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CURRENT AFFAIRS MAGAZINE

November 2025

COMPREHENSIVE PRELIMS + MAINS COVERAGE	PRACTICE QUESTIONS + MCQS	PRACTICE MAPS	MAINS VALUE ADDITION

WE COVER WHAT MATTERS

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Editor's Note to Readers...

Hello Everyone,

*Last month, we published the first issue of the CORE Monthly Magazine by UPSCprep.com. The response we received was truly beyond our expectations. It stood as a living reflection of the teaching from the Bhagavad Gita — कर्मण्येवाधिकारस्ते मा फलेषु कदाचन. Guided by this principle, our focus remained on doing our best to bring out a magazine that is **C**omprehensive, **O**bjective, **R**elevant, and strictly **E**xam-focused.*

We sincerely thank you for the overwhelming love and warm reception for our team's efforts.

*Along with the appreciation, we also received numerous requests for editions covering previous months. Keeping your requests in mind, and taking along practical considerations, we are pleased to inform you that we will be releasing **CORE Magazine issues covering current affairs from June to September 2025**.*

We hope that your current affairs preparation is progressing smoothly with the help of this magazine, and we look forward to receiving the same support and appreciation for future editions.

We would once again like to give a special shout-out to our team members Rohan sir, Anisha ma'am, Nishi ma'am, and Rishikesh sir for making this magazine a reality. Lastly, the leadership and guidance of Abhijeet sir and Shashank sir have been crucial to this endeavour.

If you have any feedback or suggestions to help us make this magazine even better, please feel free to write to us at newsletter@upscprep.com.

Regards,
Krishna Tupe
Faculty, UPSCprep.com

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POLITY & GOVERNANCE

Uniform Civil Code

Context: President Droupadi Murmu praised the Uttarakhand Assembly for becoming the first state (after Goa) to pass a comprehensive Uniform Civil Code (UCC), advancing the constitutional directive under Article 44.

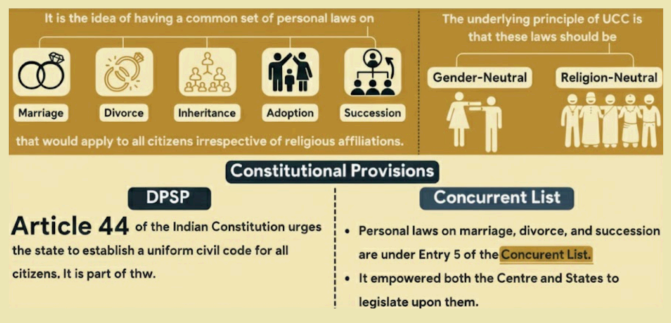


Figure 1: Uniform Civil Code

Key Provisions of the Uttarakhand UCC

- Complete ban on instant triple talaq and similar unilateral divorce practices.
- Equal inheritance and property rights for women, ensuring gender parity across communities.
- Uniform rules for marriage, divorce, maintenance, and succession for all residents of Uttarakhand (except Scheduled Tribes).
- Mandatory registration of marriages and compulsory registration of live-in relationships to prevent exploitation.
- Standardized grounds for divorce, alimony, and guardianship across religions.

Constitutional Linkage

- **Article 44 (DPSP):** Directs the State to work toward securing a Uniform Civil Code for all citizens.
- Reflects the constitutional vision of legal uniformity and secular governance in civil matters.

Significance

- Promotes gender justice, especially for women facing discrimination in personal laws.
- Reduces religion-based inequality in civil and family matters.
- Strengthens national integration by introducing uniformity in civil laws.

Advantages

- **Gender Equality:** Removes discriminatory provisions in personal laws and offers equal rights in marriage, divorce, and inheritance.
- **National Integration:** Moves toward "one nation, one civil law," fostering unity in civil matters.
- **Strengthens Secularism:** Upholds equal treatment of citizens regardless of religion.
- **Legal Uniformity:** Simplifies India's complex personal law system, reducing confusion and litigation.
- **Progressive Legal Reform**: Aligns civil laws with contemporary democratic and global legal standards.

Challenges / Criticisms

- **Cultural and Religious Sensitivities:** Concerns about interference with religious customs and traditions.
- **Federal Challenges:** Personal laws are in the Concurrent List, raising coordination issues between Centre and states.
- **Minority Fears:** Apprehensions of majoritarian imposition or dilution of community identity.
- **Implementation Complexity:** Harmonizing diverse practices across religions is difficult and time intensive.
- **Political Polarization:** Risk of debates shifting from gender justice to political agendas.

Way Forward

- Gradual implementation through consensus and awareness-building.
- Codification of personal laws before creating uniformity.
- Consultations with religious leaders, legal experts, and women's groups.
- Encouraging gender-just reforms within communities.
- Pilot adoption by more states to test and refine the framework.

Conclusion

Uttarakhand's UCC marks a major step toward legal equality and uniformity in civil matters. Its long-term success will depend on inclusive dialogue, careful implementation, and respect for India's social diversity.

Supreme Court on Assent to State Bills

Context: In its opinion on the 16th Presidential Reference, the Supreme Court refused to prescribe fixed timelines for Governors or the President while granting assent to State Bills — a decision widely viewed as strengthening executive discretion and weakening India's federal structure.

Supreme Court Ruling

- **No Fixed Timelines:** The Court held it cannot impose a uniform timetable for assent, as doing so would encroach on constitutional discretion.
- **No Deemed Assent:** SC cannot presume automatic assent through legal fiction. Article 142 cannot be used to compel assent.

- **Governor's Conduct:** Governors cannot indulge in prolonged or evasive inaction, but the Court left "reasonable delay" undefined.

Process if Assent Withheld:

- Bill must be returned to the State Legislature (except Money Bills).
- Even after re-passage, the Governor may reserve it for the President, extending the process indefinitely.

President's Role

- Under Article 201, the President may give or withhold assent.
- Not mandated to consult the Supreme Court or give reasons.
- No constitutional time limit.

Limited Mandamus: SC may intervene only in cases of extraordinary, unjustified delay, but cannot set a timeline framework.

Constitutional Framework on Assent

1. **Article 200 – Governor's Options**
   When a Bill is passed by the State Legislature, the Governor may:
   - Give assent
   - Withhold assent
   - Return the Bill (except Money Bills)
   - Reserve it for the President's consideration
2. **Article 201 – President's Powers**
   When a Bill is reserved:
   - President may grant or withhold assent
   - No time limits are prescribed in the Constitution

Static Principle: Separation of Powers

- **Article 50** mandates separation of judiciary and executive.
- SC held that prescribing timelines would amount to judicial overreach and interfere with executive discretion.
- However, critics argue that unchecked delays undermine democratic accountability, as elected legislatures remain powerless.

Federalism and the Governor's Role

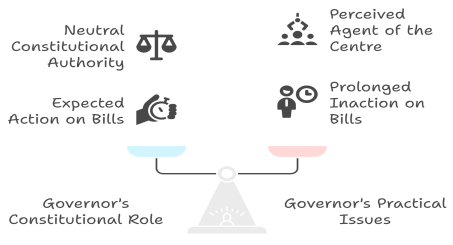


Figure 2: Balancing Constitutional Duties with Practical Challenges

Effect of the Verdict

- Strengthens Governor's discretionary power
- Weakens the supremacy of State Legislatures, even after a Bill is re-passed
- Seen as legitimising the Governor's ability to delay or stall State laws
- Enhances Centre's influence over State policymaking

Implications for Indian Federalism

- Empowers Governors at the expense of elected State Assemblies
- Undermines the finality of the second passage by the Legislature
- Leaves States with no effective remedy against arbitrary delay
- Enables indirect central control over State law-making through the Governor and President
- Viewed as contrary to the spirit of cooperative federalism

Conclusion

By refusing to set timelines, the Supreme Court has preserved executive discretion but widened the scope for delay, deepening tensions in Centre–State relations and raising significant concerns for Indian federalism.

Digital Personal Data Protection Laws

Context: The Digital Personal Data Protection (DPDP) Act, 2023 and the DPDP Rules, 2025 establish India's data protection regime, but concerns remain over delayed implementation of protections and the immediate weakening of RTI safeguards.

DPDP Act, 2023 – Key Provisions

Core Protections

- Access control, encryption, and security audits for Significant Data Fiduciaries (SDFs).
- Mandatory informed consent from data principals.
- Right to erase or modify personal data.
- Automatic deletion of data after defined inactivity.
- Appointment of Data Protection Officer (DPO) for large entities.
- Strict restrictions on child data processing.
- Creation of a Consent Manager framework.
- Mandatory data breach reporting obligations.

Objective: Provide Indian citizens with rights similar to global standards (GDPR EU, PDPA Singapore), ensuring privacy and accountability in data use.

DPDP Rules, 2025

- Rules notified to operationalise the Act.
- Kickstarts the formation of the Data Protection Board of India (DPBI).
- Begins laying out compliance requirements for firms.

Implementation Timeline

- Firms have up to 18 months to comply with most provisions.
- Some parts — like appointment of DPOs — to be completed within one year.
- Raises concerns that protections will be delayed, while other legal changes take effect immediately.

Controversy: RTI Dilution

- Amendment to Section 8(1)(j) of the RTI Act, 2005 implemented immediately.
- Expands "personal information" exemption.
- Allows greater government discretion to deny information even when public interest is involved.
- Critics argue it restricts transparency and weakens citizens' ability to hold authorities accountable.

Key Criticisms

- Delays in core data protection measures despite urgent need.
- Immediate dilution of RTI rights, undermining transparency.
- DPBI lacks independence, functioning under MeitY.
- Potential avenues for misuse by state agencies and Big Tech companies.
- Fear of selective data protection instead of citizen-centric privacy.

Conclusion

India's data protection regime has begun to take shape, but staggered implementation and the weakening of RTI pose risks to transparency, accountability, and citizen trust.

Deepfakes and Synthetic Media

Context: The government has proposed amendments to the IT Rules, 2021 requiring Significant Social Media Intermediaries (SSMIs) to label synthetic or AI-generated media, following incidents like the Finance Minister's deepfake video.

Synthetic Media / Deepfakes

Definition: AI-created or AI-modified audio, video, or images that convincingly mimic real content.

Current Regulatory Approach (Draft IT Rules, 2021 Amendments)

- Mandatory labelling of synthetic/AI-generated media by SSMIs.
- Proposed requirement: Labels covering at least 10% of the visual area or initial duration.
- Government modified its stance due to the rapid rise and misuse of deepfakes.

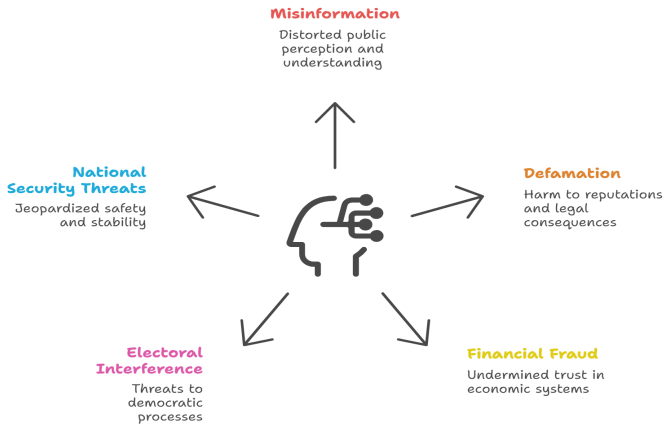


Figure 3: Risks of AI Generated Content

Challenges in Implementation

- Ambiguous Grouping: "Synthetic media" is broad; not all AI-generated content is harmful.
- Volume of Content: Over 50% of internet content is now AI-generated, making detection and labelling difficult.
- Effectiveness Issues: Labels may not be noticed; 10% rule may not deter misinformation.
- Technology Neutrality: Prescriptive rules may become obsolete as AI evolves rapidly.
- Watermarking Limitations: Watermarks can be easily removed.
- Detection Gaps: Automated tools struggle to reliably detect deepfakes; independent systems are still inconsistent.

Suggested Improvements

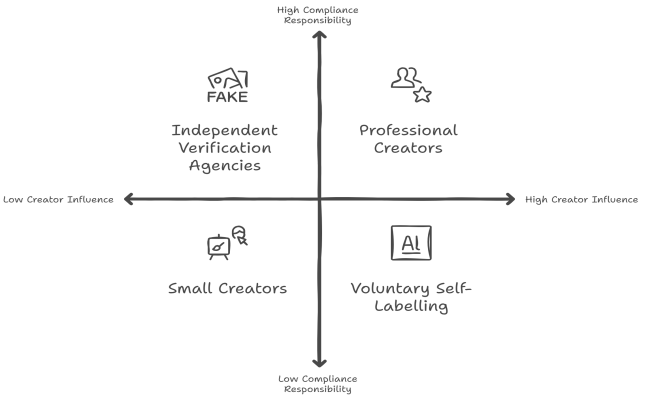


Figure 4: AI Content Labelling and Compliance

Conclusion

To effectively tackle deepfakes, India needs a balanced regulatory system combining responsible platform behaviour,

creator transparency, and independent verification mechanisms.

Tenth Schedule (Anti-Defection Law)

Context: In Padi Kaushik Reddy vs. State of Telangana, the Supreme Court criticised the Speaker's delay in deciding disqualification cases and held that the Speaker, acting as a tribunal, is not immune from judicial review.

About the Tenth Schedule (Anti-Defection Law)

Introduction

- Added by the 52nd Constitutional Amendment (1985).
- Establishes the grounds and procedures for disqualifying legislators who defect from their political parties.

Grounds for Disqualification

- Voluntarily giving up membership of the original political party.
- Voting or abstaining from voting against the party whip.
- Independent MLAs/MPs joining a political party after election.
- Nominated members joining any party after six months of taking their seat.

Exception: Party Merger: No disqualification if two-thirds of legislators support a merger with another party.

Significance of the Anti-Defection Law

- Prevents political defections induced by money, coercion, or manipulation.
- Ensures government stability by curbing the "Aaya Ram Gaya Ram" phenomenon.
- Protects voter mandate, discourages opportunistic floor-crossing.

Role of the Speaker

- The Speaker/Chairperson decides on disqualification petitions.
- Judicial criticisms arise because Speakers (often from the ruling party) sometimes delay decisions to favour political interests.
- The Supreme ourt emphasises that the Speaker's role must be neutral and time-bound.

Key Supreme Court Judgements on Anti-Defection

- **Kihoto Hollohan v. Zachillhu (1992):** Held that Speaker's disqualification orders are subject to judicial review since the Speaker functions as a tribunal.
- **Sadiq Ali v. Election Commission of India (1971):** Laid down the three-test formula for identifying the "real" political party:
    - Party's aims & objects
    - Party constitution
    - Legislative majority
- **Rajendra Singh Rana v. Swami Prasad Maurya (2007):** Speaker cannot delay disqualification proceedings indefinitely.
- **Keisham Meghachandra Singh v. Speaker, Manipur (2020):** Disqualification petitions should ideally be decided within three months, except in extraordinary circumstances.

Conclusion

The Supreme Court's warning to the Telangana Speaker reinforces the need for timely, impartial decisions under the Tenth Schedule. Delays undermine legislative integrity and weaken the purpose of the Anti-Defection Law.

SC on Tribunals Reforms Act, 2021

Context: The Supreme Court struck down key provisions of the Tribunals Reforms Act, 2021, noting they were identical to those earlier invalidated in the Madras Bar Association case. It held that these provisions violated separation of powers and undermined judicial independence.

Why the Provisions Were Struck Down

- The unconstitutional provisions related to appointments, tenure, and service conditions of tribunal members.
- The SC observed that the executive cannot dominate tribunal appointments, especially since the government is frequently a litigating party before these tribunals.
- Any such dominance compromises judicial independence.

Key Highlights of the Judgment

1. Minimum Age of 50 Years – Struck Down

- Declared arbitrary and violative of Article 14.
- Excluded many competent younger professionals from tribunal appointments.

2. Four-Year Tenure – Invalidated

- Court reinstated the earlier five-year minimum tenure to ensure stability, security of service, and institutional independence.

3. National Tribunals Commission – Directed to be Set Up

- The Court reiterated its direction to the Centre to establish a National Tribunals Commission (NTC) within four months.
- The NTC will function as an independent body responsible for:
- Overseeing tribunal appointments
- Supervising service conditions

- Managing administrative and infrastructural needs
- The SC stressed that an independent commission is essential to safeguard tribunal autonomy.

About Tribunals in India

- Tribunals are quasi-judicial bodies created to ensure specialised, efficient, and speedy adjudication in specific areas (e.g., tax, telecom, service matters).
- Part XIV-A was inserted through the 42nd Constitutional Amendment Act, 1976.
- **Constitutional Provisions**
  - **Article 323-A:** Empowers Parliament to establish administrative tribunals, primarily for service matters.
  - **Article 323-B:** Enables Parliament or State legislatures to create tribunals for subjects such as:
    - Taxation
    - Industrial disputes
    - Land reforms
    - Foreign exchange
    - Elections
    - Urban ceiling
    - Food procurement and distribution

Conclusion

By striking down restrictive provisions and ordering the creation of a National Tribunals Commission, the Supreme Court has reinforced judicial independence and ensured that tribunals remain impartial, autonomous forums for specialised adjudication.

Reforming State PSCs

Context: The Telangana State Public Service Commission (TSPSC) is hosting the 2025 national conference of State Public Service Commission (PSC) chairpersons. This comes at a time when many PSCs face controversies over paper leaks, irregular recruitments, and lack of transparency — highlighting the need for structural, procedural, and institutional reforms.

Overview of Public Service Commissions in India

- Public Service Commissions were born from India's demand for merit-based civil service recruitment during the freedom struggle.
- Government of India Act, 1935: Established PSCs in provinces.
- Post-independence: India retained this structure with UPSC at the Union level and State PSCs for each State.

Challenges and Key Reform Areas

- **Manpower Planning**
  - Create a dedicated State Ministry of Personnel for structured manpower planning.
  - Prepare a predictable recruitment calendar for all departments.
- **Appointment Reforms**
  - Constitutional amendment to fix:
    - Minimum age: 55 years
    - Maximum age: 65 years
  - Define clear eligibility criteria (experience in administration, education, judiciary).
  - Consider pre-consultation with the Leader of the Opposition for non-official members to improve neutrality.
- **Syllabus & Examination Reforms**
  - Periodic syllabus revision aligned with:
    - Evolving administrative needs
    - UPSC standards
    - Public feedback
  - Adopt:
    - Objective formats for region-specific subjects
    - Mixed objective + descriptive formats for mains
  - Improve:
    - Translation quality
    - Measures to counter misuse of AI tools in answer writing

Leadership and Supervision

- Appoint senior officers with experience in academia, testing, or educational administration to supervise exams.
- Adopt UPSC's model of combining transparency + confidentiality, e.g., Strict paper-setting norms, Multi-layered moderation and Secure printing and transport

How UPSC Differs from State PSCs

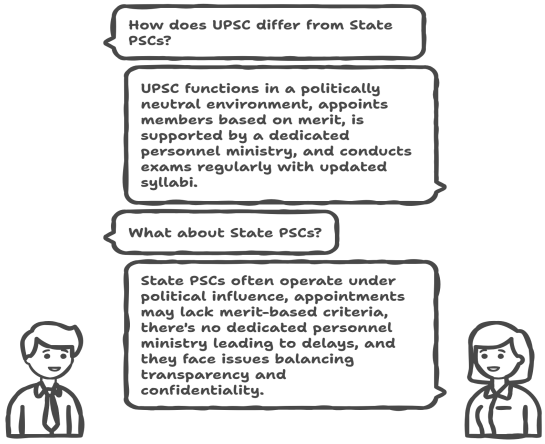


Figure 5: UPSC vs State PCS

Conclusion

Reforming State PSCs through stronger appointments, structured manpower planning, updated exams, and professional leadership is essential to restore public trust and achieve UPSC-level credibility across all States.

AI & Personality Rights

Context: Actors Abhishek Bachchan and Aishwarya Rai Bachchan recently filed a lawsuit alleging that AI-generated videos depicting them in false scenarios violate their personality rights. The case highlights growing legal and ethical challenges surrounding deepfakes and AI-manipulated content in India.

What Are Personality Rights?

Personality rights refer to an individual's exclusive control over the commercial and public use of their identity, including:

- Name
- Image and likeness
- Voice
- Signature styles, gestures, behaviour
- Any uniquely identifiable attributes

AI and Personality Rights: Key Concerns

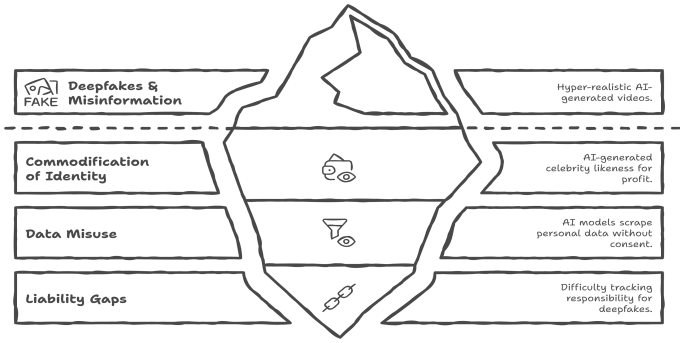


Figure 6: AI's Hidden Ethical Challenges

Legal Basis in India

- Although India lacks a dedicated personality rights statute, protection arises from:
- Common Law – passing off, defamation, misappropriation
- Article 21 (Right to Privacy) – recognition of identity autonomy

Intellectual Property Laws

- IT Act, 2000 + 2024 IT Intermediary Guidelines: Acts against impersonation, deepfakes
- Copyright Act, 1957: Protects performers, gives control over reproduction and distortion
- Trade Marks Act, 1999: Allows registration of names, signatures, expressions as trademarks

Judicial Precedents

- **Anil Kapoor Case (2023):** Delhi High Court banned unauthorized AI-generated replication of Kapoor's identity.
- **Arijit Singh Case (2024):** Court protected the singer's voice from AI cloning. Courts have held AI misuse as a violation of privacy, publicity rights, and intellectual property.

Conclusion

The rise of AI and deepfake technologies demands clearer statutory frameworks and stronger regulatory safeguards to protect personality rights, ensuring individual identity is not misused, monetised, or manipulated without consent.

Upholding Fundamental Duties

Context: On Constitution Day, the Prime Minister urged citizens to uphold Fundamental Duties and actively contribute to strengthening India's democratic framework. The appeal highlights the need to balance rights with responsibilities in a rapidly transforming society.

Constitutional Status of Fundamental Duties

- **Constitutional Provision**
  - Listed under Article 51A, Part IVA of the Constitution.
  - Inserted by the 42nd Constitutional Amendment Act, 1976.
- **Committee Recommendation:** Introduced based on the recommendations of the Swaran Singh Committee (1976).
- **Amendments**
  - Initially 10 duties.
  - The 86th Constitutional Amendment Act, 2002 added the 11th duty:
  - To provide opportunities for education to children between 6–14 years
- **Purpose**
  - To outline citizens' moral obligations.
  - Promote patriotism, unity, and integrity of India.
  - Strengthen democratic culture and social responsibility.
- **Nature**
  - Non-justiciable → Courts cannot enforce them.
  - However, they remain critical for governance and civic morality.

Relationship Between Rights and Duties

- **Complementary Nature:** Rights and duties are interdependent — one cannot exist meaningfully without the other.
- **Balance in Democracy:** Duties prevent the misuse of rights and ensure that individual liberty does not violate the rights of others.

Moral Linkage

Duties promote:

- Discipline
- Respect for institutions
- Protection of constitutional values
- Sustainable Rights

- Rights remain meaningful only when citizens uphold their duties, forming the foundation of a stable democratic order.

Philosophical Foundations of a Duty-Centric Ethic

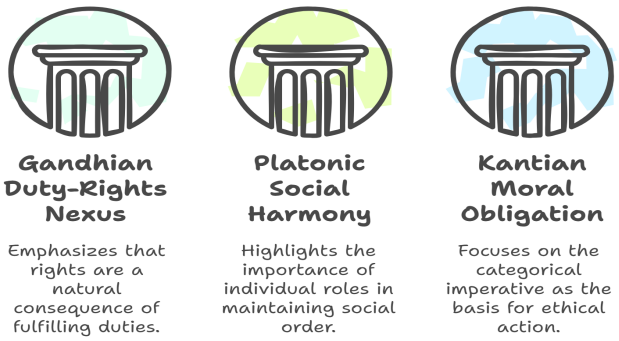


Figure 7: Ethical Foundations of Duty

Conclusion

The PM's call highlights that constitutional values flourish only when citizens balance their rights with responsible performance of Fundamental Duties, creating a harmonious, just, and resilient democracy.

Trilemma of Digital Governance

Context: As global power shifts from oil to data, India faces a strategic trilemma in digital governance:

- Digital Ascendancy (accepting foreign dominance),
- Digital Capitulation (ceding autonomy for commercial gain), or
- Genuine Digital Sovereignty (self-reliant and secure digital governance).

Why India Is Being Pushed Toward Digital Sovereignty

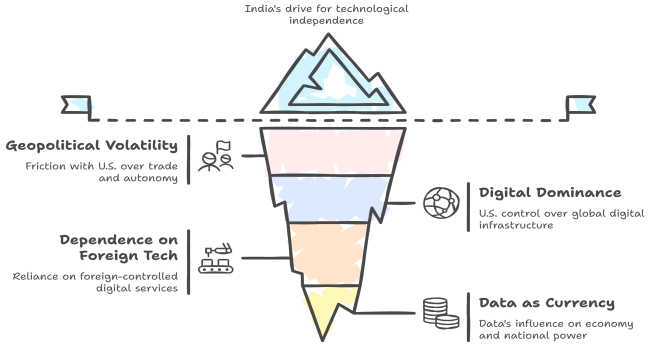


Figure 8: India's Tech Self Reliance: Unveiling the Underlying Motivations

- **Geopolitical Volatility**

  India–U.S. friction over:

  - Trade and tariff disputes
  - Russian oil imports
  - Regional geopolitical autonomy

These uncertainties incentivize tech self-reliance for national resilience.

- **Global Digital Dominance**

  The U.S.-led digital order controls:

  - Global data flows
  - Internet infrastructure
  - Global financial systems like SWIFT

This digital infrastructure has been weaponized against nations like Iran and Russia, signalling potential risks for India as well.

- **Dependence on Foreign Tech Providers:** Example: Microsoft abruptly suspending services to Nayara Energy due to EU sanctions revealed how foreign-controlled digital services can undermine India's strategic autonomy.
- **Data as Strategic Currency:** In the digital age, data equals national power — influencing economy, security, and global influence more than traditional resources.

Pathways to Achieve Digital Sovereignty in India

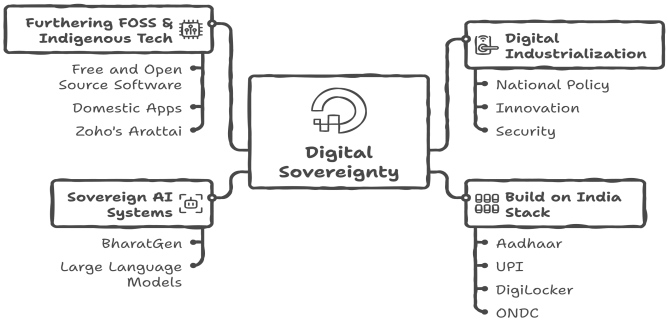


Figure 9: India's Digital Sovereignty and Industrialization

Digital Sovereignty

Definition: Creating laws, regulations, and infrastructure that guarantee India's sovereign control over:

- Data flows,
- Digital platforms,
- AI ecosystems,
- National digital space.

Example: Digital Personal Data Protection (DPDP) Act.

- **Digital Industrialization:** Instead of China's strict exclusion model, India needs a national digital industrialization policy, balancing innovation and security.
- **Build on India Stack**
  Strengthen Digital Public Infrastructure (DPI):
  - Aadhaar
  - UPI
  - DigiLocker

- ONDC

These reduce reliance on foreign private platforms.

- **Sovereign AI Systems:** Initiatives like BharatGen aim to build India-owned large language models and AI infrastructure.
- **Furthering FOSS & Indigenous Tech**
  - Promote Free and Open Source Software to reduce licensing dependence.
  - Encourage domestic apps and platforms (e.g., Arattai by Zoho) to replace foreign alternatives in sensitive sectors.

Challenges on the Path to Digital Sovereignty

- **Risk of Digital Capitulation**
  - India must avoid Free Trade Agreements (FTAs) requiring:
  - Mandatory non-discrimination of foreign digital services
  - Restrictions on data localization
  - Indonesia and Malaysia have already traded sovereignty for commercial incentives — a cautionary example.
- **Foreign Investment vs Sovereignty Tension:** Example: Google's $15 billion AI hub in India brings investment but also risks of dependency, surveillance, and external influence.
- **Failure of Domestic Alternatives:** Koo failed to replace X (Twitter) despite government support — showing the difficulty of building scalable Indian platforms.
- **Privacy vs Secrecy Dilemma**
  Domestic tech solutions must maintain:
  - Strong privacy protections
  - Transparency
  - Example: Zoho's Arattai raised concerns where privacy assurances blurred with secrecy, highlighting need for robust regulatory oversight.

Conclusion

India must navigate carefully to achieve genuine digital sovereignty — balancing innovation with autonomy, leveraging foreign investment without dependence, and building indigenous digital capabilities while safeguarding democratic values.

Electoral Nomination Process Reforms

Context: India's electoral nomination process has long faced scrutiny for allowing procedural technicalities to disqualify candidates — often without adequate review or opportunity for correction. This undermines electoral fairness and restricts voter choice, warranting urgent reforms.

Current Issues in the Nomination Process

- **Excessive Discretion with Returning Officers (ROs)**
  - Under Section 36 of the Representation of the People Act (1951), ROs can reject nominations on technical grounds.
  - Lack of clear guidelines on what constitutes a "defect of a substantial character" creates room for arbitrary or politically influenced decision-making.
- **Supreme Court–Mandated Affidavit Requirements**
  - Detailed affidavits (criminal record, assets, liabilities, education) ensure transparency but have made nominations more complex, increasing the chances of rejection over technicalities.

Common Procedural Traps

- **The Oath Trap:** Candidates must take an oath at a specific time and location. Any deviation → nomination rejected.
- **The Treasury Trap:** Incorrectly timed or improperly formatted security deposits lead to disqualification.
- **The Notarisation Trap:** Missing or incorrect notarization on affidavits results in rejection.
- **The Certificate Trap:** No-dues and clearance certificates require coordination across multiple offices. Any delay from issuing authorities may cost candidates their nomination.

Comparative International Practices

- **United Kingdom:** ROs assist candidates in correcting paperwork before deadlines.
- **Canada:** 48-hour window to rectify nomination errors.
- **Germany**: Written notifications plus time for corrections; multi-layered appeals process.
- **Australia:** Encourages early filing to allow checking and correcting documents.

Proposed Reforms

- **Restructure RO's Role: From Discretion to Duty**
  Mandatory written notice of errors.
  - 48-hour correction period before rejection.
- **Categorise Defects for Fairness**
  - Category 1: Technical / paperwork errors → should not trigger rejection.
  - Category 2: Verification issues → investigate before rejecting.
  - Category 3: Constitutional or statutory disqualifications → immediate rejection.
- **Digital-by-Default Nomination System**
  - Reduce paperwork errors.
  - Track submission status seamlessly.
  - Ensure uniformity across states.
- **Public Dashboards**
  - Real-time display of nomination progress.
  - Enhances transparency, reduces scope for manipulation.

Conclusion

India's current nomination process is prone to misuse and exclusion. Adopting transparent, tech-enabled, and correction-friendly reforms can strengthen electoral fairness, protect the right to contest, and uphold voters' choice, thereby reinforcing democracy.

Constitution Day (26 November)

Context: India observes **Constitution Day (Samvidhan Divas)** on **26 November** to commemorate the adoption of the Constitution in 1949. The occasion has renewed focus on constitutional values amid debates on institutional autonomy, rights, duties, and democratic conduct.

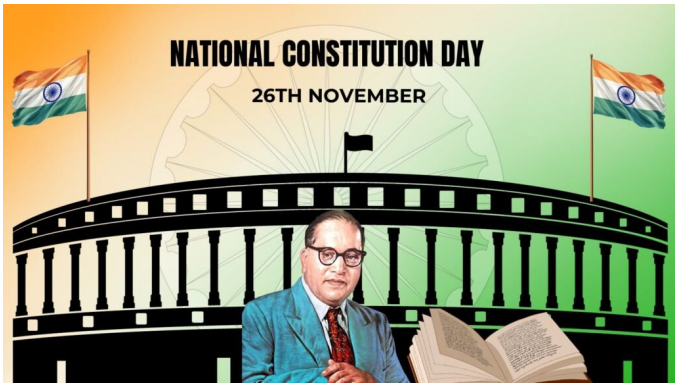


Figure 10: National Constitution Day| Source: LawChakra

Constitutional Background

- **26 November 1949**: Constitution adopted
- **26 January 1950**: Constitution came into force
- Constitution Day formally notified in **2015** to promote constitutional awareness.

Core Constitutional Values

- **Sovereignty, Socialism, Secularism, Democracy, Republic** (Preamble)
- **Justice** (social, economic, political)
- **Liberty** (thought, expression, belief)
- **Equality** (status and opportunity)
- **Fraternity** (unity and dignity)

Constitutional Significance

- The Constitution acts as a **living document**, evolving through judicial interpretation.
- It balances **individual rights and collective governance**.
- Serves as the foundational framework for:
    - Fundamental Rights (Part III)
    - Directive Principles (Part IV)
    - Federal governance and separation of powers

Contemporary Relevance

- Rising debates on constitutional morality, federalism, and civil liberties.
- Judicial emphasis on **constitutional values over majoritarian impulses** (e.g., *Navtej Johar, Puttaswamy judgments*).
- Importance of constitutional literacy in democratic participation.

Challenges

- Selective invocation of constitutional values.
- Weak enforcement of constitutional ethics in public life.
- Declining respect for dissent and institutional checks.

Way Forward

- Constitutional education beyond symbolic observance.
- Strengthening institutions as guardians of the Constitution.
- Public discourse anchored in constitutional morality.

Conclusion

Constitution Day is not ceremonial; it is a reminder that India's democracy survives not merely on elections, but on **constitutional discipline and values**.

Legal Aid Mechanism

Context: Access to justice remains uneven in India, particularly for economically and socially vulnerable sections. Recent judicial observations and policy discussions have renewed focus on strengthening the **legal aid system**.

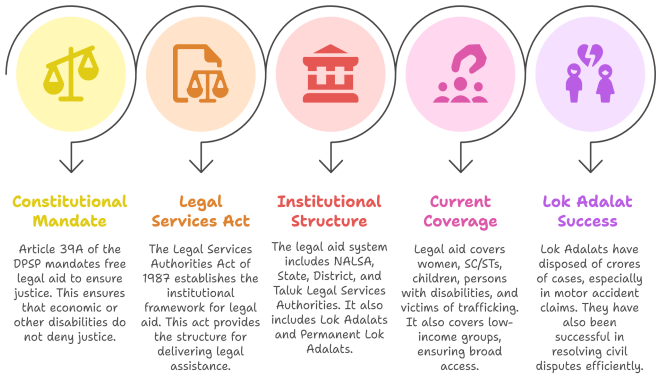


Figure 11: Legal Aid Framework

Constitutional & Legal Framework

- **Article 39A (DPSP):** Mandates free legal aid to ensure justice is not denied due to economic or other disabilities.
- **Legal Services Authorities Act, 1987:** Establishes institutional framework for legal aid.

Institutional Structure

- National Legal Services Authority (NALSA)

- State, District, and Taluk Legal Services Authorities
- Lok Adalats and Permanent Lok Adalats

Current Status

- Legal aid covers women, SC/STs, children, persons with disabilities, victims of trafficking, and low-income groups.
- Lok Adalats have disposed of crores of cases, especially in motor accident claims and civil disputes.

Key Challenges

- Low awareness among beneficiaries.
- Inadequate quality and motivation of legal aid lawyers.
- Limited use of technology and regional language barriers.
- Urban–rural disparity in access.

Recent Developments

- Push for **e-Lok Adalats** and digital legal services.
- Judicial emphasis on making legal aid "meaningful, not symbolic."

Way Forward

- Professionalise legal aid services through better remuneration and training.
- Use technology for outreach, legal awareness, and case tracking.
- Integrate legal aid with grassroots institutions and civil society organizations.

Conclusion

Legal aid is integral to **substantive equality before law**. Strengthening it is essential for transforming constitutional promise into lived reality.

National Social Assistance Programme

Context: The **National Social Assistance Programme (NSAP)** continues to be a key pillar of India's social security framework, especially for the elderly, widows, and persons with disabilities belonging to poor households.

Overview

- Launched in **1995**.
- Centrally Sponsored Scheme under the **Ministry of Rural Development**.
- Implements **Article 41** (Right to public assistance).

Major Components

- Indira Gandhi National Old Age Pension Scheme (IGNOAPS)
- Indira Gandhi National Widow Pension Scheme (IGNWPS)
- Indira Gandhi National Disability Pension Scheme (IGNDPS)
- National Family Benefit Scheme (NFBS)

Significance

- Provides minimum income security to vulnerable populations.
- Acts as a safety net in the absence of universal social security.
- Supports dignity and subsistence among elderly and marginalised groups.

Key Issues

- Low pension amounts not indexed to inflation.
- Exclusion errors due to outdated BPL criteria.
- Delays in payments and Aadhaar-related issues.
- Inter-state variation in coverage and top-ups.

Way Forward

- Update beneficiary identification using dynamic socio-economic data.
- Enhance pension amounts and link them to inflation.
- Improve portability and grievance redressal mechanisms.
- Move towards universal or quasi-universal social pensions.

Conclusion

NSAP remains crucial for inclusive governance but requires **reforms in coverage, adequacy, and delivery** to meet contemporary social security needs.

International IDEA

Context: The **International Institute for Democracy and Electoral Assistance (International IDEA)** continues to play a significant role in promoting democratic governance globally, particularly in electoral processes and institutional capacity-building.

About International IDEA

- Intergovernmental organisation established in **1995**.
- Headquarters: **Stockholm, Sweden**.
- India is a **member state**.

Mandate

- Support sustainable democratic institutions.
- Strengthen electoral processes.
- Promote inclusive participation and constitutional design.

Key Areas of Work

- Electoral management and integrity.
- Political party systems.
- Constitution-building processes.
- Democracy assessments and indices.

Relevance for India

- IDEA's frameworks inform debates on:
  - Electoral reforms
  - Democratic backsliding
  - Institutional accountability
- Provides comparative global best practices.

Challenges

- Shrinking democratic spaces globally.
- Rise of authoritarian tendencies.
- Politicisation of electoral institutions.

Way Forward

- Use IDEA's analytical tools to inform domestic electoral reforms.
- Strengthen cooperation on election management and transparency.
- Promote democratic norms in foreign policy engagements.

Conclusion

International IDEA remains a vital institution for reinforcing democratic governance in an era of growing global democratic stress.

WORLD AFFAIRS

The High Seas Treaty (BBNJ)

Figure 12: UN High Sea Treaty

Context: The High Seas Treaty—officially the BBNJ Agreement—has now been ratified by over 60 countries and will formally come into force in January 2026, marking a major milestone in global ocean governance.

Formal Name: Biodiversity Beyond National Jurisdiction (BBNJ) Agreement

Objective:

- Establish an inclusive global framework for governing and managing marine biodiversity in areas beyond national jurisdiction.
- Ensure sustainable use and conservation of high-seas biodiversity.
- Address major threats such as climate change, overfishing, habitat loss, and pollution.

Key Pillars of the High Seas Treaty

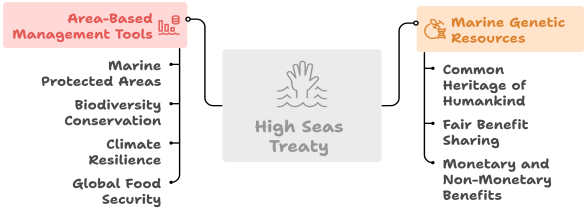


Figure 13: Key Pillars of the High Sea Treaty

Environmental Impact Assessments (EIAs)

- Requires states to conduct EIAs for activities that may impact high-sea ecosystems.
- Considers cumulative, long-term, and transboundary impacts.
- Promotes transparency through public access to environmental assessment reports.

Capacity Building & Technology Transfer

- Encourages global cooperation to enhance scientific research and marine capabilities.
- Ensures developing countries receive access to technology, training, and data.
- Supports equitable participation in conservation and sustainable ocean resource use.

Origin

- Initiated by the UN General Assembly in 2004 to address gaps in the UNCLOS (1982) regime regarding marine biodiversity beyond national jurisdiction.
- Agreement was finalized in March 2023 and formally adopted in June 2023 after years of negotiations.

Major Challenges

- **Ambiguity of Principles**
  Persistent tension between:
  - Common Heritage of Humankind → supports equitable benefit-sharing.
  - Freedom of the High Seas → supports open access and exploitation.
  - Partial application to MGRs creates governance uncertainties.
- **MGRs Governance Issues**
  - No clear, legally binding mechanism for monetary or non-monetary benefit sharing.
  - Raises fears of "biopiracy", especially for data-rich and technologically advanced countries accessing resources first.
- **Reluctance of Big Powers**
  - Major powers like the United States, China, and Russia have not ratified the treaty.
  - Weakens global legitimacy and reduces enforcement potential.
- **Overlaps with Multilateral Institutions**
  - Possible friction with bodies such as:
  - International Seabed Authority (ISA)
  - Regional Fisheries Management Organizations (RFMOs)
  - Risks fragmented ocean governance and duplication of mandates.

Way Forward

- Develop dynamic, science-based management for MPAs with continuous monitoring.
- Integrate climate–biodiversity–ocean linkages for stronger ecosystem resilience.
- Establish clearer rules for MGR benefit-sharing, aligning with the common heritage principle.
- Strengthen cooperation among global institutions to avoid governance overlap.

Conclusion

The High Seas Treaty represents a historic step toward protecting marine biodiversity beyond national borders. Its effectiveness will depend on clear governance rules, stronger cooperation, and widespread participation from all major global powers.

India–Qatar Relations

Context: External Affairs Minister S. Jaishankar met Qatar's leadership to discuss cooperation in energy, trade, investment, and security ahead of upcoming SCO engagements.

Figure 14: Prime Minister Narendra Modi and Emir of the State of Qatar, Sheikh Tamim Bin Hamad Al-Thani | ORF

Areas of Convergence

- **Energy Security:** Qatar supplies nearly 40% of India's LNG imports through long-term contracts.
- **Robust Trade Partnership:** Bilateral trade worth USD 14–15 billion, dominated by LNG, LPG, petrochemicals, and fertilisers.
- **Indian Diaspora:** Over 7 lakh Indians reside in Qatar, crucial to its construction, hospitality, and service sectors.
- **Defence & Maritime Cooperation:** Joint naval exercises such as Zair-Al-Bahr. Coordination on counter-piracy and maritime safety in the Gulf.
- **Shared Regional Interests:** Stability in the Gulf, counterterrorism cooperation, and secure sea routes.

Areas of Divergence

- **Qatar's Ties with Iran & Hamas:** Sometimes diverge from India's partnerships with Israel, Saudi Arabia, and the U.S.
- **Labor Rights Concerns:** Reports of unsafe working conditions and wage issues for Indian workers, particularly during mega projects.
- **Overdependence on Energy Trade:** Limits diversification into manufacturing, technology, and services.
- **Intra-GCC Tensions:** Past Qatar blockade complicated India's diplomatic balancing act in West Asia.
- **Restricted Market Access:** Indian SMEs face barriers in Qatar's market and regulatory ecosystem.

Way Forward / Solutions

- **Diversify Economic Cooperation:** Expand into renewables, agri-tech, fintech, logistics, aviation, and digital services.
- **Institutionalize Strategic Dialogue:** Establish a 2+2 ministerial framework for structured engagement.
- **Strengthen Labour Protection:** Use digital grievance systems, MoUs, and oversight mechanisms to protect Indian workers.
- **Promote Qatari Investments in India:** Encourage investments in infrastructure, green hydrogen, ports, and data centres.
- **Enhance Maritime Security Collaboration:** Scale joint exercises, naval exchanges, and cooperation in the Indian Ocean and Gulf regions.

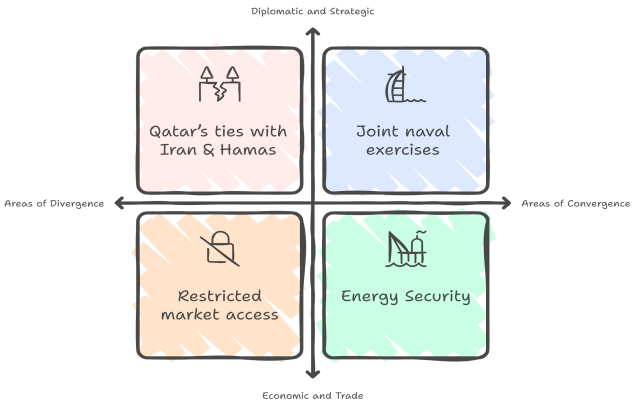


Figure 15: India- Qatar Bilateral Relations

Conclusion

India–Qatar relations remain strategically strong, but deeper engagement, sectoral diversification, and worker protection mechanisms are crucial for a more balanced and resilient partnership.

US HIRE Act: Impact on India

Context: The proposed US "Halting International Relocation of Employment (HIRE) Act" aims to impose a 25% tax on outsourcing payments, posing significant risks for India's IT, BPO, consulting, and Global Capability Centre (GCC) industries.

HIRE Bill – Provisions & Impact

- **Proposed Legislation:** Halting International Relocation of Employment (HIRE) Act, introduced in the US Senate.
- **Key Provision:** Imposes a 25% tax on any American person or company making an outsourcing payment to a foreign entity.
- **Target:** Designed to deter US companies from outsourcing jobs or relocating employment overseas.

Impact on India

- **Services Sector:** Directly affects India's IT services, BPO, consulting, and GCCs, which rely heavily on outsourcing contracts from US companies.
- **Economic Consequences:** Could severely affect foreign exchange inflows, IT export revenues, and employment.
- **Competitiveness:** Raises outsourcing costs for US firms, making Indian service providers less competitive compared to domestic or alternative markets.
- **Investment Sentiment:** Could discourage US companies from expanding or sustaining operations, including technology centers and GCCs in India.

India's Services Sector Context

- **Major Contributor to Economy:** IT and IT-enabled services are vital contributors to GDP, exports, and high-skilled employment in India.
- **US as Largest Market:** The US accounts for nearly 60% of India's software export revenue, making Indian firms particularly vulnerable.
- **Role of GCCs:** India hosts thousands of Global Capability Centres providing R&D, analytics, engineering, and operations support for multinational corporations. A 25% outsourcing tax would increase operating costs and threaten future GCC expansion.

Way Forward / Strategic Response

- **Diplomatic Engagement:** Use bilateral platforms like the India–US Trade Policy Forum and multilateral forums like the WTO to seek exemptions or negotiate safeguards for genuine service exports.
- **Diversify Export Markets:** Strengthen market presence in Europe, Asia-Pacific, Latin America, and Africa to reduce dependence on the US.
- **Move Up the Value Chain:** Promote high-value services like AI/ML-based solutions, cybersecurity, cloud services, product engineering, and consulting to reduce vulnerability to cost-focused outsourcing restrictions.

Conclusion

The HIRE Act presents a serious external risk to India's services-led economy. Proactive diplomacy, diversification, and upgrading to higher-value digital services are essential to safeguard India's long-term competitiveness.

U.S. to Resume Nuclear Weapons Testing

Context: The United States has ordered the resumption of nuclear weapons testing, ending a three-decade moratorium. This move comes despite global norms established by the Comprehensive Nuclear-Test-Ban Treaty (CTBT), and raises serious concerns about arms race escalation and erosion of global non-proliferation efforts.

Why the Decision Matters

- Break from 33 years of restraint: The U.S. last conducted a full-scale nuclear test in 1992.
- Although the U.S. signed the CTBT, it never ratified it, allowing legal room to restart testing.

Global Implications

1. **Weakening of Global Disarmament Norms**
   - The CTBT created a near-universal global norm against nuclear testing.
   - The U.S. decision risks dismantling this norm and may encourage other nuclear powers to follow suit.
2. **Possibility of a New Nuclear Arms Race**
   - Major powers like Russia and China may resume tests to modernise or expand their arsenals.
   - Countries with fewer past tests could gain technical advantage by conducting new ones.
3. **Heightened Geopolitical Instability**
   - Renewed testing undermines existing arms control frameworks (e.g., New START).
   - Could complicate diplomatic engagement and deepen global mistrust.
4. **Environmental & Human Security Concerns**
   - Nuclear tests historically led to radiation exposure, health crises, and long-term environmental damage.
   - Communities near test sites face renewed risk.

Implications for India

- India may need to re-evaluate its nuclear deterrence posture, particularly if regional adversaries also resume tests.
- Undermines global disarmament goals India has consistently supported.
- Increases pressure on India to upgrade its strategic capabilities amid shifting global power equations.

Conclusion

The U.S. decision to resume nuclear weapons testing marks a major setback for global arms control. It risks triggering a new nuclear arms race, weakening non-proliferation norms, and escalating geopolitical tensions—making renewed international diplomacy and commitment to nuclear restraint more crucial than ever.

Indo-Pacific Regional Dialogue 2025

Context: The Indian Navy hosted the Indo-Pacific Regional Dialogue (IPRD) 2025 in New Delhi, bringing together over 30 countries to discuss maritime security, regional cooperation, and blue economy priorities in the Indo-Pacific.

India's Stakes in the Indo-Pacific

- **Maritime Security:** Over 95% of India's trade by volume moves through the Indian Ocean. Strategic doctrines like

SAGAR and MAHASAGAR emphasise safe sea lanes, secure chokepoints, and regional stability.

- **Economic & Connectivity Opportunities:** India seeks to benefit from manufacturing diversification ("China+1") and participates in frameworks like IPEF, FTAs with Australia/UAE, and corridors such as IMEC.
- **Climate Resilience & Ocean Governance:** As IORA Chair (2025–27), India aims to promote sustainable blue economy practices, climate-resilient maritime infrastructure, and cooperative disaster management.

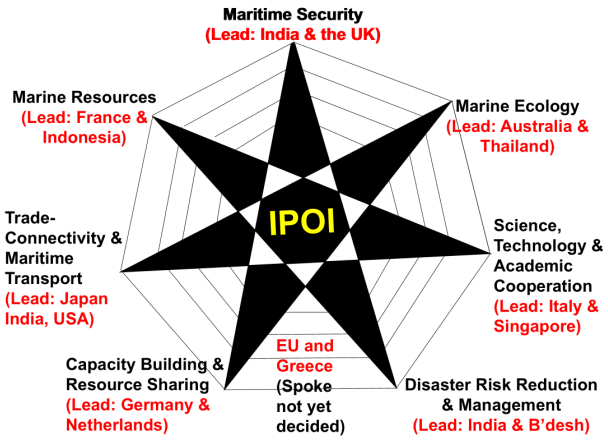


Figure 16: Aspects of IPOI

Key Challenges Highlighted at IPRD 2025

- **Great Power Rivalry:** Strategic competition, territorial disputes, and piracy increase risks to maritime trade and regional security.
- **Climate Change Threats:** Sea-level rise, coral degradation, and extreme weather disproportionately affect Indo-Pacific littorals and island nations.
- **Capability Constraints:** India's naval assets, port capacity, and deep-sea infrastructure still lag behind major powers; projects like Sagarmala and Chabahar face delays.
- **Lack of Unified Strategy:** India operates multiple frameworks (SAGAR, IPOI, Act East, IPEF) but lacks a single integrated Indo-Pacific policy for coherent strategic signalling.
- **Weak Multilateral Institutions:** Forums like IORA struggle with funding and implementation capacity.

Steps and Recommendations

- **Strengthen Legal & Security Architecture:** Expand use of the Maritime Anti-Piracy Act, 2022, improve naval logistics, enhance inter-agency coordination, and develop stronger deep-sea port infrastructure.
- **Deepen Regional Diplomacy:** Greater engagement with IORA, ASEAN, Quad, IPOI, and IONS to promote collaborative maritime security, trade facilitation, and climate governance.
- **Promote Blue Economy & Sustainability:** Focus on sustainable fisheries, ocean energy, seabed resource management, island resilience, and climate adaptation for coastal communities.
- **Improve Connectivity & Maritime Infrastructure:** Push progress on IMEC, regional shipping routes, and port-led development.
- **Move Toward a Unified Indo-Pacific Strategy:** Integrate existing initiatives into a comprehensive national Indo-Pacific doctrine for coherent foreign policy execution.

Conclusion

IPRD 2025 reaffirmed India's goal of becoming a responsible, stabilizing maritime power in the Indo-Pacific—combining security, economic growth, and sustainability through deeper collaboration and stronger institutional capacity.

BRICS Pay

Figure 17: BRICS Pay

Context: BRICS has launched BRICS Pay — a cross-border digital payment system — to reduce reliance on the Western-dominated SWIFT network and strengthen financial autonomy.

Key Points

- **Alternative Payment System:** BRICS Pay connects national platforms like UPI (India), CIPS (China), SPFS (Russia), Pix (Brazil), enabling cross-border transactions in local currencies.
- **Reducing Dollar & SWIFT Dependence**: Aims to insulate BRICS members from disruptions caused by sanctions, dollar volatility, or geopolitical pressures.
- **Boost to Local-Currency Trade:** Facilitates settlement in domestic currencies, lowering conversion costs and supporting South–South economic cooperation.
- **Financial Sovereignty:** Helps BRICS nations build an independent financial architecture, reducing vulnerability to Western-controlled networks.

Challenges

- **Technical Integration:** Different payment standards, security norms, and settlement systems make interoperability difficult.
- **Diverse National Interests:** India, China, and Russia each promote their own systems; aligning them under a unified BRICS mechanism is complex.

- **No Common Monetary Framework:** Without a shared currency or coordinated monetary policy, BRICS Pay's scale may remain limited.
- **Geopolitical Trust Deficit:** Some members fear larger economies dominating the platform; others may avoid friction with Western partners.

Conclusion

BRICS Pay is a strategic step toward financial multipolarity, aiming to expand local-currency trade and reduce dependence on SWIFT. Its success, however, hinges on technical interoperability, political cohesion, and sustained trust among member nations.

India–Latin America

Figure 18: India-Latin America Map| Source: The Diplomat

Context: India is expanding its trade and strategic engagement with Latin America, with fresh negotiation rounds concluded with Peru and Chile to deepen economic ties and diversify trade beyond traditional partners.

What's Driving the Engagement

- India–Latin America bilateral trade reached USD 35.7 billion in 2023–24, with exports crossing USD 14 billion.
- 9th round of India–Peru Trade Agreement (Nov 2025) covered goods, services, customs, and critical minerals.
- 3rd round of India–Chile CEPA negotiations concluded in October 2025 to expand market access and investment cooperation.

Strategic Gains & Opportunities

- **Trade Diversification:** Reduces India's dependence on the US, EU, and China and broadens its global economic footprint.
- **Mineral & Energy Security:** Latin America's "Lithium Triangle" (Chile, Argentina, Bolivia) holds ~75% of global lithium — critical for India's EV and renewable-energy goals.
    - India's first overseas lithium project through the **KABIL–CAMYEN agreement** marks a major milestone.
    - Brazil, Mexico, and Venezuela remain important crude oil suppliers.
- **Food Security:** Imports of edible oils, pulses, and other agri-commodities help stabilise India's domestic supply.
- **South–South Cooperation:** Enhances India's role in multipolar global governance and complements engagement through platforms like BRICS.

Challenges & Constraints

- **Concentrated Trade:** Most trade is with five key nations — Brazil, Mexico, Argentina, Chile, and Peru — leaving others under-engaged.
- **Logistical Barriers:** Long shipping distances and high freight costs limit competitiveness.
- **Chinese Dominance:** China's massive trade, investment, and infrastructure footprint in Latin America overshadows India's presence.

Way Forward

- Fast-track CEPA/PTA negotiations with multiple Latin American economies.
- Develop better logistical and maritime connectivity to reduce transport time and costs.
- Secure long-term partnerships for critical minerals and agricultural imports.
- Increase political, economic, and technological cooperation to build a strong South–South development partnership.

Conclusion

Deeper engagement with Latin America enhances India's economic resilience, strengthens mineral and food security, and offers a strategic opportunity to expand its global presence in a multipolar world.

India–Bhutan

Context: India and Bhutan recently concluded high-level engagements, inaugurating major hydropower projects and expanding cooperation across trade, connectivity, and emerging technologies.

Figure 19: India Bhutan ties

Key Areas of Cooperation

1. **Trade & Economy**
   - India is Bhutan's largest trading partner.
   - Bilateral trade has grown from around USD 484 million (2014–15) to nearly USD 1.78 billion (2024–25).
   - India remains the primary source of investment and market access for Bhutan.
2. **Hydropower & Energy**
   - Core pillar of the partnership.
   - Inauguration of the 1020 MW Punatsangchhu-II project and progress on Punatsangchhu-I.
   - India provides lines of credit and long-term power purchase agreements, ensuring Bhutan's revenue stability.
3. **Connectivity & Infrastructure**
   - Expansion of border infrastructure, check-post upgrades, and integrated trade facilities.
   - Planned cross-border rail links such as Gelephu–Kokrajhar and Samtse–Banarhat.
   - Joint work on road corridors and multimodal logistics.
4. **Development & Social Sector Cooperation**
   - India supports Bhutan's Five-Year Plans across education, health, agriculture, ICT, and urban development.
   - Key programmes include capacity building, vocational training, and rural development support.
5. **Cultural & Educational Ties**
   - Over 1,000 scholarships annually for Bhutanese students.
   - Strong collaboration through cultural exchanges, ITEC training, and the India–Bhutan Foundation.
   - Deep historical and civilizational links reinforce people-to-people bonds.
6. **New-Age Cooperation (Digital, Space, Technology)**
   - Adoption of Indian digital systems: RuPay, BHIM, digital public infrastructure.
   - Cooperation in satellite development, ground stations, STEM education, cybersecurity, and ICT modernization.

Key Challenges

- **China Factor:** Bhutan's boundary negotiations with China—especially around Doklam—have strategic implications for India.
- **Economic Dependency:** Bhutan's reliance on India for trade, energy, and aid raises concerns about diversification and long-term resilience.
- **Environmental Concerns:** Hydropower projects pose risks for downstream ecosystems, siltation patterns, and flood vulnerability in India's northeastern states.
- **Limited Sectorial Diversification:** Potential sectors like tourism, MSMEs, startups, renewable energy, and high-tech industries remain under-utilised.

Conclusion

India–Bhutan relations are shifting from an aid-driven and hydropower-centred partnership to a broader, modern, and mutually beneficial cooperation framework. Sustained progress will depend on diversification, environmental safeguards, and strategic coordination amid evolving regional geopolitics.

India–Sri Lanka Relations

Context

India and Sri Lanka are deepening cooperation across trade, connectivity, defence, and development as both countries work to stabilise the region and accelerate economic recovery.

Key Areas of Cooperation

1. **Economic & Trade Partnership**
   - India is Sri Lanka's largest trading partner and among its top investors.
   - Negotiations on ETCA have resumed to expand trade, services, technology and investment.
   - India provided critical support during Sri Lanka's 2022 economic crisis through credit lines, fuel assistance and humanitarian aid.
2. **Connectivity & People-to-People Exchanges**
   - **New initiatives:** Nagapattinam–Kankesanthurai ferry, expanded air routes, and UPI–LankaPay digital payment linkage.
   - **Strong cultural ties:** Buddhism, Tamil diaspora linkages, scholarships and academic cooperation.
3. **Defence & Security Cooperation**
   - A new 5-year Defence MoU (2025) enhances maritime surveillance, training, joint exercises (SLINEX, MITRA SHAKTI), and disaster response.
   - India supports Sri Lanka's maritime security to keep Indian Ocean sea-lanes safe.
4. **Energy & New Sectors**
   - Collaboration in renewable energy, power-grid connectivity, port development and digital technologies.
   - Indian investments growing in logistics, infrastructure, fintech and manufacturing.

Major Challenges

- **Fishermen Issue:** Persistent tensions over arrests of Indian fishermen and ecological concerns from bottom trawling.
  - Katchatheevu issue and livelihood concerns remain sensitive.
- **Chinese Presence:** China's infrastructure investments and strategic footprint in Sri Lanka (ports, logistics) pose security and influence challenges for India.
- **Economic Fragility in Sri Lanka**: Slow economic recovery affects project implementation, trade growth and financial stability.
- **Delays in Agreements:** ETCA, energy grid links, and long-term infrastructure projects face bureaucratic and political delays.

Conclusion

India–Sri Lanka ties are evolving into a modern, multi-sector partnership. Sustained progress will depend on resolving maritime disputes, ensuring balanced economic cooperation, and maintaining strategic trust amid regional geopolitical shifts.

India–Africa Relations

Figure 20: India- Africa Map| Source: Vivekananda International Foundation

Context: India is renewing its engagement with Africa to strengthen South–South cooperation, enhance trade, and deepen strategic and developmental partnerships.

Key Areas of Cooperation

1. **Trade & Investment**
   - India–Africa trade has crossed **USD 100 billion**.
   - India is among Africa's top investors in sectors such as telecom, pharmaceuticals, manufacturing, and IT.
2. **Digital & Infrastructure Cooperation**
   - African nations are adopting Indian-style digital public infrastructure — digital IDs, payment systems, and e-governance tools.
   - Indian companies are active in building transport networks, industrial corridors, power projects, and smart-city solutions.
3. **Strategic & Security Engagement**
   - Collaboration in maritime security, anti-piracy patrols, and naval capacity-building to secure the Indian Ocean sea-lanes.
   - Defence training, military exchanges, and joint exercises reinforce security ties.
4. **Development Partnerships**
   - India's Lines of Credit, grants, and capacity-building programmes (like ITEC) support African countries in education, health, agriculture, and skill development.
   - Scholarships, training, and people-to-people ties remain in central pillars.
5. **Multilateral & Global South Cooperation**
   - India and Africa align on global governance reforms (UNSC expansion, WTO issues).
   - Cooperation on climate action, sustainable development, and food and energy security.

Challenges

- **Diplomatic Gaps:** Lack of regular India–Africa Forum Summits in recent years reduces strategic momentum.
- **Implementation Issues:** Project delays, slow execution of infrastructure plans, and limited integration into value chains.
- **Rising Competition:** Strong presence of major powers (China, EU, US, Gulf countries) requires India to offer competitive and development-oriented alternatives.

Conclusion

A strengthened India–Africa partnership requires consistent engagement, faster implementation of commitments, and deeper economic and technological collaboration — shifting from episodic outreach to a long-term strategic vision.

UN Cybercrime Treaty

Context: Amid a surge in digital arrest scams and online frauds, the Supreme Court has asked the Centre to decide on ratifying the United Nations Convention against Cybercrime, the world's first universal cybercrime treaty.

About the UN CyberCrime Treaty

Overview

- The treaty is the first universal legally binding framework to regulate the collection, sharing, and use of electronic evidence across borders.
- It aims to harmonise global efforts against cybercrime and streamline international cooperation.

Criminalised Offences

- Cyber-dependent crimes: hacking, malware attacks, ransomware.
- Online financial crimes: digital fraud, identity theft, phishing.
- Online child sexual abuse material (CSAM).
- Non-consensual sharing of intimate images and other technology-enabled harassment.

Adoption & Secretariat

- Adopted: 24 December 2024 by the UN General Assembly.
- Secretariat: United Nations Office on Drugs and Crime (UNODC).

Conclusion

The treaty provides a global legal framework to combat rapidly evolving cyber threats. India's decision on ratification will shape its ability to coordinate internationally on cyber investigations and protect citizens from digital crimes.

SUMMITS & ORGANISATIONS

G20 Johannesburg Summit 2025

Figure 21: G20 South Africa 2025 | Source: AllAfrica

Context: The 2025 G20 Summit was held in Johannesburg, marking the first time an African country hosted the summit — spotlighting global inequalities, development concerns, and reform of international institutions.

Major Outcomes & Themes

1. **Emphasis on Global South Priorities**
   - Agenda focused on debt relief, climate justice, sustainable infrastructure, and development finance — reflecting the concerns of emerging and developing economies.
   - Strong call for reform of global governance institutions to better represent the Global South.
2. **Climate & Energy Commitments**
   - Pledge to scale up climate financing for developing countries and support sustainable, low-carbon transitions.
   - Agreement to balance climate mitigation with development needs, especially in least-developed and middle-income nations.
3. **Food, Fertilizer & Nutrition Security**
   - Commitment to stabilize global food and fertilizer supply chains.
   - Focus on affordable food access, agricultural resilience, and support for vulnerable populations.
4. **Digital Governance & Global Health**
   - Agreement to cooperate on global digital infrastructure, data governance, and equitable access to technology.
   - Commitment to strengthen global health architecture, prepare for pandemics, and ensure fair vaccine and medical access.
5. **Debt and Development Finance**
   - Consensus on debt restructuring and relief for highly indebted developing countries.
   - Proposal for a New Collective Quantified Financing Goal to mobilize resources for climate, infrastructure, health, and development.

India's Role & Gains

- India emphasized Global South solidarity, equitable climate action, and voice for emerging economies in global governance.
- Strengthened partnerships across Africa — aligning with India's Indo-Pacific and Neighborhood First policies.
- Positioned as a leader advocating development-friendly climate and financial policies for emerging economies.

Conclusion

G20 Johannesburg 2025 reoriented global priorities toward development, equity, and inclusive growth. Its success will depend on follow-through on financing, reforms, and meaningful delivery for Global South nations.

IMO Council

Context: India has been re-elected to the International Maritime Organization (IMO) Council for the 2026–27 term, securing the highest votes, reflecting strong global support for its maritime leadership.

Key Points

1. **Importance of the Re-election**
   - Reinforces India's role as a major maritime nation and a key voice for the Global South.
   - Strengthens India's influence in decisions on maritime safety, ship regulation, and pollution control.
2. **Strategic Benefits**
   - Supports India's vision under SAGAR and its role as a net security provider in the Indian Ocean.
   - Enhances India's ability to shape global rules on green shipping, de-carbonisation, and port standards.
3. **Boost to Domestic Maritime Sector**
   - Alignment of global maritime norms with India's priorities on port modernisation, ship recycling, and coastal security.
   - Improves India's profile in global maritime trade and logistics governance.

Conclusion

With this re-election, India strengthens its position in global maritime governance and gains greater leverage to advance its strategic, environmental, and economic maritime interests.

World Artificial Intelligence Cooperation Organization (WAICO)

Context: At the APEC summit in South Korea, China proposed the creation of a global body — the World Artificial Intelligence Cooperation Organization (WAICO) — to shape international norms for AI governance.

About WAICO

Aim

- To establish global standards for cooperation on Artificial Intelligence.
- To offer an alternative governance model to Western (especially US-led) AI frameworks.

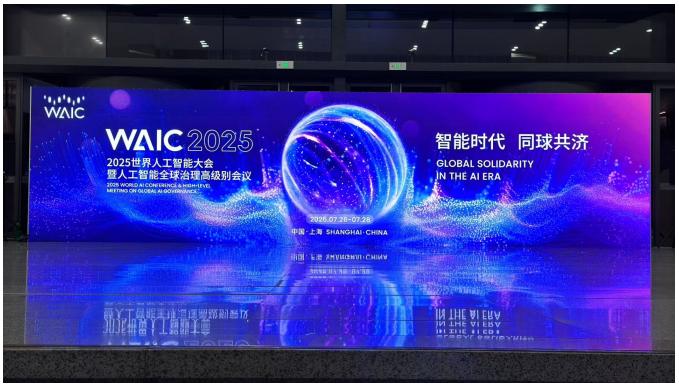


Figure 22: WAIC| Source: Pandaily

Origins & Background

- Announced at the 2025 World Artificial Intelligence Conference in Shanghai.
- Draws heavily from China's 2023 Global AI Governance Initiative, which promotes principles aligned with China's regulatory philosophy.

Key Principles

- Human-centric design: AI systems should operate in ways that directly benefit societal welfare.
- Data sovereignty: Nations retain full control over their data, aligning with China's emphasis on digital sovereignty.
- Algorithmic transparency: Encourages disclosure of algorithmic decision-making processes, though within state-defined boundaries.

Strategic Purpose

- Reimagining global AI governance to reflect multipolar norms rather than US-dominated systems.
- Expanding China's soft power by leading an international institution in a frontier technology domain.
- Providing a platform for developing nations seeking alternative AI regulatory models.
- Shaping standards in emerging areas like generative AI, cross-border data flow, safety protocols, and ethical use frameworks.

Conclusion

WAICO represents China's attempt to influence global AI architecture, promote data sovereignty, and challenge Western-led governance models — signalling growing geopolitical competition in setting the rules of emerging technologies.

Gaza Peace Summit 2025

Figure 23: Gaza Peace Summit

Context: The Gaza Peace Summit, held in Sharm El-Sheikh in October 2025, brought together key mediators to chart a roadmap for ending the Israel–Hamas conflict and initiating Gaza's reconstruction.

Key Outcomes

1. **20-Point Peace Plan (Trump Declaration)**
   - Mediators — the US, Egypt, Qatar, and Turkey — agreed on a comprehensive peace framework.
   - Immediate ceasefire, creation of safe humanitarian corridors, and commitment to no forced displacement of Palestinians.
   - Israel assured it would not permanently occupy Gaza.
2. **Security & Governance Measures**
   - Disarmament of militant groups in Gaza under international supervision.
   - Transitional governance arrangement for Gaza during the reconstruction phase.
3. **Reconstruction Commitments**
   - Large-scale rebuilding of civilian infrastructure: homes, hospitals, utilities and essential services.
   - Internationally managed funds to ensure transparent and conflict-free reconstruction.
4. **Diplomatic Approach**
   - Summit stressed that all future disputes must be resolved through negotiation and diplomacy, not force.

- No explicit commitment to a two-state solution, which remains a major gap.

Significance

- Opens humanitarian access for over 2 million Gazans.
- Reduces regional tensions in a strategically important corridor near Red Sea and Suez Canal.
- Provides a structured framework for ceasefire, disarmament and rebuilding.

Challenges

- Key stakeholders, including Israel's leadership and Hamas, did not attend the summit.
- Lack of political roadmap for Palestinian statehood limits long-term stability.
- Implementation depends on strict compliance and credible international monitoring.

Conclusion

The **Gaza Peace Summit 2025** offers a fragile but important opportunity to end violence and begin rebuilding Gaza. Its success will depend on inclusive political engagement, sustained international oversight, and genuine commitment from all parties to long-term peace.

UN Secretary-General Election

Context: With the United Nations completing 80 years, renewed attention has emerged on the process of electing the UN Secretary-General (UNSG), particularly amid calls for greater transparency, inclusivity, and reform of global governance institutions.

Institutional Framework

- **Article 97 of the UN Charter**: The Secretary-General is appointed by the UN General Assembly on the recommendation of the UN Security Council (UNSC).
- **Term**: 5 years, renewable once (by convention).
- **Current UNSG**: António Guterres (second term: 2022–2026).

Election Process

1. **UNSC Recommendation**
   - 15-member Council conducts closed-door straw polls.
   - A candidate must secure:
     - At least 9 affirmative votes
     - No veto from P5 (US, UK, France, Russia, China)
2. **General Assembly Appointment**
   - GA formally appoints the recommended candidate by consensus or vote.

Key Reform Demands

- Lack of transparency due to secretive UNSC process.
- Dominance of P5 undermines democratic legitimacy.
- Calls for open hearings, regional rotation and gender representation (no woman has yet served as UNSG)

Significance

- UNSG acts as:
  - Chief administrative officer of the UN
  - Global mediator and moral authority
- Central role in peacekeeping, humanitarian crises, and multilateral diplomacy.

Challenges

- Geopolitical rivalries among P5.
- Limited autonomy due to dependence on major powers.
- Increasing erosion of multilateralism.

Way Forward

- Codify transparent selection criteria.
- Strengthen GA's role.
- Encourage regional and gender balance.

Conclusion

Reforming the UNSG election process is critical to restoring the credibility and effectiveness of the UN in a multipolar world.

UN Office on Drugs and Crime (UNODC)

Figure 24: UNDOC logo

Context: Rising cyber-enabled financial crimes, illicit money flows, and transnational drug trafficking have brought renewed attention to the role of the UN Office on Drugs and Crime (UNODC), particularly in cybercrime governance and asset recovery.

About UNODC

- Established in 1997.
- Headquarters: Vienna, Austri**a**.
- Mandate areas:
  - Drug trafficking
  - Organised crime
  - Corruption

  - Terrorism
  - Cybercrime

Cybercrime Role

- UNODC acts as the custodian agency for the proposed UN Cybercrime Convention (Hanoi Convention).
- Provides:
  - Capacity building for digital investigations.
  - Legal harmonisation support for cyber laws.
  - Cross-border cooperation frameworks.

Asset Recovery

- UNODC implements the UN Convention Against Corruption (UNCAC).
- Assists states in tracing illicit assets, freezing and confiscation and mutual legal assistance.
- Links closely with FATF standards on anti-money laundering.

India's Engagement

- India cooperates with UNODC on narcotics control, terror financing and Cybercrime capacity building.
- Supports a state-centric approach to cyber governance.

Challenges

- Divergence between free-speech concerns and cybercrime controls.
- Jurisdictional conflicts in digital crimes.
- Capacity gaps in developing countries.

Way Forward

- Early finalisation of the UN Cybercrime Convention.
- Stronger coordination with INTERPOL and FATF.
- Balancing digital freedoms with security.

Conclusion

UNODC is emerging as a critical node in global cyber governance, linking crime control with financial integrity in an increasingly digitised world.

Moscow Format of Consultations

Context: Russia convened the Moscow Format of Consultations on Afghanistan as a regional diplomatic platform to discuss Afghanistan's political future, security situation, and humanitarian challenges, outside Western-dominated mechanisms such as NATO-led forums. The format has gained renewed relevance following the Taliban's return to power in 2021 and the withdrawal of US-NATO forces.

Background

- Initiated by Russia in 2017.
- Designed as a regional ownership framework involving Afghanistan's immediate neighbours and key stakeholders.
- Operates parallel to UN-led efforts, without formally recognising the Taliban regime.

Participants

- **Core participants include:**
  - Russia, India, China, Iran
  - **Central Asian states** (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan)
  - **Taliban representatives**
- The United States participates only selectively, reflecting geopolitical divergence.

Key Objectives

- **Counter-terrorism:** Prevent Afghan territory from being used by terror groups such as ISIS-K and Al-Qaeda.
- **Inclusive Governance:** Encourage formation of an inclusive political structure representing ethnic and social diversity.
- **Regional Stability:** Address refugee flows, narcotics trafficking, and cross-border security threats.

India's Role and Position

- India participates as a key regional stakeholder with strong security concerns.
- Advocates:
  - Zero tolerance towards terrorism.
  - Respect for Afghanistan's sovereignty and territorial integrity.
- Humanitarian assistance without conferring diplomatic legitimacy on the Taliban regime.
- India has consistently highlighted the need to protect women's rights and minority interests.

Significance

- Reflects the shift from extra-regional to regional diplomacy on Afghanistan.
- Provides India a platform to engage pragmatically while safeguarding core interests.
- Balances China–Pakistan influence within a multilateral setting.

Challenges

- Divergent interests among participants.
- Limited leverage over Taliban behaviour.
- Absence of enforceable mechanisms.

Conclusion

The Moscow Format reflects a growing emphasis on **regional solutions for Afghan stabilisation**, offering India a calibrated platform to engage without compromising its principled position on terrorism and legitimacy.

India–SICA

Context: India participated in the Foreign Ministers' Meeting of the Conference on Interaction and Confidence Building Measures in Asia (CICA / SICA) as part of its broader effort to expand engagement with pan-Asian multilateral security platforms.

About CICA / SICA

- Established in 1999 on Kazakhstan's initiative.
- Comprises 27 member states, representing nearly 90% of Asia's territory.
- Aims to promote confidence-building, dialogue, and cooperative security.

Key Areas of Engagement

- Traditional and non-traditional security challenges.
- Counter-terrorism and extremism.
- Cybersecurity, energy security, and disaster management.

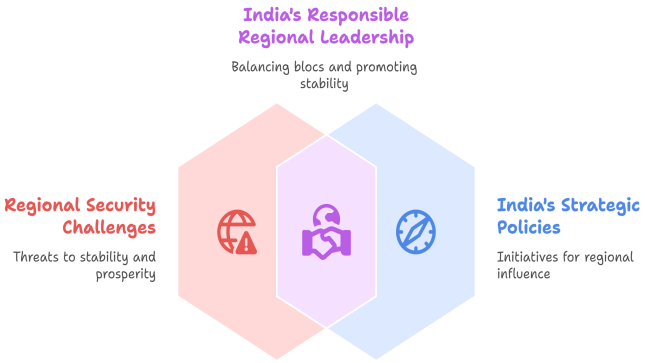


Figure 25: India's Strategic Engagement in Asia

Significance for India

- Provides a non-alliance, dialogue-based platform consistent with India's strategic autonomy.
- Complements India's:
  - Act East Policy
  - Connect Central Asia Policy
- Enables India to engage Central Asia, West Asia, and East Asia simultaneously.

Strategic Importance

- Helps balance competing regional blocs.
- Reinforces India's image as a responsible Asian security stakeholder.
- Supports inclusive, rules-based regional architecture.

Challenges

- Overlapping mandates with other Asian forums.
- Limited institutional capacity for enforcement.

Conclusion

India's engagement with SICA enhances its pan-Asian diplomatic footprint, reinforcing dialogue-driven security cooperation in a fragmented geopolitical environment.

BIMREN

Context: India launched the BIMSTEC–India Marine Research Network (BIMREN) to promote collaborative marine research and sustainable management of resources in the Bay of Bengal, a region increasingly vulnerable to climate change and ecological stress.

Background

- BIMSTEC links South Asia and Southeast Asia.
- Marine cooperation has emerged as a key functional pillar due to shared maritime ecosystems.

Objectives

- **Marine Biodiversity Conservation:** Study coral reefs, mangroves, and marine species.
- **Climate Resilience:** Research sea-level rise, coastal erosion, and extreme weather events.
- **Blue Economy Cooperation:** Promote sustainable fisheries, marine biotechnology, and ocean-based livelihoods.

Significance

- Strengthens BIMSTEC's functional relevance beyond diplomacy.
- Enhances India's leadership in marine science and climate governance.
- Supports India's SAGAR vision and Indo-Pacific maritime cooperation.

Challenges

- Capacity gaps among member states.
- Funding and data-sharing constraints.

Conclusion

BIMREN marks a shift from declaratory cooperation to science-driven regional collaboration, strengthening BIMSTEC's institutional depth and India's maritime diplomacy.

Major Non-NATO Ally (MNNA) Framework

Context: The Major Non-NATO Ally (MNNA) status is a US-designated framework aimed at strengthening defence and strategic partnerships with select countries outside NATO.

Key Features

- Preferential access to:
  - Defence technology cooperation
  - Joint training and exercises
  - Logistics and interoperability frameworks
- Does not entail mutual defence obligations.

Countries with MNNA Status: Includes Japan, Australia, South Korea, Israel, and others.

India's Position

- India is **not an MNNA**.
- Prefers **strategic autonomy** and issue-based partnerships.
- Engages the US through:
  - Foundational defence agreements
  - Quad framework
  - Bilateral defence cooperation mechanisms.

Strategic Implications

- MNNA reflects evolving US security architectures.
- India's non-alignment with MNNA preserves flexibility in relations with Russia, Iran, and Global South.

Conclusion

While MNNA is an important US tool, it remains **secondary to India's multi-alignment strategy**, which prioritises autonomy over formal alliance labels.

Colombo Security Conclave

Context: The Colombo Security Conclave has emerged as a key Indian Ocean regional security mechanism, reflecting India's focus on maritime security and neighbourhood cooperation.

Members: India, Sri Lanka, Maldives, Mauritius *(Bangladesh and Seychelles participate as observers)*

Focus Areas

- **Maritime Security:** Combating piracy, trafficking, and illegal fishing.
- **Counter-Terrorism:** Intelligence sharing and capacity building.
- **Humanitarian Assistance & Disaster Relief (HADR):** Coordinated response to natural disasters.

Strategic Significance

- Strengthens trust and interoperability among littoral states.
- Counters extra-regional influence in the Indian Ocean.
- Reinforces India's role as a net security provider.

Challenges

- Resource asymmetry among members.
- Overlapping regional mechanisms.

Conclusion

The Colombo Security Conclave institutionalises India-led cooperative security in the Indian Ocean, aligning neighbourhood diplomacy with maritime stability.

ECONOMY

India's IT Sector Transformation

Context

India's IT sector is undergoing rapid transformation due to automation, AI-led restructuring, global economic uncertainty, and changing client expectations — leading to layoffs and a major shift in required skillsets.

Economic Contribution of India's IT Sector

- Contributes ~7% to India's GDP.
- Employs ~6 million skilled workers.
- Adds over USD 280 billion to the economy annually.

Reasons for the Current "Layoff Wave"

- **AI-Driven Automation:** Routine coding, testing, and back-office tasks are being replaced by AI models and agentic workflows from OpenAI, Anthropic, and enterprise automation platforms.
- **Restrictive U.S. Immigration Policies:** Higher H-1B visa fees, localisation mandates, and reduced mobility for Indian IT workers.
- **Tightening Client Budgets:** Economic slowdown in the U.S. and Europe, India's largest clients, has reduced outsourcing demand and delayed new deals.
- **Shift from Cost Arbitrage to Expertise:** Clients now demand specialized talent, not large teams of low-cost developers. Priority skills: AI, cloud, data, cybersecurity, product engineering.

The "Obsolete" IT Delivery Model

The old model of mass recruitment for repetitive digital maintenance tasks — the "digital assembly line" — is no longer viable.

- Current Client Demands
- Cloud-native architectures
- Cybersecurity frameworks
- Advanced data analytics
- Generative AI integration and automation pipelines

Skill Mismatch Challenge

- Many mid-career professionals lack new-age skills such as:
  - AI & machine learning
  - Data science & analytics
  - Cloud computing (AWS, Azure, GCP)
  - Cybersecurity operations
  - Legacy skills like mainframes, SAP ECC, and traditional coding are rapidly losing relevance.

Recommendations / Way Forward

- **Reimagine Skilling:** Modernise engineering curricula and embed AI, cybersecurity, cloud, and data literacy from early stages.
- **Industry-Led Investment:** Large-scale reskilling programs; e.g., TCS upskilling 550,000 employees in AI.
- **Support Deep-Tech and AI Startups:** Expand funding, incubators, and regulatory clarity for India's AI and robotics ecosystem.
- **Government Policy Support:** Strengthen visa partnerships, ensure data sovereignty, and provide clear national AI strategy.
- **Social Safety Nets:** Mandate 6–9 months severance pay. Provide career transition support and mental health assistance for laid-off employees.

Conclusion

India's IT sector stands at a critical transition point. Embracing AI-led innovation, reskilling its workforce, and supporting startups will determine India's global competitiveness in the next decade.

Boosting Textile Competitiveness

Context: The government is preparing a detailed cost-roadmap and sectoral reforms to strengthen India's textile and apparel industry, which faces intense global competition from countries like Bangladesh, Vietnam, and China.

Sector Snapshot

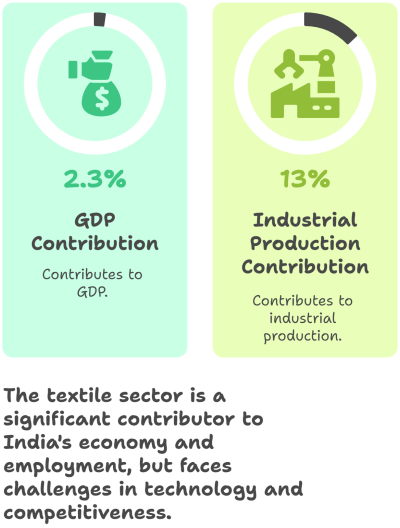


Figure 26: Textile Sector Snapshot

- Contributes 2.3% to GDP and 13% to industrial production.
- Provides direct employment to 45 million people — second only to agriculture.
- Textile exports were USD 34.4 billion in 2023–24.

- **Major challenges:** high production costs, outdated technology, fragmented value chains, weak competitiveness in man-made fibre (MMF) and technical textiles.

Key Government Measures

- **Cost-Roadmap for Competitiveness:** Aims to rationalise raw material prices, labour costs, taxes, and compliance burdens. Seeks to align Indian textile cost structure with global leaders.
- **Tex-RAMPS Scheme:** ₹305 crore programme (2025–2031) to promote research, innovation, quality enhancement, and modern manufacturing practices.
- **Modernization & Investment Push:** Support through PLI Scheme and PM-MITRA textile parks to build integrated value chains, scale up MMF textiles, and promote technical textiles.
- **Labour & Regulatory Reforms:** Simplified labour codes, improved compliance environment, and better workplace standards to help MSMEs reduce operational costs.
- **Raw Material Security:** Initiatives like a multi-year Cotton Mission to increase productivity, especially for extra-long staple cotton, reducing import dependence.

Expected Impact

- Improved global competitiveness and export readiness.
- Expansion into high-value segments like technical textiles and MMF.
- Strengthened supply chains and better quality standards for international markets.
- Significant job creation in rural and semi-urban regions.

Conclusion

By combining cost rationalisation, innovation, regulatory reforms, and targeted investment, India aims to transform its textile sector into a globally competitive, technology-driven, and employment-rich industry.

Rising Household Debt in India

Context: Recent data reveal a sharp rise in household borrowing in India, raising concerns about financial vulnerability and long-term economic stability.

Key Facts & Trends

- Between 2019–20 and 2024–25, household liabilities roughly doubled, far outpacing the growth in household financial assets.
- As of 2024, household debt stands close to 42% of GDP, up significantly from earlier years.
- Much of this surge is driven by non-housing consumer credit — personal loans, credit-cards, gold and other retail borrowings — rather than productive investments.
- At the same time, net financial savings have contracted, leaving households with smaller buffers against shocks.

Implications

- **Financial Fragility:** High debt combined with shrinking savings leaves many households vulnerable to income shocks, job losses, or rising interest rates.
- **Reduced Long-Term Wealth Building:** Consumer-driven debt leaves little scope for asset accumulation or long-term investments, undermining intergenerational wealth creation.
- **Economic Risk:** Widespread debt servicing could dampen consumption, slowing economic growth and increasing default risks.
- **Stress on Credit Institutions:** Rising unsecured credit increases the probability of delinquencies and pressures banking stability if not managed prudently.

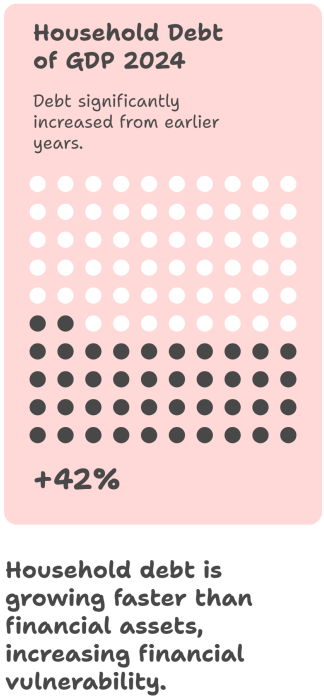


Figure 27: Household Debt vs Financial Assets

Conclusion

India's rapid rise in household debt — without proportional increase in assets or savings — signals growing financial stress. Immediate focus on financial literacy, encouraging savings, and stricter credit regulation is essential to safeguard household welfare and economic stability.

Special Economic Zones (SEZs)

Context: The government is undertaking efforts to revitalise Special Economic Zones (SEZs) to restore their competitiveness and align them with evolving global trade, manufacturing, and export dynamics.

Key Issues with Current SEZs

- Many SEZs suffer from under-utilisation, outdated infrastructure, and poor linkages to supply chains.
- Incentives and operational ease have waned, reducing their attractiveness to investors.
- SEZs often face infrastructural bottlenecks, labour constraints, and regulatory delays — undermining their export potential.

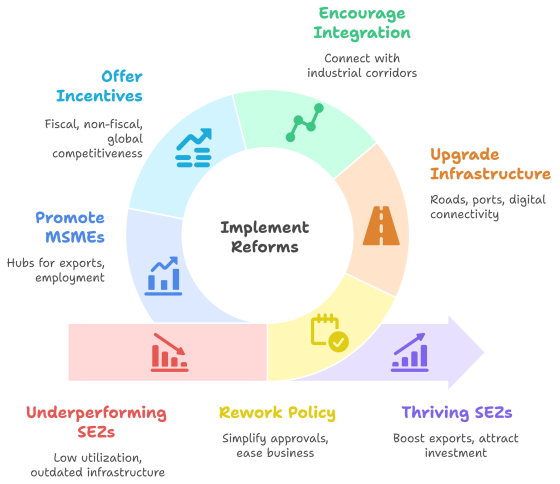


Figure 28: Revitalizing Special Economic Zones

Proposed Reforms and Strategic Measures

- Rework the SEZ policy framework to simplify approvals, improve ease-of-doing business, and enhance investor confidence.
- Upgrade infrastructure — roads, ports, logistics, power, and digital connectivity — to match global manufacturing standards.
- Encourage integration of SEZs with domestic industrial corridors, supply chains, and export networks.
- Offer fiscal and non-fiscal incentives aligned to global competitiveness, especially for high-value manufacturing, tech exports, and green industries.
- Promote SEZs as hubs for MSMEs, exports, and employment rather than just large-scale manufacturing.

Potential Impact

- Boost export performance and global competitiveness of Indian manufacturing.
- Generate employment and stimulate industrial growth, especially in lagging regions.
- Attract foreign direct investment and foster technology transfer.
- Strengthen supply chain linkages and domestic value addition.

Conclusion

Revamping SEZs through policy reform, upgraded infrastructure, and strategic incentives can re-ignite their role as engines of export-led growth, industrialisation, and employment, aligning them with India's evolving economic ambitions.

Universal Basic Income (UBI)

Context: With persistent inequality, informal labour, and gaps in social protection, the idea of a Universal Basic Income (UBI) is being debated in India as a way to simplify welfare delivery and provide a guaranteed safety net for all.

What is UBI & Why It's Being Considered

- Universal Basic Income — regular cash payment to every citizen, regardless of income or employment status.
- Aims to replace or supplement existing fragmented welfare schemes, reducing leakages and ensuring a minimum standard of living.

Could help address:

- Informal economy workers with irregular income
- Digital divides, automation-induced job losses
- Poverty persistence despite welfare efforts

Potential Advantages

- **Administrative Simplicity:** avoids complex eligibility criteria, targeting errors, and bureaucratic delays.
- **Economic Security & Dignity:** offers predictable income security, enabling people to meet basic needs, take entrepreneurial risks, or invest in education.
- **Boost to Demand & Consumption:** regular cash inflows can stimulate consumption, potentially boosting growth.
- **Inclusive Welfare:** reaches the poorest, informal workers, and marginalised groups who often miss welfare benefits.

Key Challenges & Constraints

- **Fiscal Cost:** providing UBI to a large population requires huge public spending; long-term sustainability is a concern.
- **Inflation Risk:** increased cash in circulation may push up prices, especially essentials.
- **Undermining Existing Schemes:** replacing targeted welfare may harm those who need more than just basic income (e.g. health benefits, education support).

- **Work Disincentive Debate:** possibility that guaranteed income might reduce labour participation.
- **Implementation and Equity Concerns:** ensuring fair distribution across rural-urban, gender, and regional divides remains challenging.

Conclusion

UBI offers a compelling alternative to India's fragmented welfare system — promising simplicity, inclusivity, and economic security. However, its success depends on careful design: ensuring fiscal viability, avoiding inflation, and preserving essential welfare components for vulnerable groups.

India's Export Strategy

Context: India is recalibrating its export strategy to boost competitiveness and adapt to evolving global trade dynamics, aiming to reduce reliance on traditional markets and sectors.

Key Challenges in Existing Export Pattern

- Heavy reliance on traditional commodities and markets — exposing India to global demand fluctuations.
- Rising input costs, logistic bottlenecks, and weak linkages between production and global value chains.
- Low value addition in several export segments, limiting competitiveness in high-tech and high-value goods.

Strategic Shifts in New Export Strategy

Figure 29: Strategic Shifts in New Export Strategy

Expected Impact

- Increased export revenues with higher value addition.
- Enhanced resilience against global demand shocks through diversified export basket.
- Job creation and industrial growth beyond traditional sectors.
- Better integration of India into global value chains.

Conclusion

India's reimagined export pathway—shifting toward diversified, value-added, and globally competitive goods and services—offers a realistic route to sustainable growth, increased employment, and stronger global trade presence.

Labour Laws: Challenges

Context: India's new labour codes aim to replace over a dozen old laws. Effective implementation is crucial to safeguard workers' rights while promoting ease of doing business and economic growth.

Key Challenges

- Complex compliance requirements and lack of clarity in rules increase uncertainty for employers and workers.
- Informal sector and contractual labour are still large; given low enforcement capacity, many workers remain unprotected.
- State-level inconsistency: states differ in adoption and interpretation of labour codes, leading to fragmented implementation.
- Need strong social safety nets, universal social security coverage, and worker-skilling to align labour reforms with future job demands.

Recommended Measures

- Simplify compliance procedures and ensure ease of registration for small and medium enterprises.
- Strengthen inspection, grievance redressal, and enforcement mechanisms to protect workers' rights.
- Extend social security coverage — pensions, health, unemployment benefits — especially to informal and contract workers.
- Invest in skilling and employability programs to match evolving industry demands and support labor transitions.
- Harmonize state-level rules with central labour codes to ensure uniformity and prevent regulatory arbitrage.

Conclusion

For labour reforms to deliver both worker protection and economic growth, the focus must shift from legislation to effective implementation, strong enforcement, and comprehensive social security — making India's workforce resilient and future-ready.

Reviving India's MSMEs

Figure 30: MSMEs

Context: Recent assessments highlight growing stress in India's MSME sector, especially due to credit constraints and delayed payments. Strengthening MSMEs is crucial for economic resilience and inclusive growth.

Why MSMEs Matter

- They contribute significantly to GDP, manufacturing output, exports, and employment.
- Support entrepreneurship, regional development, and value addition across the economy.

Key Challenges

- **Limited Access to Finance:** Many MSMEs struggle to obtain timely, affordable credit and working capital.
- **Delayed Payments:** Payment delays from large companies and government departments disrupt cash flows and increase financial vulnerability.
- **Technology & Skill Gaps:** Low digital adoption and limited skilling reduce competitiveness in domestic and global markets.
- **High Compliance Burden:** Complex regulations and administrative procedures raise costs and discourage formalization.

Required Reforms

- **Improve Credit Access:** Strengthen collateral-free lending, expand credit guarantees, and streamline loan disbursement.
- **Enforce Timely Payments:** Strict implementation of payment timelines, particularly in public procurement.
- **Promote Digital & Technology Upgradation:** Encourage adoption of digital tools, automation, e-commerce, and provide targeted skilling.
- **Ease of Doing Business:** Simplify registrations, unify digital portals, and reduce compliance requirements for small units.
- **Boost Market Access:** Support cluster development, help MSMEs integrate into global value chains, and promote innovation.

Conclusion

Reforms that improve credit flow, reduce compliance, and strengthen technology adoption can significantly enhance MSME resilience, enabling them to drive growth, jobs, and competitiveness in India's economy.

Initial Public Offering (IPO)

Context: India's Chief Economic Advisor has raised concerns that IPOs are increasingly being used as exit routes for early-stage investors rather than for raising durable, long-term capital for business growth.

What is an IPO?

An Initial Public Offering (IPO) is the first sale of a company's shares to the public in the primary market, converting a private company into a publicly listed one. It allows firms to access large volumes of funds with long or indefinite maturity.

Types of IPOs

- **Fixed Price Issue:** Share price is pre-determined.
- **Book Building Issue:** No fixed price; a price band is declared and final price is discovered through investor bids.

Current Concerns

- Many IPOs today are structured to help early investors exit, instead of raising fresh capital for expansion.
- This shifts the primary purpose of IPOs away from investment and long-term growth towards speculative gains and quick exits.
- It raises risks for retail investors who may enter at inflated valuations.

Conclusion

While IPOs are vital for capital formation, their increasing use as exit mechanisms calls for better scrutiny and transparency to ensure they genuinely support long-term business development.

Digital Gold and SEBI

Context: SEBI has issued a public advisory warning investors against purchasing "Digital Gold" or "E-Gold" through online platforms, stating that these products lie outside SEBI's regulatory oversight.

What is Digital Gold?

- Digital gold allows investors to buy, sell, and store gold electronically without physically holding the metal.
- Its price is directly linked to physical gold, making it a convenient alternative to jewellery or gold coins.
- Many platforms use blockchain technology to record and verify transactions.

- However, it is not recognised as a security and is not regulated as a commodity derivative, leaving investors without formal protection.

Conclusion

Digital gold offers convenience and accessibility, but with no regulatory oversight, it carries risks. Investors should exercise caution and rely on regulated gold investment options for safer financial planning.

Quality Control Orders (QCOs)

Context: To ease compliance and support manufacturing and exports, India is considering relaxing certain Quality Control Orders (QCOs), which currently impose mandatory standards on a wide range of products.

What Are QCOs?

- **Legal Basis:** Issued by the Central Government under the BIS Act, 2016, after consultation with the Bureau of Indian Standards (BIS).
- **Mandatory Standards:** Although BIS certification is usually voluntary, QCOs make compliance compulsory for specific products.

Purpose:

- Protect human, animal, and plant health
- Ensure product safety and quality
- Safeguard national security
- Prevent substandard imports and strengthen domestic industry
- Products under QCOs must carry the Standard Mark (ISI mark) through a Licence or Certificate of Conformity issued by BIS.

Conclusion

QCOs are essential for ensuring quality and safety, but easing certain norms can help industries reduce compliance costs and improve export competitiveness without compromising standards.

IMF's "C-Grade" for India

Context: In 2025, the International Monetary Fund (IMF) assigned India a "C" grade under its Data Quality and Transparency Assessment, triggering debate on India's statistical credibility, macroeconomic transparency, and global investor confidence. The grading does not assess economic performance, but evaluates the quality, coverage, timeliness, and reliability of macroeconomic data shared with international institutions.

Figure 31: IMC Report System

What is the IMF "Grade" System?

The IMF assesses countries under frameworks such as:

- Data Quality Assessment Framework (DQAF)
- Special Data Dissemination Standard (SDDS)
- Enhanced General Data Dissemination System (e-GDDS)

Grading Scale (Simplified)

- A – Best practices followed
- B – Largely adequate, minor gaps
- C – Significant deficiencies
- D – Serious shortcomings

A "C" grade indicates that while data exists, there are methodological gaps, inconsistencies, or transparency concerns that limit its reliability for international comparison.

Why Did India Receive a "C" Grade?

1. **Concerns Over National Accounts Data**
   - Questions raised over:
     - GDP base year revisions
     - Methodological changes post-2011–12 base year
   - IMF flagged limited backward comparability and insufficient clarity on revisions.
2. **Employment and Labour Market Data Gaps**
   - Lack of high-frequency, comprehensive employment data.
   - Heavy reliance on Periodic Labour Force Survey (PLFS) with time lags.
   - Informal sector employment measurement remains weak.
3. **Household Consumption & Inequality Data**
   - Delay and controversy surrounding Consumer Expenditure Surveys.
   - Infrequent updates reduce reliability of poverty and inequality estimates.
4. **Fiscal Transparency Issues**
   - Differences between:
     - Budget estimates
     - Actual fiscal outcomes

- Off-budget borrowings and contingent liabilities flagged as opacity risks.

5. **Data Dissemination and Accessibility**
   - Delays in public release of datasets.
   - Limited granular datasets for independent verification.

What the IMF "C Grade" Does NOT Mean

It is important to clarify misconceptions:

- It does not imply India's economy is weak.
- It does not mean data is fabricated.
- It does not downgrade India's growth potential.

Instead, it highlights institutional and methodological shortcomings in statistical systems.

India's Response & Official Position

The Indian government has:

- Rejected claims of data manipulation.
- Emphasised reforms in:
  - National Statistical Office (NSO)
  - Digital data collection
- Asserted that India adheres to global statistical norms.

India also points out that:

- Many developing economies face similar data challenges.
- IMF grading does not fully capture informal-economy complexity.

Implications for India

1. **Global Credibility**
   - International investors, rating agencies, and multilateral lenders rely on IMF-validated data.
   - Persistent grading issues may affect perception, not fundamentals.
2. **Policy Formulation**
   - Weak data limits:
     - Targeted welfare design
     - Labour market interventions
     - Poverty alleviation accuracy
3. **Multilateral Negotiations**
   - Data credibility influences:
     - IMF quota reform debates
     - Climate finance negotiations
     - Development assistance terms

Structural Challenges Behind the Issue

- Size and diversity of informal economy.
- Federal data fragmentation (Centre–State coordination).
- Capacity constraints in state statistical departments.
- Frequent methodological shifts without adequate documentation.

Way Forward

1. **Strengthen Statistical Autonomy**
   - Enhance independence of NSO.
   - Reduce political influence in data release cycles.
2. **Improve Frequency & Granularity**
   - Annual consumption surveys.
   - Quarterly labour force indicators.
3. **Transparency in Methodology**
   - Publish detailed revision notes.
   - Ensure backward compatibility of datasets.
4. **Digital & Administrative Data Integration**
   - Use GST, EPFO, and digital transaction data responsibly.
   - Create interoperable data ecosystems.

Conclusion

The IMF's "C-grade" for India is not a verdict on economic strength, but a diagnosis of data system limitations. As India aspires to global leadership, statistical credibility becomes strategic capital. Strengthening data governance is essential not just for external validation, but for evidence-based policymaking at home.

SOCIAL ISSUES

India's Road Safety Crisis

Context: With over 1.7 lakh road crash deaths in 2023, the Supreme Court has raised concerns over frequent mass-casualty accidents. The crisis reflects systemic failures in licensing, enforcement, infrastructure, and trauma care.

Figure 32: Accident in India

Key Problems Identified

1. **Flawed Licensing & Training**
   - Licences often issued without formal training.
   - Driving tests are perfunctory and outdated.
   - No structured safety training for commercial drivers.
   - No mechanisms to evaluate driver skill, alertness, or fitness after licensing.
2. **Weak Enforcement**
   - Manual policing is resource-limited, inconsistent, and prone to discretion.
   - Limited use of technology-based enforcement (cameras, automated challans).
   - Poor data integration and weak penalty recovery systems.
   - Major violations: speeding, overloading, lane violations, drunk driving.
3. **Poor Infrastructure**
   - Hazardous curves, missing crash barriers, poor lighting, and lack of rest areas.
   - Highways prioritise speed over safety, creating "unforgiving roads."
   - Maintenance failures: broken medians, exposed structures, unmarked construction zones.
   - Urban areas lack safe pedestrian infrastructure, leading to high pedestrian fatalities.
4. **Inadequate Trauma Care**
   - Critical "golden hour" response is inconsistent.
   - Ambulance networks vary widely in availability and efficiency.
   - Rural areas face major delays in reaching definitive trauma care.
   - Shortage of trauma specialists, blood banks, and emergency resuscitation facilities near crash hotspots.
5. **Siloed Governance**
   - Licensing, road design, enforcement, and trauma care fall under multiple ministries.
   - Lack of coordination, data sharing, and accountability weakens overall road safety outcomes.

Solutions / Recommendations

- **Strengthen Licensing**
  - Make licensing a rigorous filtration system, not a paperwork exercise.
  - Introduce mandatory formal training, including simulator-based learning.
- **Standardized Training for Commercial Drivers:** Mandatory certification, periodic skill assessment, and fatigue management training.
- **Technology-led Enforcement**
  - Expand electronic enforcement with:
  - Automated cameras
  - Intelligent speed monitoring
  - Digital challans
- **Strict adherence** to electronic enforcement standards under the Motor Vehicles Act.
- **Safe Road Design**
  - Prioritize safety from the planning stage.
  - Scale models like the Zero Fatality Corridor on the Mumbai–Pune Expressway.
  - Install crash barriers, improve lighting, and redesign dangerous stretches.
- **Improved Maintenance**
  - Timely repair of dividers, potholes, signages, and construction zones.
  - Mandatory safety audits for all highways.
- **Pedestrian Infrastructure:** Build sidewalks, zebra crossings, foot overbridges, and traffic calming in cities.
- **Right to Trauma Care Law**
  - Establish time-bound emergency response.
  - Create a coordinated trauma care network with linked ambulances, hospitals, and blood banks.
- **Integrated Governance**
  - Create a unified National Road Safety Authority or coordination mechanism.
  - Clear accountability across all departments involved.

Conclusion

India's road safety crisis is preventable. A coordinated approach centred on safer roads, stricter licensing, tech-led enforcement, and strong trauma care is essential to curb the rising toll of road crash deaths.

Food Security to Nutritional Security

Context: India is shifting from ensuring mere food security (adequate calories) to achieving nutritional security by providing access to foods rich in proteins, vitamins, and essential micronutrients.

Functional Foods:

Meaning

- Foods that offer health benefits beyond basic nutrition.
- Designed to promote health or prevent disease.

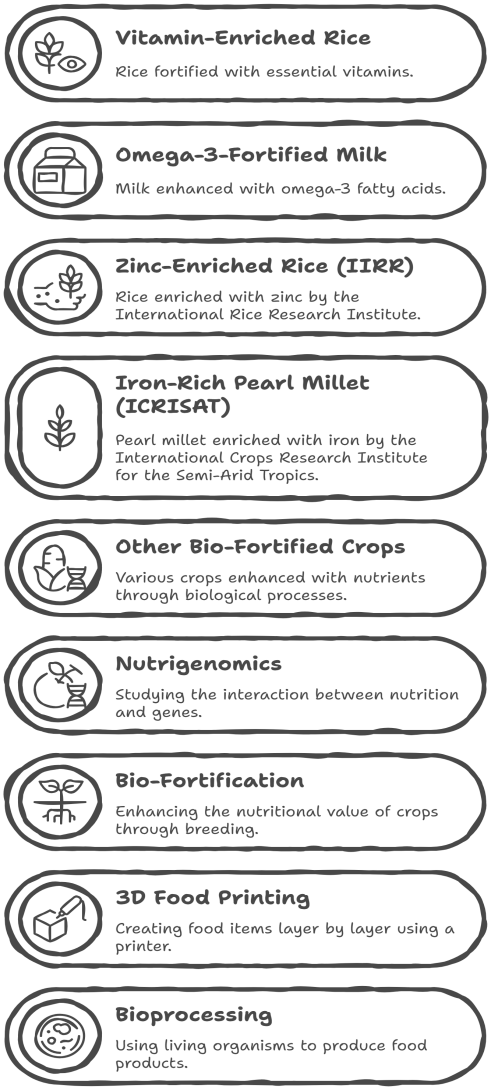


Figure 33: Functional Food Examples

Smart Proteins

Definition: Proteins produced using biotechnology to reduce dependence on conventional livestock systems.

Types

- **Plant-based proteins:** Extracts from legumes, cereals, oilseeds (e.g., plant-based milk, meat alternatives).
- **Fermentation-derived proteins:** Using microbes (e.g., precision fermentation for dairy proteins).
- **Cultivated meat:** Animal cells grown in bioreactors without slaughter (lab-grown meat).

Why India Needs Them

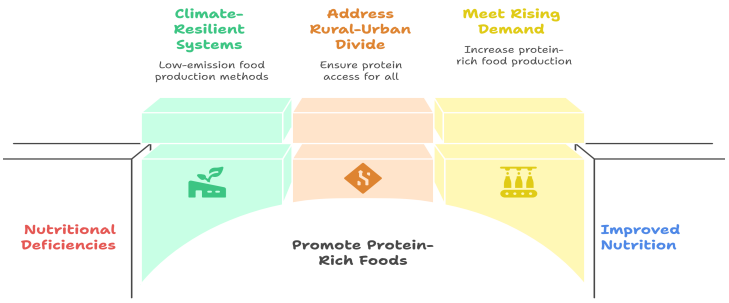


Figure 34: Addressing India's Nutritional a d Sustainability Needs

India's Current Stand

- **Policy Recognition**: Functional foods and smart proteins included under the BioE3 policy.

Research & Funding

- DBT and BIRAC funding in bio-fortification, smart proteins, and biomanufacturing.
- CCMB receives DBT support for cultivated meat research.

Growing start-up landscape: GoodDot, Blue Tribe Foods, Evo Foods.

Challenges in India

- **Regulatory Clarity:** FSSAI yet to issue clear rules for novel foods like cultivated meat.
- **Public Skepticism:** Concerns around "lab-made" foods.
- **Workforce Upskilling:** Need for skilled biomanufacturing workforce.
- **Market Concentration:** Risk of dominance by a few large companies.

Global Scenario

- **Japan**: First to regulate functional foods (1980s).
- **Singapore**: Approved sale of cultivated chicken (2020).
- **China**: Prioritises alternative proteins.
- **EU**: Supports via "Farm to Fork" strategy.

Way Forward for India

- Create a national regulatory framework for novel foods, led by FSSAI.

- Build inter-ministerial coordination for coherent policy support.
- Encourage public–private partnerships to scale indigenous technologies.
- Expand public education and include farmers in new value chains.

Conclusion

Functional foods and smart proteins are essential for securing India's nutrition needs while supporting sustainable, future-ready food systems.

Misuse of POCSO

Figure 35: POCSO logo

Context: The Supreme Court has expressed serious concern over the growing misuse of the POCSO Act to criminalise consensual adolescent relationships and stressed the need for greater legal awareness and gender equality education.

Supreme Court's Observations

- **Misuse of POCSO:** The stringent provisions of the Act are increasingly being applied to consensual relationships between adolescents, which goes against the original intent of the law.
- **Impact**: Male adolescents often face prosecution due to parental pressure or social stigma, despite the presence of consent.
- **Need for Awareness:** The Court emphasized the need for legal literacy among students, parents, and educators about the scope and limitations of POCSO.
- **Gender Equality Education**: Directed the Centre to include sexual equality, values, and moral education in school curricula.
- **Ethical Training:** Called for ethical and behavioural training for boys, focusing on respect, consent, and responsible relationships.

Associated Concepts

- **Protection of Children from Sexual Offences (POCSO) Act, 2012**
  - A comprehensive law safeguarding children from sexual abuse and exploitation.
  - Defines a child as any individual below 18 years of age.
  - Age of Consent
    - Under POCSO, the age of consent is 18 years.
    - Any sexual act with a minor, even if consensual, is treated as a criminal offence.
- **Adolescent Relationships:** Refers to consensual romantic or sexual interactions between minors, often close in age—an area where law and social reality often conflict.
- **Retribution vs. Protection:** The Court highlighted that POCSO is meant for protection, but is sometimes used for punitive actions where no genuine abuse exists.
- **Legal Literacy:** Urged stronger legal awareness to prevent misuse of the law and ensure protection where truly needed.

Way Forward

- **Revisit Age of Consent Provisions**: Consider close-in-age (Romeo and Juliet) exceptions for 16–18-year-olds to differentiate between consensual adolescent relationships and actual offences.
- **Enhanced Legal Literacy Campaigns:** Promote school and community-based programs on POCSO, consent, digital safety, through NCERT, NALSA, and civil society groups.
- **Gender & Value Education:** Integrate gender sensitivity, consent education, and ethical behaviour into secondary-level curricula.
- **Sensitization of Law Enforcement:** Train police, educators, and judicial officers to distinguish consensual cases from genuine abuse, ensuring victim-centric protection.
- **Parental & Community Engagement:** Encourage dialogue-based sex education and counselling to reduce stigma and build understanding of adolescent behaviour.

Conclusion

The Supreme Court's observations highlight the need to balance child protection with a realistic understanding of adolescent behavior. Stronger legal literacy, gender education, and nuanced reforms are essential to prevent misuse while safeguarding genuine victims.

Under 16 Social Media Ban

Context: Australia's government has announced plans to become the first country to prohibit social media access for children under 16, aiming to protect youth from online harms and safeguard mental health.

Key Points

- The proposed ban will restrict minors under 16 from registering or using social media platforms.

- The move addresses rising concerns about cyberbullying, privacy violations, addictive use, and mental-health impact among adolescents.
- Platforms will be required to implement age verification and block access for users under 16.
- Exceptions or alternative protections for older teens might be considered, but the core focus is on protecting vulnerable children.

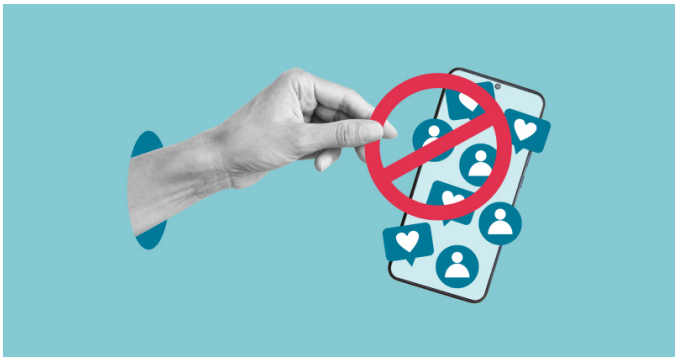


Figure 36: Social Media Ban| Source: FE Week

Significance

- Sets a global precedent in digital regulation prioritising child safety and wellbeing over unrestricted access.
- Might prompt other countries to re-evaluate youth access to social media, especially in light of rising concerns over mental health and digital addiction.
- Raises debates on digital rights, age restrictions, parental responsibility, and implications for freedom of expression online.

Conclusion

Australia's landmark decision to ban social media for under-16s reflects growing global concern about youth exposure to digital risks. Its success and impact could shape international norms around child online protection in the coming years.

National Policy for Organ Transplantation

Context: The Supreme Court has directed the Centre to draft a uniform national policy for organ transplantation across India, aiming to streamline procedures, improve transparency, and ensure ethical practices.

Key Points

- The policy must standardize donor consent protocols, allocation mechanisms, hospital accreditation, and post-transplant monitoring.
- It will aim to curb illegal organ trade, organ trafficking, and unethical transactions by enforcing clear regulatory norms.
- Uniformity would help ensure equitable access to organs irrespective of region — reducing disparities in healthcare outcomes.
- The policy may include registry and tracking systems for donors and recipients, along with legal safeguards and oversight mechanisms.

Significance

- Protects individual rights and safeguards vulnerable populations from exploitation.
- Promotes fairness and transparency in organ donation and transplantation.
- Helps strengthen India's public health system and build trust in organ donation frameworks.

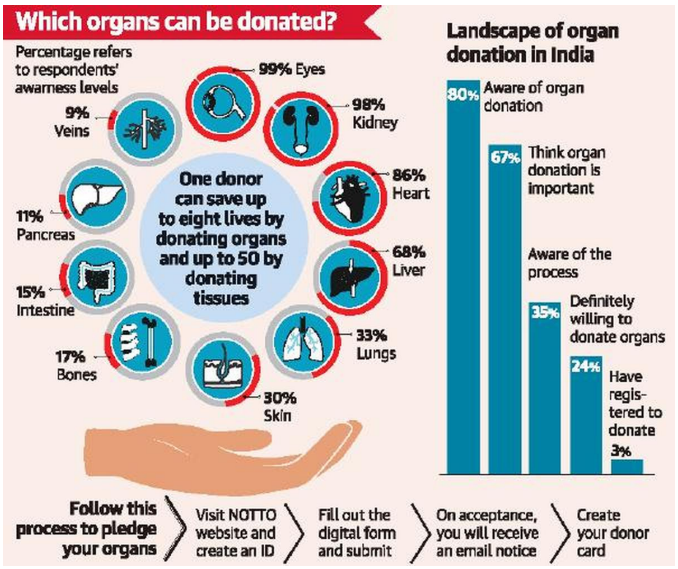


Figure 37: Organ Transplantation| Source: The Hindu

Conclusion

A standardized national transplant policy can transform organ donation and transplantation in India — ensuring ethical practices, equitable access, and greater public confidence in the health system.

State of Social Justice

Context: The ILO's 2025 report State of Social Justice: A Work in Progress reviews global and national progress on poverty reduction, inequality, labour conditions, and social protection.

Progress Noted

- Sharp decline in extreme poverty and working poverty since the mid-1990s.
- Significant reduction in child labour.
- Wider social protection coverage, including in India.

- Improvements in health, education access, and welfare delivery.

Persisting Challenges

- High levels of income and wealth inequality remain.
- Gender wage gaps continue across sectors.
- Large informal workforce lacks security and stable wages.
- Unequal access to healthcare, water, housing, and quality employment.
- Economic, technological, and environmental transitions may worsen exclusion without safeguards.

Way Forward

- Integrate social justice across all policies — labour, economic, environmental, and welfare.
- Expand universal social protection and portable benefits.
- Reduce inequality through fair wages, anti-discrimination measures, and equal opportunities.
- Ensure that digital, green, and economic transitions are equitable and inclusive.

Conclusion

Progress has been made, but social justice remains incomplete. Stronger protections, fairer opportunities, and inclusive policies are essential to ensure that growth benefits all sections of society.

India's Working-Age Adults: Health

Context: A recent study highlights a worrying trend: Rising workplace stress among India's working-age adults is contributing significantly to an **increase in Type 2 diabetes** and other lifestyle-related diseases.

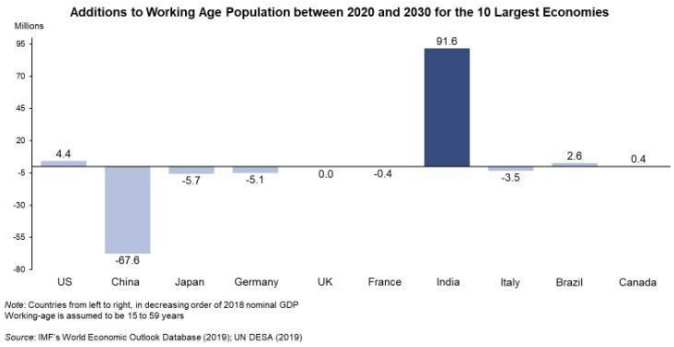


Figure 38: Workplace Stress| Source: World Economic Forum

Key Findings

- **High levels of work-related stress** — long hours, job insecurity, and poor work–life balance — are strongly correlated with increased incidence of diabetes and metabolic disorders.
- **Sedentary job profiles** combined with stress lead to unhealthy lifestyle patterns: inadequate sleep, poor diet, reduced physical activity, and greater reliance on convenience foods.
- **Younger** and **middle-aged urban workers** are most affected, indicating a shift in diabetes burden to a younger demographic.

Implications

- **Rising healthcare burden:** increased chronic disease treatment costs and reduced workforce productivity.
- **Need for employer-led interventions:** mental health support, flexible working hours, wellness programs.
- **Public health urgency:** Prevention efforts must target working adults, not just older populations.

Conclusion

Workplace stress has emerged as a major risk factor for diabetes among India's working-age population. Tackling this trend requires integrated action by employers, public health authorities, and individuals — prioritising mental wellness, healthy lifestyle, and preventive care.

DEFENCE & SECURITY

Tejas Mk1A: New Engine Deal

Context: Hindustan Aeronautics Limited (HAL) has signed a major agreement with General Electric Aerospace (GE) to procure engines for the second batch of Tejas Mk1A fighter jets — strengthening India's indigenous defence capabilities.

Figure 391: Tejas Mk1A fighter jets |Source: Defence India News

Key Details

- **Engines Ordered:** 113 units of GE's F404-GE-IN20 jet engines.
- **Aircraft Supported:** These engines will power 97 Tejas Mk1A jets under the ₹62,000-crore production contract.
- **Delivery Timeline:** Engine deliveries will begin in 2027 and continue till 2032.
- The agreement includes full logistics and technical support to ensure smooth integration into the production line.

Significance

- Keeps the Tejas Mk1A production schedule on track, supporting timely induction into the Indian Air Force.
- Enhances India's fighter fleet as older aircraft are phased out.
- Strengthens defence self-reliance by supporting one of India's most important indigenous aviation programmes.
- Boosts operational readiness through reliable and proven engine technology.

Conclusion

The HAL-GE engine deal is a crucial boost for the Tejas programme, ensuring steady production and reinforcing India's long-term goal of a modern, indigenously powered air combat fleet.

Digital Arrest Scams

Context: The Supreme Court has directed the Central Bureau of Investigation (CBI) to investigate cases of **"digital arrests"** — allegations that individuals are being detained on the basis of fabricated or manipulated digital evidence.

Main Points

- The Court observed that **misuse of digital tools and fake evidence** to frame people has become a serious concern, undermining legal rights and due process.
- It has asked the Centre to examine and act on whether existing laws and enforcement frameworks are adequate to combat digital-evidence tampering and wrongful arrests.
- The ruling underscores the **need for stringent checks on digital evidence**, **transparent investigation procedures**, and **accountability of agencies** using digital surveillance or data.
- By assigning the CBI the task, the Court aims to ensure impartial and thorough investigation into alleged cases of abuse.

Significance

- The decision reinforces the judicial commitment to protect citizens' digital rights and privacy in the age of data.
- It signals caution for law enforcement agencies: digital evidence must be handled with integrity, and misuse could lead to accountability.
- The investigation may set precedents for how digital-evidence-based arrests are scrutinised, ensuring safeguards against false charges.

Conclusion

The Supreme Court's directive for a CBI probe into digital arrest cases marks a crucial step in defending civil liberties in the digital era — highlighting the necessity of transparent, fair procedures whenever digital evidence is used against individuals.

Digital Tradecraft

Context: Recent investigations, including the car-bomb case near Delhi's Red Fort, reveal how terror groups increasingly rely on encrypted and anonymous digital tools — a shift known as digital tradecraft.

What Is Digital Tradecraft?

- Use of end-to-end encrypted apps and private servers that require no personal identification.
- Reliance on VPNs, proxies, dark-web networks, and anonymity tools to hide locations and identities.
- Digital coordination of attacks using shared maps, instructions, and operational details.
- Increasing use of AI, encrypted recruitment channels, and digital fundraising for extremist activities.

Why It Matters

- **Invisible Operations:** Terror networks can operate with minimal traceable footprints.
- **Cross-Border Reach:** Enables seamless coordination across countries without physical movement.
- **Rapid Radicalisation:** Online propaganda accelerates recruitment without direct contact.
- **Challenging Investigations:** Encrypted systems and lack of metadata complicate surveillance and evidence gathering.

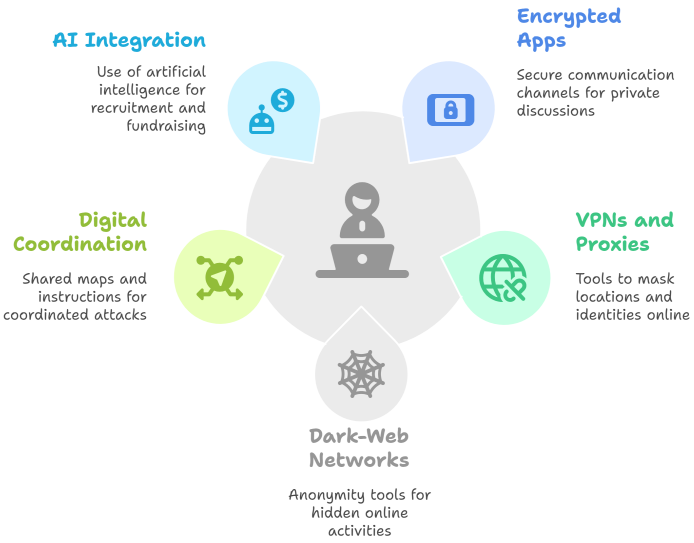


Figure 40: Digital Tradecraft in Extremist Activities

What's Needed

- Stronger cyber-forensic and digital intelligence capabilities.
- Updated laws to address encrypted communication misuse, crypto-financing, and digital anonymity.
- International cooperation to track and dismantle cross-border digital terror networks.
- Collaboration with tech companies to flag suspicious activity and curb online radicalisation.

Conclusion

Digital tradecraft has transformed terrorism into a covert, borderless threat. India must strengthen cyber capabilities, legal frameworks, and global coordination to effectively counter this new wave of digital-age extremism.

Countering Terrorism in India

Context: Amid evolving security threats, India continues to strengthen its counter-terrorism framework — refining legal tools, improving coordination, and enhancing capabilities to address both domestic and transnational terrorism.

Main Points

1. **Enhanced Legal Framework**
   - India regularly updates laws to address new threats like cyberterrorism, financing of terror, and radicalization.
   - Special courts, fast-track procedures, and stringent bail norms help expedite trials and reduce delays.
2. **Intelligence and Security Coordination**
   - Improved coordination between central and state agencies, intelligence sharing, and deployment of dedicated counter-terror units for timely detection and response.
   - Use of modern surveillance, data analytics, and technological tools to track terror networks and their financing.
3. **Border Security & Counter-Radicalisation**
   - Strengthening borders to prevent infiltration.
   - Initiatives for community engagement, rehabilitation, and outreach to vulnerable groups to counter radical narratives.
4. **International Cooperation**
   - Collaboration with foreign agencies, sharing intelligence, and extradition treaties to dismantle transnational terror networks and curb cross-border terrorism.
   - Participation in global counter-terrorism frameworks and adherence to international norms on terror financing and cyber threats.

Challenges Remaining

- **Judicial Delays & Prison Overcrowding:** Slow court processes and overloaded prisons can undermine justice and rehabilitation efforts.
- **Radicalisation & Online Propaganda:** Growing use of social media for recruitment and propaganda is hard to monitor and counter.
- **Cross-border Complexity:** Smuggling, illegal migration, and unregulated digital finance continue to aid traffickers and terror networks.
- **Need for Institutional Capacity Building:** Ensuring consistent capability upgrades, better training, and resource allocation for law enforcement and intelligence agencies.

Conclusion

India's multi-pronged counter-terrorism strategy — combining robust laws, intelligence coordination, border security, and international cooperation — is essential to safeguard national security. However, continuous reforms, institutional strengthening, and preventive measures remain vital to tackle evolving threats.

ENVIRONMENT & GEOGRAPHY

Heavy Metal Pollution: Cauvery River

Context: A study by Bharathidasan University, Tiruchirappalli, published in Environmental Earth Sciences, found significant heavy metal contamination in the Cauvery River and its fish species, prompting public health warnings and policy recommendations.

Figure 41: Cauvery River Map

Metals Studied

- Chromium (Cr)
- Cadmium (Cd)
- Copper (Cu)
- Lead (Pb)
- Zinc (Zn)

Key Findings

- **Variation Across Species and Locations:** Heavy metal concentrations in fish tissues varied widely across species and sampling sites.
- **Toxic Levels Detected**: Cadmium and lead exceeded safe thresholds for both carcinogenic and non-carcinogenic risks.
- **Multiple Pollution Indices Used**
  - Researchers employed:
  - Igeo (Geo-accumulation Index)
  - Contamination Factor
  - Pollution Load Index
  - Potential Ecological Risk Index
  - These helped distinguish anthropogenic pollution from natural geological sources.

Sources of Pollution

1. **Anthropogenic Sources**
   - Industrial discharge from textile and electroplating units near Erode.
   - Agricultural runoff containing fertilizers and pesticides.
   - Untreated urban wastewater entering the river system.
2. **Natural Sources**
   - Mineralized geological zones upstream releasing trace metals.
3. **Health Implications**
   - Prolonged consumption may cause cumulative toxic effects, especially from cadmium and lead.
   - Health risk severity depends on age, frequency of fish consumption, and species eaten.
   - Target Hazard Quotient (THQ) greater than 1 for several metals indicates potential health risks.

Recommendations

- **Moderate Fish Consumption:** Generally safe intake: ~250 g per serving, twice a week.
- **Continuous Ecological Monitoring:** Routine testing of sediments, water, and aquatic organisms.
- **Strict Pollution Control Measures**
  - Enforce regulations on industrial effluents.
  - Improve wastewater treatment infrastructure.
- **Policy and Land-Use Interventions**
  - Manage industrial expansion and agricultural runoff.
  - Strengthen zoning and environmental compliance.
- **Public Awareness:** Inform communities about safe fish consumption and pollution risks.

Significance of the Study

- Provides solid scientific evidence to support regulatory action.
- Helps design public health advisories for local populations.
- Critical for preserving the ecological health of one of South India's most important rivers.

Conclusion

The Cauvery River study highlights urgent environmental and health concerns. Strong regulatory enforcement, continuous monitoring, and community awareness are essential for safeguarding both public health and river ecosystems.

Bioindicators

Context: Bioindicators — organisms that reflect environmental conditions through their presence, absence, or abundance — play a crucial role in assessing ecosystem health, detecting pollution, and providing early warning signals of ecological degradation.

Concept

Bioindicators are plants, animals, or microorganisms that can sense and respond to changes in their environment, including pollution, temperature shifts, habitat disturbance, or chemical contamination.

Mechanism

Bioindicators reflect environmental stress through:

- Physiological changes (altered growth, pigmentation, respiration)
- Behavioural changes (reduced activity, altered movement patterns)
- Population-level shifts (decline in abundance, disappearance, or dominance by pollution-tolerant species)
- These responses can be observed or measured, offering insight into ecosystem health.

Advantages of Using Bioindicators

- **Cost-Effective:** Require fewer instruments and less laboratory testing than chemical monitoring.
- **Capture Cumulative Effects:** Reflect long-term exposure to pollutants and the combined impact of multiple contaminants.
- **Ecologically Relevant:** Provide direct evidence of how pollution affects living organisms and ecosystems.
- **Early Warning Signals:** Detect subtle ecological changes before irreversible damage occurs.

Types of Bioindicators

Type	Example	Indicator Function
Lichens	Sensitive to SO_2 and air pollutants	Decline indicates poor air quality
Aquatic Insects	Mayflies, caddisflies, stoneflies	Indicate freshwater purity and oxygen availability
Amphibians	Frogs, toads	Sensitive to air & water pollutants; early signs of ecosystem contamination
Mussels / Oysters	Marine filter feeders	Accumulate heavy metals & microplastics, indicating water contamination
Birds (e.g., Eagles)	Top predators	Population declines signals biomagnification (e.g., DDT effects)

Conclusion

Bioindicators offer an effective, low-cost, and biologically meaningful approach to environmental monitoring, helping detect pollution early and guide conservation and regulatory action.

COP30 in Belém, Brazil

Context: The 30th Conference of the Parties (COP30) under the UNFCCC begins in Belém, Brazil, for a two-week negotiation round focused on converting climate commitments into real implementation.

Why COP30 Matters This Year

- **Fossil Fuel Phase-out Debate Intensifies:** Brazil, as host, is emphasising the need to scale up past commitments and push countries toward a clear fossil fuel phase-out pathway.
- **First Official Admission of the Missed 1.5°C Target**: COP30 is the first climate summit to openly acknowledge that the 1.5°C goal is no longer within reach under current trajectories.

Figure 42: COP30 Brazil| Source: ksapa

What India Looks Forward To

- **Showcase Renewable Progress:** India will highlight its rapid shift to non-fossil energy, expanding solar, wind, and green hydrogen capacity.
- **Adaptation Metrics:** Active role in negotiations to finalize adaptation indicators under the Global Goal on Adaptation (GGA).

Paris Agreement (2015)

- **Goal**: Keep global warming well below 2°C, preferably 1.5°C above pre-industrial levels.
- **Mechanism**: Countries submit Nationally Determined Contributions (NDCs) detailing their mitigation and adaptation plans.

Why COP30 is Called the 'Implementation COP'

COP30 focuses on turning pledges into action, moving beyond declarations to:

- Concrete emission reduction plans

- Adaptation frameworks
- Actual delivery of climate finance
- Hard timelines and measurable outcomes

Global Stocktake (GST)

- A mandatory five-year review under the Paris Agreement.
- Evaluates collective progress toward long-term climate goals.
- Identifies gaps in mitigation, adaptation, and finance.
- Shapes the next round of NDCs.

Baku-to-Belém Roadmap on Climate Finance

- Joint initiative by Azerbaijan (COP29 host) and Brazil (COP30 host).
- Seeks to show pathways for scaling finance for developing countries.
- **Goal**: Mobilise at least USD 1.3 trillion annually by 2035.
- Not a binding pledge; a menu of actions guiding finance negotiations.

New Collective Quantified Goal (NCQG)

- Will replace the old USD 100 billion/year target.
- Expected level: USD 300 billion/year by 2035.
- Contentious because:
  - Developing nations say USD 300B is too low.
  - "All actors" contributing may dilute CBDR (Common But Differentiated Responsibilities).

Loss and Damage Fund

- Established at COP28 to help climate-vulnerable nations respond to irreversible losses (sea-level rise, extreme events).
- Still severely underfunded, while needs run into hundreds of billions annually.

Global Goal on Adaptation (GGA)

- Aims to define quantifiable goals, indicators, and metrics for global adaptation.
- Expected to be finalised at COP30.
- Includes adaptation finance, reporting mechanisms, and national adaptation planning.

Just Transition

- Ensuring the shift to a low-carbon economy is socially fair, including:
  - Reskilling workers
  - Supporting communities dependent on fossil fuel industries
  - Creating green jobs
- Avoiding inequitable burdens on developing economies

Nationally Determined Contributions (NDCs)

- Countries must update NDCs to cover targets up to 2035.
- Deadline: February 2025 (many countries are behind schedule).

Climate–Nature Nexus

- COP30 recognises climate and biodiversity as interconnected.
  Initiatives include:
  - The proposed Tropical Forest Forever Facility
  - Greater emphasis on nature-based solutions
  - Forest conservation financing

India's Role at COP30

- **Advocacy for Climate Justice:** Reiterating CBDR, pushing developed nations to take the lead in emission cuts and deliver climate finance.
- **Bridge-Builder:** Positioning itself as a mediator between the Global North and Global South.
- **Domestic Achievements**
  - Showcasing:
  - Green budgeting
  - Sovereign green bonds
  - Renewable capacity expansion
  - Coal phase-down trajectory

South Asia's Priorities at COP30

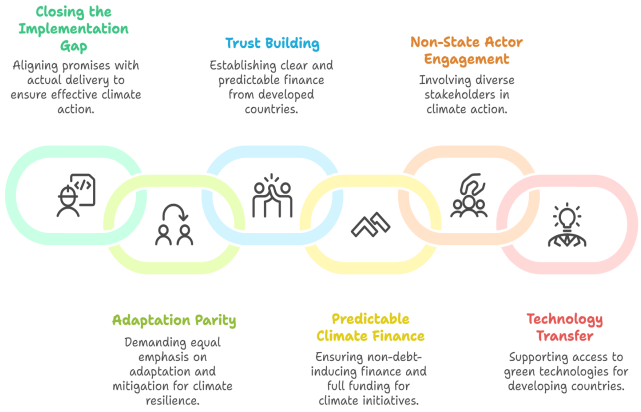


Figure 43: South Asia's Priorities at COP30

- **Closing the Implementation Gap:** Aligning promises (NDCs, finance) with actual delivery.
- **Adaptation Parity:** Demanding equal emphasis on adaptation and mitigation, crucial for a climate-vulnerable region.
- **Trust Building:** Clear, predictable finance from developed countries; updated and ambitious NDCs.
- **Predictable Climate Finance**
  - Non-debt-inducing finance
  - Full funding for the Loss and Damage Fund
  - Tripling adaptation finance

- **Non-State Actor Engagement:** Involving state governments, civil society, youth, academia, and private sector.
- **Technology Transfer:** Support for access to green technologies, ensuring developing countries are not left behind.

Conclusion

COP30 arrives at a defining moment for global climate action. With the 1.5°C goal slipping away, meaningful progress depends on translating promises into action, securing adequate finance, and ensuring equitable leadership — goals that India and South Asia will strongly advocate throughout the negotiations.

India at COP: 'Just Transition Mechanism'

Context: At global climate negotiations, India and other developing nations are advocating a just transition mechanism that prioritises both economic transformation and adequate climate adaptation finance, which remains severely underfunded.

Just Transition Work Programme (JTWP)

- **Established:** COP27 (2022)
- **Operationalized**: COP28 (2023)
- **Objective:** Support workers and communities affected by the shift away from fossil fuels by creating new employment opportunities in renewable energy and green sectors.

India's Stand on Just Transition

India argues that just transition must be holistic, encompassing:

- Resilience-building
- Adaptation measures
- Employment protection
- Poverty eradication
- Food security
- Social safety nets

Key Principles India Emphasises

- **Flexibility for Developing Countries:** Progress should reflect national circumstances and development priorities.
- **Country-Driven GGA**: The Global Goal on Adaptation must be tailored to national needs, not externally imposed.
- **Climate Justice & Equity**: Developed countries must lead emission cuts and provide predictable finance.

COP-Level Divisions

- **Developing Countries:** Unwilling to commit to phasing out fossil fuels without assured finance and technology transfer.
- **Developed Countries**
  - Resist binding commitments on:
  - Concessional finance
  - Low-cost loans
  - Predictable support obligations

Conclusion

India's push at COP reinforces the need for equitable climate action, where developing countries receive sufficient finance and policy space to pursue low-carbon development without compromising growth or social welfare.

Great Indian Bustard & Lesser Florican

Context: During a petition concerning the conservation of the Great Indian Bustard (GIB) and Lesser Florican, Justice P.S. Narasimha remarked that "imported ideas" such as intergenerational equity are often anthropocentric, prompting renewed debate on indigenous conservation approaches.

Great Indian Bustard (GIB)

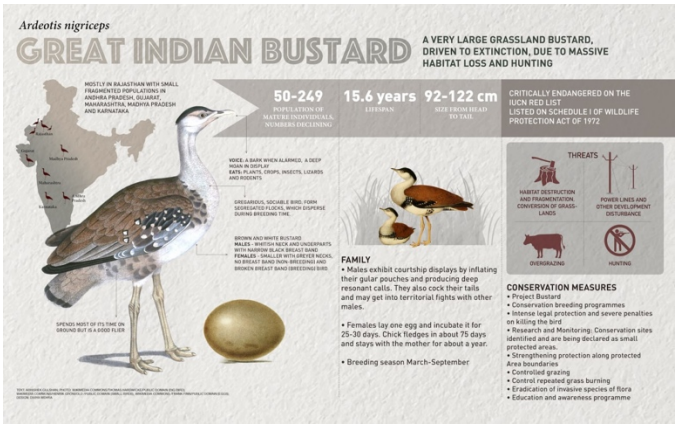


Figure 44: Great Indian Bustard| Source: Roundglass Sustain

Taxonomy & Identification

- Scientific Name: Ardeotis nigriceps
- Among the heaviest flying birds (up to 15 kg).
- Distinctive features: Black crown, white neck, brown body.

Habitat & Distribution

- A grassland specialist dependent on arid and semi-arid grasslands.

Main populations in:

- Rajasthan (Desert National Park)
- Gujarat (Kutch region)

- Smaller, fragmented groups in Maharashtra, Karnataka, Andhra Pradesh.

Conservation Status

- **IUCN:** Critically Endangered
- **Wildlife Protection Act (1972):** Schedule I
- **CITES:** Appendix I
- **CMS:** Appendix I

Lesser Florican

Taxonomy & Identification

- Scientific Name: Sypheotides indicus
- The smallest bustard species.
- Known for dramatic vertical courtship leaps during the monsoon.

Habitat & Distribution

- Prefers tall grasslands and monsoon croplands.
- Distribution ranges across:
  - Rajasthan
  - Gujarat (Blackbuck National Park)
  - Madhya Pradesh
  - Maharashtra

Figure 45: Lesser Florican | Source: Roundglass Sustain

Conservation Status

- **IUCN:** Endangered
- **Wildlife Protection Act:** Schedule I
- **CITES:** Appendix I

Conclusion

The GIB and Lesser Florican represent India's gravely threatened grassland biodiversity. Their conservation requires science-backed habitat protection and sensitive policy implementation beyond merely symbolic principles.

Pradhan Mantri Fasal Bima Yojana (PMFBY)

Context: The government has added wild animal attacks and paddy inundation as new Add-on Covers under the 'Localised Risk' category of the Pradhan Mantri Fasal Bima Yojana (PMFBY) beginning Kharif 2026.

Pradhan Mantri Fasal Bima Yojana (PMFBY)

- **Launched**: 2016
- **Ministry**: Agriculture & Farmers' Welfare
- **Type**: Comprehensive, technology-driven crop insurance scheme
- **Core Objectives**
  - Financial support for farmers after crop loss
  - Stabilise farm incomes
  - Promote modern agricultural practices
  - Encourage institutional credit by reducing farm risk

Key Features:

1. Highly Subsidised Premium Rates: No cap on government subsidy.

Season	Farmer Pays	Government Pays
Kharif	2%	Remaining premium
Rabi	1.5%	Remaining premium
Commercial/Horticultural	5%	Remaining premium

2. Comprehensive Risk Coverage: Includes losses caused by:

- Floods, drought, hailstorm, cyclone
- Pest infestation
- Fire
- Prevented sowing
- Mid-season adversity
- Post-harvest losses (up to 14 days)
- Localised calamities: landslides, cloudbursts, inundation
- New Add-on Covers (Kharif 2026)
- Wild animal attacks
- Paddy inundation

3. Technology-Based Implementation

- Remote sensing
- Drone-based crop assessment
- GPS-enabled apps for claim reporting
- Digital Crop Cutting Experiments (CCEs)

Implementation Framework

- Implemented via empanelled public and private insurers
- States select companies through bidding
- Premium shared by Centre and States

Beneficiaries

Covers:

- Loanee & non-loanee farmers
- Notified food crops, cash crops, and horticulture crops

Conclusion

The new add-on covers strengthen PMFBY's inclusiveness by addressing localised risks that disproportionately affect vulnerable farmers.

Human–Dolphin Cooperative Fishing

Context: An international research project is documenting the remarkable cooperative fishing behaviour between Indo-Pacific humpback dolphins and artisanal fishers in Ashtamudi Lake, Kollam, Kerala.

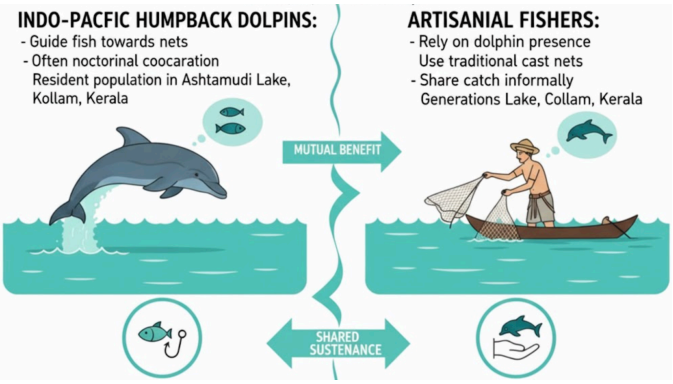


Figure 46: Human Dolphin Cooperation

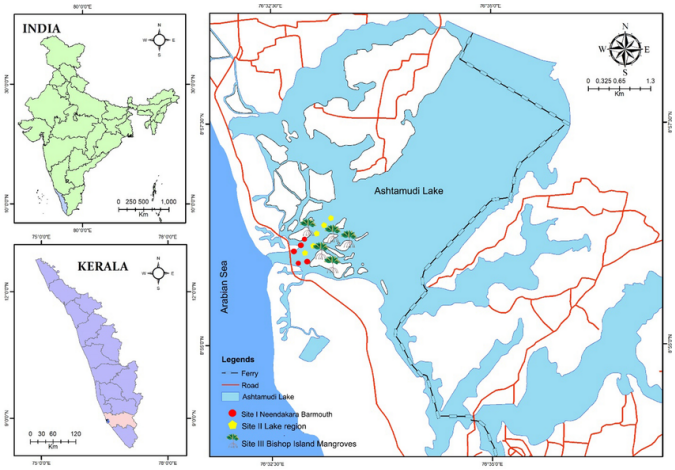


Figure 47: Ashtamudi Lake

Key Behaviour Observed

- Dolphins herd fish (usually mullet) towards shallow waters near fishing zones.
- They signal fishers through tail slaps, rolls, or specific surfacing patterns.
- Fishers cast nets at the precise moment based on the dolphins' cues.
- Both species benefit: dolphins feed on scattered fish while humans gain higher catch efficiency.
- This is comparable to known cooperative fishing cultures in Brazil (Laguna) and Myanmar.

Research Project Details

- **Title**: Ecology and Evolution of Cultural and Cooperative Behaviour among Dolphins and Humans
- **Supported by:** National Geographic Society
- **Approach**: Entirely non-invasive
  - Photo/video documentation
  - Behavioural observations
  - Interviews with local fishers
  - No dolphin capture, tagging, or disturbance.

Major Dolphin Species Found in India

Common Name	Scientific Name	Region / Habitat	Status
Ganges River Dolphin	*Platanista gangetica gangetica*	Ganga–Brahmaputra–Meghna; Karnaphuli	Endangered; National Aquatic Animal
Indus River Dolphin	*Platanista gangetica minor*	Indus River; small presence near Indo–Pak border	Endangered
Irrawaddy Dolphin	*Orcaella brevirostris*	Chilika Lake, Sundarbans	Vulnerable; known for cooperative fishing
Indo-Pacific Humpback Dolphin	*Sousa plumbea*	Kerala coast, west coast, Indian Ocean	Near Threatened

Conclusion

The Ashtamudi dolphin–human cooperation highlights the ecological intelligence of marine mammals and underscores the importance of conserving India's fragile coastal and estuarine ecosystems.

Indian Dugongs

Context: A recent IUCN assessment has highlighted escalating threats to Indian Dugongs, underscoring the urgent need for habitat protection and stricter conservation measures.

Prelims Facts

- **Scientific Name:** Dugong dugon
- **IUCN**
- **Status:**Vulnerable
  WPA, 1972: Schedule I (highest protection)
- **Diet**: Strict herbivores — exclusively seagrass specialists
- **Habitat**: Shallow coastal waters

- Gulf of Mannar (key habitat)
- Palk Bay
- Andaman & Nicobar Islands
- Gulf of Kutch

Figure 48: Dugong| Source: Roundglass Sustain

Key Threats

- **Habitat Loss:** Bottom trawling, dredging, and coastal development destroy seagrass meadows — the dugong's only food source.
- **Pollution**: Heavy metals such as lead and mercury found in tissues indicate chemical contamination of coastal ecosystems.

Conservation Efforts

- India's first Dugong Conservation Reserve established in Palk Bay (Tamil Nadu).
- Focus on seagrass restoration, bycatch prevention, and community-led coastal ecosystem management.

Conclusion

Strengthening seagrass protection and regulating destructive fishing practices remain central to preventing further decline of India's last surviving dugong populations.

Blackbuck

Context: The **Blackbuck (Antilope cervicapra)**, India's only surviving antelope species, remains a key indicator species for the conservation of **grassland and semi-arid ecosystems**, which are among the most neglected habitats in India.

Species Profile

- **Scientific Name:** *Antilope cervicapra*
- **IUCN Red List:** Least Concern
- **Wildlife Protection Act, 1972:** Schedule I
- **CITES:** Appendix III (India)

Habitat and Distribution

- Prefers open grasslands, scrublands, and semi-arid plains.
- Found mainly in:
  - Rajasthan
  - Gujarat
  - Maharashtra
  - Parts of Karnataka and Andhra Pradesh
- Historically widespread across the Indian subcontinent.

Ecological Importance

- Plays a critical role in maintaining **grassland ecology**.
- Serves as prey for large carnivores.
- Indicator of healthy open ecosystems.

Cultural Significance

- Protected by traditional communities such as the **Bishnois of Rajasthan**, who consider the species sacred.
- Demonstrates the role of **community-led conservation**.

Threats

- **Habitat loss and fragmentation** due to agriculture and infrastructure.
- Decline of grasslands due to tree-centric afforestation policies.
- Poaching and road accidents in fragmented landscapes.

Conservation Measures

- Establishment of:
  - Blackbuck Conservation Reserves
  - Community-protected areas
  - Legal protection under Schedule I.
  - Awareness and community engagement initiatives.

Challenges

- Grasslands often misclassified as "wastelands".
- Weak protection outside protected areas.
- Limited landscape-level planning.

Way Forward

- Recognise grasslands as distinct ecosystems in policy.
- Promote community stewardship models.
- Integrate conservation with rural livelihoods.

Conclusion

Blackbuck conservation highlights the urgent need to **protect India's grasslands**, ensuring that conservation strategies go beyond forests and include open natural ecosystems.

Global Methane Status Report 2025

Context: The Global Methane Status Report 2025**, released by the** UN Environment Programme (UNEP)**, underscores methane as the** single most effective lever for near-term climate mitigation**, particularly critical for keeping the** 1.5°C target **within** reach.

Background

- Methane (CH_4) is a short-lived climate pollutant with a global warming potential ~84 times that of CO_2 over a 20-year period**.**
- Since pre-industrial times, methane has contributed to nearly 30% of observed global warming**.**
- Atmospheric methane concentrations have reached record levels, driven predominantly by human activities**.**

Key Findings of the Report

- To align with Paris Agreement goals, global methane emissions must decline by ~45% by 2030**.**
- **Sectoral contribution**:
    - **Agriculture (~40%)**: Livestock enteric fermentation, manure management, rice paddies
    - **Energy sector (~35%)**: Oil and gas leaks, coal mining
    - **Waste (~20%)**: Landfills and wastewater
- **Cost-effective mitigation options**—many with net economic benefits—could reduce emissions by up to 60% this decade.
- Methane reduction also lowers ground-level ozone, preventing hundreds of thousands of premature deaths annually.

Significance

- Methane mitigation delivers rapid climate benefits due to its short atmospheric lifetime (~12 years).
- Offers strong co-benefits:
    - Improved public health
    - Higher agricultural productivity
    - Reduced climate extremes
- Acts as a bridge strategy while CO_2 decarbonisation continues.

India's Context

- India is among the world's major methane emitters, largely due to agriculture and waste sectors**.**
- India has not formally joined the Global Methane Pledge**,** citing:
    - Food security concerns
    - Livelihood dependence on livestock
- However, India is pursuing co-benefit approaches such as biogas, waste-to-energy, and improved rice cultivation practices.

Challenges

- Measurement and reporting gaps in agricultural methane.
- Limited finance and technology access for developing countries.
- Risk of imposing mitigation burdens without climate equity.

Way Forward

- Scale up climate-smart agriculture and feed management.
- Plug fugitive emissions in oil, gas, and coal sectors.
- Strengthen Methane Monitoring, Reporting and Verification (MRV) systems.
- Align methane action with developmental priorities**.**

Conclusion

The Global Methane Status Report 2025 establishes methane mitigation as a high-impact, low-cost climate opportunity**,** demanding urgent, differentiated, and equity-based global action.

China's Anti-Pollution Strategy

Context: China's evolving anti-pollution strategy represents one of the most extensive state-led environmental correction efforts undertaken by a major industrial economy, aimed at addressing severe air, water, and soil degradation.

Background

- Rapid industrialisation and coal dependence caused acute pollution in the early 2000s.
- Public discontent and health crises led to the launch of the **"War on Pollution" in 2014**.
- Pollution control was elevated to a **core governance priority**, linked to cadre evaluation.

Key Pillars of China's Strategy

1. **Air Pollution Control**
    - Closure of inefficient coal plants.
    - Ultra-low emission standards for power and industry.
    - Real-time pollution monitoring using digital platforms.
2. **Water Pollution Control**
    - River-basin-based governance (Yangtze, Yellow River).
    - Zero-liquid discharge norms for heavy industries.
3. **Soil Pollution Management**
    - **Soil Pollution Prevention Law (2019)** to address contaminated land and legacy pollution.
4. **Market-Based Instruments**
    - World's **largest Emissions Trading System (ETS)**, initially covering the power sector.

Outcomes

- PM2.5 levels in major cities declined significantly.

- Improved regulatory compliance due to strict enforcement.
- Green technologies promoted as growth drivers.

Strategic Significance

Pollution control is used to:

- Restructure industry
- Promote green innovation
- Enhance China's climate diplomacy credibility

Limitations

- Regional disparities in enforcement.
- Continued reliance on coal for energy security.
- Risk of pollution displacement to poorer regions.

Conclusion

China's anti-pollution strategy illustrates how **state capacity and regulatory enforcement** can reverse environmental degradation, though long-term sustainability hinges on energy transition.

Exotic Species Eradication

Context: Forest authorities have undertaken targeted efforts to eradicate **Senna spectabilis**, an invasive alien plant species, from the **Mudumalai Tiger Reserve**, part of the Nilgiri Biosphere Reserve.

About *Senna spectabilis*

- Native to Central America.
- Introduced in India as an ornamental and shade plant.
- Highly invasive, forming dense monocultures.

Ecological Impacts

- Suppresses native grasses critical for herbivores.
- Alters fire regimes.
- Reduces habitat quality for prey species, indirectly affecting apex predators like tigers.

Figure: 49: Senna Spectabilis

Eradication Strategy

- Mechanical uprooting and cutting.
- Controlled burning in select areas.
- Restoration using native grass and tree species.

Challenges

- High regenerative capacity of the species.
- Labour-intensive and costly operations.
- Risk of secondary invasions post-removal.

Significance

- Improves prey availability.
- Restores grassland ecosystems.
- Strengthens protected area integrity.

Conclusion

The eradication of *Senna spectabilis* highlights the importance of **active invasive species management** for ecological restoration and biodiversity conservation.

New Indigenous Territories, Brazil

Context: Brazil has formally recognised and created **new Indigenous territories**, marking a significant policy shift towards **rights-based environmental governance** and stronger protection of the **Amazon rainforest**, one of the world's most critical ecological regions.

Figure 50: Amazon's Indigenous territory

Background

- Brazil is home to nearly **900,000 Indigenous people**, belonging to over **300 tribes**.
- Indigenous territories constitute about **13–14% of Brazil's land area**, largely concentrated in the Amazon basin.
- Historically, land demarcation slowed under extractivist and agribusiness-friendly policies, leading to increased deforestation and conflicts.

Recent Developments

- The Brazilian government approved new Indigenous land demarcations after prolonged administrative delays.
- The move aligns with constitutional provisions recognising Indigenous peoples' **original rights over traditionally occupied lands**.
- It follows judicial interventions reinforcing the **"non-extinguishment of ancestral rights"**, rejecting restrictive interpretations like the "time-frame doctrine".

Ecological Significance

- Indigenous territories have been proven to be **effective barriers against deforestation**, illegal logging, and mining.
- Studies show deforestation rates inside Indigenous lands are significantly lower than in surrounding areas.
- These territories act as major **carbon sinks**, contributing to global climate mitigation.

Social and Cultural Significance

- Protects Indigenous livelihoods, languages, and cultural identity.
- Reinforces self-determination and community-based governance.
- Strengthens compliance with international commitments such as:
    - **UN Declaration on the Rights of Indigenous Peoples (UNDRIP)**
    - **Convention on Biological Diversity (CBD)**

Challenges

- Persistent threats from illegal mining, logging, and land grabbing.
- Resistance from agribusiness and political lobbies.
- Enforcement gaps in remote forest regions.

Way Forward

- Strengthen monitoring using satellite surveillance and community patrols.
- Ensure adequate funding for enforcement agencies.
- Integrate Indigenous knowledge into climate and biodiversity strategies.

Conclusion

Brazil's recognition of new Indigenous territories reaffirms that **Indigenous stewardship is central to ecological protection**, making land rights a powerful tool for climate action and sustainable development.

Cold Wave (Meteorology)

Context: Recurring and increasingly intense **cold wave conditions** in northern and central India have highlighted vulnerabilities in public health, agriculture, and infrastructure, raising concerns about **climate variability and extreme weather events**.

Definition and Criteria

According to the **India Meteorological Department (IMD)**:

- A cold wave is declared when:
    - Minimum temperature falls below **10°C in plains**, or
    - Departure from normal is **4.5°C or more**, or
    - Wind chill (WCT_n) criteria are met
- **Severe cold wave** involves larger negative departures.

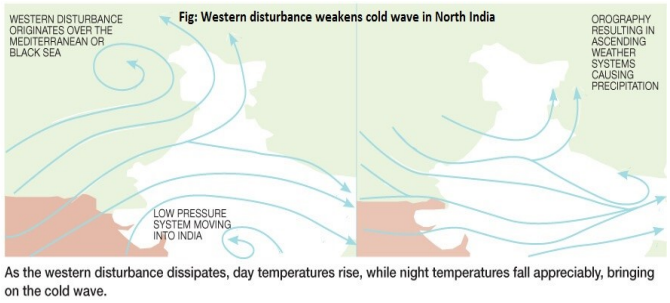


Figure 51: Cold wave in North India

Meteorological Causes

- **Western Disturbances** bringing cold air masses from higher latitudes.
- Clear skies and low humidity causing enhanced **radiative cooling** at night.
- Snow cover in the Himalayas increasing cold air advection.
- Occasional influence of Arctic air incursions.

Impacts

- **Human health:** Hypothermia-related mortality among homeless and elderly.
- **Agriculture:** Frost damage to crops like wheat, potatoes, and mustard.
- **Energy demand:** Surge in heating requirements.
- **Transport:** Disruptions due to fog and low visibility.

Climate Change Linkages

- Arctic amplification weakens the polar vortex.

- Increased frequency of extreme cold spells despite global warming.
- Greater weather variability rather than uniform warming.

Mitigation and Preparedness

- Early warning systems by IMD.
- Cold wave action plans at state and district levels.
- Night shelters and public advisories.
- Climate-resilient cropping practices.

Way Forward

- Strengthen last-mile dissemination of weather alerts.
- Integrate cold wave risks into disaster management plans.
- Improve urban planning to reduce exposure.

Conclusion

Cold waves are no longer isolated climatic anomalies but part of **changing climate dynamics**, requiring proactive adaptation, preparedness, and risk-sensitive governance.

HAYLI GUBBI VOLCANO ERUPTION

Context: In **November 2025**, Ethiopia's **Hayli Gubbi volcano**, dormant for nearly **12,000 years**, erupted violently, sending a **massive ash plume up to 45,000 feet (FL450)** into the atmosphere. The ash cloud travelled across the **Red Sea, Arabian Peninsula, Arabian Sea**, and reached **western India**, forcing **aviation diversions** and drawing global attention to the **East African Rift System (EARS)**.

Background:

A **volcanic eruption** is the expulsion of **magma, gases, and rock fragments** from within the Earth through vents or fissures.

- Internal Earth Processes
  - Beneath the Earth's crust lies the **mantle**, containing a partially molten zone called the **asthenosphere**.
  - **Magma** forms when mantle rocks partially melt due to Decompression and Heat from mantle plumes.
  - Dissolved gases (SO_2, CO_2, nitrogen compounds) expand as magma rises, creating pressure that forces magma upward.
- Products of Volcanic Eruptions
  - **Volcanic ash** (fine silicate particles)
  - **Pyroclastic debris** (glass shards, rock fragments)
  - **Gases** (Sulphur dioxide, nitrogen compounds)
  - **Lava flows**

Parameter	Details
Volcano Type	Shield Volcano
Dormancy Period	~10,000–12,000 years
Latest Eruption	23 November 2025
Eruption Style	**Sub-Plinian**
Ash Plume Height	**~45,000 ft (FL450)**
Materials Released	Ash, SO_2, volcanic glass
Drift Path	Yemen → Oman → Arabian Sea → India

Location

- **Afar Region, Ethiopia**
- Part of the **Erta Ale volcanic range**
- Situated within the **Afar Depression (Danakil Depression)**
- Lies at the junction of major tectonic rifts

Volcano Type

- **Shield Volcano**
  - Broad, gently sloping structure
  - Built by successive flows of **low-viscosity basaltic lava**
  - Typically less explosive, lava spreads widely like a shield
- Composed mainly of **dark basaltic lava**, with traces of **silica-rich material**

Geological Setting: East African Rift System (EARS)

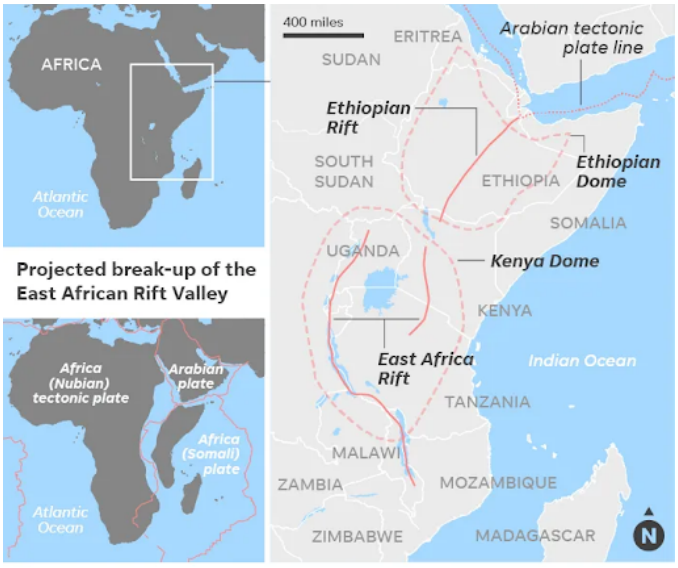


Figure 52: The East African Rift System

Hayli Gubbi lies within one of the world's most geologically active zones.

- **East African Rift System**
  - A **divergent plate boundary** where the following plates are gradually separating:
    - **Nubian Plate**
    - **Somali Plate**
- Driven by a deep **Afar mantle plume**
- Leads to:
  - Crustal thinning
  - High heat flow

  - Frequent earthquakes and volcanism
- Afar Triple Junction
  - Meeting point of:
  - Red Sea Rift
  - Gulf of Aden Rift
  - East African Rift
- One of the few places where **continental rifting may eventually form a new ocean basin**

Why Was It Explosive?

- Although shield volcanoes usually produce gentle lava flows, the Hayli Gubbi eruption became **sub-Plinian** due to:
  - Long-term gas accumulation
  - Pressure build-up in magma chambers
  - Rapid decompression during ascent

Composition of the Volcanic Plume

The high-altitude plume consisted of:

- **Volcanic ash** (silicates)
- **Sulphur dioxide (SO_2)** – causes haze, acid formation
- **Volcanic glass shards** – extremely dangerous for aircraft engines
- **Fine aerosols** – affect solar radiation and atmospheric circulation

These materials were transported at **15,000–45,000 ft**, intersecting commercial aviation corridors.

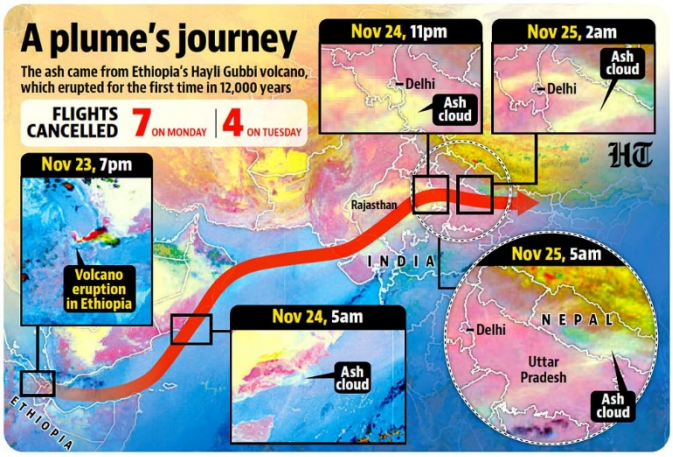


Figure 53: Smoke from Ethiopia travelling to India

Why Did the Ash Reach India?

- The eruption column entered the **upper troposphere/lower stratosphere**
- **Subtropical jet streams and upper-level westerlies** carried ash eastward
- High altitude allowed long-distance transport with minimal settling
- **Result:**
  - Ash cloud reached **western India (Gujarat, Rajasthan, Maharashtra)**
  - Led to **flight diversions and aviation advisories**
  - Minimal immediate surface air quality impact due to high altitude

Environmental Consequences

- Local Impacts (Ethiopia)
  - **Air pollution** due to ash and SO_2
  - **Water contamination** from ash deposition
  - **Vegetation damage** and habitat disruption
  - **Soil chemistry alteration** affecting agriculture
  - Creation of new lava fields and fissures
- Regional & Global Impacts
  - Atmospheric cooling potential due to aerosols
  - Disruption of aviation routes
  - Temporary changes in regional climate patterns

Economic Implications

- **Agriculture:** Crop damage, grazing land contamination
- **Pastoral Livelihoods:** Loss of fodder and livestock stress
- **Transport & Aviation:** Flight cancellations, increased logistics costs
- **Tourism:** Temporary decline in Danakil/Afar tourism
- **Public Expenditure:** Relief, rehabilitation, and monitoring costs

Other Major Volcanoes in the African Rift

- **Mount Nyiragongo (DR Congo)** – fast-moving lava
- **Dabbahu (Ethiopia)** – fissure eruptions
- **Mount Alayta (Ethiopia)** – shield volcano
- **Ardoukoba (Djibouti)** – erupted in 1978
- **Mount Silali (Kenya)** – extinct caldera

Conclusion

The **Hayli Gubbi eruption of 2025** is a rare geological event that underscores the **dynamic nature of continental rifting**, and the interconnectedness of **geology, atmosphere, aviation, and disaster management**. It reinforces the importance of monitoring tectonically active regions like the **East African Rift**, which continues to reshape the African continent—and possibly Earth's future oceans.

SCIENCE & TECHNOLOGY

Privatization of Nuclear Sector

Context: During a recent address, the Prime Minister signalled that India is moving towards opening the civil nuclear sector to private participation, similar to reforms in the space sector.

Figure 54: Nuclear Power Plant| Source: ORF

Why Open the Civil Nuclear Sector?

- **Mobilizing Private Investment:** Attracts large-scale capital for expanding nuclear capacity.
- **Boosting Innovation:** Enables faster development and deployment of Small Modular Reactors (SMRs) and next-gen technologies.
- **Enhancing Grid Stability & Energy Security:** Nuclear energy provides reliable baseload power, crucial for integrating renewables.
- **Strengthening Domestic Manufacturing:** Encourages Indian companies to develop nuclear components, reactors, and supply chains.

Civil Nuclear Sector in India: Current Status

- **Exclusive State Control:** Managed primarily by the Department of Atomic Energy (DAE).
- **Operational Capacity**
  - 24 reactors operated solely by NPCIL.
  - Installed capacity: 8.8 GW (~2% of India's total power generation).
- **Targets**
  - 22 GW by 2032.
  - 100 GW by 2047.

Governing Laws:

Atomic Energy Act (AEA), 1962

- Prohibits private or state government participation in nuclear power generation.
- Civil Liability for Nuclear Damage Act (CLNDA), 2010
- Provides compensation framework in case of nuclear accidents.
- Operators' liability capped at ₹1,500 crore.

Challenges to Private Sector Participation

- **Safety, Regulation & Liability Risks**
  - CLNDA places heavy supplier liability, discouraging private firms.
  - High compliance requirements given potential risks.
- **National Security Concerns**
  - Nuclear sector requires strict oversight, traceability, and security protocols.
  - Private involvement increases monitoring complexity.
- **Long Gestation Periods**
  - Nuclear plants take 7–10 years to build.
  - Private investors may hesitate without guaranteed returns or risk-sharing mechanisms.
- **Resource Constraints**
  - India's domestic uranium supply is insufficient.
  - Private players would depend heavily on uranium imports, impacting costs and energy security.

Conclusion

Opening India's civil nuclear sector could transform the country's clean energy landscape, but requires careful reforms in safety, liability, security, and resource management to ensure responsible and sustainable private participation.

Digital Sequence Information

Context: The UN Special Rapporteur on the Right to Food has warned that **Digital Sequence Information (DSI)** could undermine the mandate of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), raising concerns about equity, access, and global governance.

About ITPGRFA

- Adopted in 2001, in force since 2004, under the Food and Agriculture Organization (FAO).
- A legally binding agreement ensuring the conservation, sustainable use, and fair and equitable sharing of benefits from plant genetic resources.
- India is a contracting party.
- The Treaty's Governing Body meets every two years.

Digital Sequence Information (DSI)

Definition

- A placeholder term under the 1992 Convention on Biological Diversity (CBD); no global consensus on its exact definition.
- Broadly refers to digital representations of genetic material — DNA, RNA, protein sequences, and associated biological data stored digitally.

Role in Science & Development

- Used by public and private sectors for research, breeding, and innovation.
- Supports sustainable development, crop improvement, and biotechnology.

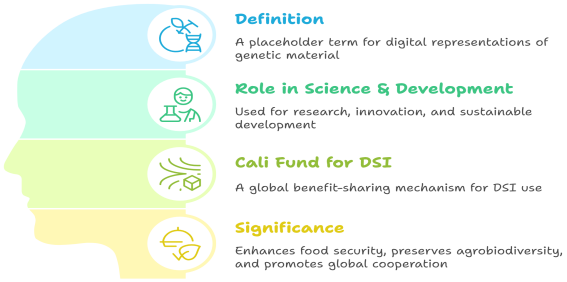


Figure 55: Understanding Digital Sequence Information

Cali Fund for DSI

- Created at CBD COP-16.
- A global benefit-sharing mechanism ensuring that profits from DSI use contribute to:
  - Biodiversity conservation
  - Capacity-building
  - Support for indigenous and local communities

Significance of DSI

- **Food & Nutritional Security:** Enables rapid development of climate-resilient, drought-tolerant, and disease-resistant crop varieties.
- **Preservation of Agrobiodiversity:** Complements physical gene banks with digital sequence repositories, preserving valuable genetic traits globally.
- **Global Scientific Cooperation:** Digital access democratizes breeding research, enabling developing countries to participate in cutting-edge innovation.

Challenges in DSI Governance

- **Unclear Definition:** Absence of a universally agreed definition under CBD complicates regulation and benefit-sharing systems.
- **Digital Biopiracy:** Genetic data may be accessed, copied, or utilised without consent, bypassing traditional access-and-benefit-sharing frameworks.
- **Impact on Farmers' Rights:** Risks weakening the role of farmers and indigenous communities — traditional custodians of genetic diversity — by shifting control to large digital platforms or corporations.

Conclusion

While DSI offers transformative potential for crop improvement and global food security, it also raises serious governance, equity, and sovereignty concerns, making it a central issue in the future of plant genetic resource management under the ITPGRFA.

BIRSA 101

Context: India has launched its first indigenous CRISPR-based gene therapy for Sickle Cell Disease (SCD), named BIRSA 101, developed by CSIR–Institute of Genomics and Integrative Biology (IGIB) and dedicated to tribal freedom fighter Bhagwan Birsa Munda.

About Gene Therapy

Definition: Gene therapy is a medical technique that uses genes to treat, prevent, or cure diseases.

Working Mechanism

- Introduces new copies of a functional gene or
- Replaces a defective or missing gene with a healthy (therapeutic) version inside the patient's cells. This helps restore normal biological function and treat genetic disorders at their root cause.

About CRISPR Technology

Figure 56: CRISPR Technology| Source: Pharmaceutical Technology

Meaning: CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) is an advanced genome-editing tool.

How It Works

It uses two key components:

- Guide RNA (gRNA)

- Identifies and binds to a specific target DNA sequence.

Cas9 Enzyme

- Acts like molecular scissors, cutting both strands of DNA at the precise location.
- Allows insertion, deletion, or replacement of genetic material.
- CRISPR enables highly accurate, efficient, and cost-effective gene editing.

About Sickle Cell Disease (SCD)

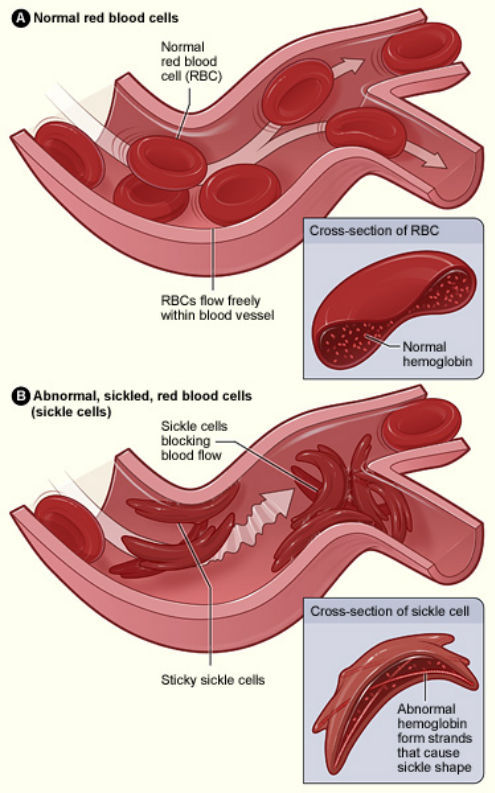


Figure 57: Sickle Cell Disease (SCD)

- SCD is a genetic blood disorder affecting hemoglobin, the oxygen-carrying molecule in red blood cells.
- Causes RBCs to become rigid, sticky, and sickle-shaped, leading to:
  - Blocked blood flow
  - Severe pain
  - Organ damage
  - Increased infection risk

Relevance to India

- Disproportionately affects the tribal population.
- 1 in 86 births among Scheduled Tribes are affected by SCD — making it a major public health priority.

Conclusion

The launch of BIRSA 101 marks a historic milestone for India's biotechnology sector, offering hope for a transformative cure for Sickle Cell Disease while advancing indigenous CRISPR-based medical innovation.

National Action Plan on AMR 2.0

Context: The Union Minister has launched the second version of the National Action Plan on Antimicrobial Resistance (NAP-AMR 2.0) for the period 2025–29, strengthening India's fight against AMR.

About NAP-AMR 2.0

- Builds on gaps and lessons from the first National Action Plan (2017–2021).
- Fully aligned with the WHO Global Action Plan on AMR.
- Introduces ministry-wise action plans, with clear timelines, budgets, and monitoring frameworks.

Key Strategies

- **Strengthening Ownership & Coordination:** Establishes well-defined mechanisms for inter-sectoral coordination across human health, animal health, agriculture, and environment sectors.
- **Enhancing Laboratory Capacity & Infection Control:** Upgrades microbiology labs, surveillance systems, and infection prevention and control (IPC) in healthcare facilities.
- **Stronger Private Sector Engagement:** Encourages responsible antibiotic use, reporting, and stewardship practices across private hospitals, pharmacies, and diagnostic centres.

About Antimicrobial Resistance (AMR)

Definition: AMR occurs when microorganisms — bacteria, viruses, fungi, parasites — evolve to resist drugs designed to kill them, making standard treatments ineffective.

Impact of AMR

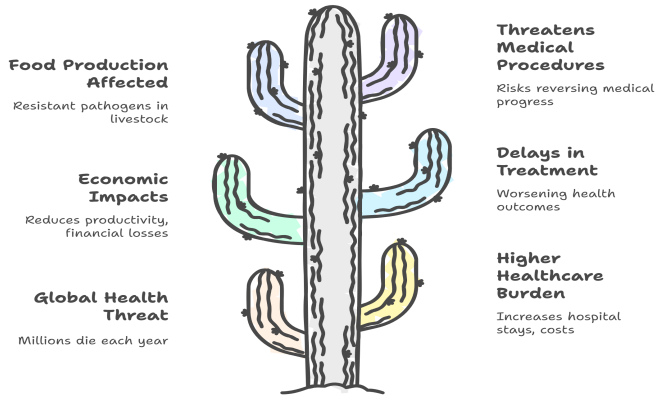


Figure 58: AMR as Global Crisis

- **Global Health Threat**
  - Associated with 4.95 million deaths each year globally.
  - 1.27 million deaths are directly caused by drug-resistant infections.
- **Higher Healthcare Burden:** Ineffective antimicrobial treatment increases hospital stays, medical costs, and out-of-pocket expenditure for families.
- **Economic Impacts**
  - Reduces productivity, affects labour markets, and leads to major financial losses.
  - Poses a threat to national and global economic growth.
- **Delays in Treatment:** Resistant infections slow down effective treatment, worsening health outcomes.
- **Other Risks**
  - Affects food production systems due to resistant pathogens in livestock.
  - Threatens critical medical procedures like surgeries and chemotherapy.
  - Risks reversing decades of medical progress.

Conclusion

NAP-AMR 2.0 represents India's strengthened, multisectoral effort to contain antimicrobial resistance, protect public health, and safeguard the effectiveness of life-saving medicines for future generations.

Precision Biotherapeutics

Context: Precision biotherapeutics have been identified by the Department of Biotechnology (DBT) as one of the six priority areas under India's BioE³ Policy, reflecting their growing importance in next-generation healthcare.

About Precision Biotherapeutics

Definition

- Precision biotherapeutics refers to the targeted use of biological therapies — such as proteins, cells, or gene-based treatments — that are tailored to an individual's genetic makeup, environment, and lifestyle.
- It represents a shift from "one-size-fits-all" medicine to precision, patient-specific interventions.

Key Technologies

- Gene Editing (e.g., CRISPR-based modification of faulty genes)
- mRNA Therapeutic Platforms (highly targeted, rapid-development vaccines and treatments)
- Monoclonal Antibodies (mAbs) (precision immune-based therapies)
- Personalised Cell-based Therapies (CAR-T, stem-cell therapies, regenerative medicine)

Advantages

- **Higher Efficacy:** Therapies are designed to target specific molecular pathways, improving clinical outcomes.
- **Reduced Adverse Effects:** By acting on precise targets, side effects are minimized compared to conventional broad-spectrum treatments.
- **Transformative for Complex Diseases**
  - Especially effective in:
  - Rare genetic disorders
  - Autoimmune diseases
  - Certain cancers
  - Metabolic and chronic conditions

Conclusion

Precision biotherapeutics mark a powerful leap toward personalised medicine, offering targeted, efficient, and safer treatments tailored to individual patient needs.

Quantum Diamond Microscope

Context: Under the National Quantum Mission, IIT Bombay has developed India's first Quantum Diamond Microscope (QDM) — marking a milestone in the country's quantum sensing and advanced instrumentation capabilities.

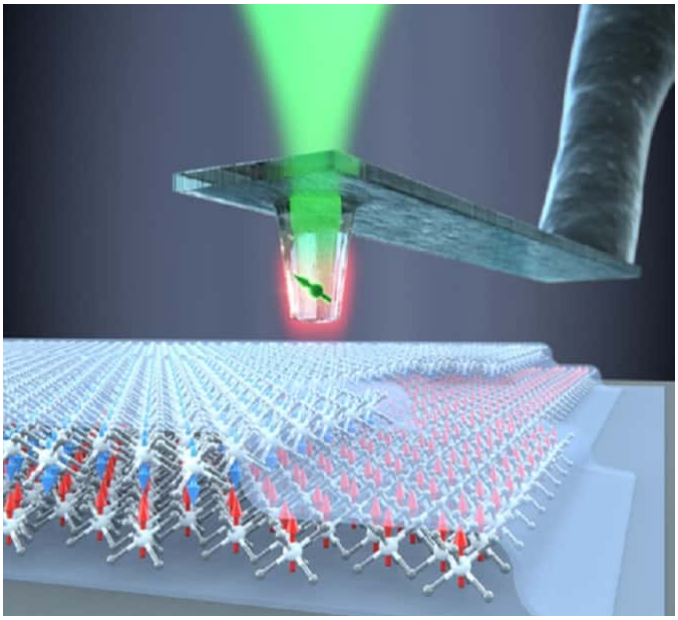


Figure 59: Quantum Diamond Microscope | Source: Physics World

About the Quantum Diamond Microscope

Technology

- Utilises nitrogen-vacancy (NV) centres in diamonds.

- These are atomic-scale defects that act as highly sensitive quantum sensors.
- The microscope images magnetic fields at nanoscale resolution, and importantly, operates at room temperature, unlike many quantum instruments requiring cryogenic conditions.

Applications

- **Neuroscience Research:** Maps tiny magnetic signals from neurons, enabling deeper understanding of brain activity.
- **Materials Science:** Detects nanoscale magnetic and structural defects in advanced materials.
- **Semiconductor Testing:** Enables non-destructive, high-precision evaluation of chips and microelectronics — crucial for India's semiconductor mission.

Significance

- Represents India's first patent in quantum sensing, placing the country among global frontrunners.
- Strengthens domestic capability in frontier instrumentation, reducing dependency on imported high-end research equipment.
- Boosts India's progress under the National Quantum Mission, advancing innovation in quantum technologies.

Conclusion

The Quantum Diamond Microscope is a landmark achievement for India's quantum ecosystem, showcasing world-class innovation in sensing technology and enabling advanced research across multiple scientific domains.

DNA Identification

Context: DNA identification/profiling has been used to identify suspects or victims at the Red Fort blast site, showcasing the crucial role of forensic genetics in disaster and crime investigation.

DNA Identification

Definition: DNA identification is a forensic technique that identifies individuals by analysing the unique genetic patterns present in their DNA.

Figure 60: DNA Identification| Source: Integra Bioscience

Key Methods Used in DNA Profiling

- **Short Tandem Repeat (STR) Analysis**
  - Most widely used forensic method.
  - Examines short, repeating DNA sequences in the nuclear genome.
  - Highly discriminatory — useful for matching individuals or confirming identity.
- **Mitochondrial DNA (mtDNA) Profiling**
  - Used when nuclear DNA is degraded (burned, decomposed, fragmented samples).
  - mtDNA is:
    - More abundant in cells
    - Maternally inherited, enabling identification through maternal relatives
    - Useful in mass disasters and old skeletal remains.
- **Y-Chromosome Analysis**
  - Targets Y-STRs, inherited father to son.
  - Helps identify male victims or suspects when comparing with paternal male relatives.
  - Useful in cases involving sexual assault or missing persons.
- **Single Nucleotide Polymorphisms (SNPs)**
  - Used for highly degraded DNA where STRs cannot be recovered.
  - SNPs reflect single-base differences unique to individuals.
  - Can be matched using:
    - Personal items (toothbrushes, combs)
    - Stored DNA records (with consent)

Conclusion

DNA identification combines multiple advanced techniques to reliably establish identity, playing a critical role in forensic investigations, victim identification, and criminal justice.

Aditya-L1 Observations

Context: India's first dedicated solar observatory, Aditya-L1, has captured some of the most detailed observations of explosive activity on the Sun, offering unprecedented scientific insights into solar eruptions and space weather dynamics.

What Aditya-L1 Has Observed

- **Solar Flares**
  - Aditya-L1's instruments detected rapid, high-energy flare events originating from magnetically active regions of the Sun.
  - These observations include the intensity profile, temperature variations, and particle acceleration during the flare.
- **Coronal Mass Ejections (CMEs)**

  - The spacecraft recorded early-stage evolution of CMEs — massive bursts of plasma and magnetic fields released from the Sun's corona.
  - Observations captured the initiation, expansion, and propagation direction of these CMEs, providing valuable data for modelling their impact on Earth.
- **Shock Waves and Magnetic Reconnection**
  - Instruments detected shock fronts produced during eruptions and signatures of magnetic reconnection, the fundamental physical process powering solar explosions.
  - This helps scientists understand how solar magnetic fields store and release enormous energy.

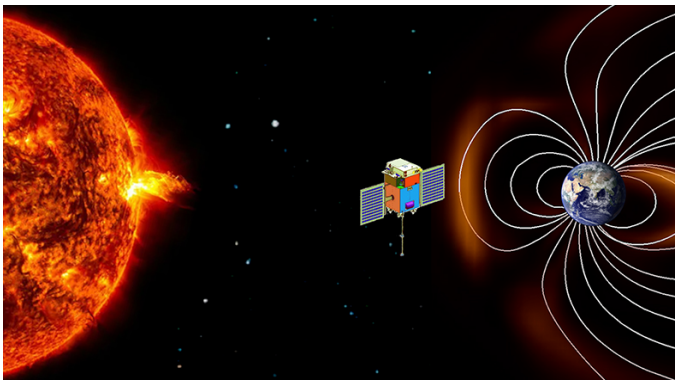


Figure 61: Aditya L1| Source: IITM Shashtra

How Aditya-L1 Makes These Observations

Aditya-L1 is positioned at the Lagrange Point L1, about 1.5 million km from Earth, providing a continuous, unobstructed view of the Sun.

Key Instruments Involved

- **VELC (Visible Emission Line Coronagraph):** Captures high-resolution images of the inner solar corona where CMEs originate.
- **SUIT (Solar Ultraviolet Imaging Telescope):** Observes the Sun in UV wavelengths, revealing temperature changes and dynamic activity in the lower atmosphere.
- **SoLEXS & HEL1OS:** Measure X-ray emissions and energetic particles during flares.

Scientific Significance

- **Space Weather Forecasting**
  - Early detection and monitoring of flares and CMEs help predict geomagnetic storms that can disrupt:
    - Satellites
    - Power grids
    - Navigation systems
    - Communication networks
- **Understanding Coronal Heating:** High-resolution data provides clues to the long-standing mystery of why the Sun's corona is far hotter than its surface.
- **Accurate CME Modelling:** Observations improve modelling of CME speed, direction, and density, enhancing India's space weather preparedness.
- **Contribution to Global Solar Science:** Data fills gaps left by other solar missions and contributes to a global, multi-mission understanding of solar physics.

Conclusion

Aditya-L1's close observations of solar eruptions mark a major scientific achievement for India. The mission is providing high-quality real-time data on solar flares, CMEs, and coronal dynamics — strengthening both global solar research and India's ability to forecast space weather hazards.

Altermagnetism

Context: Altermagnetism has recently emerged as a third fundamental form of magnetism, distinct from and yet sharing features with both ferromagnetism and antiferromagnetism.

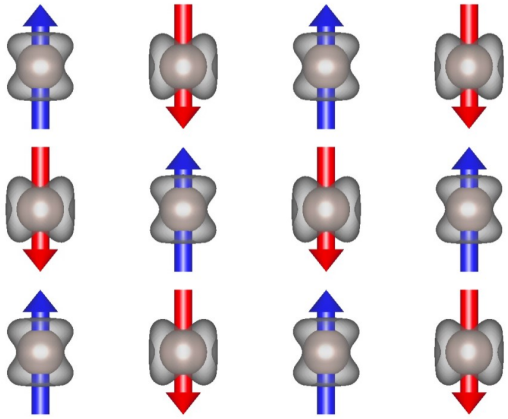


Figure 62: Altermagnetism

Understanding Altermagnetism:

Ferromagnetism (For Comparison)

- Seen in common magnets (e.g., fridge magnets).
- All atomic magnetic moments (spins) align in the same direction.
- Produces a strong external magnetic field.

Antiferromagnetism (For Comparison)

- Adjacent atomic moments point in opposite directions.
- Spins cancel out → no net magnetic field.
- Useful for fast, stable spintronic devices.

What Makes Altermagnetism Unique?

Altermagnets combine features of both ferromagnets and antiferromagnets:

- **No Net Magnetic Field (Like Antiferromagnets)**
  - Spins are arranged in a pattern that cancels the overall magnetic field.
  - This makes altermagnets compatible with sensitive electronic components.
- **Strong Spin Polarization (Like Ferromagnets)**
  - Its internal electronic structure behaves as if the spins were aligned.
  - Electrons experience large spin splitting, similar to ferromagnets.
  - This allows strong spin-polarized currents, a key requirement for spintronics.
- **Alternating Spin Arrangement (New Symmetry Pattern)**
  - The spin directions alternate, but not in a simple up–down antiferromagnetic pattern.
  - Instead, the alternation occurs in a way that creates hidden ferromagnetic-like behaviour.

Why Altermagnetism Matters

- **Spintronics Revolution**
  - Can transport spin-polarized currents without generating external magnetic fields.
  - Enables faster, energy-efficient memory and logic devices.
- **New Quantum Materials:** Its unusual symmetry offers opportunities to design topological materials, superconductors, and quantum sensors.
- **Low-Heat, High-Speed Devices:** Eliminates many limitations of ferromagnets (interference) and antiferromagnets (weak spin polarization).

Conclusion

Altermagnetism represents a fundamentally new magnetic phase that combines the best features of ferromagnets and antiferromagnets — no net magnetic field but strong spin polarization. It opens new horizons for next-generation spintronic devices and quantum technologies.

Gaganyaan Mission

Context: ISRO has successfully conducted an integrated main parachute airdrop test for the Gaganyaan Crew Module, validating its ability to withstand extreme aerodynamic loads and ensuring a safe crew touchdown during the mission's return phase.

What is Gaganyaan?

- India's first human spaceflight mission, aiming to send three Indian astronauts to Low Earth Orbit (~400 km) for three days and return them safely.
- **Implemented by:** ISRO
- **Objectives:** Gaganyaan aims to demonstrate India's capability in:
  - Human-rated launch vehicle engineering
  - Crew escape and recovery systems
  - Life-support systems for astronauts
  - Safe re-entry, deceleration, and splashdown
  - Advanced space crew training
- **Launch Vehicle**
  - **HLVM3** (Human-rated LVM3)
  - A modified, human-certified version of ISRO's heavy launcher LVM3/GSLV Mk-III.
  - Includes enhanced redundancy, safety systems, and reliability features essential for human flight.
- **International Cooperation**
  - **Russia** – astronaut training
  - **France** (CNES) – space medicine and crew health support
  - **Australia** – ground tracking and communication support

Figure 63: Gangayaan | Source: HT

Why Gaganyaan Matters

- Elevates India Into an Elite Club: Only USA, Russia, and China have independently demonstrated human spaceflight capabilities.
- Drives High-Technology Development

  Gaganyaan boosts advancements in:

  - Crew escape technologies
  - Space-grade materials
  - Robotics and automation
  - Life-support and bioastronautics
  - Reusable systems and precision landing
- **Strengthens Global Partnerships**: The mission enhances India's stature in international space collaborations, paving the way for future projects like space stations, deep-space habitats, and lunar exploration.

Conclusion

The successful parachute airdrop tests mark a major milestone for Gaganyaan, bringing India closer to achieving indigenous human spaceflight capability and joining the global ranks of advanced spacefaring nations.

GNSS Spoofing

Context: Multiple aircraft flying within 60 nautical miles of Delhi recently reported cases of GNSS (Global Navigation Satellite System) spoofing, triggering false terrain warnings and incorrect navigation data — an unusual incident for a major inland metropolitan area.

What is GNSS Spoofing?

- The transmission of counterfeit satellite signals to mislead aircraft's navigation receivers.
- Causes incorrect calculation of:
  - Aircraft position
  - Altitude
  - Heading
    - Terrain proximity

This can degrade or disable navigation and safety systems.

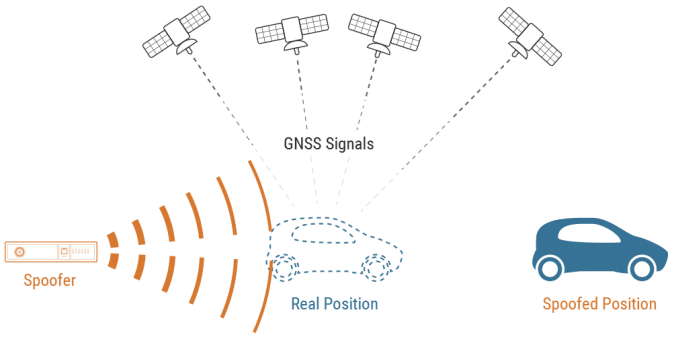


Figure 64: GNSS Spoofing| Source: Safran

Recent Instances (India, Nov 2025)

- Pilots flying near Delhi reported:
- False terrain alerts
- Incorrect position indications
- Disrupted navigation flight paths
- Increased cockpit workload and safety risk

This marks a rare case outside typical geopolitically sensitive zones.

Historical Global Hotspots

GNSS spoofing has earlier been seen mainly in:

- West Asia
- Eastern Russia
- Ukraine conflict regions
- Pakistan and Myanmar border areas (spillover into India)
- Rarely does such interference appear deep within domestic airspace.

Impact on Aircraft Systems

- Incorrect position and terrain mapping
- Malfunction of auto-landing or auto-braking systems
- Disruption of navigation databases (RNAV, RNP routes)
- Failure of Terrain Avoidance and Warning Systems (TAWS)
- Increased dependence on manual flying → higher risk in busy airspace

Possible Actors Behind Global Spoofing

- Military units testing electronic warfare systems
- Hostile states conducting cyber–electronic interference
- Security agencies during VIP protection operations
- Malicious third parties (rare but technically possible)
- The exact source in the Delhi incident is yet unidentified.

Proposed Aviation Safety Solutions (IATA Recommendations)

- Mandatory threat reporting pathways
- Cross-border intelligence cooperation on spoofing patterns
- Stronger international regulations on electronic interference
- Adoption of multi-constellation GNSS (GPS, GLONASS, Galileo, BeiDou)
- Use of anti-jamming/anti-spoofing chips in aircraft receivers
- Deployment of advanced detection sensors on aircraft and ATC systems

Conclusion

The Delhi GNSS spoofing incident highlights emerging vulnerabilities in modern aviation navigation systems and underscores the need for coordinated regulatory, technological, and intelligence-based countermeasures.

Quantum Key Distribution (QKD) Network

Context: India has rolled out its **first long-distance Quantum Key Distribution (QKD) network**, demonstrating the country's capability to deploy **next-generation, unhackable communication infrastructure**.

Background

- Conventional encryption relies on computational complexity, which is vulnerable to **quantum computers**.
- **Quantum Key Distribution** uses the principles of **quantum mechanics** to ensure secure exchange of cryptographic keys.

Science Behind QKD

- Based on principles such as:
  - **Quantum superposition**
  - **No-cloning theorem**
- Any attempt to intercept the quantum key **disturbs the quantum state**, alerting the communicating parties.

- Common protocols: BB84, E91.

Recent Developments

- India successfully demonstrated long-distance QKD over optical fibre and free-space links.
- The network connects strategic nodes, enabling:
  - Secure data transfer
  - Quantum-safe communication
- Aligns with the **National Quantum Mission** and secure communication needs of defence and governance.

Strategic Significance

- **Cybersecurity:** Protects sensitive government and defence communications.
- **Post-Quantum Readiness:** Future-proofs India against quantum-enabled cyber threats.
- **Global Standing:** Positions India among a small group of nations with operational QKD networks.

Challenges

- Distance limitations due to photon loss.
- High infrastructure and deployment costs.
- Integration with classical communication networks.

Way Forward

- Develop quantum repeaters to extend range.
- Standardise protocols for civilian adoption.
- Encourage indigenous production of quantum hardware.

Conclusion

India's QKD network represents a **paradigm shift from computational to physics-based security**, laying the foundation for a quantum-secure digital future.

Black Hole Morsels

Context: Astronomers have reported new observations of **Odd Radio Circles (ORCs)** and so-called **"Black Hole Morsels"**, expanding understanding of **exotic astrophysical phenomena** beyond conventional galaxy models.

Background

- ORCs were first discovered in 2020 using radio telescopes.
- They appear as **large, circular radio emissions** with no visible counterpart in optical wavelengths.
- "Black hole morsels" refer to **small, discrete energy events or remnants** linked to black hole activity.

Scientific Explanation

- ORCs may result from:
  - Shock waves from massive cosmic explosions
  - Galaxy mergers
  - Activity around supermassive black holes
- Black hole morsels could represent:
  - Residual energy emissions
  - Accretion-related phenomena
  - Fragmented outflows from black hole environments

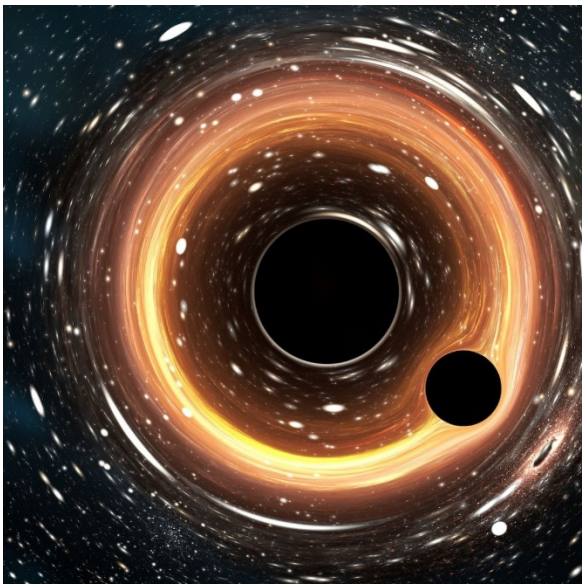


Figure 65: Black Hole Morsel

Recent Observations

- Improved radio telescope sensitivity has revealed more ORCs across the sky.
- Data suggests ORCs are **rare but widespread**, indicating unknown cosmic processes.
- The findings challenge existing models of galaxy evolution.

Significance

- Expands the frontiers of **radio astronomy**.
- Enhances understanding of:
  - Large-scale cosmic structures
  - Energy distribution in the universe
- Demonstrates the importance of multi-wavelength astronomy.

Challenges

- Limited sample size.
- Difficulty correlating radio signals with optical counterparts.
- Need for higher-resolution surveys.

Way Forward

- Use next-generation telescopes like SKA.
- Integrate data across electromagnetic spectrum.
- Develop new theoretical models.

Conclusion

ORCs and black hole morsels underline how the universe still holds **fundamental mysteries**, reminding us that astronomical discovery is far from complete.

Sentinel-6B Satellite

Context: Launched in November 2025 as part of a crucial U.S.-European mission to continue monitoring global sea-level rise, acting as a twin to its predecessor, **Sentinel-6 Michael Freilich**, and ensuring continuity of this essential, long-term dataset.

Background

- Part of the **Copernicus Programme**.
- Designed to measure **global sea-level rise** with unprecedented precision.
- Successor to earlier Jason-series missions.

Scientific Role

- Uses radar altimetry to track:
  - Ocean height
  - Ocean circulation
  - Climate-induced sea-level change
- Provides continuity in long-term climate datasets.

Significance

- Critical for climate change monitoring.
- Informs coastal planning and disaster risk reduction.
- Supports international climate assessments.

Martian Landforms & IAU Naming

Context: 3.5-billion-year-old Martian crater was recently named **Krishnan Crater** after pioneering Indian geologist **M.S. Krishnan**, with the International Astronomical Union (IAU), marking a significant recognition of Indian contributions to planetary science.

Background

- The **International Astronomical Union (IAU)** standardises names for celestial features.
- Naming conventions follow thematic rules (scientists, mythological figures, geographic analogies).

Key Details:

- **Krishnan Crater:** Named for M.S. Krishnan, the first Indian Director of the Geological Society of India, following a proposal by Indian researchers from the **Indian Institute of Space Science and Technology (IIST)**.

Other Indian Names: The IAU approved several other Indian names for Martian landforms, including:

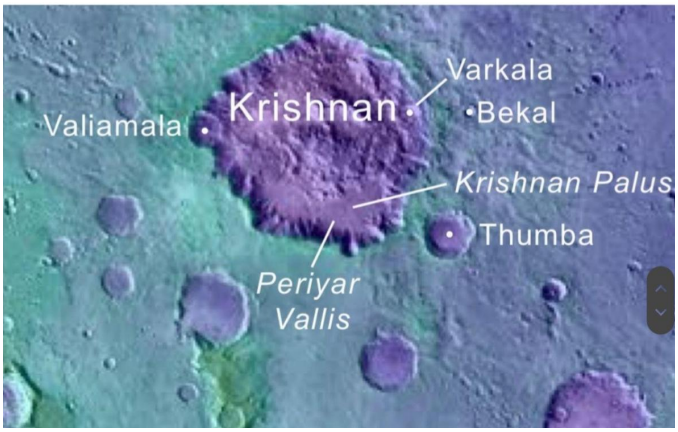


Figure 66: Mars Craters

- **Varkala Crater:** Named after the geologically unique cliffs of Varkala beach in Kerala, known for jarosite mineral similar to that on Mars.
- **Thumba Crater:** Honoring Thumba, the birthplace of India's space program (ISRO's Thumba Equatorial Rocket Launching Centre).
- **Periyar Vallis:** A valley named after India's longest river, Periyar.
- **Bekal Crater:** Named after the historic Bekal Fort in Kerala.

MARS-KERALA CONNECT

NAME	CATEGORY	SIGNIFICANCE
Krishnan	Large crater	Named after pioneering Indian geologist
Valiamala	Small crater	Site of IIST, Thiruvananthapuram
Thumba	Small crater	Birthplace of India's space programme
Varkala	Small crater	Geologically unique cliff formations
Bekal	Small crater	Site of historic Bekal Fort in Kasaragod
Periyar	Martian Valley	Longest river in Kerala

Significance: This decision highlights India's growing role in space exploration and honors Indian scientific heritage on a global stage.

Dark Patterns

Context: With the rapid expansion of digital platforms, regulators and policymakers have raised concerns over **"dark patterns"**—deceptive design practices embedded in user interfaces that manipulate user choices, undermine consent, and distort market fairness.

Background

- The term **"dark patterns"** was coined by UX designer **Harry Brignull**.
- These practices exploit **cognitive biases** to nudge users toward unintended actions such as:

- Unwarranted subscriptions
- Data over-sharing
- Hidden charges

What Are Dark Patterns?

Dark patterns are **design strategies deliberately crafted to mislead or coerce users**, rather than empower informed decision-making.

Common Types

- **Confirm-shaming:** Guilt-inducing language to discourage opt-outs
- **Bait and switch:** Promised outcome replaced by another
- **Forced continuity:** Automatic renewals without reminders
- **Roach motel:** Easy entry, difficult exit
- **Disguised ads:** Ads masquerading as content

Recent Developments (India & Global)

- **India:**
  - Ministry of Consumer Affairs notified **Guidelines for Prevention and Regulation of Dark Patterns (2023)**.
  - Enforced under the **Consumer Protection Act, 2019**.
- **Global:**
  - EU's **Digital Services Act (DSA)** and **GDPR** restrict manipulative design.
  - US FTC has penalised firms for dark pattern practices.

Significance

- Protects **consumer autonomy and informed consent**.
- Essential for **fair digital markets** and competition.
- Critical for safeguarding vulnerable users, including children and the elderly.

Challenges

- Ambiguity in identifying intent vs design optimisation.
- Rapid evolution of UI/UX techniques.
- Enforcement capacity across platforms.

Way Forward

- Continuous updating of regulatory guidelines.
- Strong penalties to deter violations.
- Digital literacy campaigns to empower users.
- Independent audits of platform design practices.

Conclusion

Dark patterns represent a **new frontier of consumer exploitation**, demanding proactive, adaptive regulation to ensure that digital innovation does not come at the cost of user dignity and choice.

Lab-Grown Milk

Context: Advances in **cellular agriculture** have enabled the production of **lab-grown milk**, raising questions around food safety, ethics, sustainability, and regulation.

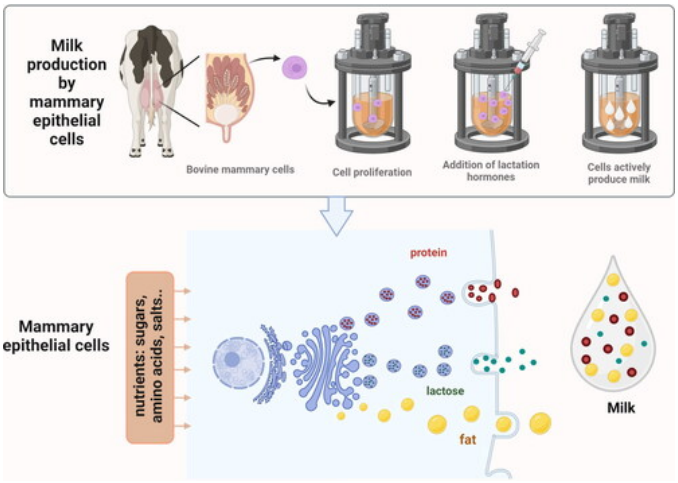


Figure 67: Lab Grown Milk

Background

- Lab-grown milk is produced using **precision fermentation**, where microbes are engineered to produce milk proteins (casein and whey).
- It replicates the nutritional composition of conventional milk **without animal involvement**.

How Lab-Grown Milk Is Produced

1. Genetic encoding of milk protein genes into microbes.
2. Fermentation in bioreactors.
3. Protein extraction and formulation into milk products.

Potential Benefits

- Reduced greenhouse gas emissions.
- Lower land and water use.
- No animal cruelty.
- Suitable for lactose-intolerant individuals (with modification).

Regulatory Developments

- Countries like the US and Singapore have initiated regulatory pathways.
- In India, food safety oversight would fall under **FSSAI**.
- Requires evaluation under **novel food regulations**.

Ethical and Social Concerns

- Acceptance among consumers.
- Impact on traditional dairy farmers.
- Labelling and transparency issues.

Challenges

- High production costs.
- Scaling up to commercial viability.
- Regulatory uncertainty in developing countries.

Way Forward

- Develop clear regulatory frameworks for novel foods.
- Ensure transparent labelling.
- Support farmer transition and diversification.

Conclusion

Lab-grown milk represents a **transformative but disruptive innovation**, requiring balanced regulation that protects consumers while encouraging sustainable food systems.

Ammonium Nitrate

Context: The use and regulation of **Ammonium Nitrate (AN)** have come under renewed scrutiny due to its **dual-use nature**—as a critical agricultural input and an industrial explosive precursor (**Red Fort Car Bomb Blast, Delhi**)—posing challenges for **public safety, disaster management, and regulatory oversight**.

Background

- Ammonium nitrate (NH_4NO_3) is a **highly soluble nitrogen-based compound**.
- Widely used as:
    - A **fertiliser** (nitrogen source)
    - An **industrial explosive component** (mining, construction)
    - Past disasters (e.g., Beirut blast) underscore its hazards when improperly stored.

Uses of Ammonium Nitrate

1. **Agriculture**
    - High nitrogen content (~34%).
    - Promotes rapid vegetative growth.
    - Used globally in fertiliser blends.

2. Industrial & Mining Sector

- Key component in **ANFO (Ammonium Nitrate Fuel Oil)** explosives.
- Used in quarrying, tunnelling, and infrastructure projects.

Safety Risks

- Not explosive by itself but **highly reactive under heat, contamination, or confinement**.
- Risk factors include:
    - Poor storage conditions
    - Exposure to fire
    - Mixing with combustible materials

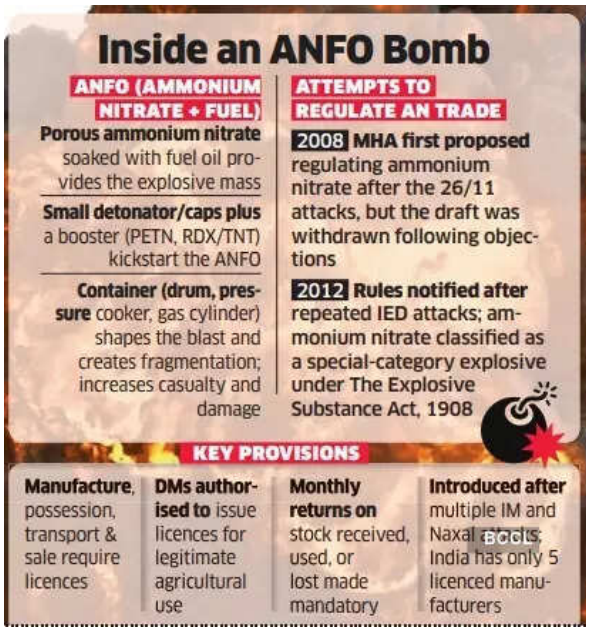


Figure 68: About ANFO Bomb

Regulatory Framework (India)

- Governed under:
    - **Explosives Act, 1884**
    - **Ammonium Nitrate Rules, 2012**
- Licensing required for manufacture, transport, storage, and sale.
- Oversight by **Petroleum and Explosives Safety Organisation (PESO)**.

Challenges

- Illegal diversion for explosives.
- Weak enforcement at local levels.
- Limited awareness among small users.

Way Forward

- Digitised tracking of AN movement.
- Strict storage standards and inspections.
- Farmer education on safe handling.

Conclusion

Ammonium nitrate regulation must balance **agricultural productivity with public safety**, requiring robust enforcement and technology-driven monitoring.

Hydrogen: Power of the Future

Context: Hydrogen is increasingly projected as a **key pillar of the global clean energy transition**, capable of decarbonising

hard-to-abate sectors such as steel, fertilisers, refining, heavy transport, and long-duration energy storage. India has placed hydrogen at the centre of its long-term energy strategy through the **National Green Hydrogen Mission**.

Background

- Hydrogen is the **most abundant element** in the universe but does not exist freely on Earth and must be produced.
- Based on production methods, hydrogen is classified as:
    - **Grey hydrogen**: Produced from fossil fuels (high emissions).
    - **Blue hydrogen**: Fossil-based with carbon capture.
    - **Green hydrogen**: Produced using renewable energy via electrolysis (zero emissions).

Why Hydrogen Matters

- **Energy security**: Reduces dependence on imported fossil fuels.
- **Decarbonisation**: Critical for sectors where electrification is difficult.
- **Storage & flexibility**: Can store renewable energy for long durations.
- **Industrial transformation**: Enables low-carbon steel, ammonia, and chemicals.

India's Hydrogen Strategy

- **National Green Hydrogen Mission (2023)** aims to:
    - Produce 5 million tonnes of green hydrogen annually by 2030.
    - Create export opportunities.
    - Reduce fossil fuel imports.
- **Focus areas:**
    - Electrolyser manufacturing
    - Renewable energy integration
    - Industrial demand creation

Global Context

- EU, Japan, and Australia are investing heavily in hydrogen corridors.
- Hydrogen is emerging as a **geopolitical energy commodity**.

Challenges

- High cost of green hydrogen.
- Storage and transportation issues.
- Limited infrastructure and standards.

Way Forward

- Scale renewable capacity to reduce costs.
- Promote hydrogen hubs and demand mandates.
- Develop safety standards and pipelines.

Conclusion

Hydrogen offers India a pathway to **clean growth, energy security, and industrial leadership**, provided technological and economic barriers are systematically addressed.

India's Fusion Power Plans

Context: Release of a **roadmap for India's fusion energy program** by researchers at the Institute for Plasma Research (IPR) in Gandhinagar.

Background

- **Nuclear fusion** involves combining light atomic nuclei (typically hydrogen isotopes) to release energy, mimicking the process that powers the Sun.
- Fusion offers:
    - Zero carbon emissions
    - No long-lived radioactive waste
    - Virtually unlimited fuel supply

India's Role in Global Fusion Research

- India is a **full partner in ITER (International Thermonuclear Experimental Reactor)**, the world's largest fusion experiment.
- Indian agencies contribute:
    - Cryostat systems
    - Cooling technologies
    - Power supply components

Domestic Fusion Initiatives

- **Research led by:**
    - Institute for Plasma Research (IPR), Gandhinagar
    - Department of Atomic Energy (DAE)
- **Focus areas:**
    - Tokamak design
    - Plasma confinement
    - Superconducting magnets

Strategic Significance

- Positions India in **frontier energy science**.
- Builds advanced manufacturing and materials capability.
- Long-term energy sovereignty.

Challenges

- Fusion is technologically complex and capital-intensive.
- Commercial viability remains decades away.
- Requires sustained public investment.

Way Forward

- Strengthen indigenous fusion research facilities.
- Encourage public-private research collaboration.
- Integrate fusion R&D with advanced materials and AI.

Conclusion

While not an immediate solution, fusion power represents a **strategic long-term investment** in India's clean energy future.

Thermal Desalination System (IISc)

Context: Indian researchers at the **Indian Institute of Science (IISc)** have developed a **low-cost, energy-efficient thermal desalination system**, addressing growing concerns over **water scarcity**, especially in coastal and arid regions.

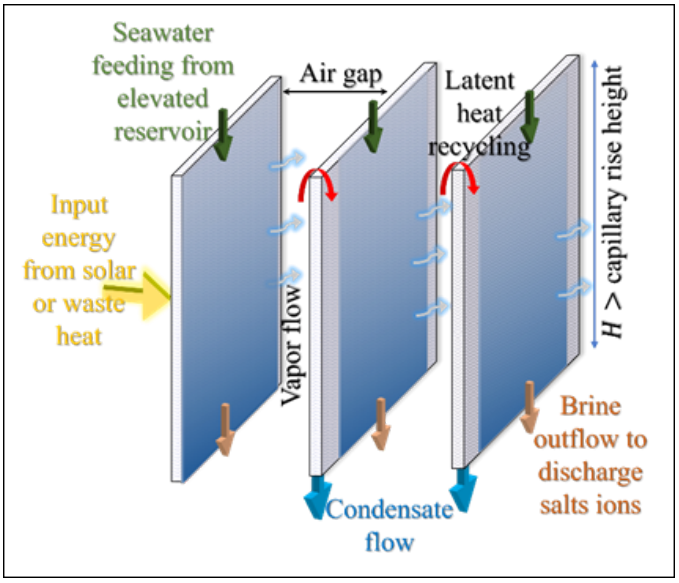


Figure: Schematic of a multistage siphon desalination system | Source: PIB

Background

- Desalination is critical for water-stressed regions but is Energy-intensive and Costly.
- **Conventional methods:**
  - Reverse osmosis
  - Multi-stage flash distillation

Figure: Source: IISc

IISc Innovation Explained

- The IISc system uses:
  - **Low-grade thermal energy** (waste heat or solar heat).
  - **Siphon-based and multi-effect evaporation principles**.
- **Designed to:**
  - Reduce energy consumption
  - Lower operational costs
  - Operate at small and decentralised scales

Significance

- **Suitable for:**
  - Coastal villages
  - Islands
  - Industrial wastewater recycling
- Reduces reliance on large, centralised desalination plants.
- **Environmental Benefits:**
  - Lower carbon footprint.
  - Reduced brine discharge impacts.

Challenges

- Scaling from pilot to mass deployment.
- Integration with renewable heat sources.
- Maintenance and durability.

Way Forward

- Support through government water missions.
- Public-private partnerships for commercialisation.
- Deployment in island and drought-prone regions.

Conclusion

The IISc thermal desalination system demonstrates how **indigenous innovation can address climate-linked water stress** through affordable technology.

CULTURE & HERITAGE

UNESCO Creative City of Gastronomy

Context: At the 43rd UNESCO General Conference, Lucknow was designated as a Creative City of Gastronomy, becoming the second Indian city in this category after Hyderabad.

Figure 69: Lucknow| Source: Ministry of Culture, GoI

Key Points

- Lucknow joins the global UNESCO Creative Cities Network (UCCN) for its rich culinary heritage, including Awadhi cuisine, traditional cooking techniques, and diverse food culture.
- Other Indian cities in UCCN include:
  - Gwalior – Music
  - Jaipur – Crafts & Folk Art
  - Chennai – Music
  - Hyderabad – Gastronomy

About UNESCO Creative Cities Network (UCCN)

- Established: 2004
- Purpose: To foster cooperation among cities that use creativity as a driver for sustainable urban development.
- Seven Creative Fields:
  - Crafts & Folk Art
  - Design
  - Film
  - Gastronomy
  - Literature
  - Music
  - Media Arts

Conclusion

Lucknow's inclusion in UCCN highlights its global culinary significance and is expected to boost cultural tourism, local livelihoods, and creative economy development.

Baliyatra Festival

Context: The President extended greetings on the occasion of Baliyatra, one of Odisha's largest cultural and maritime heritage festivals.

About Baliyatra Festival

Figure 70: Baliyatra Festival

- Celebrated annually in coastal Odisha on the day of Kartika Purnima.
- Marks the historic maritime trade links of ancient Odia sailors (Sadhabas) with Bali and other Southeast Asian regions.
- Symbolises Odisha's glorious tradition of transoceanic voyages, trade, and cultural exchange.
- Associated with the legend of 'Taapoi' and traditional observances such as:
  - Bhalukuni Osha / Khudurukuni Osha
  - Bada Osha

Conclusion

Baliyatra is both a cultural celebration and a tribute to Odisha's maritime legacy, strengthening historical memory and community identity.

Indus Valley Civilization

Context: A recent scientific study claims to have identified the primary cause behind the decline of the Indus Valley Civilization (IVC).

Key Findings

- Researchers found evidence of four prolonged mega-droughts between 4,450 and 3,400 years ago, each lasting over 80 years.
- Rainfall across the IVC region declined by 10–20%, severely reducing river flow, groundwater levels, and agricultural productivity.
- Long-term water scarcity weakened urban centres like Harappa and Mohenjo-daro, causing gradual depopulation and migration rather than sudden collapse.
- The study concludes that environmental stress, not invasion or internal conflict, was the main driver.

Figure 71: Indus Valley Civilization

Significance

The findings highlight how climate variability can destabilize even highly advanced urban societies and underline the importance of water management and climate resilience.

Conclusion

The IVC did not fall abruptly — it slowly faded due to sustained droughts that undermined agriculture, trade, and settlement patterns.

ETHICAL LENS

UNESCO: Global Norms on Neurotechnology Ethics

Context: UNESCO has released the world's first normative framework on the ethics of neurotechnology, addressing rapid advances that raise concerns about privacy, consent, and misuse of brain data. The framework aims to balance innovation with human rights protection.

What is Neurotechnology?

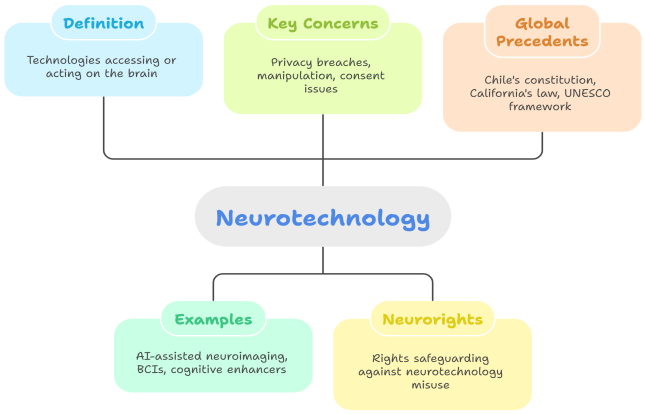


Figure 72: Understanding Neurotechnology

Technologies and procedures that access, assess, or act on the human brain or nervous system, combining neuroscience, engineering, and computing.

Examples

- AI-assisted neuroimaging for tumor detection
- Brain–computer interfaces (BCIs) such as Neuralink
- Devices used for treating neurological disorders or enhancing cognitive abilities
- Neurodata (Brain Data)
- Digitally decoded brain signals that reveal thoughts, emotions, or intentions.

Key Concerns

- Privacy breaches
- Manipulation for political or commercial purposes
- Use in insurance or employment screening
- Need for robust and informed consent

Neuro-Rights

A new category of rights safeguarding individuals against misuse of neurotechnology.

Key Neuro-Rights

- Mental Privacy
- Mental Integrity
- Cognitive Liberty (freedom to control one's own thought processes)

Global Precedents

- Chile: First constitution to protect "mental integrity."
- California (USA): Law governing protection of brain data.
- UNESCO Framework: Key Features

Aim

- Protect the brain and neural data
- Balance technological innovation with human rights

Core Values

- Human dignity
- Human rights
- Gender equality
- Social justice
- Special protection for vulnerable populations

Prohibited Uses

UNESCO explicitly bans manipulative or deceptive use of neural or non-neural data in:

- Political contexts
- Medical contexts
- Commercial contexts

Conclusion

The UNESCO framework marks the world's first coordinated global effort to regulate neurotechnology ethically, ensuring mental privacy and human dignity in the age of brain–machine integration.

Civil Servant & Corruption

Question: What Should a Civil Servant Do When Corruption Becomes the Norm?

Bribery and corruption remain among the most corrosive ethical challenges in Indian public administration. When unethical practices become normalised and even expected, a civil servant's conduct becomes the true test of integrity, moral courage, and commitment to constitutional values.

Ethical Principles at Stake

- Integrity and Probity
- Objectivity and Transparency
- Rule of Law
- Public Interest
- Accountability and Leadership by Example

Why Corruption Thrives

Corruption often emerges from a mix of institutional weaknesses, discretion without oversight, political interference, and a culture of informal expectations. When these factors converge, bribery can appear routine—even justified—unless resisted by value-driven leadership.

Figure 73: Core Ethical Foundations

What Should a Civil Servant Do?

- Refuse any inducement—monetary or otherwise—without ambiguity.
- Document and report bribery attempts through proper channels such as vigilance wings or anti-corruption agencies.
- Ensure merit-based decision-making, supported by transparency and proper record-keeping.
- Strengthen systems that reduce discretion and opportunities for corruption—e-governance, audits, digital payments.
- Demonstrate ethical leadership, signalling zero tolerance and setting institutional norms.

Examples

- **Ashok Khemka**'s resistance to corrupt land dealings shows how one officer's integrity can uphold public trust.
- A young IAS officer in Odisha who reported a contractor's bribe attempt strengthened vigilance mechanisms in her district.
- Gandhian ethics—*"Purity of means is as important as the end"*—remain relevant in resisting corruption pressures.

Ethical Analysis

Bribery violates deontological ethics (duty), fails utilitarian ethics (harm outweighs benefit), and contradicts virtue ethics (character and moral integrity). A civil servant who refuses corruption operates at Kohlberg's post-conventional level, guided by values rather than convenience.

Conclusion

When corruption becomes normal, the civil servant must become exceptional. By choosing integrity over convenience, transparency over secrecy, and accountability over complacency, a public servant not only resists corruption but also reshapes the ethical climate of governance itself.

Social Media & Governance

Question: Is Social Media a Tool for Transparency or a Threat to Ethical Governance?

Social media has transformed public administration by enabling rapid communication, citizen engagement, and real-time feedback. Yet it simultaneously poses ethical risks—misinformation, manipulation, populism, and erosion of institutional trust. For civil servants, this creates a complex ethical dilemma: How to leverage social media for transparency without compromising neutrality and governance ethics?

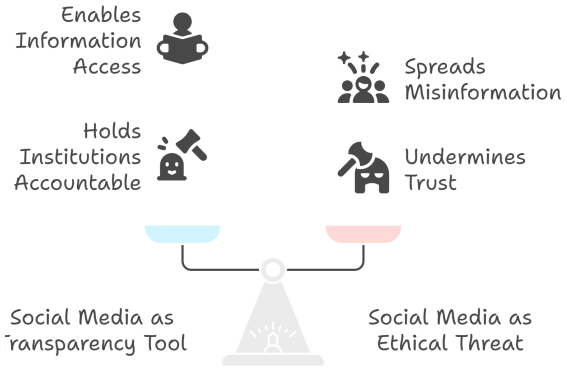


Figure 74: Balancing Social Media Dual Role in Governance

Potential for Ethical Governance

Social media can strengthen ethical public service when used responsibly:

- **Transparency:** Quick dissemination of verified information builds trust.
- **Accountability**: Citizens can question government actions openly.
- **Responsiveness**: Platforms enable faster grievance redressal.
- **Public mobilization**: Ethical campaigns (e.g., Swachh Bharat) gain momentum online.
- **Example**: Many District Magistrates track grievances through social media dashboards, improving service delivery.

Threats to Ethical Governance

However, social media also introduces serious ethical risks:

- Misinformation and deepfakes distort public perception.
- Political pressure can compromise neutrality.
- Confidentiality risks arise from premature disclosure.

- Viral sentiment may push officers toward reactive rather than rule-based decisions.
- Example: Viral outrage has at times forced administrative action that bypassed due process.

Ethical Analysis

- A deontological approach demands neutrality and rule-based conduct.
- A utilitarian view weighs benefits of transparency against harms of misinformation.
- Virtue ethics emphasises prudence and restraint in digital engagement.

What Should a Civil Servant Do?

- Use social media strictly for public interest communication.
- Ensure accuracy, neutrality, and factual verification.
- Avoid political commentary or personal bias.
- Maintain separation between official and personal accounts.
- Promote digital ethics within the administration.

Conclusion

Used responsibly, social media can support transparent governance; misused, it can undermine it. The ethical burden rests on the civil servant's judgment and adherence to constitutional values.

Population Control

Question: Is Population Control an Administrative Imperative or an Ethical Dilemma?

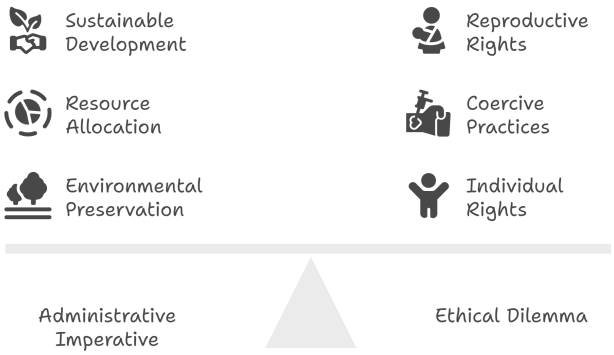


Figure 75: Balancing Population Control and Ethical Concerns

Debates on population control often surface in public policy, especially when concerns about resource scarcity, employment, and welfare delivery arise. For administrators, the challenge is not just demographic but deeply ethical—balancing individual reproductive rights with societal welfare and sustainable development.

Ethical Concerns and Principles

Population policies must uphold core values such as:

- Autonomy and personal liberty in reproductive choices
- Justice and equity in access to health services
- Non-coercion, avoiding forced or incentivised sterilisation
- Dignity and informed consent, especially for vulnerable groups
- Intergenerational responsibility for sustainable resource use

Governance Challenges

- High population can strain welfare schemes, healthcare systems, and employment opportunities.
- Unequal population growth in certain regions fuels socioeconomic imbalance.
- Political narratives may weaponise population debates, risking bias and exclusion.
- Past experiences—such as the forced sterilisation excesses during the Emergency—highlight the dangers of coercive measures.
- Example: Some states have proposed two-child norms linked to government jobs or electoral eligibility, raising concerns about fairness and constitutionality.

Administrative Approach

A civil servant must promote:

- **Evidence-based policies** grounded in public health, not political pressure.
- Voluntary family planning with full information and accessible healthcare.
- Women's empowerment, as female education and economic participation naturally reduce fertility rates.
- Social behaviour change communication rather than punitive restrictions.
- Equity, ensuring marginalised communities are not disproportionately affected.

Ethical Analysis

From a rights-based perspective, reproductive autonomy cannot be overridden by administrative convenience. From a utilitarian lens, population stabilisation supports long-term societal welfare—but only when pursued ethically. Virtue ethics emphasises compassion, fairness, and non-coercion in public policy design.

Conclusion

Population control must be pursued through empowerment, not coercion. Ethical governance demands respecting individual rights while promoting informed choices and sustainable development.

PLACES IN NEWS

Senkaku Islands

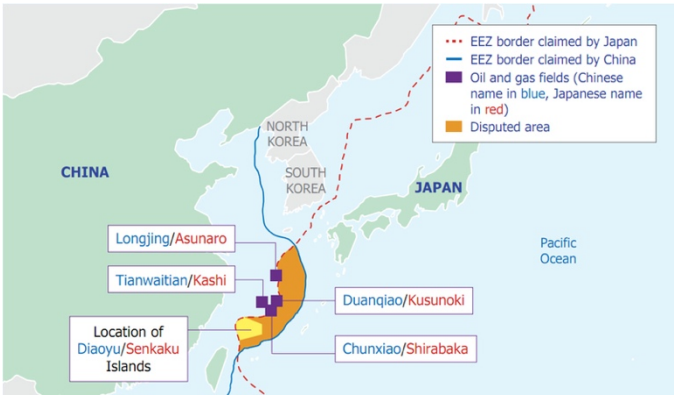


Figure 76: Senkaku Islands | Source: Japan Today

Context: Renewed maritime tensions as Chinese coast-guard vessels entered waters near the Japan-administered Senkaku Islands.

Key Points

- Located in **East China Sea**; claimed by both Japan (administers) and China (calls it Diaoyu).
- Incident part of China's intensified "rights enforcement" patrols.
- Japan protested, citing threat to regional stability.
- Reflects rising friction amid broader Indo-Pacific geopolitical rivalry.

Nigeria

Figure 77: Nigeria

Context: The U.S. expressed concern over escalating sectarian and communal violence across several Nigerian states.

Key Points

- Clashes involving armed groups increased in Plateau, Kaduna, and Benue regions.
- U.S. urged Nigeria to strengthen security responses and protect civilians.
- Issues linked to farmer–herder conflicts, banditry, and extremist violence.
- Highlighted humanitarian concerns and displacement.

Madagascar

Figure 78: Madagascar

Context: Madagascar's military reportedly took control of key installations amid a political crisis.

Key Points

- Followed disputes over election legitimacy and governance failures.
- Armed forces deployed across capital Antananarivo.
- Raised fears of democratic backsliding and constitutional breakdown.
- Regional bloc SADC called for restraint and dialogue.

Conclusion

The situation signals a deepening governance crisis with potential for prolonged instability.

Sharm el-Sheikh

Context: Sharm el-Sheikh hosted a high-level peace summit focusing on the Gaza conflict and humanitarian ceasefire proposals.

Key Points

- Egypt convened global leaders to de-escalate Middle East tensions.
- Discussions centred on humanitarian corridors, post-conflict reconstruction, and regional security.
- Aimed at reinforcing diplomatic pressure for cessation of hostilities.

Conclusion

Sharm el-Sheikh reaffirmed Egypt's traditional role as a mediator in regional peace diplomacy.

Figure 79: Sharm el-Sheikh

Port of Pasni

Context: Pasni Port in Balochistan featured in news due to renewed security measures after attacks on maritime infrastructure.

Key Points

- Located strategically near Gwadar, part of China–Pakistan Economic Corridor (CPEC).
- Recent insurgent activity prompted heightened naval patrols.
- Concerns over safety of trade routes and Chinese investments.
- Important node for regional maritime connectivity.

Figure 80: Pasni Port

Guinea-Bissau

Context: Guinea-Bissau was in the news after its government came under military control, raising concerns of renewed political instability.

Key Points

- Located in West Africa, bordered by Senegal to the north, Guinea to the east and south, and the Atlantic Ocean to the west.
- Includes the Bijagós archipelago, major rivers (Geba, Corubal, Cacheu), and inland highlands linked to the Fouta Djallon plateau.
- The military takeover has heightened fears of governance breakdown, economic disruption, and regional security challenges.

Figure 81: Guinea-Bissau

Slovenia

Context: Slovenia was in the news due to the India–Slovenia Joint Committee on Trade meeting held to enhance bilateral economic ties.

Key Points

- Both countries reviewed cooperation in trade, investment, technology, and logistics.
- Slovenia is a Central European country, bordered by Austria, Italy, Hungary, and Croatia, with a short coastline on the Adriatic Sea.
- Its location makes it a key transit and connectivity hub between Central Europe and the Mediterranean.

Conclusion

Slovenia's engagement reflects India's growing economic outreach to Europe and the strategic role of smaller EU nations in India's trade diplomacy.

Figure 82: Slovenia

Vietnam

Context: Vietnam was in the news due to strategic engagement with India and severe climate-related disasters affecting the country.

Key Points

- Hosted the 15th India–Vietnam Defence Policy Dialogue in Hanoi, strengthening defence, maritime security, and strategic cooperation.
- Faced economic strain as exports declined, particularly to the U.S., after higher tariffs on Vietnamese goods.
- Foreign investors expressed concern over proposed reforms that may reduce high-tech subsidies.
- Central and northern Vietnam experienced devastating floods and landslides, causing significant loss of life and property.

Figure 83: Vietnam

Conclusion

Vietnam's recent visibility highlights its growing strategic role in Asia while simultaneously grappling with economic pressures and climate-induced disasters.

Bahrain

Figure 84: Bahrain

Context: Bahrain was in the news due to its growing strategic engagement with India, particularly in security and maritime cooperation.

Key Points

- India and Bahrain discussed deeper collaboration in counterterrorism, intelligence sharing, defence cooperation, and trade.
- The developments follow recent visits by Indian naval ships, strengthening maritime security ties in the Gulf.
- Bahrain's strategic location in the Persian Gulf, its island-based geography, and dependence on sea routes make it a key partner for India's West Asia outreach.
- The country is known for its desert climate, pearl-diving heritage, and proximity to major Gulf shipping lanes.

Conclusion

Bahrain's growing partnership with India underscores its strategic importance in the Gulf and its role in regional security and economic cooperation.

Paatalkot Valley

Context: Paatalkot Valley was in the news due to renewed focus on tribal conservation initiatives and eco-tourism development programs in the region.

Key Points

- Located in Chhindwara district, known for its deep, bowl-shaped valley and isolation.
- Inhabited primarily by the Bharia and Gond tribes, preserving unique traditional knowledge systems.
- Rich in rare medicinal plants, making it an important centre for ethnobotanical research.
- Eco-tourism initiatives aim to promote sustainable livelihoods while protecting biodiversity and tribal heritage.

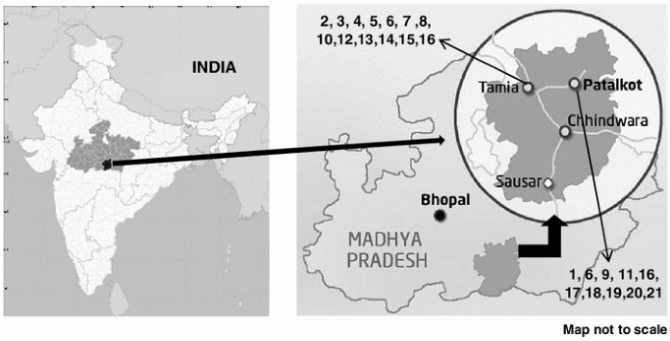


Figure 85: Paatalkot Valley

Conclusion

Paatalkot Valley highlights India's efforts to balance ecological conservation with cultural preservation and sustainable development.

Visakhapatnam

Context: Visakhapatnam was in the news after being selected to host the International Fleet Review (IFR) 2026.

Key Points

- IFR 2026 will bring together naval ships and delegations from multiple countries, strengthening maritime diplomacy.
- Visakhapatnam is a major base of the Eastern Naval Command, making it strategically suitable for global naval events.
- The city is also a leading centre for shipbuilding, maritime manufacturing, and defence infrastructure.
- Hosting the IFR reinforces India's role as a key maritime power in the Indo-Pacific.

Conclusion

Visakhapatnam's selection showcases India's naval capability and enhances its international maritime engagement.

Achanakmar Tiger Reserve

Context: Recognized internationally for its exceptional rise in tiger population.

Key Points

- Located in Chhattisgarh; part of Achanakmar–Amarkantak Biosphere Reserve.
- Sharp increase credited to better protection, habitat restoration, and anti-poaching systems.
- Cited globally as evidence of India's effective wildlife conservation model.

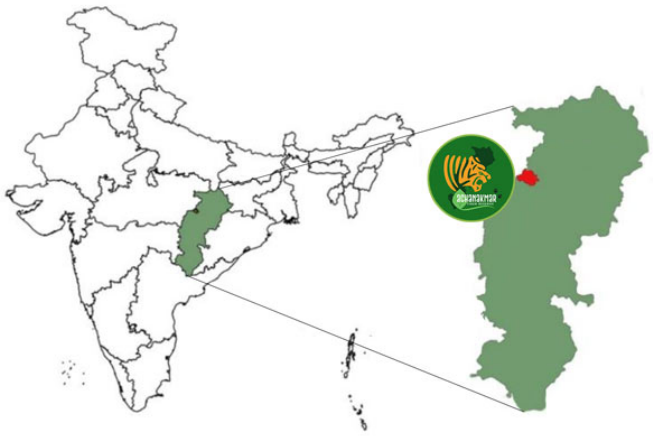


Figure 86: Achanakmar Tiger Reserve

Conclusion

Achanakmar became a global conservation success story for tiger recovery.

Mudumalai Tiger Reserve, Tamil Nadu

Context: The Tamil Nadu Forest Department initiated a large-scale drive to remove the invasive *Senna spectabilis* from the Mudumalai landscape.

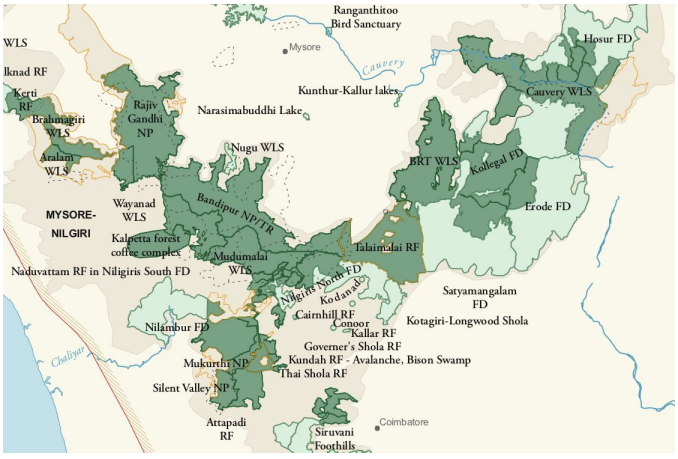


Figure 87: Mudumalai TR, Tamil Nadu

Key Points

- Located in the Nilgiri district, Western Ghats.
- Part of the Nilgiri Biosphere Reserve.
- Forms a contiguous landscape with Bandipur–Wayanad–Nagarhole.

- Approximately 1,963 ha cleared of invasive *Senna spectabilis*.
- Invasive species suppress grasslands, reduce prey base, and alter habitat.
- Case study for invasive control and biomass utilisation partnerships (e.g., paper/pulpwood).

Conclusion

The eradication drive highlights efforts in biodiversity governance and ecosystem restoration against invasive species in a critical tiger habitat.

Dawki-Umngot River, Meghalaya

Context: Reports surfaced regarding pollution and tourism-linked stress in the Dawki–Umngot stretch, raising environmental concerns.

Figure 88: Dawki River, Meghalaya

Key Points

- Flows near Dawki in West Jaintia Hills, Meghalaya.
- Famous for its high water clarity, attracting tourism.
- Reports indicate pollution and quality deterioration.
- Environmental compliance and legal filings have emerged.
- Highlights the "eco-tourism vs. ecology" trade-off.
- Raises issues of river governance, solid waste management, and carrying capacity.

Conclusion

The situation on the Umngot River exemplifies the challenges of balancing tourism with environmental preservation in fragile ecosystems.

Cold Desert Biosphere Reserve, India

Context: UNESCO designated India's Cold Desert Biosphere Reserve as part of the World Network of Biosphere Reserves.

Key Points

- Located in the Trans-Himalayan cold desert region of Himachal Pradesh.
- Specifically covers the Spiti–Lahaul region.
- Designated by UNESCO in September 2025.
- Focuses on high-altitude ecosystem conservation and climate vulnerability.
- Promotes sustainable livelihoods under the Man and the Biosphere (MAB) framework.
- This addition increases India's count of UNESCO biosphere reserves.

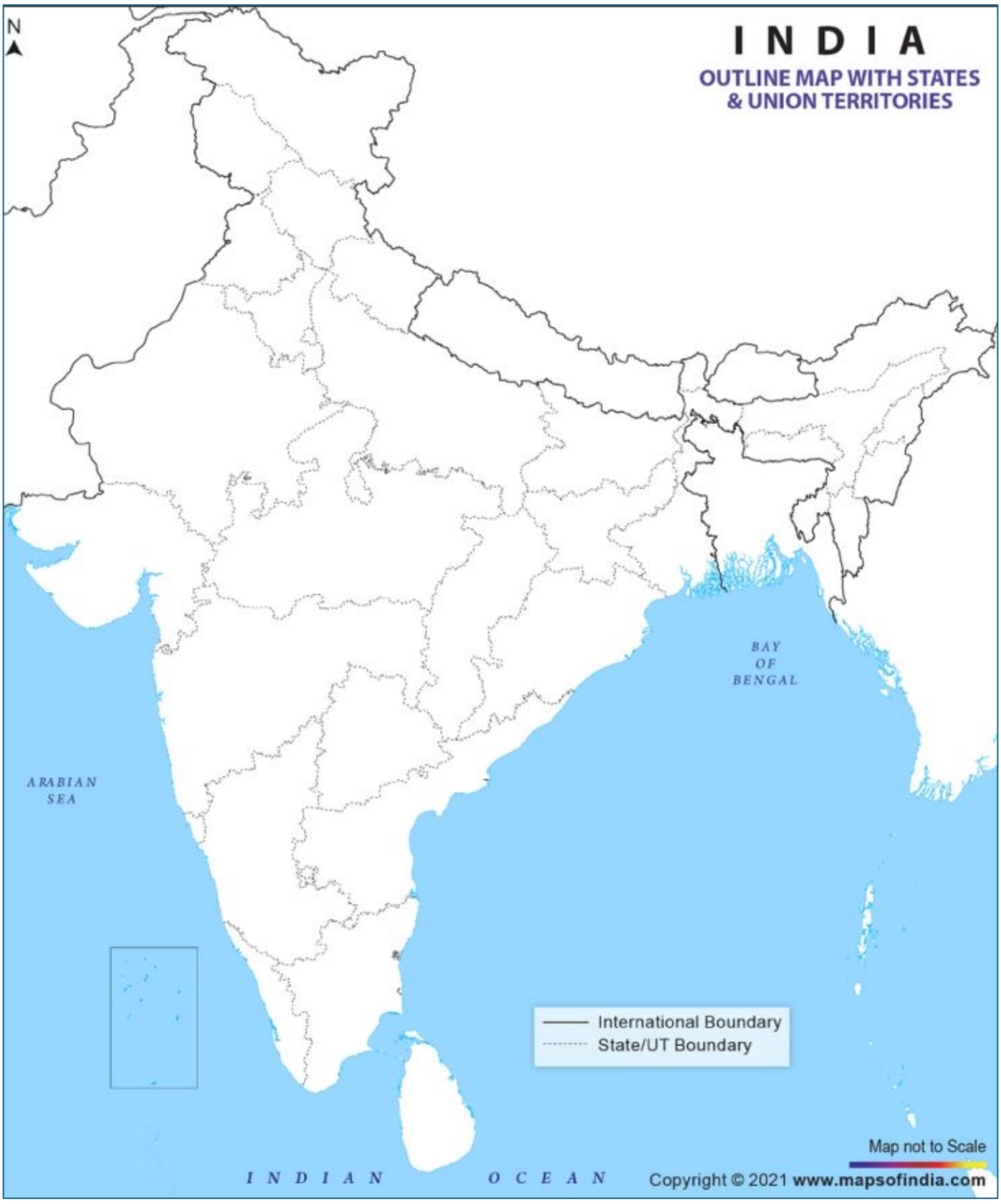
Figure 89: Cold Desert Biosphere Reserve

Conclusion

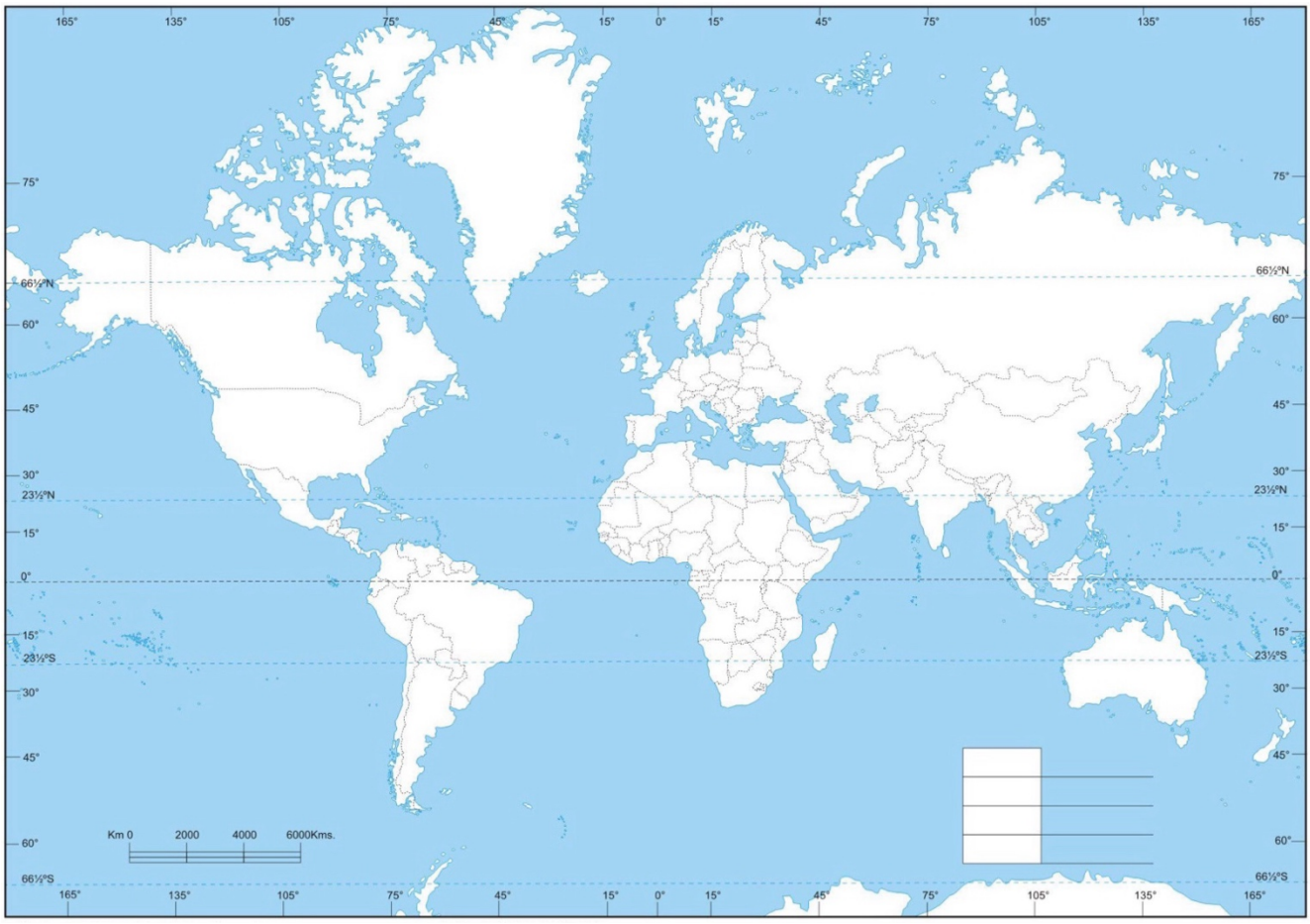
The UNESCO designation highlights the global importance of the Cold Desert Biosphere Reserve for high-altitude conservation and sustainable development.

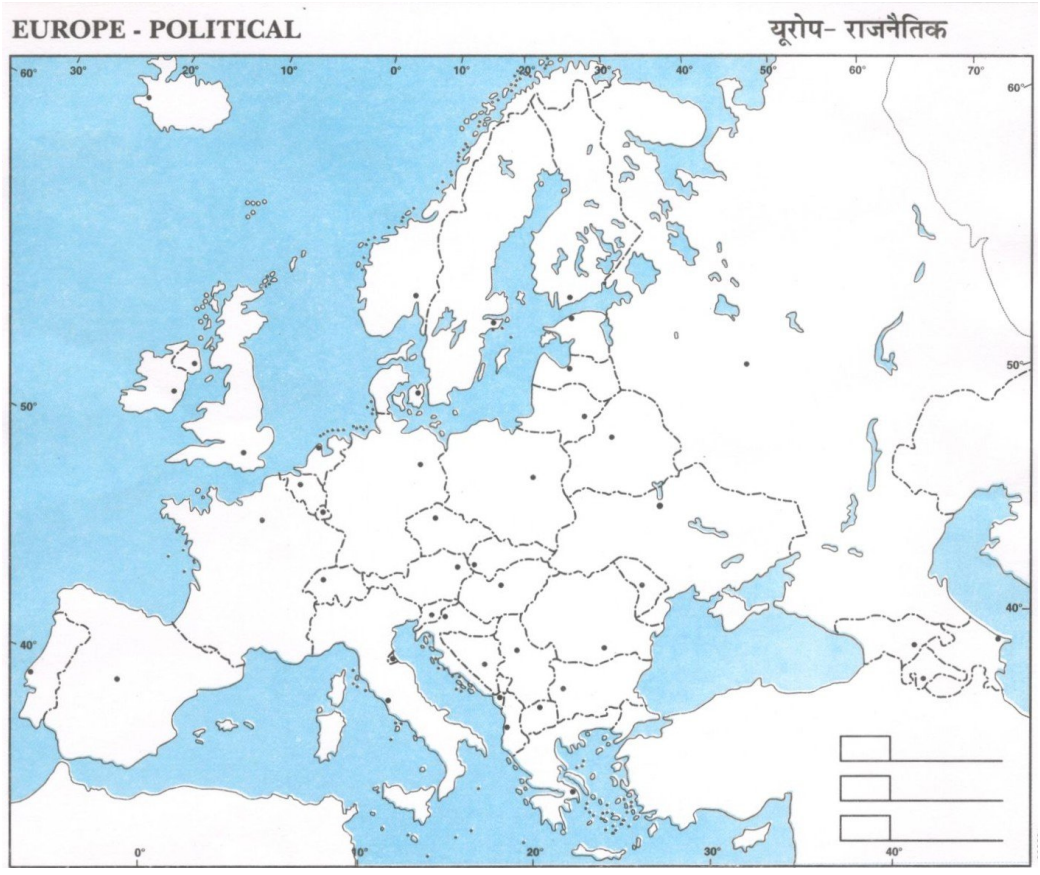
Exercise Maps

Mark the places mentioned in the previous section, on the map given below.



Mark the places mentioned in the previous section, on the map given below.





Mark the places mentioned in the previous section, on the map given below.

PERSONALITIES IN NEWS

Birsa Munda

Context: On the 150th birth anniversary of Bhagwan Birsa Munda, national leaders paid tribute to his legacy as a tribal freedom fighter and symbol of resistance against colonial oppression.

About Birsa Munda

- Born in 1875 in present-day Jharkhand, revered as "Dharti Aaba" (Father of the Earth).
- Led the Ulgulan (Great Tumult) movement against British policies that displaced tribals from their land and forests.
- Advocated tribal self-rule, cultural identity, and socio-religious reforms.
- Died young at 25, but became an icon of tribal empowerment and anti-colonial struggle.

Government Observance

- **15 November** is observed as **Janjatiya Gaurav Diwas** to honour tribal heritage.
- The 150th anniversary saw nationwide events celebrating tribal culture, history, and welfare initiatives.

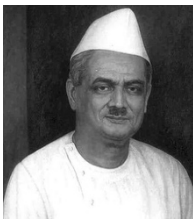
Significance

- Highlights the often-ignored contributions of tribal communities in India's freedom movement.
- Reinforces efforts toward tribal development, inclusion, and cultural preservation.

Conclusion

Birsa Munda's legacy continues to inspire movements for justice, dignity, and empowerment among tribal communities across India.

G. V. Mavalankar



Context: He was in news as Parliament commemorated his birth anniversary, recognizing his foundational role in shaping India's parliamentary democracy.

Key Points

- **First Speaker** of the **Lok Sabha**; earlier presided over the Central Legislative Assembly and the Provisional Parliament.
- Known as the **"Father of the Lok Sabha"** for establishing parliamentary procedures and conventions.
- Played a key role in freedom movement activities such as the Non-Cooperation and Khaira No-Rent campaigns.
- Strong advocate of constitutionalism and social reforms; contributed to educational and civic institutions in Gujarat.

Conclusion

Mavalankar's legacy rests in building the procedural backbone of India's Parliament and strengthening democratic governance in the early years of the Republic.

Dr. Verghese Kurien

Context: In news on 26 November, observed as National Milk Day, marking his birth anniversary and celebrating his contribution to India's dairy revolution.

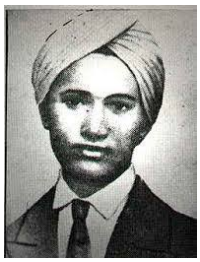
Key Points

- Born in 1921 in Kozhikode, Kerala; popularly known as the **Father of the White Revolution**.
- Architect of **Operation Flood**, which transformed India into the world's largest milk producer.
- Founder of key institutions such as NDDB, GCMMF (Amul), and IRMA, strengthening cooperative dairy structures.
- Helped launch the Dhara edible oil brand, extending cooperative success beyond milk.
- Recipient of major honours including Ramon Magsaysay Award, World Food Prize, and Padma Vibhushan.

Conclusion

Dr. Kurien's pioneering cooperative model reshaped rural livelihoods and made India self-reliant in milk production, leaving a lasting legacy in nation-building.

Kartar Singh Sarabha



Context: In news on his death anniversary, with renewed focus on his contribution to India's early revolutionary movement.

Key Points

- Born in 1896 in Ludhiana, he became one of the youngest revolutionaries of the freedom struggle.
- Joined the **Ghadar Party in the U.S.** at age 15 and helped publish the Ghadar newspaper to mobilized Indians against British rule.
- Returned to India in 1914 to organise an armed revolt and train volunteers; involved in preparing weapons and coordinating uprisings.

- Arrested in the Lahore Conspiracy Case and executed in 1915 at just 19 years of age.

Conclusion

Sarabha remains a symbol of youthful patriotism and revolutionary zeal, inspiring generations with his courage and sacrifice.

Chittaranjan Das (C.R. Das)

Context: Chittaranjan Das was in the news on his birth anniversary, reminding the nation of his legacy as a prominent freedom fighter, lawyer, and political leader in India's independence movement.

Key Points

- Born in 1870, Das was a distinguished lawyer and became a key leader of the Indian freedom movement.
- He earned the title **"Deshbandhu"** — "Friend of the Nation" — for his commitment to justice, civil rights, and national unity.
- Known for defending nationalist leaders in colonial courts and resisting repressive laws; he upheld constitutional principles even under British rule.
- Served as Chief Minister (Premier) of Bengal Presidency in 1940, promoting welfare, education, and social reforms, and advocating Hindu–Muslim unity.
- He played a crucial role in founding the Forward Bloc together with Subhas Chandra Bose, advocating more radical nationalist strategies.

Conclusion

C.R. Das remains remembered for his blend of legal brilliance, moral courage, and political leadership — a key architect of India's struggle for freedom and social reform.

Veer Narayan Singh

Context: Veer Narayan Singh was in the news following the inauguration of a memorial and Tribal Freedom Fighters Museum in Chhattisgarh, honouring his role in India's freedom struggle.

Key Points

- Born in 1795 in Sonakhan (present-day Chhattisgarh), belonging to the Binjhwar tribal community.
- Led a major local uprising during the **Revolt of 1857**, especially after distributing grain to famine-hit villagers, which led to his arrest by the British.
- Escaped from prison and mobilised hundreds of tribal and peasant fighters against colonial forces.
- Captured and executed on 10 December 1857, remembered as the first martyr of Chhattisgarh.
- The newly inaugurated museum highlights tribal contributions to the freedom movement.

Conclusion

Veer Narayan Singh remains a powerful symbol of tribal resistance and early anti-colonial struggle in central India.

Mahatma Jyotiba Phule

Context: India marked the death anniversary of Mahatma Jyotiba Phule, remembering his pioneering role in social justice, caste reform, and women's education.

Key Points

- Born in 1827 in Maharashtra, Phule emerged as a major critic of caste oppression and Brahminical dominance.
- **Championed women's education**, opening one of India's first schools for girls in 1848 with Savitribai Phule.
- Advocated education for Dalits, Shudras, and other marginalised communities, asserting that education is the foundation of social liberation.
- Founded **Satyashodhak Samaj** in 1873 to promote equality, rationalism, and resistance to social discrimination.
- Worked extensively for widow remarriage, condemning child marriage, and improving the dignity of oppressed communities.

Conclusion

Jyotiba Phule remains a transformative figure whose ideas on equality, education, and social justice continue to influence India's reform discourse.

Batukeshwar Dutt

Context: India commemorates the birth anniversary of Batukeshwar Dutt, a revolutionary freedom fighter associated with the Hindustan Socialist Republican Association (HSRA).

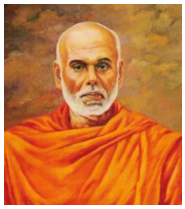
Key Points

- Born on 18 November 1910 in present-day West Bengal.
- Close associate of Bhagat Singh and member of **HSRA**.
- Famously **threw non-lethal bombs in the Central Legislative Assembly (1929)** to protest colonial repression; surrendered afterward to use the trial as a platform for nationalist messaging.
- Sentenced to life imprisonment and sent to Cellular Jail; participated in hunger strikes for political prisoners' rights.
- Joined the Quit India Movement (1942) after release.
- Lived a modest life post-independence; died in 1965 in Delhi.

Conclusion

Dutt remains a symbol of fearless resistance and moral courage, whose sacrifices played a vital role in shaping India's freedom struggle.

Sree Narayana Guru



Context: Sree Narayana Guru is celebrated as one of modern India's greatest social and spiritual reformers, whose teachings played a transformative role in Kerala's social renaissance.

About Sree Narayana Guru

- Born in 1856 in Chempazhanthy (Kerala), belonging to the marginalized Ezhava community.
- A **saint**, **philosopher**, **poet**, and leading **social reformer** who fought caste discrimination.
- Famous for the message: ***"One caste, one religion, one God for all."***

Major Contributions

- **Aruvippuram Temple (1888):** Consecrated by Guru himself, challenging caste restrictions in temple entry and priesthood.
- **Advaita Vedanta:** Reinterpreted non-dualistic philosophy to promote equality and social harmony.
- **Educational & Social Reform:** Encouraged education, dignity of labour, and upliftment of oppressed communities.
- **Organizational Legacy:** Inspired the creation of SNDP Yogam, which carried forward his reform movement.
- Authored works on spirituality, ethics, and social values that reshaped Kerala's intellectual landscape.

Legacy

- Played a key role in Kerala's social renaissance, influencing later reform movements.
- Revered as "Jagat Guru", his teachings continue to guide efforts for social equality and human dignity.

Conclusion

Sree Narayana Guru's life embodies a visionary blend of spirituality and social justice, making him a central figure in India's reformist tradition.

SCHEMES & INITIATIVES

BharatGen

Context: BharatGen has been launched under the IndiaAI Mission to develop **India-owned Large Language Models (LLMs)** that reflect India's multilingual, cultural, and socio-economic realities, ensuring AI sovereignty and last-mile inclusion.

Ministry	Objectives	Key Features & Components	Recent Updates
Ministry of Electronics and Information Technology (MeitY)	Build sovereign, India-owned foundational AI models	· Development of indigenous LLMs · Multilingual & Indic language focus · Public sector & startup access to AI models · India-centric datasets	· Part of **IndiaAI Mission** (₹10,371.92 crore outlay) · Ensures **data sovereignty** · Reduces dependence on foreign AI platforms

SMILE 2025

Context: SMILE 2025 (Support for Marginalised Individuals for Livelihood & Enterprise) strengthens social protection for transgender persons and other marginalized groups by integrating health, shelter, education, and livelihood support.

Ministry	Objectives	Key Features & Components	Recent Updates
Ministry of Social Justice and Empowerment	Socio-economic empowerment of marginalized individuals	· Scholarships from secondary to PG level · Skill development & livelihood support · Financial assistance for enterprises	· **Ayushman Bharat TG Plus** expanded: gender-affirming surgeries & hormone therapy in govt hospitals · **Garima Greh** shelters planned in 20+ states

PM-MITRA Parks

Context: PM-MITRA Parks (Pradhan Mantri Mega Integrated Textile Region and Apparel) are aimed at positioning India as a **global textile manufacturing hub**, competing with countries like China and Vietnam.

Ministry	Objectives	Key Features & Components	Recent Updates
Ministry of Textiles	Create globally competitive textile manufacturing ecosystems	· Integrated value chain parks · Focus on **Man-Made Fibre (MMF)** & Technical Textiles · Plug-and-play infrastructure	· Enhances export competitiveness · Rationalizes logistics & labour costs · Aligns with **Atmanirbhar Bharat** & export-led growth

NAP-AMR 2.0

Context: National Action Plan on AMR 2.0 (2025-2029) addresses the growing threat of **Antimicrobial Resistance (AMR)**, which risks making existing treatments ineffective.

Ministry	Objectives	Key Features & Components	Significance
Ministry of Health and Family Welfare (MoHFW)	Combat Antimicrobial Resistance through coordinated action	· **One Health approach** (human-animal-environment) · Strengthened AMR surveillance · Antibiotic stewardship programs	· Aligned with **WHO Global Action Plan** · Addresses rise of **superbugs** · Critical for public health security

Tex-RAMPS Scheme

Context: Tex-RAMPS Scheme (Textile Research, Innovation & Modernisation) is introduced to modernize India's textile sector by enhancing innovation and sustainability, especially among MSMEs.

Ministry	Objectives	Key Features & Components	Recent Updates
Ministry of Textiles	Promote R&D and modern manufacturing in textiles	· **Financial outlay:** ₹305 crore (2025–2031) · Machinery upgradation · Sustainable & green practices	· Targets **MSME competitiveness** · Supports technology adoption · Strengthens India's textile exports

MAINS VALUE ADDITIONS

GENERAL STUDIES PAPER – I

Indian Society | Social Issues | Culture | Secularism

Theme	Notes
Social Development	**Kerala** achieved a milestone by **eradicating extreme poverty**, marking its 69th formation day.
Science & Culture Interface	The International Astronomical Union (IAU) has approved 7 new Indian names proposed by Kerala-based researchers for Martian geological features, including a 3.5-billion-year-old crater named after geologist **M. S. Krishnan**, along with nearby landforms named after Kerala locations such as **Valiamala**, **Thumba**, **Bekal**, **Varkala**, and **Periyar**.

GENERAL STUDIES PAPER – II

Governance | Social Justice | Policing | Welfare | Cooperative Federalism

Theme	Notes
Nutrition Governance	PM Modi called for a shift from food security to nutrition security at the first **Emerging Science Technology and Innovation Conclave (ESTIC)**. o Generate ideas for nutrition security. o Create biofortified crops to address malnutrition. o Develop low-cost fertilizers. o Better map India's genomic biodiversity for personalised medicine. o Innovate in clean battery storage.
Judiciary & Technology	**Karnataka** government plans legislation to introduce **AI in district judiciary**. Legislation Karnataka District Judiciary Reforms Bill, 2025
Constitutional Values	Constitution Day celebrations - President says *"Constitution as a document of national pride and a guide for development."*
Electoral Reforms	Chief Electoral Officer (CEO) using **AI** for the **Special Intensive Revision (SIR)** of voter lists. Facial Recognition: To identify duplicate voters (same person registered in multiple booths/constituencies).
Inclusive Governance	Inclusive Governance **- Tamil Nadu's** pioneering model for transgender-inclusive healthcare, featuring **Gender Guidance Clinics**, insurance coverage for gender-affirming care, and supportive policy/legal reforms, despite remaining challenges.

GENERAL STUDIES PAPER – III

Economy | Environment | Disaster Management | Agriculture | Infrastructure | Science & Technology | Defence

Theme	Notes
Disaster Management	**Cyclone Montha** - Andhra Pradesh - **AWARE 2.0** (AP Weather Forecasting and Early Warning Research Centre): Accurate 72-hour early alerts, predicted wind speeds (80-100 kmph, actual 87 kmph).
Internal Security	ITBP establishing 10 all-woman Border Posts. Current Status: Two being established in Ladakh's **Lukung** and Himachal Pradesh's **Thangi**
Left Wing Extremism	"**Pandum Café**" in Bastar, Chhattisgarh, aims to rehabilitate surrendered Maoists and Naxal violence victims through employment in hospitality.
Air Pollution	**Unified Airshed Management Plan** for NCR

	○ Generate ideas for nutrition security. ○ Create biofortified crops to address malnutrition. ○ Develop low-cost fertilizers. ○ Better map India's genomic biodiversity for personalised medicine. ○ Innovate in clean battery storage.
Public Health	Kerala declared **snakebite envenomation** a notifiable disease under **Kerala Public Health Act, 2023**.

GENERAL STUDIES PAPER – IV

Ethics | Integrity | Aptitude

Theme	Notes
Knower–Doer Split	Knower Doer Split - The controversial U.S. embrace of Ahmed al-Sharaa, former al-Qaeda leader and now President of Syria, despite his violent past, raising concerns about accountability and the future of Syria.

PRACTICE QUESTIONS

Prelims Practice MCQs

Q1. Consider the following statements with reference to Bengal Famine of 1943:

1. Large-scale diversion of food for war purposes during World War II and a cyclone were among the factors responsible for the famine.
2. The Government of India built an official national memorial for the victims of famine soon after independence in Noakhali.

Which of the above given statement is/are true?

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

Q2. With reference to elephant conservation in India, consider the following statements:

1. Asian Elephants in India are listed under Schedule I of the Wildlife (Protection) Act, 1972.
2. Project Elephant includes components such as human–elephant conflict mitigation and elephant health management.
3. Recent assessments indicate that the fragmented landscapes of the Eastern Ghats have recorded the sharpest decline in elephant numbers.

How many of the statements given above are correct?

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

Q3. With reference to the Northeast Monsoon, consider the following statements:

1. It is known as the retreating monsoon.
2. It is important for southern India.
3. It creates a high-pressure area over the Indian subcontinent and a low-pressure area over the surrounding seas.

Which of the statements given above is/are correct?

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

Q4. The Loop Line Speed Control Test and SPAD (Signal Passed at Danger) Prevention Test are associated with which of the following systems?

(a) Automatic Train Protection (ATP) system of Indian Railways
(b) Integrated Bridge Navigation System used in merchant shipping
(c) Air Traffic Collision Avoidance System
(d) Automated Vehicle Tracking and Safety System in mining operations

Q5. With reference to the Maratha Empire, consider the following statements:

1. The formal beginning of the Maratha Empire is marked by the coronation of Shivaji at Raigad.
2. During the reign of the later Marathas, the empire exercised political influence over regions such as Malwa, Gujarat and Bundelkhand.
3. The borders of the Maratha state remained confined to the western Deccan throughout its expansion.

How many of the statements given above are correct?

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

Q6. With reference to single-cell sequencing, consider the following statements:

1. It enables the analysis of genomic, transcriptomic or epigenomic information at the level of individual cells.
2. The process involves isolating single cells and converting their genetic material into sequencing libraries.
3. It allows researchers to study cell-to-cell variability within a tissue or organism.

How many of the statements given above are correct?

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

Q7. With reference to the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), consider the following statements:

1. It guarantees 100 days of wage employment in a financial year to rural households whose adult members volunteer to do unskilled manual work.
2. The Supreme Court recently allowed the resumption of MGNREGA operations in West Bengal after a suspension of over three years.
3. Under MGNREGA, the Centre and States share the wage expenditure in the ratio of 50:50.

How many of the statements given above are correct?

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

Q8. A recent Constitution Bench of the Supreme Court was constituted to determine the criteria for fixing seniority in the Higher Judicial Services. This Bench was led by:

(a) Chief Justice D.Y. Chandrachud

(b) Justice Sanjiv Khanna
(c) Justice B.R. Gavai
(d) Justice Surya Kant

Q9. What is the overarching theme of India Maritime Summit 2025?

(a) India as the Global Maritime Hub
(b) Blue Economy and Sustainable Ocean Governance
(c) Strengthening Maritime Security Architecture
(d) Digital Transformation of Ports and Logistics

Q10. The Nellie massacre (1983), one of the most violent episodes during the Assam agitation, was primarily linked to issues arising from:

(a) Illegal migration from Bangladesh and disputes over electoral rolls
(b) Demands for a separate Bodoland state
(c) Ethnic conflict between Bodos and Santhals
(d) Insurgency led by ULFA in Upper Assam

Q11. With reference to the Indian Ornamental Tarantula (Poecilotheria metallica), consider the following statements:

1. It is endemic to the Eastern Ghats region of India.
2. Its venom is not lethal to humans, although it can cause severe pain and discomfort.

Which of the statements given above is/are correct?

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

Q12. Consider the following statements regarding Makhana (fox nuts):

1. It is the dried edible seed of the prickly water lily.
2. It is a species that grows in saltwater ponds.
3. The Indian state of Bihar contributes to roughly 80% of its production under a traditional agricultural system.

How many of the above statements are correct?

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

Q13. Consider the following statements regarding Global Depository Receipts (GDRs):

1. GDRs represent negotiable financial instruments issued abroad and held by investors outside the issuing company's home market.
2. A GDR provides its holder with direct ownership rights over the underlying company's assets.

Which of the statements given above is/are correct?

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

Q14. Rampur and Mudhol, recently referenced in the context of indigenous biodiversity initiatives, are breeds of which of the following?

(a) Indigenous cattle known for drought resistance
(b) Native sheep varieties adapted to arid ecosystems
(c) Indian hound breeds traditionally used for hunting
(d) High-yielding poultry breeds developed for rural farming

Q15. Consider the following statements regarding primary and secondary sanctions, often discussed in the context of U.S. and EU measures against Russia:

1. Under international law, primary sanctions are considered coercive measures imposed on third states or their entities for engaging with a sanctioned actor.
2. Unlike primary sanctions, which regulate the conduct of a state's own nationals and activities within its territory, secondary sanctions extend punitive measures to non-nationals who engage with the primary target.
3. Secondary sanctions function by restricting access to major financial or commercial systems, thereby exerting indirect pressure on third parties to comply with the sanctioning state's policy goals.

How many of the above statements are correct?

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

Q16. With reference to carbon dioxide, consider the following statements:

1. The atmospheric concentration of carbon dioxide continues to rise not just due to current emissions but also because of the cumulative buildup of greenhouse gases already present in the atmosphere.
2. Compared to carbon dioxide, other greenhouse gases such as methane and nitrous oxide have significantly higher global warming potential.

How many of the above statements are correct?

(a) One
(b) Two
(c) None
(d) Cannot be determined

Q17. With reference to India–China trade, consider the following statements:

1. China is India's second-largest trading partner.
2. India's exports to China increased in 2024–25, while imports from China declined during the same period.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only

(c) Both 1 and 2
(d) Neither 1 nor 2

Q18. Consider the following statements regarding Tomahawk missiles:

1. Tomahawk missiles are long-range, precision-guided cruise missiles originally developed for sea-to-land strike missions.
2. Ukraine indigenously developed the Tomahawk missile in 2015.

Which of the statements given above is/are correct?

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

Q19. Consider the following statements regarding the Doha Political Declaration:

1. It reaffirms the universality and indivisibility of human rights.
2. It calls for stronger regulation of digital technologies, including AI, to safeguard human rights.
3. It creates a binding global mechanism to monitor states' human rights compliance.

How many of the above statements are correct?

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

Q20. Consider the following statements regarding the Biodiversity Finance Initiative (BIOFIN):

1. BIOFIN is a global programme led by UNDP to help countries identify and mobilise finance for biodiversity conservation.
2. Under BIOFIN, countries prepare a Biodiversity Finance Plan based on an assessment of financing gaps and expenditure needs.
3. India is not a participating country under the BIOFIN programme.

How many of the above statements are correct?

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

Q21. Consider the following statements regarding the Quantum Diamond Microscope (QDM):

1. QDM uses nitrogen–vacancy (NV) centers in diamonds to map extremely weak magnetic fields with high spatial resolution.
2. QDM enables non-destructive imaging, making it useful for analysing meteorites, biological samples, and quantum materials.
3. QDM requires cryogenic temperatures to function and cannot operate at room temperature.

How many of the above statements are correct?

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

Q22. The 27th Amendment to the Constitution, which undermines democracy and establishes military supremacy over the state, was signed by the President of which country?

(a) Pakistan
(b) Myanmar
(c) Egypt
(d) Sudan

Q23. With reference to dugongs, often referred to as "sea cows," which of the following statements are correct?

1. They are herbivorous marine mammals that feed primarily on seagrass and live in shallow coastal waters.
2. Their distribution in India includes the Gulf of Kutch, the Gulf of Mannar–Palk Bay region, and the Andaman & Nicobar Islands.
3. Recent global assessments indicate that dugong populations in all Indian regions are stable and increasing.

Select the correct answer using the code given below.

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

Q24. With reference to the Pradhan Mantri Fasal Bima Yojana (PMFBY), which of the following statements are correct?

1. PMFBY is a Central Sector Scheme launched in 2016 to provide financial protection to farmers against crop losses caused by natural calamities, pests, and diseases.
2. The scheme is implemented by the Ministry of Agriculture & Farmers Welfare.
3. Only large landholding farmers are eligible under PMFBY, while tenant farmers and sharecroppers are excluded.

Select the correct answer using the code given below.

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

Q25. With reference to Ratanmahal Wildlife Sanctuary, recently in news after a tiger was officially sighted there for the first time since 1989, which of the following statements are correct?

1. Ratanmahal Wildlife Sanctuary is located in Gujarat's Dahod district and borders Madhya Pradesh regions known for tiger populations.
2. The sanctuary is primarily recognized for hosting Gujarat's largest population of Sloth Bears.

3. The sanctuary consists mainly of mangrove forests and serves as a major wetland ecosystem for migratory birds.

Select the correct answer using the code given below.

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

Q26. UNESCO's first global normative framework on the ethics of neurotechnology aims to:

(a) Promote unrestricted use of neurotechnology for medical advancements
(b) Balance innovation with human rights by protecting brain and neural data from misuse
(c) Encourage the use of neurotechnology in military applications
(d) Regulate the economic market of neurotechnology

Q27. An aurora, which is a captivating natural light display in the night sky, is caused by:

(a) Reflection of sunlight off ice crystals in the atmosphere
(b) Collisions of ions with oxygen atoms at lower altitudes
(c) Volcanic eruptions releasing gases into the atmosphere
(d) The emission of light from stars at night

Q28. In the context of Operation Pawan, consider the following statements:

1. Operation Pawan involved the Indian Peace Keeping Force (IPKF) deployment in Sri Lanka under the 1987 Indo-Sri Lanka Accord.
2. A key objective of the IPKF during Operation Pawan was to remove LTTE control over the Jaffna Peninsula and enforce disarmament.

Which of the statements given above is/are correct?

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

Q29. In the context of Constitution Day, consider the following statements:

1. Constitution Day is observed on 26th November to commemorate the adoption of the Indian Constitution in 1949.
2. Constitution Day was officially declared in 2015, replacing the earlier observance known as Law Day.

Which of the statements given above is/are correct?

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

Q30. In the context of the Hayli Gubbi volcano, consider the following statements:

1. Hayli Gubbi is a shield volcano located in the Afar region of Ethiopia, along the East African Rift where tectonic plates are diverging.
2. Shield volcanoes are steep-sided cones formed by thick, viscous lava that causes highly explosive eruptions.

Which of the statements given above is/are correct?

(a) I only
(b) II only
(c) Both I and II
(d) Neither I nor II

Mains Practice Questions

1. Examine the constitutional and ethical challenges posed by large-scale DNA identification systems in India and suggest measures to balance forensic effectiveness with individual privacy. (150 Words)

2. Heavy metal pollution in the Cauvery River reflects deeper failures in ecological governance. Analyze its causes, impacts, and the institutional reforms required for sustainable river management. (150 Words)

3. DNA-based policing and identification technologies have the potential to expand state surveillance. Critically assess their implications for privacy, federalism, and accountability in India. (150 Words)

4. Bans on social media platforms to address misinformation and security concerns raise concerns about proportionality and constitutional freedoms. Critically evaluate the legitimacy and consequences of such bans in India. (250 Words)

5. India's IT sector is transitioning from traditional outsourcing to AI-driven innovation. Discuss the key drivers of this transformation, the challenges involved, and the policy steps needed to retain global competitiveness. (250 Words)

MCQs Solutions

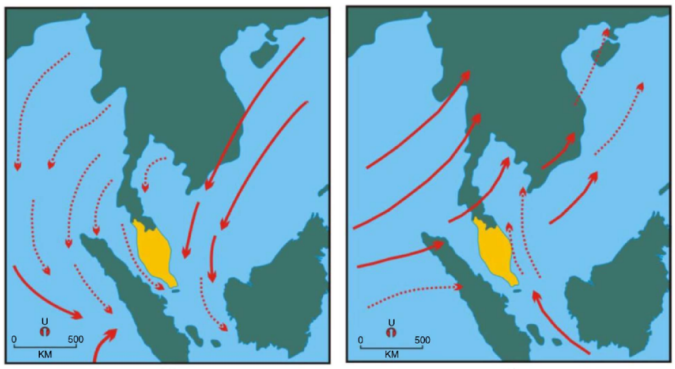
Q1. (a) 1 only

- **Statement 1 is correct:** The famine was triggered by wartime diversion of food and transport resources, along with a 1942 cyclone that destroyed crops and stocks.
- **Statement 2 is incorrect**: No official national memorial for famine victims was built by the Government of India after independence, in Noakhali or elsewhere.

Q2. (b) Only two

- **Statement 1 is correct:** Asian Elephants are protected under Schedule I of the Wildlife (Protection) Act, 1972.
- **Statement 2 is correct:** Project Elephant covers human–elephant conflict mitigation and health management.
- **Statement 3 is incorrect:** The sharpest elephant population decline has not been recorded in the Eastern Ghats; other regions show greater declines.

Q3. (a) 1 and 2 only



- **Statement 1 is correct:** The Northeast Monsoon is also called the retreating monsoon as winds withdraw from the Indian subcontinent.
- **Statement 2 is correct:** It is crucial for southern India, especially Tamil Nadu, Andhra Pradesh, and parts of Karnataka.
- **Statement 3 is incorrect:** During this period, a high-pressure area forms over land (cooling continent), but rainfall occurs due to low-pressure systems over the Bay of Bengal, not because of a persistent low-pressure over surrounding seas created by the monsoon itself.

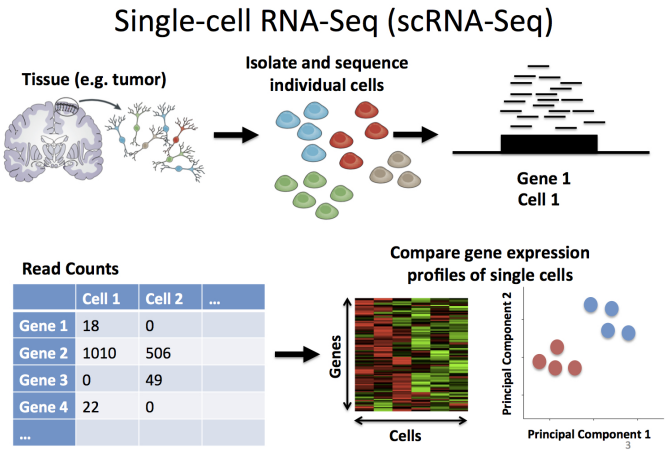
Q4. (a) Automatic Train Protection (ATP) system of Indian Railways

- **Explanation:** Both tests are part of ATP systems like Kavach, designed to prevent SPAD incidents, control train speed, and enhance railway safety.

Q5. (b). Only two

- **Statement 1 is correct:** Shivaji's coronation at Raigad in 1674 marks the formal beginning of the Maratha Empire.
- **Statement 2 is correct:** The later Marathas held political influence over large regions including Malwa, Gujarat, Bundelkhand, and parts of the north.
- **Statement 3 is incorrect:** The Maratha Empire expanded far beyond the western Deccan, reaching as far as Peshawar and Madurai at its peak.

Q6. (c) All three



- **Statement 1 is correct:** Single-cell sequencing allows genomic, transcriptomic, or epigenomic analysis at the individual cell level.
- **Statement 2 is correct:** It involves isolating single cells and converting their genetic material into sequencing libraries.
- **Statement 3 is correct:** It helps researchers study cell-to-cell variability within tissues or organisms.

Q7. (a) Only one

- **Statement 1 is correct:** MGNREGA guarantees 100 days of wage employment per year to rural households whose adult members volunteer for unskilled work.
- **Statement 2 is incorrect:** The Supreme Court did not order resumption; the Centre restored funds to West Bengal after suspension, not by SC direction.
- **Statement 3 is incorrect**: Under MGNREGA, the Centre bears 100% of unskilled wage cost; it is not a 50:50 sharing arrangement.

Q8. (c). Justice B.R. Gavai

- **Explanation**: The Constitution Bench examining criteria for fixing seniority in Higher Judicial Services was headed by Justice B.R. Gavai.

Q9. (a) India as the Global Maritime Hub

- **Explanation:** The theme of the India Maritime Summit 2025 is "India as the Global Maritime Hub," focusing on infrastructure, logistics, and global competitiveness.

Q10. (a) Illegal migration from Bangladesh and disputes over electoral rolls

- **Explanation:** The Nellie massacre occurred during the Assam agitation, primarily over illegal migration, inclusion of alleged migrants in electoral rolls, and related demographic anxieties.

Q11. (c) Both 1 and 2

- **Statement 1 is correct:** Poecilotheria metallica is endemic to the Eastern Ghats, particularly a small forest patch in Andhra Pradesh.
- **Statement 2 is correct:** Its venom is not deadly to humans but can cause intense pain, swelling, and discomfort.

Q12. (b) Only two

- **Statement 1 is correct:** Makhana is the dried edible seed of the prickly water lily (Euryale ferox).
- **Statement 2 is incorrect:** It grows in freshwater ponds, not saltwater.
- **Statement 3 is correct:** Bihar produces around 80% of India's makhana under its traditional pond-based cultivation system.

Q13. (a) 1 only

- **Statement 1 is correct:** GDRs are negotiable instruments issued abroad for investors outside the issuing company's home market.
- **Statement 2 is incorrect:** GDR holders do not get direct ownership of company assets; they receive beneficial ownership or rights to underlying shares.

Q14. (c) Indian hound breeds traditionally used for hunting

- **Explanation:** Rampur Hound and Mudhol Hound are indigenous Indian sighthound breeds, historically used for hunting and now promoted under indigenous biodiversity and dog-breeding initiatives.

Q15. (b) Two

- **Statement 1 is incorrect:** Primary sanctions apply to a state's own nationals, companies, and territory—not to third states.
- **Statement 2 is correct:** Secondary sanctions extend penalties to non-nationals engaging with the sanctioned actor.
- **Statement 3 is correct:** They work by restricting access to major financial and commercial systems, pressuring third parties to comply.

Q16. (b) Two

- **Statement 1 is correct:** CO_2 levels rise due to both current emissions and the long-term cumulative buildup of greenhouse gases in the atmosphere.
- **Statement 2 is correct:** Methane and nitrous oxide have much higher global warming potential compared to CO_2.

Q17. (a) 1 only

- **Statement 1 is correct:** China is India's second-largest trading partner, after the United States.
- **Statement 2 is incorrect:** Recent data shows India's exports to China declined, while imports increased, widening the trade deficit. So exports did not rise, nor did imports fall.

Q18. (a) 1 only

- **Statement 1 is correct:** Tomahawk missiles are long-range, precision-guided cruise missiles developed mainly for sea-to-land strikes by the United States.
- **Statement 2 is incorrect:** Ukraine did not develop the Tomahawk missile; it is an American system.

Q19. (b) Two

- **Statement 1 is correct:** The declaration reaffirms that human rights are universal and indivisible.
- **Statement 2 is correct:** It emphasises stronger regulation of digital technologies and AI to protect human rights.
- **Statement 3 is incorrect**: It does not create any binding global monitoring mechanism; it is a non-binding political declaration.

Q20. (b) Two

- **Statement 1 is correct:** BIOFIN is a UNDP-led global programme supporting biodiversity financing strategies.
- **Statement 2 is correct:** Countries prepare Biodiversity Finance Plans after assessing expenditure needs and financing gaps.
- **Statement 3 is incorrect:** India is a participating country in BIOFIN.

Q21. (b) Two

- **Statement 1 is correct:** The QDM uses nitrogen-vacancy (NV) centers, which are atomic-scale defects in a diamond's crystal lattice, as highly sensitive quantum sensors. These NV centers allow the mapping of extremely weak magnetic fields with high spatial resolution.
- **Statement 2 is correct:** QDM enables non-destructive imaging of magnetic fields, making it useful for analyzing various samples, including meteorites (geological samples), biological samples (e.g., for neuroscience and biomedical imaging), and quantum/superconducting materials.
- **Statement 3 is incorrect:** A key advantage of QDM technology is that it functions under ambient conditions, including room temperature, without requiring complex and expensive cryogenic cooling systems. This allows for the development of portable QDM devices for in-the-field studies.

Q22. (a) Pakistan

- The 27th Amendment to the Pakistani Constitution marks a historic shift that undermines democratic principles by formally establishing military supremacy over the state.
- This amendment has sparked widespread concerns over the erosion of democratic structures in Pakistan and the growing power of the military in national governance.

Q23. (a) 1 and 2 only

- **Statement 1 is correct.** Dugongs are strictly herbivorous marine mammals, feeding mainly on seagrass species such as Cymodocea, Halophila, Thalassia, and Halodule. Their reliance on seagrass meadows makes them dependent on shallow, warm coastal waters—bays, lagoons, and estuaries—usually less than 10 metres deep. This feeding behaviour has earned them names like "sea cows" and "farmers of the sea."
- **Statement 2 is correct.** In India, dugongs occur in three major regions:
    - Gulf of Kutch
    - Gulf of Mannar–Palk Bay region (shared with Sri Lanka)
    - Andaman and Nicobar Islands

  These locations support seagrass ecosystems vital for their survival.
- **Statement 3 is incorrect.** According to recent assessments of global dugong populations, their survival in the Gulf of Kutch and the Andaman & Nicobar Islands is highly uncertain and faces significant challenges. The population in the Gulf of Mannar–Palk Bay has declined sharply, indicating a deteriorating conservation status rather than a stable or increasing trend.

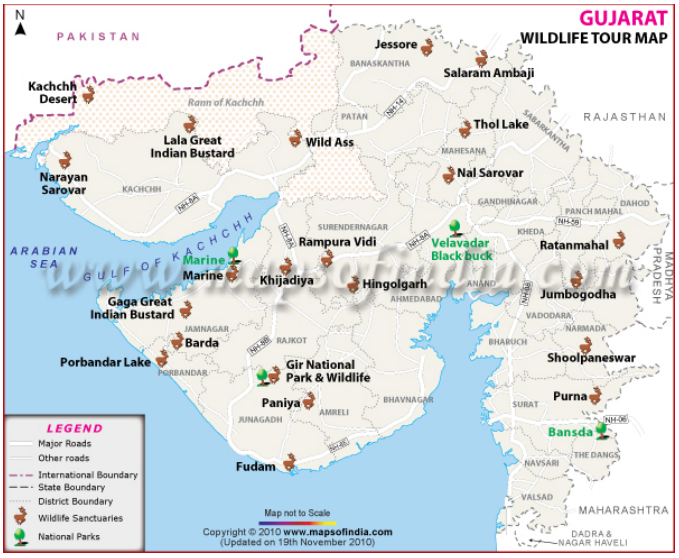
Q24. (a) 1 and 2 only

- **Statement 1 is correct.** PMFBY, launched in 2016, provides financial protection to farmers by compensating them for crop losses resulting from natural disasters, pests, and diseases. It aims to stabilize farmer income and encourage sustainable farming.
- **Statement 2 is correct.** The scheme is implemented by the Ministry of Agriculture & Farmers Welfare, which oversees its guidelines, monitoring, and coordination with states and insurance companies.
- **Statement 3 is incorrect.** PMFBY is designed to be inclusive, covering all farmers, including sharecroppers and tenant farmers, provided they cultivate notified crops in designated areas. Thus, it does not restrict benefits only to large landholders.

Q25. (a) 1 and 2

- **Statement 1 is correct.** Ratanmahal Wildlife Sanctuary—also known as Ratanmahal Sloth Bear Sanctuary—is situated in the Dahod district of Gujarat. It shares its boundary with the Jhabua and Kathiwada regions of Madhya Pradesh, both of which are known for sustaining tiger populations. This proximity explains how a tiger could naturally disperse into Ratanmahal.
- **Statement 2 is correct.** The sanctuary is an extremely important habitat for the Sloth Bear, hosting the largest sloth bear population in Gujarat. This makes it an important site for conservation of this species. The sanctuary also supports leopards and diverse forest fauna.
- **Statement 3 is incorrect.** Ratanmahal WLS is not a mangrove or wetland ecosystem. Instead, it comprises dry teak forests, mixed deciduous forests, and dry bamboo thickets. It is located in hilly terrain and forms the catchment area of the Panam River, supporting

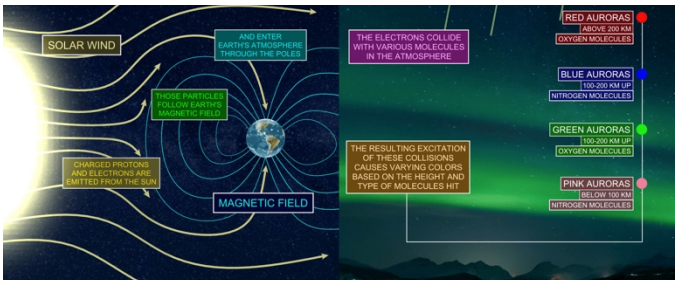
water conservation for the Dahod and Panchmahals districts. It is not known for migratory bird wetlands.



Q26. (b) Balance innovation with human rights by protecting brain and neural data from misuse

- UNESCO's normative framework on neurotechnology ethics aims to balance innovation with human rights, ensuring that advances in neurotechnology do not infringe on privacy, autonomy, or lead to manipulation.
- This framework emphasizes the need to protect brain and neural data from potential misuse while encouraging medical advancements that could offer significant benefits, such as treatments for neurological disorders.
- The growing field of neurotechnology poses ethical concerns related to privacy and the potential for control over an individual's thoughts or behavior.

Q27. (b) Collisions of ions with oxygen atoms at lower altitudes



- An aurora is caused by ions (charged particles) colliding with oxygen atoms in the Earth's atmosphere at lower altitudes.
- These collisions release energy in the form of light, creating the beautiful and shifting colours seen in the sky.
- The most common colour is green-yellow, but auroras can also appear in other colours like blue, red, yellow, and orange, depending on the type of gas and altitude involved in the collisions.

Q28. (c) Both 1 and 2

- **Statement 1 is correct:** Operation Pawan refers to the deployment of the IPKF in Sri Lanka under the 1987 Indo-Sri Lanka Accord, marking India's first major international peacekeeping mission after Independence.
- **Statement 2 is correct:** The IPKF was tasked with removing LTTE control over the Jaffna Peninsula and implementing disarmament, forming the core operational objective of Operation Pawan.

Q29. (c) Both 1 and 2

- **Statement 1 is correct:** Constitution Day is observed on 26th November as it marks the adoption of the Constitution in 1949 by the Constituent Assembly.
- **Statement 2 is correct:** In 2015, the Government of India officially declared Constitution Day, replacing Law Day, in honour of Dr. B.R. Ambedkar's 125th birth anniversary.

Q30. (a) Only 1

- **Statement 1 is correct:** Hayli Gubbi is a shield volcano in the Afar region of Ethiopia, part of the Erta Ale Range, and lies along the East African Rift, where the African and Arabian plates are diverging.
- **Statement 2 is incorrect:** Shield volcanoes are broad and gently sloping, created by thin, fluid basaltic lava, and their eruptions are less explosive, not steep-sided or highly viscous.

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