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1. Strengthening India's Statistical Ecosystem – Towards Data-Driven Governance

Introduction

MoSPI's plan to integrate ASUSE and PLFS for bottom-up District Domestic Product estimation marks a shift toward evidence-based, decentralised governance aligned with Viksit Bharat @2047.

Present Gaps in India's Statistical System

- Outdated top-down DDP estimation using broad indicators like population or workforce ratio.
- Under-representation of the informal sector, which accounts for most employment and nearly half of GDP.
- Fragmented data due to isolated surveys across sectors.
- Infrequent surveys limit tracking of rapid economic changes.
- Uneven statistical capacity and infrastructure across states.

MoSPI's Reform Initiative: Integrating ASUSE & PLFS

MoSPI will integrate ASUSE and PLFS to build a bottom-up DDP framework, using enterprise and labour data for district-level output estimation, with pilots in 2025 and full rollout by 2026.

Broader Significance for Governance and Development

- **Data-Driven Governance:** Links budgets to measurable outcomes.
- **Localised Planning:** Empowers districts to tailor schemes to their economic strengths.
- **SDG Monitoring:** Tracks progress on goals like poverty and employment at micro levels.
- **Cooperative Federalism:** Strengthens Centre–State coordination in data generation.
- **Targeted Welfare:** Enables precise, evidence-based social interventions.

Challenges in Implementation

Challenge	Explanation
Data Reliability	Informal enterprises often lack accounts or documentation.
Harmonisation Issues	Risk of double-counting while integrating enterprise and labour datasets.
State Capacity	Need for training of local statistical officers and digital infrastructure.
Timeliness	Large-scale surveys require quick processing and validation mechanisms.
Inter-Agency Coordination	Multiple agencies (NSO, DES, Labour Ministry, etc.) must synchronise data frameworks.

Way Forward

- **Strengthen State Systems:** Upgrade DES offices with digital tools, training, and manpower.
- **Leverage Technology:** Use AI, GIS, and dashboards for faster, accurate data analysis.
- **Institutional Reform:** Empower NSC for quality oversight.
- **Data Integration:** Create common identifiers for seamless dataset merging.
- **Transparency:** Ensure open access to anonymised public data.
- **Best Practices:** Replicate successful DDP models from states like Maharashtra, Karnataka, and Tamil Nadu.

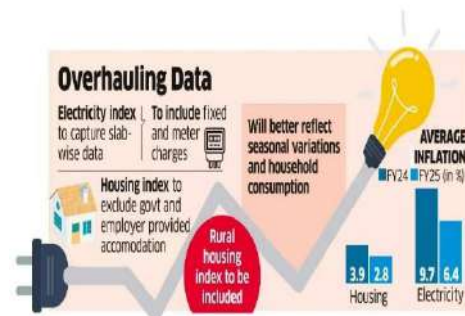
2. MoSPI's Overhaul of the CPI Housing Index – Towards More Accurate Inflation Measurement

Introduction

MoSPI plans major reforms to the CPI Housing Index to better capture post-pandemic rental patterns and improve accuracy ahead of the 2024 CPI base revision.

Need for Reform

- **Outdated Base (2012):** Misses post-pandemic shifts like migration and remote work.
- **Urban Bias:** Excludes rural housing data.
- **Distorted Proxies:** HRA and employer housing don't reflect real rents.
- **Low Frequency:** Biannual surveys fail to capture fast rent changes.
- **Policy Impact:** Skewed data can misguide RBI and welfare decisions.



Key Proposed Methodological Changes

Proposed changes include monthly rent collection, rural and owner-occupied coverage, exclusion of employer housing, a larger IMF-aligned sample, and updated weights from HCES 2023–24.

Transparency and Consultation Process

- **Open Consultation:** MoSPI released a discussion paper and invited feedback till Nov 20, 2025.
- **Stakeholder Engagement:** Data conferences and expert consultations planned for inclusivity.
- **Transparency Goal:** Builds trust and credibility in India's official statistics.

Significance of the Reform

- **Accuracy:** Monthly all-India rent data ensures realistic inflation tracking.
- **Representation:** Rural housing inclusion fills major data gap.
- **Policy Relevance:** Supports evidence-based decisions by RBI and government.
- **Transparency:** Consultative process boosts public trust.
- **Global Alignment:** Adopts IMF-backed best practices.

Challenges Ahead

Key challenges include ensuring high-quality frequent data, estimating rural rents, maintaining comparability with the old series, strengthening administrative capacity, and coordinating among multiple stakeholders.

Way Forward

- **Institutional Strengthening:** Build capacity of **National Statistical Office (NSO)** and local data agencies for regular, high-quality collection.
- **Technological Adoption:** Use **AI tools, GIS mapping, and real-time dashboards** to track rent changes efficiently.
- **Data Integration:** Merge HCES, Census, and administrative databases for comprehensive insights.
- **Public Communication:** Simplify dissemination of inflation data to enhance public understanding and trust.

3. US Secondary Sanctions: Implications for India's Russian Oil Imports

Context and Background

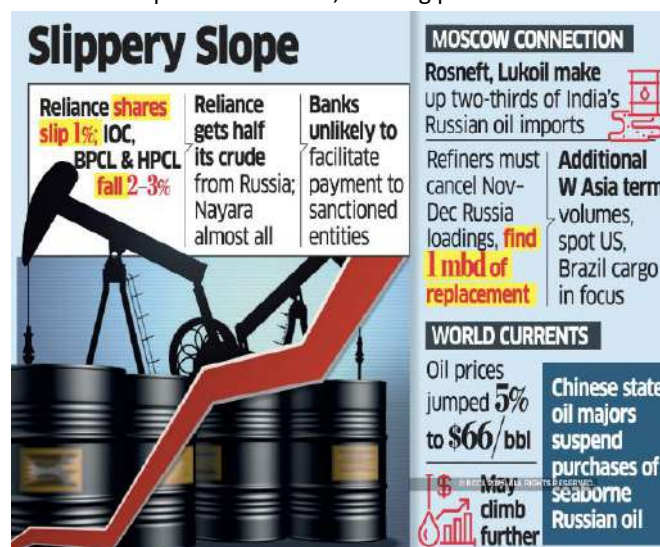
US sanctions on Rosneft and Lukoil in Oct 2025 pressured India's Russia-dependent refiners, echoing past reluctant compliance to avoid trade and financial fallout.

What are Secondary Sanctions?

- **Primary Sanctions:** Restrict US entities from dealing with blacklisted firms like Rosneft.
- **Secondary Sanctions:** Target non-US entities engaging with sanctioned firms by threatening exclusion from the US financial or dollar system (e.g., SWIFT access).

Why It Matters for India

Discounted Russian oil has benefited India, but new US sanctions risk disrupting dollar-based payments, exposing refiners like IOC, BPCL and RIL to financial and corporate fallout, and potentially forcing a shift to costlier Middle Eastern crude—raising CAD and fuel inflation.



Broader Geopolitical and Economic Dimensions

(a) Strategic Autonomy at Test

India's "multi-alignment" diplomacy faces stress — balancing ties with both **Russia (energy and defence)** and the **US (technology and investment)**.

(b) Dollar Dominance Question

The sanctions episode reinforces the **vulnerability of dollar dependence**.

India may accelerate efforts to **settle trade in rupees** or use alternative currencies like **the UAE dirham** or **Chinese yuan**.

(c) Energy Security Challenge

A sudden cut in Russian crude may force India to depend more on **OPEC** suppliers, who may not offer the same discounts — impacting **fuel prices** and **inflation**.

Lessons and Policy Takeaways

- **Diversify Energy Sources:** Strengthen long-term contracts with Gulf and African suppliers.
- **Build Strategic Oil Reserves:** To cushion against supply shocks.
- **Develop Alternative Payment Systems:** Promote **INR-based trade settlements** through mechanisms like **Special Vostro Accounts**.
- **Institutional Preparedness:** Empower MEA and Ministry of Petroleum to anticipate sanction scenarios and develop response strategies.
- **Global Advocacy:** Work with BRICS, SCO, and G20 partners to **oppose extraterritorial sanctions** and promote **multilateral rules**.

Conclusion

US secondary sanctions test India's energy diplomacy, forcing a balance between strategic autonomy and economic pragmatism. They underscore that true energy security depends on financial sovereignty in a globally interconnected system.

4. Freedom of Press in India: The Sentinel of Democracy

Introduction

Freedom of the press, a democratic cornerstone, keeps India informed and accountable but continues to face persistent pressures and challenges despite constitutional protection.

Constitutional and Legal Basis

Constitutional Provision:

Article 19(1)(a) guarantees freedom of speech and expression, which the Supreme Court in *Romesh Thappar vs State of Madras (1950)* interpreted to include press freedom.

Reasonable Restrictions:

Under Article 19(2), this freedom is limited by concerns of sovereignty, security, public order, decency, morality, contempt of court, defamation, and incitement—ensuring a balance between liberty and responsibility.

Legal and Institutional Framework

India protects press freedom through Article 19(1)(a) and media laws, while bodies like PCI, NBDSA, RNI, MIB, and Prasar Bharati regulate ethics, registration, policy, and public broadcasting.

Judicial Interpretation and Landmark Cases

- **Romesh Thappar (1950):** Press freedom is part of freedom of expression.
- **Brij Bhushan (1950):** Pre-censorship of newspapers is unconstitutional.
- **Sakal Papers (1962):** State control over newspaper circulation struck down.
- **Bennett Coleman (1973):** Press freedom includes the right to publish and circulate.
- **Indian Express (1985):** Press freedom vital for democracy; no arbitrary taxes.
- **R. Rajagopal (1994):** Journalists can publish without prior approval unless defamatory.

Major Challenges to Press Freedom in India

- **Political Pressure:** Attempts to control narratives; raids on critical media. → *Ensure institutional autonomy, transparent funding.*
- **Misuse of Laws:** Sedition and defamation used to curb dissent. → *Reform colonial laws.*
- **Journalist Safety:** 50+ killed (2006–23); rising attacks. → *Enact Journalist Protection Act.*
- **Media Monopoly:** Corporate control breeds bias. → *Enforce ownership transparency.*
- **Fake News:** Social media misinformation spikes during elections. → *Promote fact-checking, digital literacy.*
- **Economic Dependence:** Ad-driven model hurts independence. → *Develop public-interest funding.*
- **Internet Shutdowns:** Frequent bans hamper digital journalism. → *Require judicial oversight.*
- **Trust Deficit:** Sensationalism erodes credibility. → *Strengthen ethics and accountability.*

Way Forward

- Empower PCI & NBDSA with enforcement powers.
- Reform sedition and defamation laws.
- Ensure journalist safety through legal protection.
- Promote ethical, responsible journalism.
- Regulate digital media via independent oversight.
- Foster media pluralism and regional journalism.
- Enhance media literacy to curb misinformation.

5. ISRO's Heaviest Communication Satellite CMS-03: A Leap in India's Space Autonomy

Introduction: A Proud Milestone for Indian Space Science

On 2 Nov 2025, ISRO's LVM3-M5 launched CMS-03, India's heaviest communication satellite, marking a significant boost to national space self-reliance and capability.

What is CMS-03?

CMS-03, a 4,410-kg multiband satellite placed in GTO, will deliver secure, high-bandwidth communication across India and nearby oceans, especially strengthening encrypted links for the Armed Forces.

Why is this Mission Historic?

CMS-03's launch shows India can now deploy 4-tonne-class satellites indigenously, ending reliance on foreign launchers and advancing Atmanirbhar Bharat while cutting costs.



Strategic and National Security Dimensions

Defence Applications

- CMS-03 will strengthen **secure, real-time communication** for defence forces.
- Enables **encrypted military communication** across the **Indian Ocean Region (IOR)**.
- Enhances **maritime surveillance, border monitoring, and network-centric warfare capabilities**.

Strategic Autonomy

- India reduces dependency on foreign launchers for strategic payloads.
- Strengthens **cybersecurity and communication sovereignty**, essential for modern warfare and disaster management.

Technological Significance

- Demonstrates India's mastery in **heavy-lift launch technology**.
- Establishes **LVM3** as a globally competitive launch vehicle.
- Enhances India's capacity to launch **next-generation broadband and defence satellites**.
- Validates ISRO's reliability for upcoming manned and interplanetary missions.

Economic and Strategic Impacts

- **Cost Efficiency:** Saves foreign exchange and strengthens India's space economy.
- **Commercial Potential:** Enhances ISRO's global launch market credibility via NSIL.
- **Tech Spin-offs:** Advances in cryogenic tech benefit aviation, materials, and defence sectors.

Challenges and Way Forward

Challenge	Way Forward
Limited payload capacity (vs. global heavy launchers like Falcon Heavy)	Develop semi-cryogenic engines and reusable launch vehicles.
Space debris & orbital congestion	Adopt responsible space practices and active debris management.
Private sector integration	Strengthen PPPs under India's new Space Policy 2023.

6. High Seas Treaty: Challenges in Global Ocean Governance

Introduction

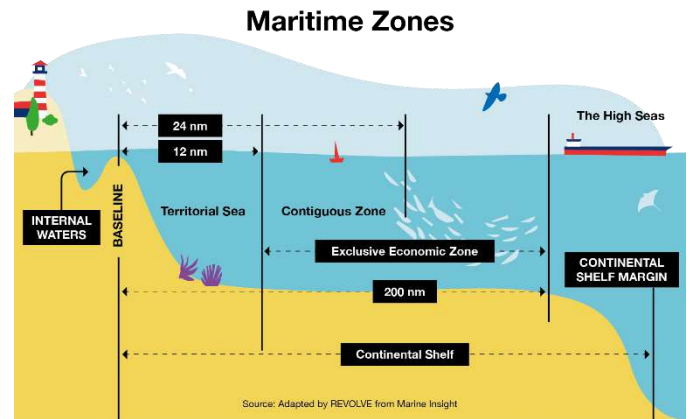
The 2023 High Seas Treaty, set to take effect in Jan 2026, brings long-needed regulation to the high seas—vital regions that absorb CO₂, generate oxygen, and cover 71% of Earth.

Background and Evolution

Negotiated from 2004 to 2023, the High Seas Treaty fills key UNCLOS gaps and establishes rules for managing biodiversity in the largely ungoverned high seas.

Key Objectives of the Treaty

- **Conservation of Marine Biodiversity** in areas beyond national jurisdiction.
- **Sustainable Use of Ocean Resources** to balance ecological protection with economic development.
- **Equitable Benefit-Sharing** from marine genetic resources (MGRs).
- **Strengthening Global Ocean Governance** through cooperation, technology transfer, and capacity building.



Core Provisions and Mechanisms

- MGRs: Shared genetic resources with equitable benefit-sharing
- ABMTs: MPAs for biodiversity conservation
- EIAs: Mandatory assessments to prevent high-sea ecological harm
- Capacity building: Tech and skill transfer to support developing nations

Major Challenges in Implementation

- Legal ambiguity between common heritage and freedom of the seas
- No clear formula for MGR benefit-sharing, risking biopiracy
- Major powers (U.S., China, Russia) not ratifying
- Overlap with bodies like ISA and RFMOs
- High monitoring and enforcement costs for developing nations

Way Forward

- **Finalize Guidelines:** Define clear rules for benefit-sharing, MPAs, and EIAs.
- **Enhance Synergy:** Align BBNJ with UNCLOS, ISA, and RFMOs to avoid overlaps.
- **Promote Ratification:** Bring major powers on board through diplomacy.
- **Integrate Agendas:** Link BBNJ with SDG-14, Paris Agreement, and Global Biodiversity Framework.
- **Support Developing Nations:** Establish funds and knowledge platforms for research and capacity building.

7. ESTIC 2025 – Building a Future-Ready India through Research, Innovation and Inclusivity

Introduction

India's journey to becoming a *Viksit Bharat* by 2047 hinges on science, technology, and innovation. The **ESTIC 2025**, replacing the Indian Science Congress, serves as a modern platform to drive a research-led, inclusive, and globally competitive STI ecosystem through collaboration among government, academia, industry, and startups.

Strengthening India's Research and Innovation Framework

- **Institutional Reforms:**
 - **ANRF** to boost university research.
 - **₹1 Lakh Cr RDI Fund** for high-risk, private-led innovation.
 - Policy reforms to enhance “ease of doing research” and lab-to-market linkages.
- **R&D Progress:**
 - R&D spending doubled; patents up 17×.
 - India: 3rd largest startup hub with 6,000+ deep-tech ventures.
 - Bio-economy grew from **\$10B (2014)** to **\$140B (2025)**.



Focus on Emerging and Sunrise Sectors

- **Tech Frontiers:** Focus on green hydrogen, quantum computing, deep-sea research, semiconductors, and AI to drive clean energy and digital self-reliance.
- **Inclusive Transformation:** Aims to make innovation accessible, ensuring technology benefits every section of society.

Empowering Women in Science

- Women's patent filings grew from **<100/year** a decade ago to **>5,000 annually** in 2025.
- **43% of STEM students** in India are women — higher than the global average (~33%).
- From **space missions** to **scientific leadership**, women are driving India's innovation narrative.
- Programs like **Vigyan Jyoti**, **GATI**, and **NIDHI Women Startup Program** promote gender inclusivity in research.

Nurturing Scientific Temper and Youth Talent

- **Education & Skills:** 10,000+ ATLs engaging 1 crore students (target 25,000); 10,000 new PM Research Fellowships; NEP 2020 promoting STEM in local languages.
- **Institutional Growth:** Expansion of higher education with 7 new IITs and 16 IIITs to boost R&D capacity.

Way Forward – Toward a Developed India through STI

- **Collaboration:** Strengthen linkages among government, academia, and industry.
- **Inclusivity:** Promote women, youth, and rural innovators.
- **Ethics:** Align innovation with sustainability and social responsibility.
- **Global Partnerships:** Deepen cooperation in frontier sciences and space research.

8. Dowry System in India – Causes, Impact, Laws and the Way Forward

Introduction

Despite being banned for decades, dowry persists as a major social evil, turning a once voluntary gift into exploitation and violence—exposing the gap between law and practice.

Causes of the Dowry System in India

Dowry persists due to patriarchy, economic inequality, social status pressures, inheritance biases, weak law enforcement, and cultural normalization.



Legal Framework against Dowry

- **Dowry Prohibition Act (1961):** Bans giving, taking, or demanding dowry; up to 5 years jail + fine.
- **BNS Sec. 85 (Dowry Death):** Replaces IPC 304B; applies to deaths within 7 years of marriage linked to dowry.
- **BNS Sec. 498A:** Protects women from cruelty by husband/in-laws.
- **Domestic Violence Act (2005):** Legal remedy for dowry-related abuse.
- **Evidence Act Sec. 113B:** Presumes guilt in dowry death cases.

Key Supreme Court Judgments

- **Pratibha Rani (1985):** Upheld woman's absolute right over *Stridhan*.
- **Arnesh Kumar (2014):** Cautioned against misuse of Sec. 498A; restricted arbitrary arrests.
- **Satbir Singh (2021):** Defined cruelty linked to dowry as *dowry death*.
- **Preeti Gupta (2010):** Stressed balanced enforcement to curb false cases.

Government Policies and Initiatives

Key initiatives include Beti Bachao Beti Padhao for girl-child education and protection, Sukanya Samriddhi Yojana for financial security, Mahila Shakti Kendras for skill-driven empowerment, One Stop Centres for integrated support to women in distress, and the NCW for safeguarding women's rights.

Challenges in Curbing Dowry

- **Cultural Normalization:** Seen as a social norm rather than a crime.
- **Weak Enforcement:** Low conviction rates and slow judicial processes.
- **Economic Incentives:** Dowry acts as a form of wealth accumulation.
- **Gender Inequality:** Deep-rooted patriarchy undermines women's bargaining power.
- **Fear of Stigma:** Women often withdraw complaints due to social pressure.

Way Forward

- **Education and Awareness:** Promote gender equality through schools and local campaigns.
- **Women's Economic Empowerment:** Ensure equal property and inheritance rights.
- **Pre-marital Counselling:** Encourage dialogue about dowry-free marriages.
- **Community Participation:** Involve panchayats, NGOs, and youth groups in anti-dowry movements.
- **Social Recognition:** Reward dowry-free weddings through local governance incentives.
- **Strict Monitoring:** Implement digital tracking of dowry-related cases and outcomes.

9. BRICS Pay – Redefining Global Financial Architecture

Introduction

BRICS launched BRICS Pay to cut SWIFT reliance, boost local currency trade, and foster a multipolar, sanctions-resistant financial system.

What is BRICS Pay?

Definition

BRICS Pay is a proposed **digital cross-border payment system** that enables trade settlements and financial transactions among BRICS members using **local currencies**, without routing through SWIFT or relying on the U.S. dollar.

Objective

- **Reduce dependence on SWIFT**
- **Promote use of local currencies** in intra-BRICS trade
- **Enhance financial sovereignty and resilience** against sanctions

Institutional Mechanism

- Developed by the **BRICS Payment Task Force (BPTF)**.
- Aims for **interoperability** among national payment systems of BRICS countries.

Strategic and Economic Motivation

- **Financial sovereignty:** Protects members from U.S. sanctions
- **Economic efficiency:** Enables faster, cheaper real-time settlements
- **Geopolitical assertion:** Counters Western dominance; sanctions-resilient
- **De-dollarisation:** Promotes local currency trade amid declining dollar share

Challenges and Concerns

- **Divergent Priorities:** India, China, and Russia are expanding their own systems (UPI, CIPS, SPFS), making a unified BRICS framework difficult.
- **Interoperability Issues:** Integrating diverse systems needs common cybersecurity, KYC, and regulatory standards.
- **No Common Currency:** Lack of a unified BRICS currency causes exchange-rate hurdles; reserve currency plans remain tentative.
- **Trust Deficit:** Fears of Chinese dominance demand transparent, balanced governance mechanisms.
- **External Pressure:** The U.S. views BRICS Pay as a strategic challenge; threats of tariffs highlight its geopolitical sensitivity.

Way Forward

- **Institutional Clarity** – Establish a **BRICS Payment Council** for policy coordination.
- **Technical Integration** – Develop a **shared blockchain ledger** to ensure transparency and security.
- **Local Currency Swap Mechanisms** – Expand bilateral currency swap lines to ensure liquidity.
- **Regulatory Harmonisation** – Common rules for **AML/CFT**, data protection, and transaction security.
- **Trust Building** – Shared governance, equal voting rights, and transparent dispute resolution.

BRICS Pay Consortium's Areas of Focus



➤ BRICS Pay QR	Retail Payment System	Learn more
➤ BRICS Pay B2B	Business Payment System	Learn more
➤ BRICS UNIT	BRICS+ Unit of Account (issue under discussion)	Learn more
➤ BRICS Loyalty	Traveler Rewards System	Scan
➤ BRICS CLEAR	Interstate digital settlement system for cross-border securities settlement	Scan

For more detailed information, please visit the BRICS Pay Consortium page
<https://brics-pay.com/consortium>

10. Foreign Debt Inflows Fall Short Despite Easier FAR Norms

Introduction

Foreign debt inflows are vital for funding growth and strengthening bond markets, but despite India's liberalised Fully Accessible Route (FAR) for foreign investors, 2025 inflows have fallen short due to global and domestic headwinds.

Factors Behind Slower Inflows

1. Global Factors

- **Interest Rate Volatility:** Uncertain U.S. Fed policies and rising global yields made FPIs cautious.
- **Geopolitical Tensions:** Ongoing geopolitical risks increased global risk aversion.
- **Barbell Strategy by Investors:** Preference for combining low-risk sovereign debt with high-yield emerging markets, reducing allocation to India.
- **Currency Fluctuations:** Rupee volatility relative to the U.S. dollar affected attractiveness.

2. Domestic Factors

- Stable inflation (around **4–5%**) and resilient GDP growth (**~7% FY26**) continue to anchor long-term investor confidence.
- Record **domestic consumption** trends show economic resilience, providing reassurance to FPIs.

Importance of Foreign Debt Inflows

- **Government Financing:** Lowers borrowing costs and funds development projects efficiently.
- **Market Depth:** Expands the sovereign yield curve and liquidity in G-sec markets.
- **Currency Stability:** Helps maintain external stability of the Rupee.
- **Global Integration:** Inclusion in global indices like **JP Morgan, FTSE, and Bloomberg** symbolizes India's integration into international financial markets.

Challenges in Attracting Debt Inflows

- **Global Uncertainty:** Rate hikes and inflation globally reduce appetite for emerging market debt.
- **Policy Limits:** Exclusion of long-term bonds and cautious liberalization limits the scope for FPIs.
- **Equity Outflows:** FPIs withdrew Rs. 1.39 lakh crore from Indian equities in 2025, signaling selective investment behavior.
- **Competition:** Other emerging markets may offer higher yields or perceived stability.

Future Outlook

- **Potential Boosters:**
 - Completion of bond index inclusion by agencies like **FTSE** and **Bloomberg**
 - Positive market sentiment from **India-U.S. trade deals**
 - Gradual easing of global monetary policy
- **Risks:**
 - Sudden global inflation surge or unexpected **Fed rate hikes**
 - Continued geopolitical tensions impacting risk appetite
- **Analyst View:** Medium-term prospects remain **optimistic**, as India's macro fundamentals and policy stability provide a long-term investment case.

11. Strengthening Panchayati Raj Institutions (PRIs) in India

The **73rd Amendment (1992)** made Panchayati Raj the bedrock of grassroots democracy, yet many Panchayats remain state-dependent. Empowering them is key to true local self-governance and inclusive development.

I. Evolution and Significance of Panchayati Raj in India

India's Panchayati Raj, rooted in ancient self-governing villages and shaped by post-independence committees, was constitutionally formalized by the 73rd Amendment (1992), establishing a three-tier system with elected bodies, reservations for SC/ST and women, and fiscal devolution to manage local development.

II. Achievements and Positive Developments

- **Democratic Representation:** 31 lakh elected members (46% women); Rajasthan's *Nari Shakti se Jal Shakti* revived water bodies; Bastar's tribal PRIs linked forest rights with governance.
- **Participatory Governance:** Gram Sabhas enable citizen voice; *People's Plan Campaign (2018)* and Kerala's model showcase inclusive local planning.
- **Fiscal Decentralisation:** ₹2.4 lakh crore (15th FC, 2021–26); southern states lead in Own Source Revenue; devolution rose to 43.9% (2021–22).
- **Capacity & Digital Governance:** RGSA (2022) for training; e-GramSwaraj, Panchayat NIRNAY, SVAMITVA, SabhaSaar (2025), and Gram Manchitra enhance transparency and planning.
- **Youth & Citizen Engagement:** *Model Youth Gram Sabha (2025)* builds civic values; *Meri Panchayat App* promotes real-time citizen participation.



III. Persistent Challenges

- **Incomplete Devolution:** Key functions like health and electrification remain with states; devolution fell from 35.3% to 29.2% (2022); PRIs often act as implementers.
- **Fiscal Dependence:** Only 1% revenue from local taxes; 95% funds from higher levels; delays and DBT schemes weaken PRI autonomy.
- **Gender & Social Barriers:** *Sarpanch Pati* practice, patriarchy, and caste bias limit inclusion; women's Gram Sabha participation only 7%.
- **Weak Gram Sabhas:** Irregular meetings, poor awareness, and exclusion of marginalized groups.
- **Administrative Gaps:** Inadequate infrastructure, staff shortages, and bureaucratic control hinder self-governance.

IV. The Way Forward: Comprehensive Measures for Empowerment

- **Devolution & Autonomy:** Transfer all 29 subjects, strengthen Panchayat staff, and enhance fiscal independence through OSR, PPPs, and untied grants.
- **Participation & Inclusion:** Revive Gram Sabhas, ensure women and youth engagement, and curb *Sarpanch Pati* practices.
- **Capacity & Accountability:** Expand RGSA training, mandate social audits, and empower State Election Commissions.

12. Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 – Towards Rational and Sustainable Forest Governance

Background and Context

India's Forest (Conservation) Act, 1980—renamed Van Adhiniyam in 2023—protects forests amid industrial growth to support ecology, livelihoods, and climate goals.

Objectives of the Act

The Act conserves forests, regulates land diversion, ensures ecological balance, enhances central oversight, and mandates compensatory afforestation.

Key Provisions of the Act

- **Central approval:** Prior permission from MoEFCC required for forest land diversion.
- **Non-forest purpose:** Covers mining, industry, dams, roads, and similar projects.
- **De-reservation:** Forests cannot be de-reserved without Central approval.
- **Penal action:** Violations invite Penal Compensatory Afforestation (CA) or Penal Net Present Value (NPV).
- **Advisory body:** Forest Advisory Committee (FAC) reviews proposals and ensures ecological safeguards.



Judicial and Policy Backing

- **T.N. Godavarman Thirumulpad vs Union of India (1996)** – Expanded definition of forest and mandated Central oversight.
- **SC Directions (2017)** – Introduced concept of **penal NPV** to strengthen accountability.
- **National Forest Policy 1988 & Draft 2018** – Stress on ecological security and community participation.

Challenges Ahead

- Delays in **fund utilisation** by states (CAMPA).
- Poor **quality of afforestation** – low survival rate of saplings.
- Limited **capacity and manpower** in forest departments.
- Balancing **development vs conservation** in infrastructure-heavy states.
- Ensuring **community participation** and local benefit sharing.

Way Forward

- **Codify uniform penalty guidelines** under the Van Adhiniyam Rules.
- **Digitise violation tracking** through GIS and satellite tools.
- **Enhance inter-agency coordination** (FAC–CAMPA–State).
- **Regular third-party audits** of compensatory afforestation.
- **Capacity building** of officials for scientific valuation of NPV.
- **Public disclosure portals** for transparency in forest diversion decisions.

13. Right to Freedom (Articles 19–22): The Soul of Indian Democracy

Introduction

The Right to Freedom (Articles 19–22) is the foundation of India's democracy, enabling individuals to think, speak, and live freely within legal and social limits. As Dr. B.R. Ambedkar noted, true liberty balances individual freedom with the interests of the community.

Constitutional Framework (Articles 19–22)

- **Article 19:** Six freedoms – speech, assembly, association, movement, residence, and profession – for **citizens only**.
- **Article 20:** Protection in conviction for offences – for **all persons**.
- **Article 21:** Protection of life and personal liberty – for **all persons**.
- **Article 21A:** Right to free and compulsory education (ages 6–14) – for **children**.
- **Article 22:** Protection against arrest and preventive detention – for **citizens and non-citizens**.

Judicial Landmarks on Right to Freedom

- *Romesh Thappar (1950)* – Freedom of press.
- *A.K. Gopalan (1950)* – Narrow liberty view.
- *Kharak Singh (1963)* – Basis of privacy right.
- *Maneka Gandhi (1978)* – Fair, just, reasonable law.
- *Bijoe Emmanuel (1986)* – Freedom of conscience.
- *Shreya Singhal (2015)* – Online free speech.
- *Common Cause (2018)* – Right to die with dignity.



Challenges and Way Forward

Challenge	Concern	Way Forward
Misuse of Sedition (Sec. 152 of BNS, earlier 124A IPC)	Curtails dissent	Review law per SC directive
Preventive Detention Misuse	Arbitrary arrests	Strengthen judicial review
Internet Shutdowns	Disrupt digital rights	Clear legal guidelines & proportionality
Media Pressure	Threats to independence	Strengthen Press Council autonomy
Censorship & Defamation	Stifles criticism	Adopt balanced, civil-defamation model

14. Comptroller and Auditor General of India (CAG): The Guardian of Public Funds

Introduction

CAG ensures lawful use of public funds and is shifting toward data-driven, centralised audits through new Railway reviews and specialised cadres.

Constitutional Provisions

Articles 148–151: Establish CAG's office, powers, accounting role, and reporting duties; a constitutional authority independent like a Supreme Court judge.

Appointment and Tenure

Appointed by the President, the CAG serves 6 years (or until 65) and can be removed like a Supreme Court judge, ensuring independence.

Roles and Functions

CAG audits government accounts, PSUs, performance, environment, and IT systems, and advises on financial propriety and accounting.

CAG and the Parliament

CAG reports go to the President or Governor and are examined by PAC and COPU to ensure executive accountability.

Example: PAC used CAG reports to expose the Mundhra Scandal.

Importance of CAG in Governance

Dimension	Role of CAG
Accountability	Ensures that taxpayer money is used lawfully.
Transparency	Brings financial facts before Parliament and citizens.
Efficiency	Promotes fiscal discipline and cost-effectiveness.
Good Governance	Acts as a check on arbitrary or wasteful spending.

Example: CAG reports on **2G Spectrum Allocation**, **Coal Block Allocation**, and **CWG 2010** were instrumental in exposing large-scale irregularities and shaping anti-corruption discourse in India.

Challenges

- **Limited Enforcing Power:** CAG can only report; it cannot enforce corrective action.
- **Delay in Audit Reports:** Many reports are tabled long after the expenditure has been made.
- **Resource Constraints:** Complex digital and environmental audits need greater expertise.
- **Perception of Politicisation:** CAG's findings are sometimes used selectively for political narratives.
- **Coordination with PAC:** Follow-up action on CAG reports is often weak at the legislative level.

Way Forward

- **Strengthen Institutional Capacity:** Invest in IT, AI, and data analytics for smarter audits.
- **Real-Time Auditing:** Integrate digital monitoring tools for continuous audit of large schemes.
- **Audit Independence:** Protect CAG appointments and tenure from executive interference.
- **Public Engagement:** Summarise key audit findings in citizen-friendly formats.
- **Green and Social Audits:** Expand scope to cover sustainability, climate finance, and welfare outcomes.

15. India's New AI Governance Guidelines: Innovation with Guardrails

Context & Background

MeitY's **India AI Governance Guidelines (2025)** promote **responsible, innovation-friendly AI**, balancing growth with citizen safeguards.

Why These Guidelines Matter

Aspect	Significance
Strategic Need	To ensure AI strengthens India's economic competitiveness and governance efficiency.
Ethical Imperative	To prevent harm from bias, misinformation, privacy violations, or deepfakes.
Global Relevance	To align India with global frameworks like EU AI Act, OECD AI Principles, and G20 AI dialogues.
Timing	Released ahead of the Delhi AI Impact Summit 2026 , signaling India's proactive global stance.

Practical Guidelines for Stakeholders

For Industry

- Adopt **voluntary codes of conduct** and publish **transparency reports**.
- Set up internal **grievance redressal** and **bias detection** systems.
- Ensure AI products comply with Indian privacy and cybersecurity norms.

For Regulators

- Encourage innovation through **regulatory sandboxes**.
- Use **techno-legal solutions** like watermarking, algorithmic audits, and differential privacy.
- Avoid heavy compliance burdens that could hurt small innovators.

Challenges Ahead

- **Enforcement Gap:** Voluntary guidelines may lack teeth without legal backing.
- **Data Access & Quality:** Skewed or poor-quality data can limit fairness.
- **Institutional Coordination:** Multi-agency roles may cause overlap.
- **Public Awareness:** Citizens must understand rights and redressal mechanisms.

Way Forward

- Build **legal clarity** around liability and data usage.
- Launch **AI awareness campaigns** for citizens and civil servants.
- Encourage **AI-for-Good projects** (health, climate, agriculture).
- Strengthen **AI Safety Institute** for continuous risk evaluation.
- Promote **international cooperation** for ethical AI standards.

Conclusion

India's **AI Governance Guidelines (2025)** balance **innovation and regulation**, promoting **trust, transparency, and inclusivity**, and may serve as a **Global South blueprint for human-centric AI**.



16. Nine Years After Demonetisation: Why Cash in Circulation Remains High

Introduction

Nine years after demonetisation, India shows a paradox: digital payments have surged and GDP is strong, yet cash in circulation has doubled—revealing a “dual-track economy” where rising digitisation coexists with deep-rooted cash dependence.

Why Cash in Circulation Remains High Even After Demonetisation

- Large informal sector (45–50%) depends on trust-based cash dealings.
- Cultural preference: cash seen as secure and convenient.
- COVID-19 led to higher precautionary cash holdings.
- Low digital literacy and patchy internet hinder digital use.
- Fear of tax scrutiny, transaction failures, and fraud risks persist.
- Economic uncertainty encourages cash hoarding.

Currency-to-GDP Ratio: A More Reliable Indicator

India’s digital shift is slowed by an informal, cash-reliant economy and uneven digital access. Cash use rebounded once new notes returned, and limited follow-through reforms reduced lasting impact. The anonymity and familiarity of cash keep it widely preferred.

Economic Implications of High Cash Circulation

Negative Impacts

- **Weakens Monetary Transmission:** Cash reduces effectiveness of interest rate changes.
- **Supports the Informal Sector:** Not necessarily bad, but reduces tax collections.
- **Encourages unreported cash transactions:** May aid small-scale black money circulation.
- **Increases cost of printing, storing, managing cash:** RBI printing cost keeps rising.

Positive Impacts

- **Supports rural demand:** Farmers, labourers, and small traders rely on cash.
- **Acts as a safety buffer during crises:** Seen during COVID-19.
- **Facilitates microtransactions:** Easier for street vendors, kirana shops, daily-wage payments.

Why Demonetisation Failed to Reduce Cash Dependency (Critical Analysis)

- Informal sector, cultural cash habits, and patchy digital access slow digitisation.
- Cash use bounced back once new notes arrived.
- Missing long-term reforms in taxes, literacy, and incentives limited impact.
- Cash’s anonymity keeps it popular.

Policy Suggestions Going Forward

- Improve digital infrastructure and literacy, especially in rural areas.
- Cut payment failures with strong grievance systems and cybersecurity.
- Ease GST and MSME compliance to boost formalisation.
- Use RBI’s calibrated cash management to moderate CIC and promote smaller notes.
- Encourage digital use through financial literacy and reward-based nudges.

17. Soil Organic Carbon (SOC) Decline in India: Causes, Impacts & Way Forward

Introduction: Why Soil Organic Carbon Matters

SOC is the carbon stored in soil from decomposed organic matter and is vital for soil fertility, crop productivity, and climate stability, as soils store far more carbon than the atmosphere.

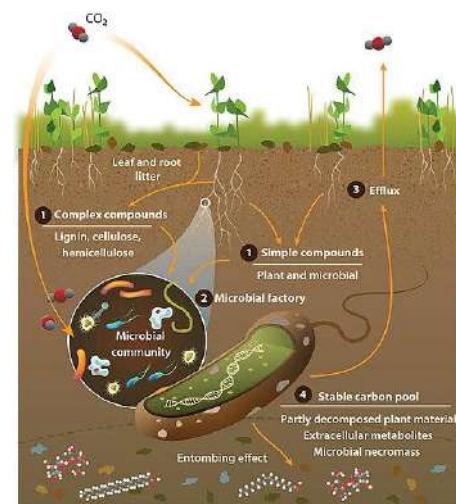
Understanding SOC: Components and Functions

What SOC Does

SOC acts as a nutrient bank, improves soil structure, prevents erosion, increases water-holding capacity, supports microbes, and serves as a major carbon sink. Ideally, soils need over **0.75%** SOC, but many Indian soils remain low at around **0.3–0.4%**.

How Climate & Geography Shape SOC

SOC is higher in cooler, high-altitude regions and moderate rainfall areas, but hot climates, excessive rain, residue-burning crops, and heavy urea use accelerate its loss.



Hayden D, et al, 2020, *Arctic Res. Environ. Technol.* 45:29–39

Human-Induced Drivers of SOC Decline

- **Unbalanced fertiliser use:** Distorted NPK ratio and excess urea speed up SOC breakdown.
- **Residue burning:** Removes biomass and directly destroys soil carbon.
- **Intensive tillage:** Exposes carbon to oxygen, causing rapid decomposition.
- **Monocropping:** Low biomass return reduces SOC buildup.
- **Low manure use:** Less FYM as dung is diverted for fuel.
- **Urbanisation/land degradation:** Construction, mining, and erosion deplete soil carbon.

Link Between SOC and Climate Change

Rising temperatures sharply reduce SOC by speeding up decomposition, releasing more CO₂ and weakening soil's role as a carbon sink. This creates a harmful feedback loop: falling SOC increases soil heat absorption, raises surface temperatures, boosts GHG emissions, and further accelerates SOC loss.

Policy Implications: What India Needs to Do

- **Promote organic carbon:** compost, green manure, biochar, cover crops
- **Balanced fertilisers:** correct NPK, slow-release nitrogen
- Incentivise carbon credits for farmers
- **Crop diversification:** pulses, millets, legumes, intercropping
- **Climate-smart practices:** zero tillage, precision farming, micro-irrigation
- **Expand vegetative cover:** agroforestry, shelterbelts, perennials
- **Digital monitoring:** AI soil maps, updated Soil Health Cards, remote sensing

Way Forward

- Integrate **organic inputs + balanced fertilisers + climate-smart practices**.
- Strengthen missions like **NMSA, National Soil Health Programme, Paramparagat Krishi Vikas Yojana (PKVY)**.
- Push for farmer training, residue management machines, and agroforestry adoption.

18. India's Withdrawal from Ayni Airbase, Tajikistan

What Happened?

- India has withdrawn its personnel and equipment from the **Ayni Airbase** in Tajikistan—its **only overseas military base**.
- Ends nearly **20 years** of India's military presence in Central Asia.
- Withdrawal followed the **expiry of the bilateral agreement** in 2022; Tajikistan did not renew it.

Why Ayni Was Important

- Located near **Wakhan Corridor**, Xinjiang (China), and **PoK** → critical vantage over China–Pakistan–Afghanistan.
- Helped India support the **Northern Alliance** (pre-2001), and later for Kabul evacuation (2021).
- India invested **~\$80 million** (BRO) to upgrade runway, hangars, ATC.
- Hosted **~200 Indian Army & IAF personnel** with rotational Sukhoi-30 MKIs.



Strategic Implications

Ayni base was strategically vital for India to monitor China, access Afghanistan bypassing Pakistan, support counter-terror efforts, and assert regional security and diplomatic influence.

Way Forward for India

Build Deeper Defence Ties with Central Asian States

- Enhanced dialogues with:
 - Kazakhstan
 - Uzbekistan
 - Kyrgyz Republic
 - Turkmenistan
- More joint exercises, pilot training, cyber-security partnerships.

Strengthen Air Connectivity via Chabahar & INSTC

- Develop **Chabahar Port** and **International North–South Transport Corridor (INSTC)** to unlock new logistical pathways.

Focus on Indian Ocean Power Projection

- Use Agaléga and Andaman–Nicobar Command to dominate the **Indo-Pacific**.
- Integrate platforms like:
 - P-8I
 - MQ-9B Sea Guardian
 - Indigenous UAVs

Explore “Lily Pad” Small Facilities

- Instead of large bases, opt for: **Logistics support points, Refuelling stations, Rotational deployments**
This allows presence without political backlash.

19. India–Bhutan Relations: Strengthening Timeless Ties

Introduction

India-Bhutan ties, rooted in trust and development partnership, were reaffirmed during the Indian PM's 2025 visit for K4's 70th birthday under Neighbourhood First and Act East policies.

Political and Strategic Dimensions

Defence & Security

- Joint Operation All Clear (2003) eliminated insurgent camps.
- IMTRAT ensures training, coordination, and intelligence sharing.
- Bhutan consults India on China border talks; Doklam (2017) underscored strategic alignment.



Economic and Developmental Partnership

Hydropower Cooperation

- Core of bilateral ties with major projects like Chukha, Tala, and Mangdechhu.
- 60:40 grant-loan model supports sustainability.
- Exports to India provide ~40% of Bhutan's revenue and clean energy to India.

Trade and Connectivity

- India = Bhutan's **largest trading partner** (~80% of total trade).
- **FTA (2006) & Transit Agreement (2021)** enable duty-free movement.
- **Upcoming:** Gelephu–Samtse rail link, integrated check-posts, and border haats.

Development Assistance

- ₹10,000 cr aid (12th Plan, 2018–23) and ₹4,000 cr credit (2025) for energy and digital projects.
- Support spans health, agriculture, infrastructure, and education.

Socio-Cultural and Spiritual Bonds

Cultural & People Ties

- Shared Buddhist heritage strengthened through relic exchanges and cultural projects.
- ICCR scholarships, academic support, and healthcare links deepen people-to-people bonds.

Way Forward

Area	Future Focus
Connectivity	Fast-track rail and border infrastructure
Energy	Diversify into solar, wind, green hydrogen
Digital	Deepen UPI, RuPay, e-governance
Security	Joint vigilance on border & cyber threats
Culture	Promote Buddhist circuits, youth exchanges
Regional Role	Enhance cooperation via BIMSTEC

20. Tribunals in India: Balancing Justice, Expertise & Independence

Introduction

Tribunals are specialised bodies for speedy, expert, and cost-effective justice in technical areas, aimed at reducing court backlog. However, executive control and vacancies raise concerns over their independence.

Constitutional & Legal Basis

- **42nd Amendment (1976):** Added Articles 323A & 323B for administrative and specialised tribunals.
- **323A:** Administrative tribunals (e.g. CAT).
- **323B:** Tribunals for taxation, labour, land, etc.
- **L. Chandra Kumar (1997):** Restored judicial review by High Courts & Supreme Court.



Objectives of Tribunals

Objective	Explanation
Reduce case load	Divert cases from regular courts
Provide expertise	Domain-specific adjudication
Speedy disposal	Simplified, time-bound process
Accessible justice	Less formal and affordable

Key Concerns

- **Lack of Independence:** Executive control over appointments and funding affects impartiality.
- **Fragmentation:** Overlapping jurisdictions and multiple small tribunals confuse litigants.
- **Persistent Vacancies:** Delayed selections slow down justice delivery.
- **Financial Dependence:** Tribunals depend on parent ministries for resources, reducing autonomy.

Reform Roadmap

Area	Recommendation
Institutional Reform	Create a National Tribunals Commission (NTC) for appointments & oversight
Tenure & Age	Minimum 5-year term , transparent reappointment
Administrative Control	Shift under Law Ministry
Infrastructure	Promote digital case management, hybrid hearings
Uniform Rules	Harmonise procedures across tribunals

Way Forward

- Tribunals must blend **executive efficiency** with **judicial neutrality**.
- Ensuring **secure tenure**, **financial independence**, and **transparent selection** will restore credibility.
- An empowered **National Tribunals Commission** could depoliticize appointments and ensure uniform standards.

Conclusion

Tribunals must become independent constitutional bodies to ensure justice is both swift and credible, not just fast.

21. Index of Industrial Production (IIP): Tracking India's Industrial Growth

Introduction

The **Index of Industrial Production (IIP)** is a key economic indicator released by **MoSPI** that measures **monthly changes in industrial output** in India.

It reflects how manufacturing, mining, and electricity sectors are performing and helps policymakers gauge industrial health.

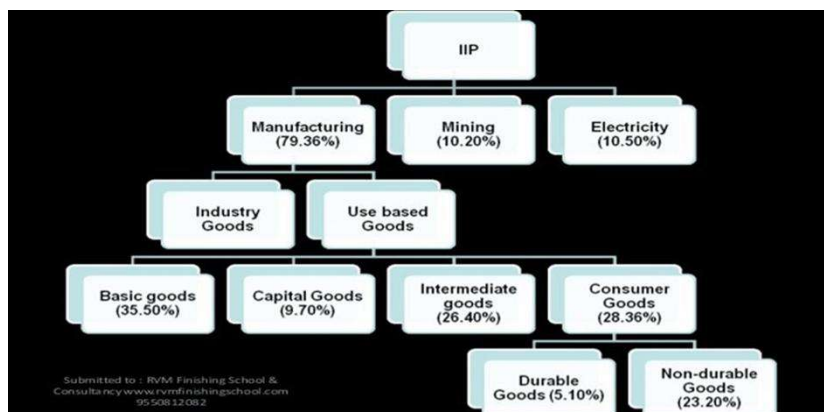
Understanding the IIP

Definition

IIP measures the **volume of industrial production** compared to a **base year**, showing whether industries are producing more or less over time.

Historical Background

- Introduced in **1937** (base year 1937).
- Periodically revised; current base year **2011–12**, proposed update to **2022–23** by **2026**.



Composition of IIP

The Indian industrial sector comprises manufacturing (77.6%), mining (14.2%), and electricity (8.2%), while its output can be classified by use into primary, capital, intermediate, infrastructure/construction, consumer durables, and consumer non-durables.

Compilation Method

- Compiled **monthly** by **CSO, MoSPI** using data from **14 source agencies**.
- Covers **407 items**.
- Uses **Laspeyres Index formula** to measure volume change.

Limitations

- Outdated base year misses new industries.
- Focus on physical volume, ignores value addition.
- Manual data causes lags.
- Excludes informal/unorganised units.
- Volatile month-to-month fluctuations.

Reforms & Way Forward

- Integrate **real-time digital data** (GSTN, MCA-21).
- Regularly **update sample factories**.
- Align IIP with **GDP/GVA** estimates.
- Add **green and sustainable indicators**.
- Strengthen **state statistical systems**.

22. National Mineral Policy 2019: Towards Sustainable and Responsible Mining

Introduction

India, rich in 95+ minerals, introduced the **National Mineral Policy (NMP) 2019** to promote **sustainable, transparent, and inclusive mining**. It replaces the 2008 policy and aims to modernize the sector, attract investment, and ensure environmental protection and community welfare.

Objectives

- Boost mineral exploration and data mapping.
- Promote sustainable, eco-friendly mining.
- Attract domestic and foreign investment.
- Reduce import dependence on critical minerals.
- Ensure equitable benefit-sharing via DMF.
- Improve governance through digital systems.

Key Features

- Mining given industry status
- Boosted exploration via GSI, NGDR, PPP
- Leases through open auctions
- Improved mineral logistics
- Promoted deep-sea & strategic minerals
- Ensured environmental, social responsibility
- Digital governance with e-clearance system

Economic Significance

- Mining contributes **~2.5% of GDP**, potential to reach 6%.
- Creates **1 crore+ jobs** directly/indirectly.
- Ensures **raw material security** for steel, cement, and EV sectors.
- Reduces imports, boosts exports via **value addition**.

Challenges

- **Private dominance:** Welfare goals sidelined.
- **Auction bias:** Small players excluded.
- **Delayed clearances:** Procedural bottlenecks.
- **Poor DMF use:** Funds misused or idle.
- **Environmental lapses:** Weak enforcement.
- **Skill & data gaps:** Limited expertise, poor mapping.
- **Low value addition:** Export of raw ores continues.

Way Forward

- Balance profit with **people's welfare**.
- Strengthen **state-level monitoring** and transparency.
- Make **DMF spending** public and audited.
- Promote **green and scientific mining**.



23. Viksit Krishi Sankalp Abhiyan (VKSA)

Overview

A nationwide campaign by ICAR and the **Ministry of Agriculture & Farmers Welfare** (29 May–12 June 2025) to promote **scientific farming, sustainable practices**, and **farmer awareness** across all states and UTs. It bridges the **lab-to-land gap**, ensuring research benefits reach farmers before the **Kharif season**.

Objectives

- Educate farmers on **improved crop varieties, balanced fertilizer use, and soil health**.
- Spread awareness on **government schemes, crop insurance, and allied sectors**.
- Promote **climate-smart, sustainable agriculture** for risk reduction.
- Collect **grassroots feedback** to align research and policy.
- Enhance **farmer income, food security**, and make India a **global agri leader**.



Key Features

- **Mass Outreach:** 2,000+ multidisciplinary teams covering **700+ districts** and **65,000+ villages**.
- **Village-Level Interaction:** Demonstrations, group meetings, and real-time farmer consultations.
- **Data-Based Advisory:** Use of **Soil Health Cards** and **local agro-climatic data**.
- **Promotion of Allied Sectors:** Focus on **horticulture, fisheries, livestock, and millets**.
- **Science in the Field:** Coordination among **KVKs, ICAR institutes, and state agencies**.

Challenges

- **Logistical hurdles:** Difficult to reach remote villages.
- **Limited continuity:** 15-day campaign needs long-term follow-up.
- **Adoption gap:** Translating advice into field action requires handholding.
- **Impact assessment:** Weak monitoring of yield and income outcomes.
- **Inclusion gaps:** Small, tribal, and women farmers may be left out.

Way Forward

- **Institutionalize VKSA:**
Convert from short-term drive to **continuous farmer engagement program**.
- **Strengthen Follow-Up:**
Deploy **cluster-level resource persons** for field support and periodic visits.
- **Use Digital Platforms:**
Mobile apps, SMS, WhatsApp advisory, and video tutorials for ongoing guidance.
- **Robust Impact Assessment:**
Use real-time data on yield, soil health, and income to evaluate outcomes.
- **Inclusivity Measures:**
Targeted campaigns for **women farmers, tribal regions, and rainfed areas**.
- **Link with Value Chains:**
Integrate VKSA learnings with **marketing, credit, and processing support**.

24. Tropical Forest Forever Facility (TFFF): A New Global Blueprint for Forest Conservation

Introduction

The \$125 billion Tropical Forest Forever Facility, announced at COP30 by Brazil's President Lula, aims to reward developing nations for conserving tropical forests, marking a Global South-led shift in climate leadership.

Objectives

- Provide **financial incentives** to nations that protect old-growth tropical forests.
- Make **conservation economically viable** compared to destructive activities like timber or soy production.
- Encourage **sustainable development** while ensuring **climate stability** and **carbon sequestration**.

Why It Matters

Environmental Significance

- Forests absorb **~30% of global CO₂ emissions** annually.
- Helps achieve **Paris Agreement goals** and **Net Zero 2050** targets.

Economic Incentive

- Makes forests **"worth more alive than dead"** by monetising ecological services.
- Encourages **eco-friendly industries, carbon credits, and sustainable livelihoods**.

Political Shift

- Positions **Global South** as a **solution provider**, not just a victim of climate change.
- Enhances **South-South cooperation** on climate action.

Concerns and Criticisms

Market Volatility

- Reliance on **bond markets** exposes TFFF to global financial instability.
- Economic crises could disrupt **fund returns** and **payments**.

Accountability Issues

- Not under **UNFCCC or Paris Agreement** → lacks **formal climate finance oversight**.
- May weaken **developed countries' obligations** for climate finance under global treaties.

Risk of Fragmentation

- Could **undermine** UN climate mechanisms by **diverting funds** from established public finance channels.

India's Relevance

- India has **97.8 mha of forest cover (21.7% area)** — major carbon sink.
- Could **benefit** through **performance-linked payments** for conservation in regions like **Northeast, Western Ghats**.
- Aligns with **Green Credit Programme (2023)** and **LiFE mission (Lifestyle for Environment)**.

Way Forward

- Integrate TFFF with **UN climate mechanisms** for legitimacy.
- Ensure **independent auditing** and **stable asset diversification** to reduce risks.
- Prioritise **community participation** in fund disbursement to avoid elite capture.

25. Tertiary Sector in India: Structure, Growth & Future Pathways

Introduction

India's services sector, spanning banking, IT, transport, tourism, education, and healthcare, contributes ~55% of GVA (2024–25) and drives employment, exports, and urban growth.

Understanding the Tertiary Sector

Meaning

Services that support production and consumption across agriculture, manufacturing and society (e.g., banking, telecom, transport, hospitality).

Tertiary–Quaternary–Quinary

- **Tertiary:** Trade, transport, hospitality, telecom.
- **Quaternary:** IT, data analytics, R&D, consultancy.
- **Quinary:** Education, health, public administration, high-level decision-making.



Major Components

- **Trade, Hotels, Transport, Communication (17.51% GVA)**
Includes retail/wholesale trade, tourism, rail/road/air transport, telecom. Examples: e-commerce boom, metro expansion, UDAN scheme.
- **Financial, Real Estate & Professional Services (22.92%)**
Includes banking, insurance, real estate, IT, BPO, consulting. Examples: UPI-led fintech growth, GCCs in major cities.
- **Public Administration, Defence & Other Services (14.50%)**
Includes govt services, health, education, community services. Examples: Digital governance, Ayushman Bharat, NEP 2020.

Role in Indian Economy

- **Contribution to GDP:** Over **half of India's GVA**, functioning as the **growth engine**.
- **Employment:** Generates jobs in IT, banking, logistics, tourism; expands opportunities for women.
- **Driving Digital India:** Supports digital payments, telemedicine, online education, remote work.
- **Boosting Trade:** India is a major exporter of IT & business services.

Challenges

- **Skill Gap:** Mismatch between modern service needs and workforce skills.
- **Digital Divide:** Rural areas lack digital access.
- **Cybersecurity Risks:** Privacy breaches and data theft.
- **Infrastructure Bottlenecks:** High logistics costs, poor last-mile connectivity.
- **Unorganised Employment:** Large share of informal workers lacking social protection.
- **Global Competition:** Need to upgrade and move towards high-end services.

Government Initiatives

- **Digital India:** Boosts online services, digital governance, e-payments.
- **National Logistics Policy:** Aims to reduce logistics cost and improve efficiency.
- **Startup India & Digital Payments:** Fintech sector supported by UPI, Aadhaar, Jan Dhan.
- **Tourism Schemes:** Swadesh Darshan, PRASAD, Incredible India 2.0.

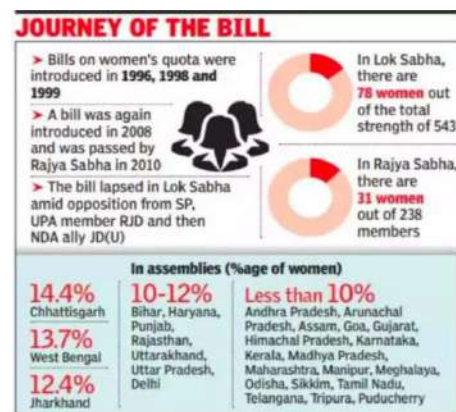
26. Women's Reservation Law in India: Current Debate, Constitutional Dimensions & Way Forward

Introduction

The Supreme Court sought clarity on the delayed Women's Reservation Act, 2023, which mandates 33% legislative seats for women but awaits Census and delimitation.

Key Features of the Women's Reservation Act, 2023

- **Constitution (106th Amendment) Act**
 - Inserts Article 334A. Provides 33% reservation for women in the Lok Sabha, State Assemblies, and Delhi Assembly.
- **Implementation Conditions**
 - Takes effect only after: Next Census. Delimitation based on updated data
- **Criticism**
 - Seen as a "delaying clause" with no fixed timeline. Viewed as hindering immediate political empowerment.



Constitutional & Ethical Basis

- **Supportive Provisions:** Article 15(3) permits special laws for women, while DPSPs (Articles 39, 42, 51A(e)) direct the State to ensure equality and dignity.
- **Democratic Imperative:** Political justice is a core Constitutional value, making women's full representation essential for a truly substantive democracy.

Challenges to Implementation

Administrative

- Census delay (pandemic, logistical reasons).
- Delimitation requires political consensus.

Political

- Parties may resist losing stronghold constituencies.
- Risk of ghettoisation of women representatives in "reserved" pockets.

Social

- Patriarchal barriers persist.
- Tokenism without genuine empowerment.

Way Forward

Possible Solutions

- Announce a **fixed timeline** for Census & delimitation.
- Introduce a **temporary rotational reservation framework** until full delimitation.
- Strengthen training, capacity-building, and political funding support for women.

Long-Term Measures

- Encourage political parties to adopt **voluntary quotas** in ticket distribution.
- Promote safe public spaces, education, and workforce participation to create a pipeline of women leaders.

27. Export Promotion Mission (EPM): Strengthening India's Export Competitiveness

Amid global protectionism and weakening demand, India has launched the ₹25,060-crore Export Promotion Mission (EPM) to strengthen export competitiveness, safeguard jobs, and diversify exports in a challenging trade environment.

Objectives of the Mission

Economic Objectives

- Enhance India's **export competitiveness** in global markets.
- Reduce the **cost of credit** for exporters, especially MSMEs.
- Boost growth in **labour-intensive sectors**.

Structural Objectives

- Address logistics gaps, branding weaknesses, and packaging inefficiencies.
- Improve access to working capital and trade finance.
- Facilitate entry into **new and high-risk markets** (Latin America, Africa, Central Asia).

Digital Objectives

- Build a unified, flexible digital platform to manage incentives and market access schemes.
- Improve transparency and reduce paperwork for exporters.



Implementation Framework – Two Sub-Schemes

The EPM has two major components: **Niryat Protsahan** and **Niryat Disha**.

Niryat Protsahan (₹10,401 cr) aids MSMEs with cheaper credit, liquidity, and export finance, while Niryat Disha (₹14,659 cr) boosts global branding, logistics, marketing, and capacity building.

Sector-Wise Impact

Textile exporters (28% US-dependent) expect EPM to offset tariff shocks through cheaper credit and better branding. **MSMEs** (40% of exports) gain from reduced compliance and improved finance. **Gems & jewellery** benefit from interest support and trade-fair assistance, helping small exporters. **Engineering goods**—down 9.4%—need EPM's liquidity and market diversification support to regain momentum.

Challenges the EPM Seeks to Address

- **Structural:** High logistics cost, slow port/inland transport, weak global branding
- **Financial:** Expensive credit, delayed payments, limited bank risk cover
- **Market:** Reliance on US/EU, tariff/non-tariff barriers, competition from China, Vietnam, Bangladesh

Way Forward

- Expand digital trade finance to improve credit access.
- Build data-driven market intelligence for new export destinations.
- Strengthen “Brand India” for key sectors (textiles, handicrafts, marine, Ayurveda, food).
- Reduce structural bottlenecks by improving last-mile connectivity and simplifying customs processes.
- Leverage existing and upcoming FTAs (UAE, Australia, UK, EU) to widen market reach.

28. Particularly Vulnerable Tribal Groups (PVTGs)

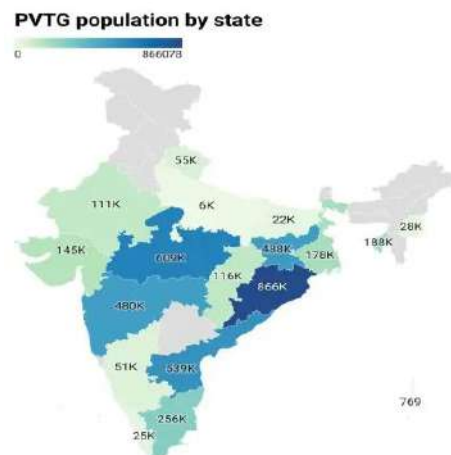
Introduction

PVTGs, first noted by the **Dhebar Commission (1960–61)**, are the most deprived ST groups. Introduced in the **5th FYP** as Primitive Tribal Groups (later renamed), India now has **75 PVTGs in 18 States and A&N Islands**.

Identification Criteria

PVTGs are identified using **simple socio-economic and demographic indicators**:

- **Pre-agricultural level of technology:** Hunting-gathering, shifting cultivation, rudimentary agriculture.
- **Subsistence economy:** Very low asset base, high dependence on minor forest produce.
- **Low literacy & poor human development:** Literacy often below 20%; high IMR, MMR and malnutrition.
- **Small or declining population:** Many groups have only a few hundred individuals.
- **Social and geographic isolation:** Habitations located in forests, hills, islands, with limited access to services.



Note: Andhra Pradesh data includes Telangana
Source: Ministry of Tribal Affairs, Census 2011 • Map data: © OSM • Created with Datamapper

Location & Distribution

- **75 PVTGs present in 18 States + 1 UT.**
- Major concentrations: **Odisha, Andhra Pradesh/Telangana, Jharkhand, MP, Chhattisgarh, Maharashtra.**
- Island PVTGs: **Great Andamanese, Jarawa, Onge, Shompen, Sentinelese.**

Challenges Faced by PVTGs

- **Geographic isolation:** Remote habitations → irregular health and education services.
- **Economic vulnerability:** Dependence on forest produce and shifting agriculture.
- **Land & habitat tenure insecurity:** FRA rights poorly implemented; threats from displacement.
- **Education deficit:** Low school attendance; language barriers; lack of teachers.
- **Demographic risks:** Small populations → high risk from epidemics, migration, ecological change.
- **Cultural erosion:** External influences threatening traditional practices.

Government Schemes & Interventions

- **MoTA CCD:** Funded housing, health, education, infrastructure
- **Rights:** FRA 2006 for PVTG rights
- **PM-JANMAN:** Develop PVTG habitations
- **Tech & Livelihood:** DST-SEED, Van Dhan, NRLM, mobile health units

Way Forward

- **Data & Rights:** Separate PVTG enumeration, habitat tracking, fast-track FRA claims
- **Cultural Planning:** CCD Plans co-created with community elders
- **Sustainable Livelihoods:** NTFP value chains, climate-resilient farming, eco-tourism
- **Human Development:** Mobile clinics, schools/hostels, Aadhaar, PDS, banking access
- **Monitoring:** Social audits, grievance redress, third-party evaluations, digital tracking

29. Draft Seeds Bill 2025

Background & Rationale

The Draft Seeds Bill 2025 aims to replace outdated laws to modernize India's seed sector, with public consultation open until 11 December 2025.

Objectives of the Bill

- **Seed Quality:** Ensure germination, purity, and health
- **Farmer Protection:** Prevent spurious/substandard seeds
- **Traceability:** Digital tracking and central portal
- **Innovation:** Ease regulations, encourage R&D and imports

Key Provisions / Features

- **Registration:** Mandatory for all varieties (except farmers'/export-only); cancellation for poor performance; state-level registration with central accreditation
- **Quality & Traceability:** Standards, QR labelling, testing labs; regulated imports with quarantine
- **Offences & Penalties:** Three-tier system, fines up to ₹30 lakh, jail for major violations
- **Institutions:** Central Seed Committee with sub-committees for registration, testing, certification, disputes
- **Farmer Rights:** Save, use, exchange, sell non-branded seeds; compensation for underperforming seeds; GM seeds need biosafety clearance
- **Price Regulation:** Centre can regulate seed prices during emergencies



Challenges & Risks

- **Trust Deficit:** Given past issues of spurious seeds, farmers may distrust seed companies and registration-driven model.
- **Regulatory Enforcement:** Uniform enforcement across States with varied capacities may be difficult.
- **Innovation vs Regulation Trade-off:** While registration ensures quality, it can raise costs, hurting small breeders.
- **Decriminalisation Risks:** Easing punishment for minor offences could reduce deterrence if not carefully structured.
- **Federal Tensions:** Agriculture is a State subject, but seed regulation under central law could lead to clashes.
- **Equity Issues:** Small/local seed producers may struggle; risk of seed market consolidation by big players.

Way Forward / Policy Recommendations

- Ensure inclusive consultations with farmers, small producers, and experts to refine registration and compensation provisions.
- Strengthen infrastructure through more accredited seed labs and trained inspectors.
- Create a fast-track, farmer-friendly compensation and grievance system.
- Support small and traditional seed producers with financial/technical help and flexible norms.
- Improve farmer awareness on rights, quality standards, QR checks, and grievance routes.
- Enforce strict biosafety and environmental checks for GM seeds.
- Build strong monitoring through digital traceability, audits, and random testing.
- Boost public-sector seed R&D and promote community seed banks and participatory breeding.

30. National Migration Survey 2026

Introduction: Why Migration Matters in India

To address gaps since 2007–08, the National Migration Survey (2026–27) will provide updated data on internal migration amid urbanisation and post-COVID shifts.

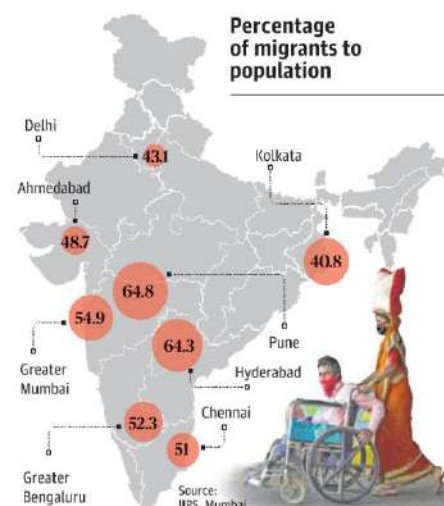
What is the National Migration Survey 2026?

The National Migration Survey (July 2026–June 2027), conducted by NSSO (MoSPI) across all States/UTs except A&N Islands, aims to measure migration rates, identify drivers like jobs, education, marriage, and climate, track earnings, employment, and seasonal migration, and study return migration and household impacts; the draft questionnaire is open for feedback until 30 Nov 2025.

Key Features of the 2026 Survey

Revised Definitions:

- **Short-term migrant:** Now defined as someone away from home for **15 days–6 months** (earlier 1–6 months), capturing labourers, gig workers, construction/brick-kiln workers, and circular migrants.
- **Individual-based tracking:** Focus shifts from households to **individual migrants**, better reflecting modern mobility patterns.



Why the Survey is Important:

- **Economic:** Migrants power key sectors (construction, manufacturing, gig work) and sustain rural households through remittances; they also add flexibility to the informal labour market.
- **Social:** Migration expands opportunities but migrants face poor housing, limited social security, language barriers, and precarious jobs.
- **Governance:** Survey data will support ONORC portability, interstate migrant welfare MoUs, ESIC/EPFO coverage, and disaster-related migration planning.
- **Urbanisation:** Migrant-dependent cities need better data for housing, transport, and labour accommodation policies.
- **Gender:** Marriage drives female migration, but women's economic migration is rising; the survey will reveal vulnerabilities, safety concerns, and wage/skill gaps.

Potential Challenges

- Tracking short-term migrants who move frequently
- Language barriers during data collection
- Underreporting of informal work
- State-level capacity and training
- Ensuring women's migration data is accurately captured
- Ensuring migrant workers trust surveyors (due to fear of losing jobs)

Expected Outcome & Policy Impact

The survey will support portable welfare, better labour and health coverage, migrant-informed city planning, skill mapping, climate/disaster strategies, and stronger urban housing policies.

31. Air Pollution in India

Introduction

Air pollution in India has become a chronic public health crisis, affecting cities and villages alike, and influencing health, economy, climate, and governance.

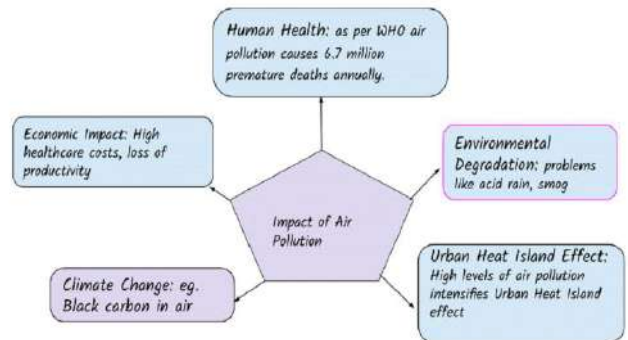
Understanding Air Pollution

Definition

Air pollution refers to harmful particles or gases in the air that can damage human health and the environment.

Key Pollutants

Key air pollutants include PM_{2.5}/PM₁₀, NO_x, SO₂, CO, O₃, VOCs, and NH₃, causing respiratory, cardiovascular, and environmental harm.



Major Sources

- **Transport:** Diesel vehicles and congestion raise urban PM levels.
- **Industries:** Coal-based units emit high SO₂, NO_x, and particulates.
- **Construction Dust:** Sites and unpaved roads generate major dust pollution.
- **Crop Burning:** Stubble burning in Punjab–Haryana worsens winter smog.
- **Household Emissions:** Biomass cooking fuels cause severe indoor pollution.
- **Waste Burning:** Burning garbage and plastics releases toxic fumes.

Impacts

- **Health:** Air pollution increases the incidence of asthma, heart disease, and strokes, leading to nearly 1.7 million premature deaths annually.
- **Economy:** Pollution reduces worker productivity, increases healthcare costs, and imposes an economic cost estimated at nearly 8% of GDP.
- **Environment:** Pollutants damage crops, accelerate Himalayan glacier melt, and reduce visibility due to haze formation.

Governance Framework

- **Legal:** Air Act 1981 & EP Act 1986 empower CPCB/SPCBs
- **NCAP 2019:** Reduce PM via monitoring and city action plans
- **GRAP:** Emergency pollution control in NCR
- **BS-VI:** Cleaner fuel/engine standards
- **Ujjwala:** LPG access to cut indoor smoke

Way Forward

- **Strengthen Governance:** Define responsibilities clearly, ensure audits, and enforce strict penalties.
- **Industrial Emission Control:** Use cleaner technologies and shift industries toward natural gas.
- **Transport Reforms:** Expand electric buses, improve metro networks, and retire old vehicles.
- **Dust Control:** Use mechanised sweeping and enforce dust norms at construction sites.
- **Crop Burning Solutions:** Promote Happy Seeder, Pusa Decomposer, and crop diversification incentives.
- **Clean Household Energy:** Make LPG refills affordable and expand PNG access.
- **Monitoring & Research:** Increase monitoring stations and use satellite tools for real-time tracking.

32. Digital Arrest Scam

Introduction

Digital arrest scams, where fraudsters impersonate authorities to extort victims, are rising, prompting Supreme Court suo motu action.

What is a Digital Arrest Scam?

- **Meaning:** Fraudsters trap victims on a long video call, claim they are under “digital arrest,” and demand money for investigation or bail.
- **Modus Operandi:**
 - Spoofed calls from police/CBI/ED/courts
 - Fake summons, FIRs, warrants
 - Accusations of money laundering/illegal parcels/cyber violations
 - Forced isolation during calls; emotional intimidation
- **Targets:** Elderly persons, professionals, NRIs, financially literate individuals.



Why are These Scams Rising?

Rising digital use, low cyber awareness, weak cross-border coordination, and misuse of advanced technologies like deepfakes and VoIP make digital arrest scams increasingly effective.

Prevention and Response

- **Public Awareness:** Nationwide campaigns to help citizens identify spoofed calls, fake warrants, and pressure-tactics used in digital arrest scams.
- **Stronger Cyber Policing:** Expand 1930 helpline, increase cyber police stations, and speed up digital forensic analysis.
- **Banking & Telecom Checks:** Quicker account-freezing, strict KYC for SIMs, and AI-enabled fraud-detection systems.
- **Global Cooperation:** Strengthen MLATs, move toward UN Cybercrime Convention, and coordinate with countries hosting fraud call-centre networks.

Impact on Society and Governance

- **Financial Losses:** High-value individual frauds with multi-crore siphoning.
- **Psychological Trauma:** Victims face anxiety, shame, isolation.
- **Erosion of Trust:** Public confidence in digital platforms and institutions declines.
- **Administrative Burden:** Complex multi-state, multi-agency investigations strain resources.

Way Forward

- **Government:** Enhance cyber policing, mandate real-time alerts, ratify global conventions
- **Law Enforcement:** Train in deepfake/VoIP detection, set up cybercrime fusion centre
- **Citizens:** Report to 1930, verify notices, avoid sharing personal info on unsolicited calls

Conclusion

Digital arrest scams expose the gaps in India's cyber governance. Strong institutional coordination, global cooperation, faster investigations, and public awareness are essential to protect citizens and uphold digital trust.

33. Precision Medicine

Introduction

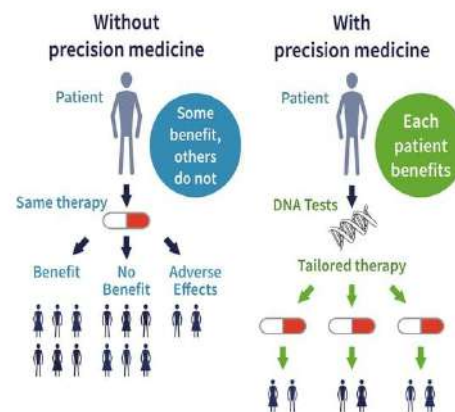
Precision medicine tailors diagnosis and treatment to an individual's genetic profile, shifting from generic to targeted care; the global market is set to exceed **\$22 billion by 2027**, with India rising as a major contributor.

What is Precision Biotherapeutics?

Personalised medical interventions designed using patient-specific genetic and protein signatures.

Key Technologies

- **Genomic & Proteomic Analysis:** Identifies mutations for precise diagnosis.
- **Gene Editing (CRISPR):** Corrects faulty genes (e.g., thalassemia, sickle cell).
- **mRNA & Nucleic Acid Therapies:** Program cells to make/suppress proteins.
- **Monoclonal Antibodies & Biologics:** Target disease-specific proteins (cancer, autoimmune disorders).
- **AI-Driven Drug Discovery:** Speeds up molecule screening and drug development.



India's Position

India's heavy **NCD burden** (~65% of deaths) makes precision medicine vital, and its vast genetic diversity provides a rich research base. The **DBT** prioritises precision therapeutics under the **BioE3 policy**, while initiatives like **GenomeIndia** and **IndiGen** are building Indian-specific genomic maps to improve the effectiveness of global drugs for Indian populations.

Challenges

- **Regulatory Gaps:** No single framework for gene/cell therapies; rules scattered across agencies.
- **High Cost:** Most treatments remain limited to wealthy urban patients.
- **Manufacturing Constraints:** Limited biologics and cell-therapy facilities.
- **Ethical & Privacy Risks:** Weak genomic data protections; risk of misuse/discrimination.

Opportunities for India

- **Cost Advantage & Skilled Workforce:** Enables affordable global-level R&D.
- **Public-Private Partnerships:** Can boost innovation and clinical trials.
- **Biomanufacturing Growth:** Supports Make in India for biotech.
- **Ethical Data Frameworks:** Essential for trust and global collaboration.

Potential Gains

- Localised, low-cost therapies.
- Wider access beyond metros.
- Increased foreign investment in biotech.

Conclusion

India can lead in precision medicine by leveraging genomics and affordable biotech, but must fix regulatory gaps, costs, infrastructure, and data ethics for equitable impact.

34. Protection of Plant Varieties and Farmers' Rights Act (PPV&FRA), 2001

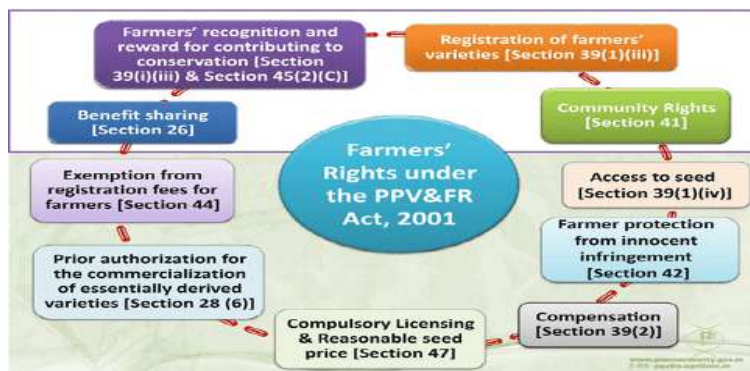
Introduction

India's agriculture depends on rich agro-biodiversity and farmer-led seed innovation.

To balance **breeder incentives** and **farmer seed freedoms**, India enacted the PPV&FRA, 2001 — a sui generis law compliant with TRIPS.

Objectives

- Promote development of new plant varieties
- Grant IPR protection to breeders
- Recognise and protect farmers' rights
- Enable benefit-sharing and conservation
- Ensure affordable seed availability



Key Features

- **Registration:** New, extant, farmers' varieties, EDVs; DUS criteria
- **Breeders' Rights:** Exclusive production/sale/export/import, licensing, 15-year protection
- **Farmers' Rights:** Save/use/exchange non-branded seeds, register varieties, compensation, IPR protection
- **National Gene Fund:** Supports benefit-sharing and conservation
- **Institutional Framework:** PPVFRA Authority manages registration, DUS testing, and awareness

Upcoming Reforms: Key Proposals

- **"Variety" Definition:** Broadened to include wider genetic combinations; aligned with Seeds Bill 2019.
- **"Seed" Definition:** Expanded to include tubers, bulbs, plantlets, synthetic seeds—raising IPR-coverage concerns.
- **"Breeder" Clarification:** Explicitly covers public/private institutions and collaborations.
- **DUS Reforms:** Trait-based updates, standardised test sites, safeguards against misuse (e.g., Njavara case).
- **"Abusive Acts":** Penalties for identical or misleading variety names.

Key Challenges

- Difficulty in registering farmers' varieties
- Conflicts between IPR and seed sovereignty
- Biopiracy risks (e.g., Njavara paddy)
- Weak enforcement of breeder accountability

Way Forward

- Improve farmer awareness and outreach
- Simplify DUS testing for traditional varieties
- Create transparent compensation guidelines
- Recognise community custodianship
- Build digital, farmer-friendly registration systems
- Maintain balanced IPR without shifting to UPOV rigidities

35. Supreme Court's Tiger Safari Ruling (2025)

The Supreme Court's 2025 ruling restricts tiger safaris to non-forest areas to curb ecological damage and safeguard India's fragile tiger habitats amid rising tourist pressure and misuse of forest land.

Key Directives of the Supreme Court

- **Tiger Safaris Only in Non-Forest/Degraded Land:** No safaris in core/critical habitats; allowed only in non-forest or degraded buffer land and must be linked to a rescue-rehab centre.
- **Why:** Core zones need complete peace for natural tiger movement, breeding, and hunting.
- **Night Tourism & Mobile Ban:** No night tourism or vehicles after dusk; mobiles barred in core zones as they disturb nocturnal tiger activity.
- **ESZ Norms:** ESZs must match MoEF&CC guidelines, at least buffer-size; states to notify in 1 year.
- **Tourism Infrastructure:** Only eco-friendly setups in buffer zones; none in tiger corridors.
- **Harmful Activities Banned:** Mining, polluting units, hydel projects, sawmills, tree felling, waste discharge, low-flying aircraft, and exotic species prohibited.



Directives to States and NTCA

- **State Responsibilities:** Update Tiger Conservation Plans in 3 months, notify core/buffer zones in 6 months, and strengthen monitoring.
- **NTCA Role:** Act as nodal enforcement agency, conduct yearly ecological audits, and submit a joint compliance report with MoEF&CC within a year.

Why the Judgment Matters (Significance)

The SC's ecocentric approach protects tiger habitats, maintains genetic diversity, balances conservation with local livelihoods, and aligns with India's global leadership in tiger recovery.

Critical Issues & Challenges

(1) Rising Tourism Pressure

- Tiger reserves face an "over-tourism" crisis—vehicles, resort expansion, and waste mismanagement.

(2) Inadequate Enforcement by States

- Many states failed to notify buffer zones or control construction.

(3) Misalignment Between Forest Departments & Tourism Departments

- Tourism incentives often clash with conservation priorities.

(4) Local Community Inclusion

- Benefits do not always reach forest-fringe communities.

Way Forward

- Adopt **carrying capacity studies** for tourism zones.
- Promote **low-impact community ecotourism**.
- Strengthen **tiger corridors** and landscape connectivity.
- Use **technology** (camera traps, drones) to track violations.
- Ensure **transparent approvals** for tourism infrastructure.

36. Modern Terrorism and Digital Tradecraft

Introduction

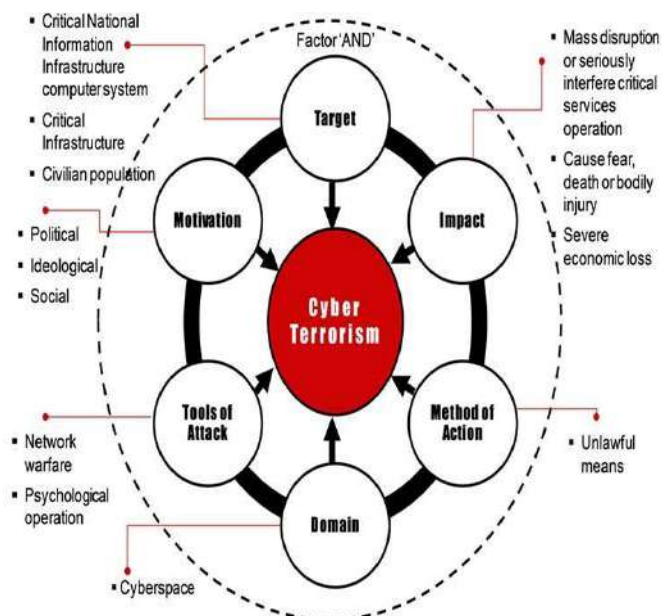
Modern terrorism combines physical attacks with digital tools, as seen in the Nov 2025 Red Fort car blast, highlighting high-tech anonymity and disciplined operations.

Understanding Modern Terrorism

Modern terrorism is decentralized, professional, and digitally enabled, exploiting smartphones, encrypted apps, dark web, offshore servers, and global networks.

Digital Tradecraft: Tools Used by Terror Cells

- **Encrypted Apps:** Threema, Signal, Element; end-to-end encryption, anonymous IDs, auto-delete chats
- **VPNs & Anonymisers:** Hide IP and location, complicate tracking
- **Dead-Drop Emails:** Shared accounts with unsent drafts, leaving minimal traces
- **Private Encrypted Servers:** Self-hosted abroad, bypassing local surveillance
- **Digital Radicalisation:** Propaganda via encrypted groups, videos, forums, and gaming chats



Physical Tradecraft with Digital Support

Terror modules conduct low-footprint recce, use cash-based logistics, and procure explosives in small, discreet quantities to avoid detection.

Challenges for India

- Weak cyber forensics and limited expertise
- Outdated surveillance tools unable to penetrate E2EE networks
- Legal gaps + slow cross-border cooperation on digital evidence
- Offshore servers keep modules outside Indian jurisdiction
- VPNs help bypass app bans and evade enforcement

Policy Recommendations

- **Strengthen Digital Forensics:** Specialised teams for memory forensics, reverse engineering, and indigenous monitoring tools.
- **Regulate Private Encrypted Servers:** Introduce licensing, lawful access, and judicial checks.
- **Modernise Counter-Terror Laws:** Cover VPN misuse, E2EE platforms, and draft-based communication.
- **Improve Counter-Radicalisation:** Better monitoring in universities and wider digital awareness initiatives.
- **Enhance International Cooperation:** Secure server access abroad and intensify intelligence sharing.
- **Upgrade Technology:** Use AI-based monitoring and track VPN traffic/exit nodes.

37. Tribunal Reforms in India – Supreme Court Strikes Down Key Provisions

India's tribunals face rising executive interference. The Supreme Court's striking down of parts of the Tribunal Reforms Act, 2021 is a key step in restoring tribunal independence.

What the Tribunal Reforms Act, 2021 Tried to Do

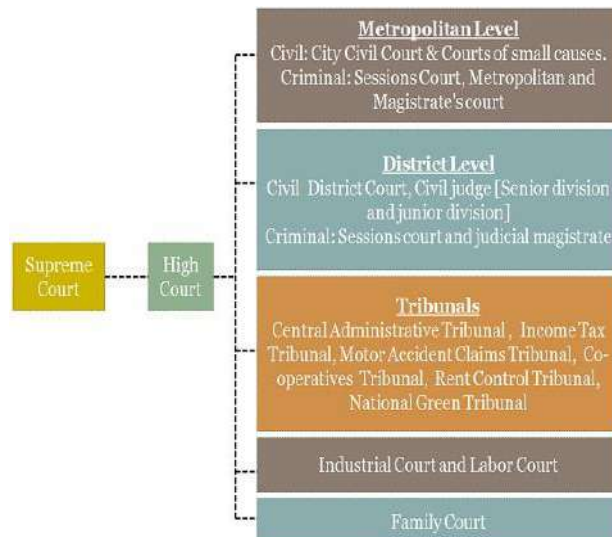
The Act, intended to reform tribunals, instead increased central control through age/tenure limits, government-dominated selection, salary and service powers, and reinstated previously struck-down provisions.

Why the Supreme Court Struck Down the Provisions

The Court struck down the Act for undermining tribunal independence, violating separation of powers, and breaching constitutional supremacy, calling it a "legislative override."

Provisions Declared Unconstitutional

The SC struck down Act provisions on age, tenure, selection committees, and executive powers, citing executive overreach and instability in tribunals.



Direction to Establish a National Tribunal Commission (NTC)

For the first time, the Court fixed a strict timeline: **NTC must be set up within four months.**

What NTC is expected to do

- Oversee appointments and removals
- Standardise pay, tenure, infrastructure
- Ensure administrative independence
- Act as a buffer between tribunals and the government

Challenges That Remain

- Setting up NTC requires inter-ministerial coordination.
- High Courts continue facing higher workloads.
- Vacancies in tribunals need urgent filling through constitutionally valid procedures.
- Future legislative reforms must align with judicial precedent.

Way Forward

- Operationalise the National Tribunal Commission and set up independent tribunal secretariats.
- Ensure transparent appointments by following SC norms on tenure, age, and selection committees.
- Clear vacancies through time-bound selection and appointment cycles.
- Grant tribunals administrative autonomy in budget, staffing, and infrastructure.
- Harmonise tribunal–High Court coordination and streamline institutional structures.

Conclusion

The SC's ruling strikes down executive-dominated tribunal reforms, advancing transparency, independence, and constitutional checks in line with the Basic Structure doctrine.

38. National Judicial Appointments Commission (NJAC)

The NJAC aimed to replace the collegium with a more transparent and accountable system for appointing higher judiciary judges, but its short-lived existence remains central to debates on judicial independence and reforms.

Constitutional Provisions Governing Judicial Appointments

Provision	Coverage
Article 124	Appointment of Supreme Court judges, including Chief Justice of India.
Article 217	Appointment of High Court judges.
Article 222	Transfer of High Court judges by the President in consultation with CJI.
Article 368	Allowed amendments to Constitution (used for 99th Amendment).
Articles 124A-124C	NJAC establishment, composition, and powers.

Functions of NJAC

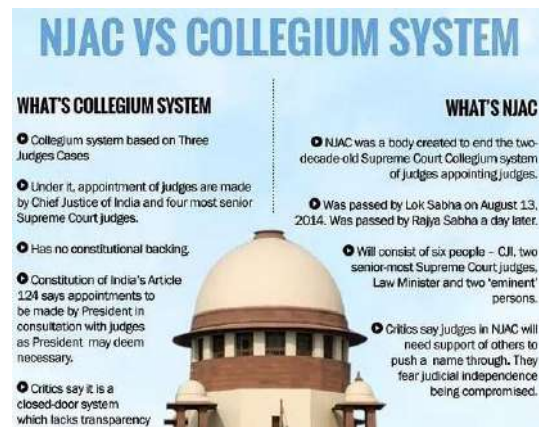
NJAC managed higher judiciary appointments and transfers, evaluating merit, integrity, expertise, and seniority, consulting stakeholders, and ensuring transparent procedures.

Reasons NJAC Was Struck Down

In 2015, the SC struck down NJAC, citing threats to judicial independence, Basic Structure violations, executive overreach, veto deadlocks, and vague criteria for “eminent persons.”

Issues and Criticisms of NJAC

Issue	Explanation
Loss of Judicial Primacy	Non-judicial members could dominate the appointment process.
Risk of Political Influence	Government participation in selecting eminent persons could politicize appointments.
Veto Provision	Two-member veto could stall appointments, creating court vacancies.
Ambiguous Criteria	“Eminent person” not clearly defined; risk of unqualified appointments.
Structural Imbalance	Equal representation of judiciary, executive, and independent members could dilute judicial independence.



Way Forward / Proposed Reforms

- **Transparent Collegium Procedure:** Publish criteria, minutes, and reasons for appointments.
- **Independent Secretariat:** Professional body to verify credentials, conduct research, and manage documentation.
- **Objective Evaluation Metrics:** Track judgments delivered, legal expertise, integrity reports, and specialization.
- **Broader Consultation:** Structured input from senior advocates, bar councils, and experts while preserving judicial decision-making.
- **Increase Diversity:** Representation of women, minorities, and marginalized sections.

39. Consumer Protection Act, 1986

The Consumer Protection Act, 1986 (CPA) marked a turning point in India's consumer rights framework by offering a simple, affordable, and fast mechanism against defective goods, unfair trade practices, and misleading advertisements.

Objectives of the Consumer Protection Act 1986

Protect consumers, ensure accurate information, prevent unfair practices, enable quick redress, and promote awareness and market participation.

Key Provisions of the Act

Defines key terms, establishes Consumer Protection Councils, sets three-tier redressal (District, State, National), and provides remedies like replacement, refund, compensation, and stopping unfair practices.

Amendments to the Act

- 1991: Expanded definitions, enhanced powers
- 1993: Time-bound disposal, better procedures
- 2002 (Major): Increased pecuniary limits, Enabled video hearings, Strengthened penalties

Need for Amendments

- Urbanization, service-sector disputes
- Rise in telecom/banking/health cases
- Early e-commerce issues

Challenges in Implementation

- Case backlog
- Low awareness in rural areas
- Weak enforcement of orders
- Poor infrastructure
- No coverage of e-commerce issues
- Lack of consumer documentation

Transition to Consumer Protection Act 2019

Why Replacement Was Needed

- E-commerce, digital payments
- Misleading celebrity ads
- Need for stricter liability and mediation

Key New Institutions

- CCPA
- E-Daakhil portal
- Mediation cells

Conclusion

The CPA 1986 empowered consumers, streamlined redressal, and curbed unfair practices, laying the foundation for India's modern consumer protection framework.

CONSUMER PROTECTION ACT 1986	PROVISIONS	CONSUMER PROTECTION ACT 2019
No separate regulator	Regulator	Central Consumer Protection Authority (CCPA) to be formed
Complaint could be filed in a consumer court where the seller's (defendant's) office is located	Consumer court	Complaint can be filed in a consumer court where the complainant resides or works
No provision. Consumer could approach a civil court but not consumer court	Product liability	Consumer can seek compensation for harm caused by a product or service
District: up to ₹20 lakh State: ₹20 lakh to ₹1 cr National: above ₹1 cr	Pecuniary jurisdiction	District: up to ₹1 cr State: ₹1 cr to ₹10 cr National: Above ₹10 cr
No provision	E-commerce	All rules of direct selling extended to e-commerce
No legal provision	Mediation cells	Court can refer settlement through mediation

40. CAFE 3 Norms: India's Next Phase of Fuel Efficiency Regulation

India's upcoming CAFE 3 (FY28–32) faces industry pushback over weight-based fuel standards, raising concerns about costs, market distortion, and environmental impact.

Background

CAFE 3 sets stricter EU-style fuel efficiency standards to reduce emissions, crude-oil dependence, and promote hybrids, EVs, and cleaner engines.

Why the Auto Industry Is Split

A. Small-Car Makers Oppose CAFE 3

- Higher compliance burden on small cars
- Costlier tech → price rise, hurting affordability
- Impacts first-time/middle-class buyers
- Argue big cars should face stricter norms, not small efficient cars

B. SUV Makers Support CAFE 3

- Already invested in EVs/hybrids
- Say small-car definitions are outdated
- Claim heavier cars need relaxations due to safety-related weight



Technical & Policy Concerns

- **“Brick in the Boot” Effect**
 - Weight-based bands may incentivize artificially increasing vehicle weight → heavier cars, higher emissions, undermining CAFE goals.
- **Small-Car Relaxation Debate:** Small cars get a 3 g CO₂/km relaxation.
- Maruti/Renault want more; Tata/Mahindra oppose, citing safety and stronger structures.
- WLTP Transition Issues
- Stricter WLTP lowers efficiency figures; some manufacturers seek more transition time.

Key Challenges Ahead

- **Small-Car Market Threat** – Stricter norms may raise prices and shrink entry-level car options.
- **SUV Push** – CAFE 3 could further accelerate India's SUV-heavy, higher-emission market.
- **Tech Constraints** – Small cars have limited space, margins, and flexibility for hybrid/EV tech.
- **Cosmetic Compliance** – Companies may meet targets on paper without real emission cuts.

Way Forward

- **Revise Weight Formula** – Give lighter cars more relaxation and prevent weight manipulation.
- **Tech-Neutral Push** – Support hybrids, EVs, efficient ICEs, and flex-fuel options.
- **Phased WLTP Shift** – Gradual rollout to avoid disruptions.
- **Protect Small Cars** – Use GST cuts, incentives, and R&D support for affordable clean tech.
- **Adopt Absolute Emission Caps** – Reduce dependence on weight-based targets.

41. High Pendency and Staffing Gaps in Juvenile Justice Boards (JJBs)

Introduction

JJBs ensure child-friendly justice under the JJ Act, 2015.

The India Justice Report (IJR) shows serious gaps—high pendency, staff shortages, weak data systems, and poor coordination—undermining rehabilitation-focused justice.

Scale of Pendency

With 55% of cases pending (154/JJB/year) and wide state variation, delays undermine child rehabilitation and protection outcomes.

Status of JJBs

- **Institutional Gaps**
 - 92% districts have JJBs, but 24% not fully constituted.
 - 30% lack legal aid clinics.
- **Implication:** Many children appear without proper legal representation.

Key Findings of IJR

- **Workload–Capacity Mismatch:** Caseload rising; capacity stagnant.
- **Staffing Shortages**
 - Vacancies in: Social workers, Support staff, Probation officers
- **Infrastructure Deficits:** Lack of child-friendly spaces, counseling rooms, transport.
- **Poor Data Transparency:** No centralized data; RTI responses fragmented: 11% rejected, 24% no reply, 36% complete

Structural Gaps in JJ Architecture

- **Weak Inter-Agency Coordination:** Police, WCD, SCPS & SLSA work in silos → delays, misreporting.
- **Weak Child Care Institutions:** Vacancies reduce quality of rehabilitation.
- **Limited Budgets:** Low spending on training, counseling, and child protection.

Impact on Children

- Violates principles of dignity & reformation.
- Psychological stress, stigma.
- Higher risk of re-offending.

Way Forward

- **National Juvenile Justice Data Grid:** Real-time tracking of pendency & performance.
- **Fill Vacancies:** Recruitment + training of social workers, probation officers.
- **Strengthen Legal Aid:** Mandatory legal aid clinics in all districts.
- **Improve Infrastructure:** Child-friendly rooms, counseling spaces, ICT tools.
- **Better Coordination:** Shared digital platforms; monthly inter-agency meetings.
- **Increase Budget:** More funds for rehabilitation & monitoring.
- **Accountability:** Quarterly audits, public dashboards.



42. 2025 G-20 Leaders' Summit – Johannesburg Declaration

1. Context and Significance of the Summit

1.1 First G-20 Summit in Africa

Historic moment for African representation in global governance.

Push for reforms in UNSC, IMF, World Bank.

1.2 Consensus Despite U.S. Boycott

U.S. boycotted due to tensions with South Africa.

Declaration adopted by all remaining members—shows Global South's rising autonomy.

1.3 Early Adoption

Declaration cleared at the start of the Summit, unusual in G-20 history.

Sherpas concluded negotiations beforehand.



2. Key Themes of the Johannesburg Declaration

India's UNGA 2025 priorities: reaffirm multilateralism, limited stance on conflicts, push Global South agendas on debt and development finance, call UNSC reform, and promote women-led development.

3. India at the 2025 G-20 Summit

3.1 Rethinking Global Growth: Critique of models causing inequality and resource depletion.

3.2 Integral Humanism: Development rooted in balance between material and spiritual well-being.

3.3 Key Indian Proposals

- Traditional Knowledge Repository.
- G20–Africa Skills Multiplier (1 million Africans).
- Global Healthcare Response Team.
- Drug–Terror Nexus Initiative.
- Open Satellite Data Partnership.
- Critical Minerals Circularity Initiative.
- ACITI Partnership (tech, AI, clean energy).

4. Challenges Highlighted

- Weak consensus on conflicts.
- Debt crisis for developing nations.
- Slow climate action despite G-20's major emissions share.
- Rising inequalities and geopolitical polarisation.

5. Way Forward

- **Strengthen Multilateral Institutions:** UNSC and WTO reform.
- **Sustainable, Traditional Knowledge-Based Growth:** Blending indigenous practices with modern technology.
- **Women-Led and Inclusive Development**
- **Technology Partnerships:** AI collaboration, satellite data sharing.
- **Counter Drug–Terror Nexus:** Global intelligence-sharing.
- **Climate Action:** Critical minerals recycling, clean energy pathways.

43. COP30 Outcomes – A Turning Point in Global Climate Politics

COP30 in Brazil advanced forest-focused, equity-driven climate diplomacy, emphasizing deforestation control and Global South leadership without binding fossil fuel cuts.

1. The Deforestation Roadmap – The Strongest Outcome

COP30 highlighted forests as key climate solutions, emphasizing finance, cross-border enforcement, restoration, and indigenous/community support, with the Amazon symbolizing strategic importance.

2. Fossil Fuels: The Most Polarising Issue

- **Push for Phase-Out:** 80+ nations demanded binding fossil fuel phase-out due to 75% emissions share.
- **Developing Country Resistance:** Energy access, inadequate climate finance, and emphasis on energy sovereignty.
- **Outcome:** Non-binding call for transition, no timelines, highlighting Global South influence and divides.

3. New Power Dynamics in Climate Diplomacy

3.1 A COP Without the U.S.

- First COP in 30 years without a U.S. delegation, weakening developed-world leverage.

3.2 BRICS Emerges as a Key Bloc

- Blocked phase-out language.
- Asserted equity, CBDR, and opposed measures like CBAM.
- Showed clear multipolar governance shift.

4. Climate Finance – The Central Axis of Disagreement

- **Two-Year Finance Work Programme:** To assess global finance needs, improve transparency, and design predictable funding.
- **Adaptation Finance:** Aim to triple adaptation finance by 2035, prioritizing vulnerable regions.
- **Article 9.1 Reaffirmed:** Developed nations' finance obligations reconfirmed — a win for Global South.

5. Significance of COP30

- **Rebalancing Climate Diplomacy:** Move toward multipolar, equity-based negotiations.
- **Realistic and Achievable Agreement:** Prioritized forests and differentiated pathways over ideal but unrealistic targets.
- **Spotlight on the Amazon:** Reinforced its global ecological importance.
- **Deep Fossil Fuel Divisions Persist:** Phase-out disagreements underscore future tensions.

Conclusion

COP30 prioritized forests, equity, indigenous leadership, and finance, highlighting Global South influence while setting a new climate governance direction despite no fossil fuel phase-out.

India's Stand at COP30, Belém: Reaffirming Commitment to Equity, Climate Justice, and Multilateralism.

WHAT ?

India delivered a formal statement at COP30 in Belém reaffirming its commitment to climate action anchored on equity, climate justice and multilateralism.

Key elements of the commitment include :

Upholding the principle of Common But Differentiated Responsibilities and Respective Capabilities (CBDR-RC) and national circumstances.

Emphasizing that developed countries must fulfil their obligations under Article 9.1 of the Paris Agreement to provide finance to developing countries.

Calling for equitable, predictable and concessional climate finance, increased adaptation finance, and technology transfer without undue market/intellectual-property barriers.

Warning against unilateral trade and climate related measures (for example, the Carbon Border Adjustment Mechanism proposed by the EU) that may undermine multilateral cooperation.



44. CISF as the New Security Regulator for Indian Seaports

India has designated CISF as the central security regulator for 250+ seaports, creating a unified and professional coastal security framework—the biggest maritime security reform since 26/11.

CISF: The Central Industrial Security Force

About CISF

- Set up: 1969, strength ~1.7 lakh.
- Secures airports, metros, nuclear & industrial units.
- Known for screening, surveillance, behaviour profiling.

Why CISF for Ports?

- Expertise in critical infrastructure security.
- Specialised units (marine, cyber, fire).
- Proven capability in access control and emergency response.

CISF as the New Unified Security Regulator

The government has designated CISF as a Recognised Security Organisation (RSO), making it the central regulator for over 250 seaports.

In Phase 1, CISF will cover 80 EXIM ports for screening, access control, and patrolling, while retaining final authority on security standards, audits, and compliance.

What CISF Will Now Do

Port security involves threat assessments (PFSA), comprehensive security plans (PFSP), a hybrid model with CISF handling core duties and police/private staff managing non-core tasks, and training/certification through CISF and a proposed Port Security Training Institute.

Key Security Challenges Addressed

- **Non-Standardised Security:** CISF ensures uniform SOPs and equipment.
- **Transnational Crimes:** Strengthens checks against smuggling, narcotics, arms.
- **Cybersecurity Threats:** Protects automated port systems and logistics networks.
- **Manpower Gaps:** Addresses lack of trained screening/security personnel.

Strategic Implications

- **Enhances India's Maritime Reputation:** Builds trust for global cargo and shipping lines.
- **Stronger Maritime Domain Awareness:** Improved coordination with Navy, Coast Guard, Customs.
- **Prepares for Future Threats:** Ready for drones, hybrid smuggling, advanced cyberattacks.

Challenges and Concerns

- **Capacity and Manpower:** Need for more marine/cyber-trained CISF units.
- **Coordination with Private Ports:** Resistance to new costs and protocols likely.
- **Balancing Security & Efficiency:** Avoid delays through tech-enabled checks.

Conclusion

Designating CISF as the unified port security regulator strengthens oversight, closes security gaps, ensures global compliance, and safeguards India's maritime economy.



45. Supreme Court's Advisory Opinion on Governor's Powers

The Supreme Court's Article 143 advisory clarified Governors' powers over state legislation, impacting India's federalism, separation of powers, and democratic governance.

Constitutional Provisions Involved

Article	Provision
Article 200	Governor's options on state Bills: assent, reserve for President, or return with observations.
Article 201	Assent to Money Bills (President's role).
Article 142	Supreme Court can pass "necessary orders" for complete justice.
Article 143	Supreme Court may give advisory opinion to the President.

Key Findings of the Supreme Court Advisory Opinion

- **Governor's Powers & Discretion:** Article 200 allows the Governor to assent, reserve for the President, or return non-Money Bills with observations, exercising independent discretion not bound by ministerial advice (Shamsher Singh, Nabam Rebia departure).
- **Judicial Role:** Courts generally cannot review assent decisions or impose timelines, intervening only in cases of prolonged/unexplained inaction; "deemed assent" under Article 142 is invalid.

Relevant Issues and Debates

- **Federalism vs Governor Discretion** – Governors represent the Union, while state governments are elected; wide discretion may delay or obstruct legislative agendas, creating tension between democratic mandate and central oversight.
- **Timeline Concerns** – Though commissions and past judgments suggested timelines (e.g., 6 months by Punchhi Commission, K.M. Singh case), the Court rejected judicially imposed deadlines, risking legislative delays.
- **Political Misuse** – Governors aligned with the Centre could stall Bills in opposition-ruled states; requires responsible discretion and Centre's neutrality.

Way Forward

- **Governors** must act with **responsible** urgency, respecting legislative mandates.
- **Centre** should prevent misuse of gubernatorial discretion for political ends.
- **Judicial** oversight remains a safety net for preventing constitutional paralysis, without overstepping separation of powers.
- **Policymakers** may consider legislative amendments or conventions to guide timely gubernatorial action while maintaining independence.

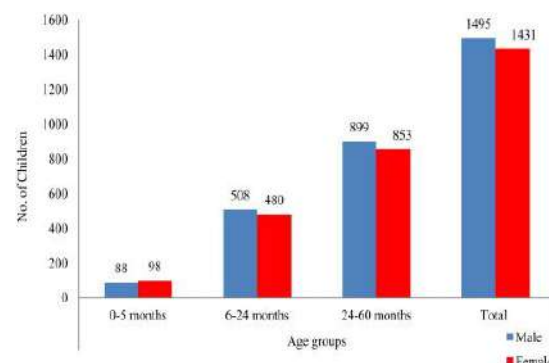


46. Melghat Malnutrition Crisis: A Persistent Public Health Emergency

Melghat, Maharashtra, home to Korku tribes, faces persistent infant deaths from malnutrition and poor healthcare, with 2025 HC highlighting administrative lapses.

Background: Why Melghat Matters

- Region: Dharni & Chikhaldara, 324 tribal villages.
- Population: Largely Korku community.
- Crisis: 30+ years of high infant and maternal deaths.
- Recent concern: 65 infant deaths (June–2025) and 220 SAM children.



Present Status: What the Numbers Show

Infant Deaths

- Caused by malnutrition + anaemia, pneumonia, sickle cell disease, delayed treatment.
- Malnutrition worsens immunity, making minor infections fatal.

Malnutrition Data

- 10,000 SAM children (Nov 2024): Dharni—1,290; Chikhaldara—788.

Statewide Indicators

- 1.82 lakh malnourished children (Feb 2025).
- Maharashtra: 35% stunted, 35% underweight, 26% wasted.

Core Factors Behind the Crisis

Melghat's persistent malnutrition and infant mortality crisis arises from multiple factors: inadequate health infrastructure with poorly equipped PHCs and difficult access; weak governance and fragmented program coordination; shortage and absenteeism of doctors due to challenging terrain; cultural and behavioural practices that limit use of formal healthcare; and an intergenerational cycle where underweight and anaemic mothers give birth to low-birth-weight infants who face repeated infections, perpetuating chronic malnutrition.

Government Interventions and Their Gaps

Schemes

- Eggs & bananas at Anganwadis.
- Village Child Development Centres (VCDC).
- Hot Cooked Meal Scheme.
- Growth monitoring and NRCs.

Gaps

- Irregular food supply.
- Delayed referrals.
- Poorly functioning NRCs.
- Inconsistent monitoring.

Broader Learnings for India

- Reflects systemic gaps in tribal health and nutrition.
- Highlights need for culturally sensitive programmes.
- Relevant schemes: ICDS, POSHAN Abhiyaan, NHM, Anaemia Mukt Bharat, JSY, Tribal Sub-Plan.

47. The Constitution (131st Amendment) Bill 2025 – Chandigarh Under Article 240

Introduction

Rumours of bringing Chandigarh under Article 240 sparked Punjab–Haryana tensions, highlighting ongoing federalism and Centre–State issues despite government denial.

What the 131st Amendment Was Reported to Do

The Bill sought to place Chandigarh under Article 240, giving the President direct regulatory control, appointing an independent administrator, and ending the Punjab Governor’s additional charge.

Key Constitutional, Administrative & Federal Issues

- **Federal Balance:** Chandigarh’s status linked to linguistic reorganisation and Centre–State power sharing.
- **Administrative Control:** Article 240 increases centralisation; reduces Punjab’s influence.
- **Police & Land Authority:** Administrator controls policing and land—shifts power away from states.
- **Inter-State Equity:** Haryana still functions from Chandigarh without building its own capital.
- **Legal Complexity:** Must align with Punjab Reorganisation Act (1966).
- **Historical Commitments:** The unimplemented 1970 promise complicates current negotiations.

Why Article 240 Matters

- Gives the President law-making power for UTs without legislatures.
- Applying it to Chandigarh alters its special “shared capital” character.

Political Implications

- **For Punjab:** Feels its historical rights weakened.
- **For Haryana:** Wants to maintain equal capital status.
- **For Centre:** Accused of centralisation.
- **For Chandigarh Residents:** Possible changes in land, policing, and local administrative rules.

Strengths & Challenges

Strengths

- Clearer administrative structure.
- Faster rule-making.
- Removes ambiguity of dual charge.

Challenges

- Heightens Punjab–Haryana tensions.
- Seen as undermining federalism.
- Political backlash.
- Reopens unresolved 1970 issues.
- Complex constitutional interpretation.

Way Forward

- **Stakeholder Dialogue:** Involve Punjab, Haryana, and Chandigarh administration.
- **Federal Consensus:** Decisions should avoid reopening historic disputes.
- **Review 1970 Commitments:** Clarify past promises for trust-building.

48. Ethiopia Volcano Eruption – Hayli Gubbi (2025)

Introduction

On 23 Nov 2025, Ethiopia's Hayli Gubbi volcano erupted after ~12,000 years, sending a 45,000-ft ash plume toward the Red Sea, Arabian Sea, and western India, affecting aviation and climate.

Location and Geological Setting

Hayli Gubbi, a shield volcano in Ethiopia's Afar Region within the Erta Ale range, lies at the active Afar Triple Junction and had been dormant for ~10,000–12,000 years.

Tectonic Background: East African Rift System (EARS)

Divergent plates and the Afar mantle plume create fissures and thin crust, enabling magma ascent, making the region a live example of continental breakup.



Composition of the Ash Plume

Eruption plume contained fine ash, SO₂, volcanic glass, and aerosols, posing aviation risks and short-term local weather impacts.

Environmental Impact

- **Air pollution & visibility reduction** — especially dangerous for flights over Red Sea–Arabian Sea corridor.
- **Possible acid rain, ashfall** can damage vegetation, soil, and water resources in downwind zones.
- **Ecosystem disruption** — ash deposition may harm flora/fauna; soil quality may degrade.

Economic Implications

- **Agriculture & Livestock losses** — ash can destroy crops, contaminate grazing land.
- **Transport and aviation disruption** — flights rerouted or cancelled; shipping delays.
- **Tourism impact** — regions like Afar and Danakil may see temporary decline.
- **Relief and rehabilitation costs** — for affected communities.
- **For India / international aviation:** Alerts for flight safety in Arabian Sea–West Asia routes; possible rerouting or delays.

Geographic Context

- **Ethiopia's neighbours:** Eritrea, Djibouti, Somalia, Kenya, South Sudan, Sudan — all part of Horn of Africa / Northeast African geography.
- **The Afar Depression** sits below sea level, characterized by salt flats, lava fields, and geothermal features.

Way Forward & Lessons for Disaster Management

- **Monitoring & early-warning:** Satellite tracking, volcanic-ash advisories (VAAC).
- **International cooperation:** Sharing data among Africa, Middle-East, South-Asia.
- **Aviation safety protocols:** Rerouting, engine checks, ash-avoidance procedures.
- **Public awareness:** For populations in rift zones — evacuation plans, clean water supply, health advisories.

49. International Day for the Elimination of Violence Against Women (25 November)

The **International Day for the Elimination of Violence Against Women (IDEVAW)**, observed on 25 November, calls for ending all forms of gender-based violence, including physical, emotional, economic, and digital abuse.

Theme for 2025: “UNiTE to End Digital Violence Against All Women and Girls”

The 2025 theme focuses on the explosion of online harms such as:

- Cyberstalking
- Deepfake pornography
- Doxxing (leaking personal information)
- Online blackmail & harassment
- Trolling & hate campaigns

The theme urges:

- Governments to strengthen cyber laws
- Tech platforms to improve accountability
- Communities to promote digital literacy and safe online behaviour



Forms of Violence Against Women

A. Traditional: Domestic violence, sexual harassment/assault, trafficking, honour killings, child marriage, economic abuse.

B. Digital (Growing in India): Deepfakes, non-consensual images, cyber grooming, threats via apps, honey-trap scams, identity theft.

India's Multi-Layered Approach

Legal framework includes Bharatiya Nyaya Sanhita (2023) for stricter penalties and faster trials, PWDVA (2005) for domestic abuse protection, and POSH Act (2013) for workplace safety; institutional support comes from NCW, FTSCs, and WHDs, while technology aids policing and reporting through platforms like SHe-Box, Digital Shakti, ERSS 112, and Cri-MAC.

Impact of Violence Against Women

- **Social:** Reinforces patriarchy, restricts participation.
- **Economic:** Loss of productivity; global cost ~2% of GDP.
- **Psychological:** Trauma and mental health issues.
- **National Development:** Hampers SDG-5 and inclusive growth.

Challenges That Still Persist

Underreporting, low convictions, weak POSH compliance, low cyber awareness, fast-evolving AI threats, slow investigations.

Way Forward

- **Legal:** Update cyber laws for AI/deepfakes, better workplace monitoring.
- **Technology:** AI-driven moderation, deepfake detection, platform–government coordination.
- **Institutional:** More FTSCs, specialised cyber units.
- **Societal:** Gender sensitisation, male participation, community vigilance.
- **International:** Data-sharing, cooperation on AI governance.

50. Regulating User-Generated Content (UGC) in India: Balancing Free Speech and Citizen Protection

The Supreme Court highlights the need to regulate harmful UGC online while safeguarding free speech and protecting vulnerable users.

Introduction: Understanding UGC

User-Generated Content (UGC) includes online posts by individuals; harmful types like obscene, defamatory, fake, or discriminatory content can spread rapidly, posing social, psychological, and legal risks.

Key Concerns Identified by the Supreme Court

Harmful UGC spreads rapidly, targets vulnerable groups, lacks user/platform accountability, and faces enforcement challenges due to vague legal definitions and overlapping IT Rules.

Proposed Regulatory Measures

SC suggests an independent UGC regulator, mandatory age verification (Aadhaar/PAN), and AI-based early detection to curb harmful content.

Amendments to IT Rules, 2021

Expanded UGC rules cover obscenity, AI/deepfakes, age ratings, and accessibility; define obscene/anti-national content; and prohibit defamatory, false, violent, gender- or disability-derogatory, and unbriefed anti-terror live content.

Concerns and Challenges

- **Risk of Pre-Censorship:** The term “preventive regulation” may imply pre-censorship, which could affect free expression.
- **Ambiguity in Key Terms:** Vague definitions of “anti-national” or “perverse content” may lead to misuse.
- **Technical and Operational:** Platforms may struggle with rapid virality, cross-border content, and AI moderation limitations.
- Pre-legislative public consultations, as mandated in 2014 policy, have not been fully implemented.

Way Forward: Recommendations

- **Independent Digital Content Authority:** To monitor and regulate UGC impartially.
- **Secure Age Verification:** Protect minors while ensuring privacy.
- **Strengthen IT Rules, 2021:** Include explicit standards for:
 - Obscenity, deepfakes, community harm, discrimination
- **Mandatory AI Tools:** For early detection and risk assessment of harmful content.
- **Clear Legal Definitions:** Anti-national, obscene, and perverse content must be legally precise.
- **Enhanced Platform Accountability:** Strict penalties for non-compliance, similar to SC/ST Act safeguards.

Conclusion

The Supreme Court advocates a balanced UGC framework combining tech safeguards, autonomous oversight, and legal clarity to protect citizens while upholding free speech.



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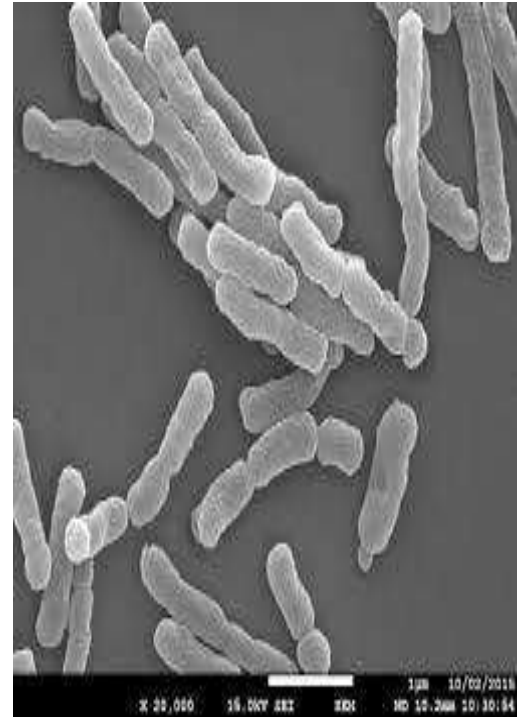
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PRELIMS POINTERS

Bordetella holmesii

- **Type:** Gram-negative coccobacillus (identified in 1995).
- **Causes:** Pertussis-like illness and invasive infections (endocarditis, pneumonia, cellulitis, arthritis, pyelonephritis).
- **Recent finding:** PGIMER, Chandigarh reported rising cases — ~37% of pertussis-like infections in North India due to *B. holmesii* (more than *B. pertussis*).
- **Resembles:** Whooping cough (caused by *Bordetella pertussis*).
- **Transmission:** Respiratory droplets (similar to pertussis).
- **Symptoms:** Cold-like symptoms → severe cough with “whoop,” apnea in children.
- **Vaccine:** Current DTaP vaccine targets *B. pertussis*, not *B. holmesii*.



Neasden Temple

- **Full name:** BAPS Shri Swaminarayan Mandir, Neasden, London.
- **Significance:** First traditional Hindu stone temple in Europe.
- **Opened:** 1995; built under **Pramukh Swami Maharaj**.
- **Record:** Once listed by *Guinness World Records 2000* as “Biggest Hindu Temple outside India.”
- **Construction:** 2,828 t Bulgarian limestone + 2,000 t Italian marble → carved by 1,526 Indian artisans.
- **Cost:** £12 million, fully funded by the Hindu community.
- **Components:** Mandir, “Understanding Hinduism” exhibition, and BAPS Haveli (cultural centre).
- **Latest News:** Visited by **King Charles III and Queen Camilla** (2025).



Global Virus Network (GVN)

- **Type:** Voluntary global consortium of virology labs & scientists.
- **Aim:** Prevent and control global viral threats.
- **Members:** Experts from **25+ countries**, covering all classes of human viral diseases.
- **Founded:** To unite top medical virologists for collaborative global research.
- **Core Areas:**
 - Cutting-edge research support
 - Public education
 - Advocacy
- **Latest News:** Added **3 new Centers of Excellence** in the Americas to expand its global reach.



Meteor Missile

- **Type:** Radar-guided **Beyond Visual Range Air-to-Air Missile (BVRAAM)**.
- **Developer:** MBDA (European consortium – UK, France, Germany, Italy, Spain, Sweden).
- **Engine:** **Ramjet-powered** – enables sustained speed & long range.
- **Range:** Up to **200 km**; speed > **Mach 4**.
- **Features:**
 - **Active radar seeker** for all-weather precision.
 - **Two-way datalink** for in-flight updates/re-targeting.
 - **Blast-fragmentation warhead**.
- **Latest News:** India planning large-scale acquisition post **Operation Sindoor**.



Tajikistan

- **Location:** Landlocked country in **Central Asia**.
- **Borders:** Kyrgyzstan (N), Uzbekistan (W), China (E), Afghanistan (S).
- **Capital:** **Dushanbe**.
- **Terrain:** Predominantly **mountainous** – Alay & Pamir ranges.
- **Highest Peak:** **Qullai Ismoili Somoni** – 7,495 m.
- **Major Rivers:** **Amu Darya, Syr Darya**.



- **Lakes:** Karakul, Iskanderkul.
- **Climate:** Continental; hot summers, cold winters.
- **Resources:** Petroleum, uranium, gold, silver, coal, etc.
- **Organisation:** Member of SCO.
- **Latest News:** India ended military presence at **Ayni Airbase** after agreement lapsed.

Amphipods

- Small crustaceans related to crabs, lobsters, and shrimps.
- Found in marine, freshwater, and terrestrial habitats.
- Name *Amphipoda* means “different-footed” — legs not uniform.
- 7,000+ known species; most belong to *Gammaridea*.
- Size: 0.1 cm to 34 cm (deep-sea species largest).
- Mostly detritivores—feed on dead organic matter.
- ~750 species found in caves.
- Two new Indian species (2025):
 - *Grandidierella geetanjalae* – Chilika Lagoon, Odisha.
 - *Grandidierella khambhatensis* – Gulf of Khambhat, Gujarat.
- Ecological role: aid in nutrient recycling and natural cleaning.



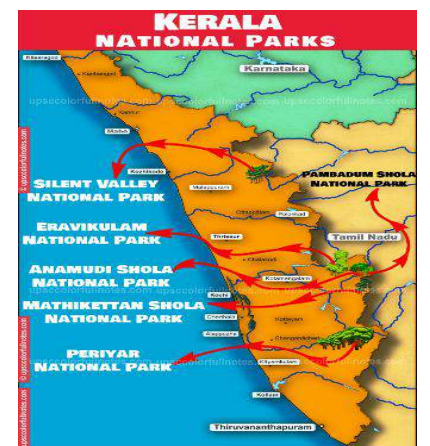
Pilia malenadu

- Newly discovered species of **jumping spider**.
- Belongs to the **genus Pilia**.
- Found in **Madhugundi, Mudigere taluk, Chikkamagaluru**, Karnataka (Western Ghats).
- Named *Pilia malenadu* after its place of discovery.
- First *Pilia* species discovered in **123 years** (last in 1902, Kerala).
- Both **male and female** specimens identified for the first time.
- Habitat: Found on **Memecylon umbellatum** and **Memecylon malabaricum** plants, concealed between leaves.



Pampadum Shola National Park

- **Location:** Eastern part of Southern Western Ghats, Kerala; borders **Dindigul (Tamil Nadu)**.
- **Declared:** 2004; **smallest national park in Kerala**.



- **Landscape:** Southernmost **shola–grassland mosaic** of Western Ghats; altitude **1600–2400 m**.
- **Connectivity:** Links **Eravikulam NP** with **Palani Hills**.
- **Climate:** Receives heavy **Northeast monsoon** rainfall.
- **Flora:** Tropical montane forests, grasslands, rich in **medicinal plants, orchids, ferns**.
- **Fauna:** **Nilgiri marten, Kerala laughing thrush, black-and-orange flycatcher**.
- **Recent news:** Grasslands being restored after removal of **invasive Australian wattle**.

Encephalomyocarditis Virus (EMCV)

- **Type:** Non-enveloped, positive-sense, single-stranded **RNA virus** (Genus *Cardiovirus*, Family *Picornaviridae*).
- **Hosts:** Pigs, non-human primates, zoo animals, wild species; **African elephants** highly susceptible.
- **Transmission:** Through **food/water contaminated** by feces or urine of infected **rodents**.
- **Zoonotic:** Yes — human infections mostly **asymptomatic**.
- **Symptoms (humans):** Fever, headache, myalgia, nausea; severe cases show **neurological signs**.
- **Treatment:** **Supportive care** only (no specific antiviral).



In News: Delhi Zoo elephant death linked to **rodent-borne EMCV** (IVRI report, 2025).

Heavy Metals

- **Definition:** Metallic elements with **high density, toxic even at low concentrations**.
- **Examples:** **Hg, Cd, As, Cr, Tl, Pb** (most harmful); essential in trace amounts — **Cu, Se, Zn**.
- **Sources:** **Industrial waste, acid rain, lead pipes, food chain** contamination.
- **Impact:** Cause **bioaccumulation** and **poisoning**; affect nervous, renal, and reproductive systems.
- **In News:** **Cauvery River** and its fish found contaminated with heavy metals (TN study, 2025).



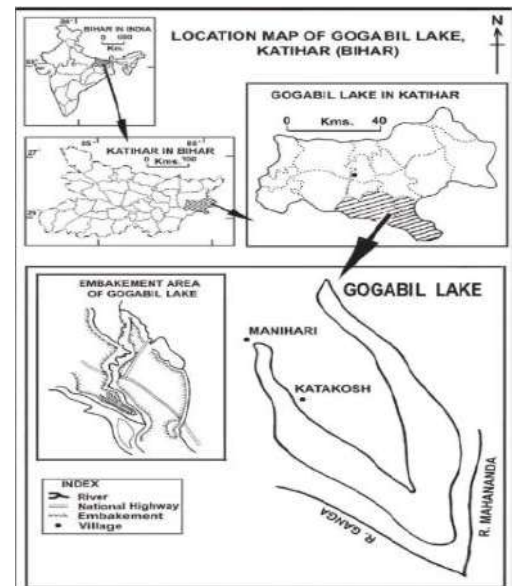
Mussel

- **Type:** Bivalve mollusk — Marine (*Mytilidae*) & Freshwater (*Unionidae*).
- **Habitat:** Found in cool seas, rivers, lakes, ponds worldwide.
- **Features:** Wedge/pear-shaped (5–15 cm); attach via *byssus threads*; often form dense clusters.
- **Color:** Dark blue/greenish-brown outside, pearly inside.
- **Ecological Role:** Filter feeders — absorb contaminants & microplastics; bioindicators of marine pollution.
- **Uses:** Edible (rich in protein & omega-3), pearl cultivation, pollution monitoring.
- **In News:** Greece deployed mussels to detect *microplastics* on the seafloor.



Gogabeel Lake

- **Location:** Katihar district, Bihar; part of the *Trans-Gangetic plains*.
- **Type:** *Ox-bow lake* formed by Mahananda & Ganga rivers.
- **Status:** Bihar's *first Community Reserve*; now a *Ramsar Site (2025)*.
- **Flora:** Tropical dry deciduous vegetation.
- **Fauna:** Habitat for migratory birds; *Smooth-coated Otter* & *Helicopter Catfish* (*Walago attu*).
- **Cultural Significance:** Local festivals — *Sirva*, *Adra*, *Chhath*.
- **Ramsar Convention (1971):** Global treaty for *wetland conservation & wise use*.



Water Lettuce

- **Type:** Free-floating *aquatic weed* (also called *Water Cabbage* / *Nile Cabbage* / *Shellflower*).
- **Distribution:** Found in *tropical regions* — Asia, Africa, and America.
- **Appearance:** Rosette of soft, velvety leaves resembling lettuce; *feathery roots* hang below.
- **Habitat:** Prefers *still or slow-moving freshwater* (lakes, ponds, reservoirs).



- **Invasive Nature:** Forms *dense mats* → blocks waterways, reduces oxygen → harms fish & biodiversity.
- **In News:** Overgrowth in *Lake Suchitlán, El Salvador*, disrupting fishing & tourism.

Ramnami Tribe

- **Location:** *Chhattisgarh* (central & northern regions).
- **Origin:** 19th-century *anti-caste Bhakti movement* founded by *Parsuram Bhardwaj*.
- **Belief:** Worship *nirgun Ram* (formless God); emphasize *equality and devotion*.
- **Unique Practice:** Tattoo “Ram” on *body and face*; wear *white clothes* inscribed with “Ram”.
- **Symbols:** *Peacock-feather crown* and *ghungroos* during bhajans and dances.
- **Legal Recognition:** Won a 1910 court case upholding their right to tattoo and display “Ram”.
- **In News:** PM recently wore their *traditional peacock-feather headgear* in honour of the community.



Exercise ‘Poorvi Prachand Prahar’

- **Type:** Tri-service military exercise (Army, Navy, Air Force).
- **Location:** *Mechuka, Arunachal Pradesh*.
- **Aim:** Enhance warfighting capabilities, interoperability, and technological adaptation.
- **Focus:** Multi-domain integration across *land, air, and maritime* fronts; joint operations using special forces, unmanned systems, and precision platforms.
- **Context:** Successor to ‘*Bhala Prahar*’ (2023) and ‘*Poorvi Prahar*’ (2024).
- **Significance:** Validates command, control, and networked operations under *high-altitude* conditions.



Cycad Plant

- **Type:** Ancient palm-like *gymnosperm*; coexisted with dinosaurs (~300 million years ago).
- **Feature:** Woody, long-lived, unisexual plants with pinnate leaves and cones; thick, fleshy roots.
- **Habitat:** Found in tropical & subtropical regions — Americas, Africa, Madagascar, India, SE Asia, Australia.
- **Adaptation:** Fire-adapted; regrow leaves post-blaze.



- **Soil:** Tolerant to varied soils — rich organic, sandy, rocky, swampy, or saline.
- **Threats:** Habitat loss, illegal collection, and climate change.
- **In News:** AIIMS Bhubaneswar studying possible neurotoxin *BMAA* linked to Cycad.

Indian Mouse Deer

- **Scientific Name:** *Moschiola indica*
- **Common Name:** Indian Spotted Chevrotain
- **Type:** Smallest deer species in India; shy and nocturnal.
- **Distribution:** Endemic to India — Western & Eastern Ghats, Central India (old records from Nepal).
- **Features:** 25–30 cm tall, 2–4 kg, dark brown fur with white spots; males have tusk-like canines.
- **Unique Trait:** Three-chambered stomach (not four like other ruminants).
- **Diet:** Fruits, roots, leaves, herbs; occasionally insects or small animals.
- **Lifespan:** 8–12 years.
- **IUCN Status:** *Least Concern*
- **In News:** Recently sighted in **Tungreshwar Wildlife Sanctuary**, Maharashtra.



Ramman Festival

- **Location:** Saloor-Dungra villages, Uttarakhand
- **Deity Honoured:** *Bhumiya Devta* (local earth deity)
- **Time:** Annual festival in **April**
- **Recognition:** Inscribed in **UNESCO's Intangible Cultural Heritage List (2009)**
- **Features:** Rituals, *Ramayana* recitations, folk songs, and **masked dances**
- **Masks:** 18 types made from *Bhojpatra* (Himalayan birch)
- **Instruments Used:** Dhol, Damau, Manjira, Jhanjhar, Bhankora
- **Community Role:** Entire village participates; roles caste-based; knowledge passed orally
- **In News:** President of India presented with a **Ramman mask** at Uttarakhand Assembly.



River Umngot (Dawki River)

- **Location:** West Jaintia Hills, **Meghalaya**

- **Origin:** Eastern Shillong Peak (~1,800 m)
- **Fame:** Known for **crystal-clear waters**; called the *cleanest river in India*
- **Forms Boundaries:** Between **Khasi and Jaintia Hills**, and partly **India–Bangladesh border**
- **Event:** Annual **boat race** (March–April)
- **Infrastructure:** Suspension bridge (NH-40, built in **1932**) – key Indo-Bangladesh trade route
- **In News:** Waters turning **murky due to soil dumping and construction debris**.



Tanzania

- **Location:** East Africa, south of the Equator
- **Area:** ~945,000 sq km
- **Capitals:** **Dodoma** (legislative), **Dar es Salaam** (administrative)
- **Borders:** Kenya, Uganda, Rwanda, Burundi, DRC, Zambia, Malawi, Mozambique; **east – Indian Ocean**
- **Formed:** 1964 – merger of **Tanganyika & Zanzibar**
- **Government:** Presidential Republic
- **Language:** Swahili, English
- **Currency:** Tanzanian Shilling
- **Climate:** Tropical; long dry & two rainy seasons
- **Major Lakes:** Victoria, Tanganyika, Nyasa
- **Highest Peak:** **Mount Kilimanjaro** (Africa's highest, dormant volcano)
- **Major Rivers:** Great Ruaha, Rufiji, Kagera
- **Islands:** Zanzibar, Pemba, Mafia (Indian Ocean)
- **In News:** Protests and internet blackout during President **Samia Suluhu Hassan's** inauguration.



Alprazolam

- **Type:** Psychotropic substance under **NDPS Act, 1985**.
- **Class:** **Benzodiazepine** – CNS depressant; tranquillizer for anxiety & panic disorders.
- **Recent News:** DRI busted illegal Alprazolam factory in **Valsad** under *Operation White Cauldron*.



- **NDPS Act, 1985 – Key Points:**

- Prohibits production, sale, transport, or use of narcotic/psychotropic substances.
- Provides for **forfeiture of property** from illicit drug trade.
- Implements **UN conventions** on narcotic control.
- Empowers govt. to **add/remove substances** from the list.

National Cooperative Development Corporation (NCDC)

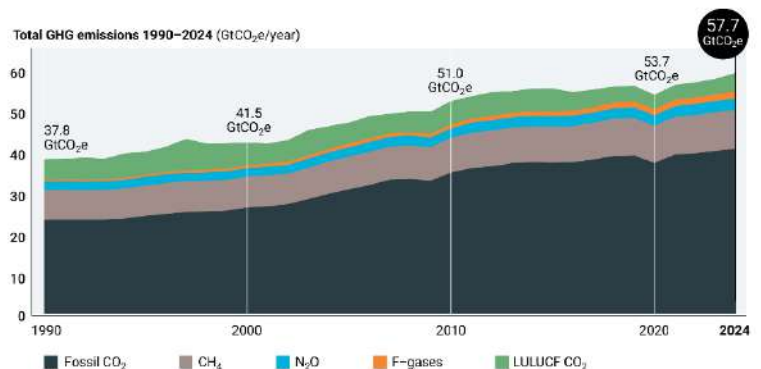
- **Established:** 1963, under **Ministry of Cooperation**, Govt. of India.
- **Type:** Statutory organisation promoting cooperative development.
- **Functions:**
 - Strengthen **farmer cooperatives** to boost production & productivity.
 - Support **post-harvest facilities**: storage, cold chain, processing, marketing.
 - Aid **non-farm & weaker section cooperatives**: dairy, livestock, handloom, sericulture.
 - Provide **financial assistance** via NCDC-sponsored & GoI schemes.
- **Key Initiatives:**
 - **Yuva Sahakar:** Supports cooperative start-ups; focus on NE region, Aspirational Districts, and women/SC/ST/PwD cooperatives.
 - **Ayushman Sahakar:** Strengthens healthcare via cooperative institutions.



Emissions Gap Report (EGR)

2025

- **Publisher:** United Nations Environment Programme (UNEP) annually before UNFCCC COP.
- **Purpose:** Tracks global progress toward **Paris Agreement targets** (well below 2°C, pursue 1.5°C).
- **Key Findings 2025:**
 - Even with full **NDC implementation**, temperatures may rise **2.3–2.5°C** this century.
 - **Global GHG emissions:** 57.7 Gt CO₂ eq in 2024 (+2.3%).



Project Suncatcher

- **Initiator:** Google research initiative.
- **Aim:** Explore **solar-powered satellite constellations** to host **space-based AI data centres**.
- **Features:**
 - **Modular satellite arrays** linked via high-speed optical communication (tens of Tbps).
 - **TPU-equipped satellites** for AI processing.
 - **Orbit:** Dawn–dusk sun-synchronous Low Earth Orbit (LEO).
 - **Prototype launch:** Two satellites with Planet Labs by early 2027.
- Early tests confirm TPUs can **withstand space radiation**.



Second World Summit for Social Development (WSSD-2) 2025

- **Venue:** Doha, Qatar; **India's Representation:** Labour & Employment Minister.
- **Convenes:** United Nations; follows **1995 Copenhagen Summit**.
- **Aim:** Eradicate poverty, promote full & productive employment, decent work, and social inclusion.
- **Alignment:** 2030 SDGs, 2023 SDG Summit Declaration, Pact of the Future, FfD4.
- **Objectives:**
 - Assess progress and address social development gaps.
 - Reaffirm Copenhagen's 10 commitments.
 - Promote equality, inclusion, well-being, and global solidarity.



World Social Summit under the title
Second World Summit for Social Development

4 - 6 November 2025

Black-Headed Ibis (*Threskiornis melanocephalus*)

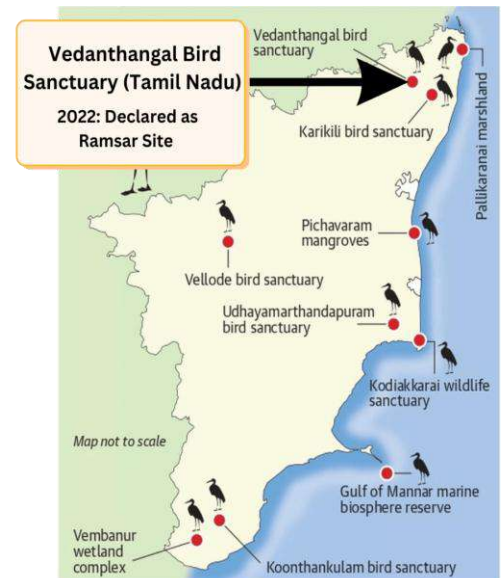
- **Other Names:** Oriental White Ibis, Indian White Ibis, Black-necked Ibis
- **Family:** Threskiornithidae (wading birds)
- **Habitat & Distribution:** South & Southeast Asia (India to Japan); wetlands, agricultural fields, coastal areas, and human-modified landscapes



- **Features:** Large wader (65–76 cm); white body with black head & neck; greyish tail, turns black in breeding season; males & females similar
- **Conservation Status:** Least Concern (IUCN)
 - **Recent Sighting:** Salt pans, Thoothukudi, Tamil Nadu

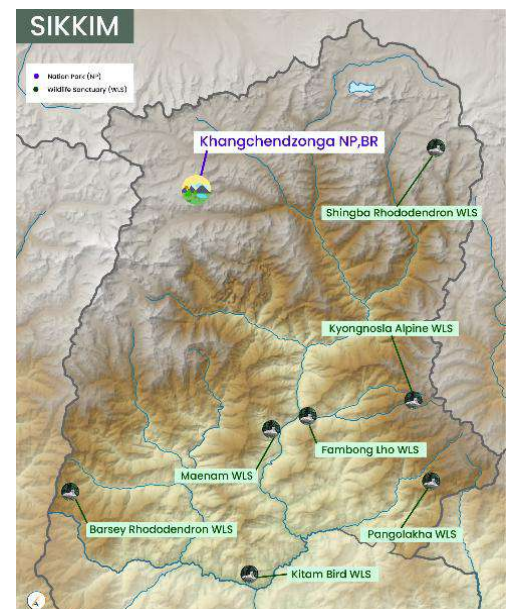
Vedanthangal Bird Sanctuary

- **Location:** Chengalpattu District, Tamil Nadu
- **Significance:** One of India's oldest bird-protected areas; community-protected heronry
- **International Recognition:** Important Bird and Biodiversity Area (IBA); Ramsar Site (2022)
- **Habitat Type:** Freshwater wetland
- **Flora:** *Alangium salviflorum*, *Acacia nilotica*, thorn forests, dry evergreen scrub
- **Fauna:** Black-headed ibis, Eurasian spoonbill, black-crowned night heron, painted stork
- **Unique Feature:** Traditional local protection enhances agriculture via nutrient-rich water (Liquid Guano Effect)
- **Recent Update:** Arrival of thousands of migratory birds marking the season



Khangchendzonga National Park

- **Location:** North Sikkim, along Sikkim-Nepal border
- **Area:** 1,784 sq.km; part of Khangchendzonga Biosphere Reserve (KBR)
- **UNESCO Status:** Mixed World Heritage Site (2016) – natural + cultural significance
- **Global Recognition:** IUCN rated “good” in latest review
- **Altitude Range:** 1,220 m – 8,586 m; includes Mt. Khangchendzonga (3rd highest peak)
- **Glaciers:** 18 total; Zemu Glacier is Asia's largest
- **Flora:** Subtropical to alpine – oak, fir, birch, maple, rhododendron
- **Fauna:** Snow leopard, red panda, Tibetan wolf, blue sheep, Himalayan Tahr, mainland serow; nearly 50% of India's bird diversity
- **Cultural Aspect:** Lepcha tribal settlements
- **Biodiversity Hotspot:** Part of the Himalaya global biodiversity hotspot



Baliyatra Festival

- **Location:** Cuttack, Odisha
- **Meaning:** "Voyage to Bali"
- **Time:** Celebrated annually on **Kartika Purnima**
- **Significance:** Marks ancient maritime trade of **Kalinga (Odisha)** with **Bali, Java, Sumatra, Borneo, Myanmar, Sri Lanka** (~2000 years old).
- **Main Ritual:** **Boita Bandana** – women float paper/banana-leaf boats with lamps on the **Mahanadi River**.
- **Celebration:** Grand fair with cultural events, rides, food, and dance.
- **In News (2025):** President of India extended greetings on the occasion.



Vande Mataram 150 Years Celebration

- **National Song of India:** *Vande Mataram*
- **Author:** Bankim Chandra Chatterjee (Sanskrit-Bengali blend)
- **First Published:** Novel *Anandamath*, 1882
- **Composer:** Yadunath Bhattacharya
- **Historical Significance:**
 - Symbol of patriotism during freedom struggle
 - First sung by Rabindranath Tagore, 1896 Congress session
 - Political slogan first used: 7 August 1905
 - Madam Bhikaji Cama included it on flag abroad, 1907
- **Official Recognition:** Adopted as National Song by Constituent Assembly, 24 Jan 1950
- **Celebration (2025):** Year-long commemoration inaugurated by PM in New Delhi



Indian Laburnum

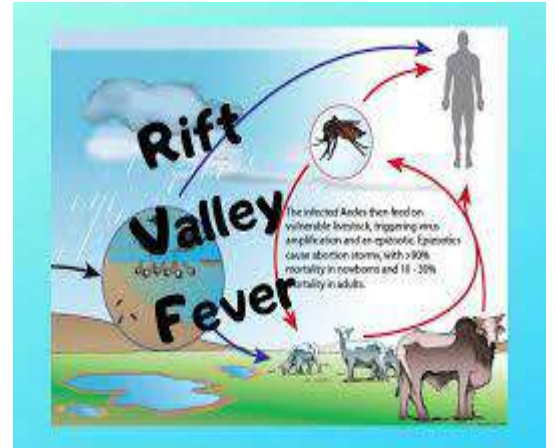
- **Scientific name:** *Cassia fistula*
- **Family:** Fabaceae
- **Common names:** Indian Laburnum, **Amaltas** (North India), **Kanikonna** (South India), Golden Shower Tree.
- **State Tree:** Kerala and Delhi.
- **Distribution:** Native to **Indian subcontinent**; found across SE Asia & Middle East; widely grown as an **ornamental**.
- **Tree Type:** Medium-sized **deciduous** (leafless briefly in **March–May**).



- **Flowers:** Long, pendulous **bright yellow clusters**; mass blooming in summer.
- **Recent Phenology News:** SeasonWatch reports **earlier-than-usual flowering** in recent years.
- **Uses:**
 - Traditional medicine (constipation, skin issues, digestion).
 - Bark → **dye**; fruit pulp → **purgative**.

Rift Valley Fever

- **Causative agent:** *Phlebovirus* (family **Phenuiviridae**).
- **Affects:** Mainly **sheep, goats, cattle, camels**; zoonotic to humans.
- **Transmission to humans:**
 - Contact with infected animals/tissues
 - **Mosquito bites** (multiple species)
 - **No human-to-human transmission.**
- **Origin:** First identified in **Kenya's Rift Valley (1930s)**.
- **Spread:** Sub-Saharan Africa → **Egypt (1977)** → **Saudi Arabia & Yemen (2000)**.
- **Symptoms:** Mostly **mild flu-like**; small % develop **eye, brain, liver** complications.
- **Treatment:** **No specific antiviral**; supportive care only.
- **Latest News:** WHO confirms outbreak in **Mauritania & Senegal** (West Africa).



Molasses

- **Byproduct** of **crushed sugarcane/sugar beet** processing.
- **Thick, dark brown, viscous** liquid; rich in sugars + some vitamins/minerals.
- **Types:**
 - **Light molasses** – first boiling; light & sweet.
 - **Dark molasses** – second boiling; thicker, darker.
 - **Blackstrap** – third boiling; thickest, darkest, bitter.
- **Uses:**
 - Animal feed
 - Ethanol, ethyl alcohol
 - Yeast, lactic acid production
- **Latest News:** Govt allowed **export of 1.5 MT sugar (2025–26)** and removed **50% export duty on molasses**.



Exercise MITRA SHAKTI-2025

- **11th edition** of the **India–Sri Lanka joint military exercise**.
- **Location:** Foreign Training Node, **Belagavi, Karnataka**.
- **Aim:** Sub-conventional operations under **UN Chapter VII** mandate.
- **Indian participants:** **RAJPUT Regiment + Indian Air Force**.
- **Key drills:** Counter-terror ops, raids, search & destroy, heliborne ops, drones & counter-UAS, securing helipads, casualty evacuation.
- **Significance:** Enhances **India–Sri Lanka defence cooperation** & joint interoperability.



Booker Prize

- **World's top award** for a **single work of fiction** (founded **1969**, UK).
- **Open to:** Any nationality; novel must be **originally written in English + published in UK/Ireland** (no translations, no self-publishing).
- **Prize:** Winner **£50,000**; shortlisted authors **£2,500**.
- **Purpose:** Reward the **best English-language novel** of the year.



Latest (2025)

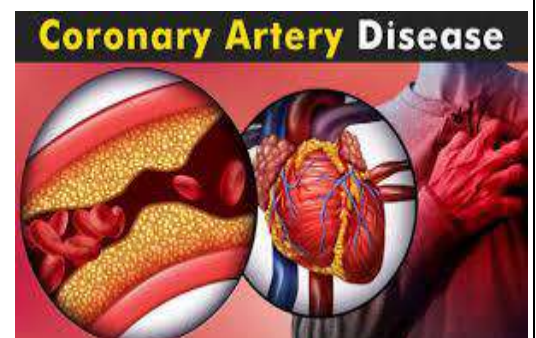
- **Winner:** **David Szalay** for '**Flesh**' – first **Hungarian-British** author.

Indian / Indian-origin Booker Winners

- **V.S. Naipaul** – *In a Free State*
- **Salman Rushdie** – *Midnight's Children*
- **Arundhati Roy** – *The God of Small Things*
- **Kiran Desai** – *The Inheritance of Loss* (2006)
- **Aravind Adiga** – *The White Tiger* (2008)

Coronary Artery Disease (CAD)

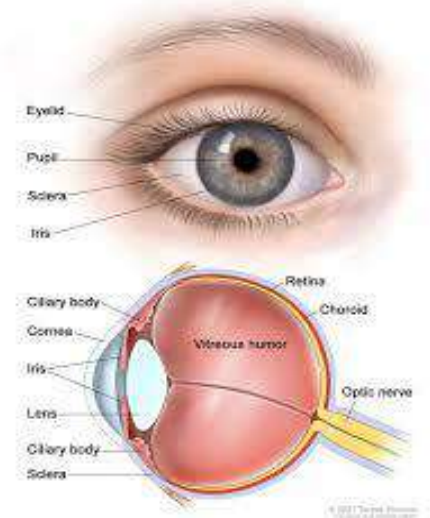
- **Definition:** Narrowing or blockage of coronary arteries due to plaque (fat, cholesterol, etc.) buildup — *atherosclerosis*.
- **Effect:** Reduces blood flow to the heart; may cause *angina* or *heart attack*.
- **Causes:** Atherosclerosis, high cholesterol, hypertension, diabetes, smoking, obesity.



- **Symptoms:** Chest pain, shortness of breath, fatigue, sweating, dizziness, nausea.
- **Complication:** Complete blockage → *Myocardial Infarction (Heart Attack)*.
- **Prevention:** Healthy diet, regular exercise, no smoking, control BP & sugar.
- **Treatment:** Medications, angioplasty, or bypass surgery.
- **Latest Research:** Seoul study links *gut microbes* with CAD development.

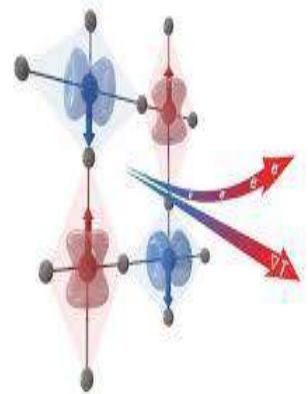
Cornea

- **Definition:** Transparent outer layer at the front of the eye covering the pupil, iris, and anterior chamber.
- **Function:** Refracts (bends) and focuses **65–75%** of incoming light; filters some **UV rays**.
- **Structure:** No blood vessels; nourished by **tears and aqueous humor**; highly sensitive due to dense nerves.
- **Refractive Errors:** Caused by abnormal corneal curvature (e.g. **myopia, hyperopia, astigmatism**).
- **Repair:** Minor injuries heal quickly; deep scars cause **loss of transparency → vision loss**.
- **Latest Update (2025):** Govt amended **Transplantation of Human Organs and Tissues Rules** to promote **cornea donation and transplantation**.



Altermagnets

- **Definition:** A new type of magnetism where **magnetic moments align oppositely but in a rotated pattern**.
- **Combination of:**
 - *Ferromagnets* → allow **spin-polarised currents**.
 - *Antiferromagnets* → have **no net magnetic field**.
- **Unique Feature:** Opposite spins arranged in a **rotated crystal pattern**, enabling **spin-polarised currents without stray magnetic fields**.
- **Applications:** Advanced **electronics, spintronics, and data storage**.
- **Significance:** Offers magnetic control without external magnetic interference — a breakthrough in **quantum and semiconductor research**.



Improvised Explosive Device (IED)

- **Definition:** Unconventional explosive weapon made from readily available materials; used by terrorists and insurgents.
- **Forms:** Can be vehicle-borne, roadside, or person/carried; size and placement determine damage.



- **Origin of Term:** Popularised during the 2003 Iraq War.
- **Key Components:** Initiator, switch, main charge, power source, and container.
- **Enhancements:** Nails, glass, or metal fragments to increase shrapnel.
- **Common Materials:** Fertilizer, gunpowder, hydrogen peroxide, ANFO (ammonium nitrate + fuel oil).
- **Features:** Cheap, easy to conceal, assemble, and detonate.

Lake Turkana

- **Location:** Northern Kenya; northern tip extends into Ethiopia; in the **Eastern Rift Valley**.
- **Rivers:** Omo (90% inflow), Kerio, and Turkwel.
- **Geography:** Separated from Lake Logipi by *The Barriers* (young volcanoes).

Dimensions: 6,405 sq km area; 24 *Jaechanax*



Kuranganiensis

- **Type:** New species of **water-penny beetle**.
- **Discovered in:** Kurangani stream, Bodi Hills, **Western Ghats (Tamil Nadu)**.
- **Significance:** First record of *Jaechanax* genus in Tamil Nadu.
- **Previously known from:** 3 species in other Asian countries.
- **Identification:** Based on **distinct larval form**.
- **Larval traits:**
 - Flat, **disc-like shape** – helps cling to rocks in fast-flowing streams.
 - Unique **oblique groove (sulcus)** on **pronotum** (behind head).
 - **9th abdominal segment** subrectangular, **1.2× wider than long**.
- **Ecological role:** Important in **stream food chain**; acts as a **bioindicator** of **freshwater ecosystem health**.
- **Etymology:** Named *kuranganiensis* after the **Kurangani stream**.



Humboldt Penguin

- **Scientific name:** *Spheniscus humboldti*
- **Genus:** *Spheniscus* – the '**banded**' penguin group
- **Named after:** **Humboldt Current** (cold oceanic upwelling along South America's west coast)



- **Distribution:** Pacific coasts of Chile and Peru (≈80% in Chile)
- **Appearance:**
 - Medium-sized (~2 ft tall)
 - **Bare skin patches around eyes** – help in cooling
- **Breeding:** **Monogamous**; breeding in **Mar–Apr** or **Sep–Oct** (varies by colony); recognize mates via **vocal cues**
- **Threats:** **Overfishing, habitat loss, pollution, avian flu, climate change**
- **Conservation status:**
 - **IUCN:** Vulnerable
- **CITES:** Appendix I

Ethiopia

- **Location:** Horn of Africa; **landlocked** (after Eritrea's 1993 secession)
- **Capital:** Addis Ababa
- **Currency:** Birr (ETB)
- **Political System:** Democratic Republic
- **Languages:** Afar, Amharic, Oromo, Somali, Tigrinya
- **Borders:** Eritrea (N), Djibouti (NE), Somalia (E), Kenya (S), South Sudan (W), Sudan (NW)
- **Topography:** Rugged; includes **Rift Valley, Western/Eastern Highlands & Lowlands**
- **Highest Point:** Mount Ras Dejen (4,533 m)
- **Major Rivers:** Blue Nile, Omo, Awash
- **Major Lake:** Lake Tana – source of Blue Nile, ~50% of nation's freshwater
- **International Role:** Founding member of **UN, OAU/AU**, and **UNECA HQ in Addis Ababa**
- **Latest News:** Set to **host COP32 in 2027**



Climate Investment Fund (CIF)

- **Launched:** 2008; **Type:** Multilateral fund for 70+ developing nations.
- **Aim:** Support climate **mitigation & adaptation** via concessional finance.
- **Funds:** Clean Technology Fund (CTF) & Strategic Climate Fund (SCF).
- **Partners:** Works through **6 MDBs** – ADB, AfDB, EBRD, IsDB, IFC, World Bank.
- **Governance:** Managed by **CTF Trust Fund Committee**; Secretariat at **World Bank**.
- **Recent:** Germany & Spain pledged **\$100 mn (COP30)** for **ARISE** program.
- **Fact:** First to issue **bonds (2024)** via **CIF Capital Markets Mechanism**.



Intergenerational Equity

- **Meaning:** Duty of the present generation to preserve natural resources for **future generations**.
- **Origin:** Popularized by **Brundtland Report (1987)** – “Our Common Future.”
- **Legal Basis:** Recognized principle of **International Environmental Law**.
- **Key Frameworks:** Embedded in **UNFCCC** and **Rio Declaration (1992)**.
- **Essence:** Promotes **sustainable development** ensuring equal environmental rights for present & future generations.
- **Recent News:** Justice **P.S. Narasimha** noted the concept is **anthropocentric**, offering limited help in protecting endangered species.
- 8 km long; 16–32 km wide; depth ~73 m.
- **Significance:** Africa’s **4th largest lake**; **world’s largest desert lake**; **UNESCO World Heritage Site**.
- **Nature:** Highly saline and brackish; unsuitable for drinking; prone to sudden storms.
- **Recent Issue:** Drying climate reducing water levels, triggering quakes and volcanic activity.



Himalayan Black Bear

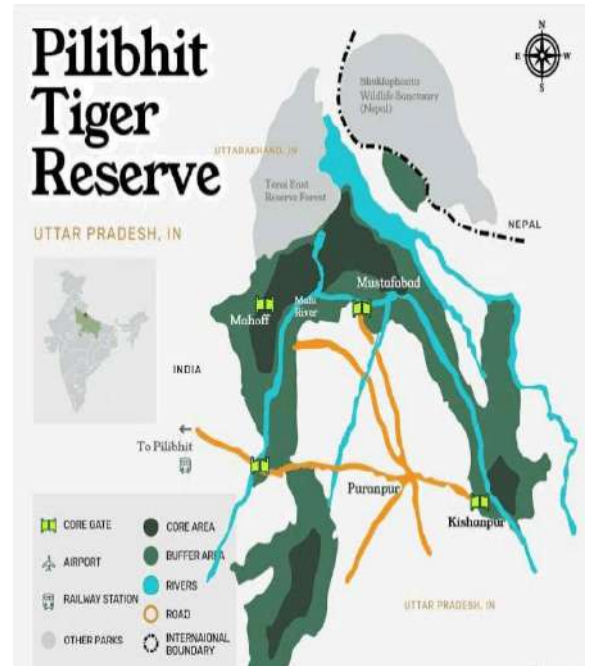
- **Scientific Name:** *Ursus thibetanus laniger* (subspecies of Asiatic Black Bear).
- **Latest Issue:** Erratic weather disrupting hibernation → increasing aggression (Uttarakhand).
- **Distribution:** Himalayas (J&K → Arunachal Pradesh), Nepal, Pakistan, Tibet, China; also NE hill regions.
- **Habitat:** Dense broadleaf & coniferous forests.
- **Key Features:** Black fur with white chest “V” mark; lifespan 25–30 years.
- **Diet:** Omnivore—fruits, nuts, acorns, roots, honey, insects.
- **Behaviour:** Naturally diurnal; turns nocturnal to avoid humans.
- **IUCN Status:** Vulnerable.



Pilibhit Tiger Reserve

- **Location:** Pilibhit & Shahjahanpur districts, Uttar Pradesh; part of **Terai Arc Landscape**; along **India–Nepal border**.

- **Area:** 730 sq km (core 602 sq km).
- **Rivers:** Gomti originates here; catchment of Sharda, Chuka, Mala Khannot; Sharda Sagar Dam borders reserve.
- **Habitat:** Dense sal forests, tall alluvial grasslands, swamps; maintained by periodic river flooding.
- **Vegetation:** Tropical moist & dry deciduous, semi-evergreen, swamp forests.
- **Key Flora:** Dense sal (76% of area); grasses like *Saccharum*, *Imperata*, *Themeda*.
- **Fauna:** Tigers, swamp deer, hog deer, leopard, Bengal florican, great hornbill; rich wetland & grassland birdlife.
- **Latest News:** Farmer killed in suspected tiger attack near Barahi range.



Vanadium

- **Element:** Symbol **V**, Atomic No. **23**; silver-gray, hard, ductile metal; corrosion-resistant.
- **Occurrence:** 22nd most abundant element; found in >60 minerals—**vanadinite**, **carnotite**, **roscoelite**; major resources in **South Africa, Russia**.
- **Top Producers:** **China, Russia, South Africa**.
- **Uses:**
 - **Alloying** in steel (strength, durability).
 - **Vanadium Redox Flow Batteries (VRFBs)** for renewable energy storage.
 - **Catalysts** (e.g., sulfuric acid production).
 - **Nuclear reactors** (structural material).
 - **Medical research** (diabetes, heart disease).
- **Latest News:** India's **first MWh-scale VRFB** inaugurated at **NTPC NETRA, Noida**.
- **Major Lake:** **Lake Tana** – source of Blue Nile, ~50% of nation's freshwater
- **International Role:** Founding member of **UN, OAU/AU**, and **UNECA HQ in Addis Ababa**
- **Latest News:** Set to **host COP32 in 2027**



Rare Earth Hypothesis

- **Definition:** Says **complex life is extremely rare** in the universe due to highly specific conditions required.
- **Proposed by:** Peter Ward & Donald Brownlee (2000).
- **Reasoning:** Microbial life may be common, but complex life needs rare factors—
 - Right **galactic zone**,
 - Suitable **star type & distance**,
 - Planet's **size, geology, plate tectonics**,
 - Presence of a **large stabilizing moon**.
- **Contrasts with:** Principle of Mediocrity (Earth is not special).
- **Link to:** Fermi Paradox (why intelligent aliens not found).
- **Latest News:** New exoplanet studies reopened debate on its validity.

DRISHTI System

- **What:** AI-based Freight Wagon Locking Monitoring System.
- **Developed by:** NFR + IIT Guwahati TIDF.
- **Purpose:** Detect unlocked/tampered freight wagon doors in real time.
- **How it works:** Uses AI-powered cameras, sensors, computer vision, machine learning.
- **Benefits:**
 - Enhances **freight security** & wagon sealing integrity.
 - Reduces **manual inspections**.
 - Enables real-time **alerts** without stopping trains.
- **Status:** Trials ongoing; planned for wider NFR deployment.



Palar River

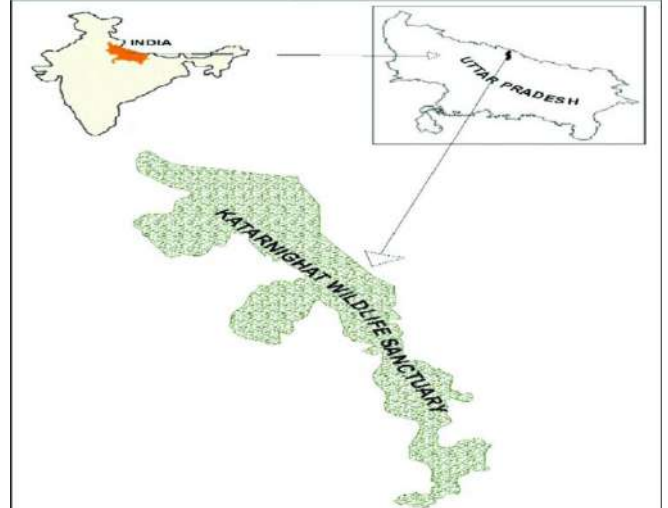
- **Origin:** Nandidurg hills, Kolar (Karnataka); starts as **Guptagamini** (underground).
- **Flows Through:** Karnataka → Andhra Pradesh → Tamil Nadu → **Bay of Bengal** (Vayalur).
- **Basin Area:** ~17,633 sq km.
- **Key Tributaries:** Cheyyar, Ponnai.
- **Cities:** Vellore, Ambur, Arcot, Kanchipuram, Chingleput.



- **Notable:** Arcot Dam; major temples along banks.
- **In News:** Flash flood near Vellore caused a death.

Katarniaghat Wildlife Sanctuary

- **Location:** Terai region, Bahraich district, **Uttar Pradesh**; Upper Gangetic Plain; shares border with **Nepal**.
- **Part of:** **Dudhwa Tiger Reserve** (with Dudhwa NP + Kishanpur WS); under **Project Tiger** since 1987.
- **Area:** ~400 sq km.
- **Key Purpose:** Protection of **Gharial** population; connectivity to **Bardia NP (Nepal)**.
- **Vegetation:** Grasslands, mixed & moist deciduous forests; **Sal-dominated**.
- **Important Fauna:** Tiger, rhino, gharial, **Gangetic dolphin**, swamp deer, hispid hare, Bengal florican, vultures.
- **River:** **Gairwa River** → sanctuary for **mugger & gharial**; rich aquatic biodiversity.
- **In News:** **Leopard attack** near Kakraha Range.



Strait of Hormuz

- **Location:** Between **Iran (north)** and **UAE + Musandam (Oman) (south)**.
- **Connects:** **Persian Gulf (west)** ↔ **Gulf of Oman & Arabian Sea (east)**.
- **Size:** 167 km long; **29 nautical miles** (54 km) at narrowest; **2-mile-wide** shipping channels + buffer.
- **Islands:** Hormuz, Hengam, Qishm.
- **Importance:** World's most critical oil chokepoint — **25% of global oil & 30% of LNG** transit.
- **In News:** **Iran seized a Marshall Islands-flagged oil tanker** in the strait.



Uturuncu Volcano

- **Location:** Southwestern **Bolivia**, Andes Mountains.
- **Type:** **Stratovolcano** with dacitic lava domes/flows.
- **Elevation:** ~6,008 m — tallest peak in southern Bolivia.

- **Status:** Dormant; last erupted ~**250,000 years ago**; seismically active.
- **Geological Features:**
 - Sits above the **Altiplano-Puna Magma Body** (largest active magma body in Earth's crust).
 - Shows “**sombrero**” pattern — center uplift, edges subsidence.
 - Nicknamed a “**zombie volcano**” (active unrest but low eruption risk).
- **In News:** New mapping shows surface motion due to **fluids/gases**, not rising magma.



RuTAG Initiative

- **Launched:** 2004 by **Office of the Principal Scientific Adviser (OPSA)**.
- **Purpose:** Bring **S&T interventions** to rural areas; bridge **technology gaps** at grassroots.
- **Approach:** **Demand-driven**, stakeholder collaboration (NGOs, SHGs, CBOs, start-ups).
- **Functions:**
 - Identify tech needs
 - Develop rural-relevant technologies
 - Validate prototypes
 - Support **commercialization**
- **RuTAG 2.0 (2023):**
 - Focus on **commercialization & market-ready products**
 - Wider dissemination; stronger socio-economic impact
- **Latest News:** 2nd annual review meeting chaired by PSA.



Foraminifera

- **Single-celled marine protists** found in **open oceans, coasts, estuaries**.
- Possess **calcareous or agglutinated shells** (tests) with tiny holes called **foramen**.
- Use **pseudopodia** through foramen for **movement + feeding**.
- **Majority are benthic**; only ~**40** of ~**8,000** species are planktonic.
- Size usually **< 500 microns**; some tropical species reach **20 cm**.



- Diet: **detritus, diatoms, algae, bacteria, tiny zooplankton.**
- Important in **paleoclimate studies, biostratigraphy, and oil exploration** (fossil forams).
- **Latest news:** Global review identified **57 new living species.**

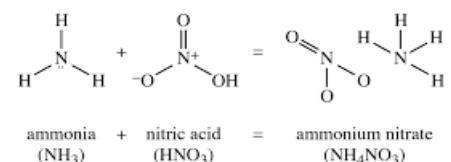
Caracal

- **Medium-sized wild cat**; scientific name: **Caracal caracal.**
- Known as **siya gosh** in India (Persian: “black ear”).
- **Distribution:** Africa, Middle East, Central Asia, NW India, Pakistan.
- **India:** ~50 individuals; mainly **Rajasthan & Gujarat.**
- **Habitat:** Semi-deserts, savannahs, shrublands, dry forests, steppes.
- **Key Features:**
 - Black **ear tufts**, long legs, short face, red-tan coat.
 - Excellent **jumper** (up to 3 m); top speed **~80 km/h.**
 - Mostly **nocturnal**, shy, elusive.
- **IUCN Status:** **Least Concern.**
- **Latest News:** **Asiatic Caracal spotted in Ramgarh, Jaisalmer (Rajasthan).**



Ammonium Nitrate

- **Chemical:** NH_4NO_3 ; white, crystalline solid; ammonia + nitric acid.
- **Uses:** High-nitrogen fertiliser; oxidiser in commercial explosives (mining slurry).
- **Properties:** Melting point $\sim 170^\circ\text{C}$; highly water-soluble; decomposes to nitrous oxide when heated in solution.
- **Explosiveness:** Not explosive alone; becomes explosive when mixed with fuel + triggered with detonators.
- **Legal Controls (India):**
 - Mixtures $>45\%$ ammonium nitrate = classified as explosive (Rules 2012, amended 2021).
 - DM can allow possession up to **30 MT**; above that needs **PESO** licence (manufacture, storage, transport, use).
- **Latest News:** Substance linked to Delhi explosion; earlier used in multiple Mumbai blasts.



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Thames River

- **Location:** 346-km river in southern England; longest in England, second longest in UK.

- **Source:** Thames Head, Cotswold Hills (Gloucestershire).
- **Mouth:** Flows into the **North Sea** via the **Thames Estuary** (Nore sandbank marks mouth).
- **Basin:** ~16,130 sq km; tidal upstream of London.
- **Tributaries:** Lea, Kennet (largest), Churn, Coln, Windrush, Evenlode, Ock, Loddon.
- **Cities Along Course:** Oxford (locally called *Isis*), Reading, Windsor, London.
- **Importance:** Supplies ~ $\frac{2}{3}$ of London's drinking water; historic trade and navigation route.
- **Infrastructure:** 16 major bridges in Greater London (e.g., Millennium Bridge, Golden Jubilee Bridge).



Gulf Cooperation Council (GCC)

- **Established:** 1981
- **Type:** Regional political & economic alliance
- **Members:** Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, UAE
- **HQ:** Riyadh, Saudi Arabia
- **Objective:** Economic, security, cultural & social cooperation
- **Background:** Formed amid regional tensions (1979 Iranian Revolution, Iran–Iraq War)
- **Key Bodies:**
 - **Supreme Council:** Heads of states; highest authority
 - **Ministerial Council:** Foreign ministers; implements decisions
 - **Secretariat General:** Coordinates joint projects
- **Latest News:** GCC approves **one-stop travel system** to simplify immigration, customs & security checks across member states.



Adam Chini Rice

- **Type:** Aromatic **black rice** variety; known for strong aroma & superior cooking quality.
- **Region:** Grown mainly in **Eastern Uttar Pradesh** — Chandauli, Varanasi, Vindhya region.
- **GI Tag:** Received **GI status in 2023**.
- **Key Traits:**



- Sugar-crystal-like grains
- **Drought tolerant**, disease resistant
- Plant height: **165 cm**
- **Long maturity**: 155 days
- **Low yield**: 20–23 q/ha
- Intermediate amylose; remains **fluffy & soft on cooling**
- **BHU Mutagenesis Breakthrough (2025):**
 - Mutant-14: Height **reduced to 105 cm**
 - Mutant-19: **Early maturity** (120 days)
 - Mutants 14, 15, 19, 20: **Higher yields** (30–35 q/ha)
 - Improved variants retain **aroma** but better suited for **mass cultivation**

Kwar Hydroelectric Project

- **Type**: 540 MW **run-of-river** hydropower project.
- **River**: **Chenab River**
- **Location**: **Kishtwar district**, Jammu & Kashmir.
- **Developer**: **Chenab Valley Power Projects Pvt. Ltd. (CVPPL)**
 - JV between **NHPC (51%)** and **JKSPDC (49%)**.
- **Generation**: **1,975.54 million units** in a 90% dependable year.
- **Central Support**:
 - ₹69.80 crore for enabling infrastructure.
 - ₹655.08 crore grant for **JKSPDC's equity share**.
- **Latest News**: Fire incident inside a tunnel; labourers rescued safely.



Exercise AJEYA WARRIOR

- **Type**: **Bilateral military exercise** between **India & the United Kingdom**.
- **Started**: **2011**; held **biennially**.
- **2025 Edition**: 8th edition held at **Mahajan Field Firing Ranges, Rajasthan**.
- **Participants**: **Indian Army (Sikh Regiment) & British Army**.
- **Focus**:
 - **Counter-terrorism operations**
 - **Semi-urban warfare**
 - **UN mandate-based scenarios**
- **Key Activities**:
 - **Brigade-level joint planning**
 - **Integrated tactical drills**

- Simulation-based scenarios
- Company-level field exercises
- **Significance:** Enhances interoperability, tactical proficiency, and cooperation for complex operations.

Sentinel-6B Satellite

- **Launched from:** Vandenberg Space Force Base, California.
- **Agencies:** Joint mission of **NASA, NOAA, ESA**.
- **Type:** Ocean-tracking satellite under Copernicus Programme.
- **Objective:** Measures **global sea-level rise**, ocean topography, and climate change indicators.
- **Predecessor:** Continues data from **Sentinel-6 Michael Freilich (2020)**.
- **Orbit:** Non-Sun-synchronous; **7.2 km/s**, completes orbit in **~112 minutes**.
- **Coverage:** Measures sea level with **~1-inch accuracy** over **90% of global oceans**.
- **Payload:** **Six scientific instruments**, fixed + deployable solar arrays.
- **Mission Life:** **~5.5 years**.
- **Significance:** Enhances **weather forecasting, flood prediction**, coastal safety, and climate monitoring.



Integrated Forum on Climate Change and Trade

- **Launched at:** **COP30**, Belém (Brazil), **15 Nov 2025**.
- **Purpose:** Politically supported forum to address the **trade–climate intersection**.
- **Goal:** Bridge gaps between **trade policy** and **climate ambition**, amplify developing countries' voice.
- **Open to:** All **UNFCCC Parties**.
- **Co-Chairs:** **Brazil + one developed country partner**.
- **Status:** **Institutionally independent** of WTO & UNFCCC.
- **Nature:** **Non-binding**, no negotiations on agreements, no dispute settlement.
- **Process:** Begins with **open-ended consultations (2026)** on topics & scope.
- **Features:** Promotes **interoperability** in global climate-trade governance; engages **civil society, industry, and international initiatives**.

Ginkgo-Toothed Beaked Whale

- Rare beaked whale species (*Mesoplodon ginkgodens*); recently sighted off Baja California, Mexico.

- **Distribution:** Tropical & temperate waters of Pacific and Indian Oceans.
- **Appearance:** Robust body, fewer scars; small pointed flippers; distinctive ginkgo-shaped paired teeth on lower jaw.
- **Traits:** Deepest-diving mammals; extremely elusive; surface briefly and far from coasts.
- **Status:** IUCN – Data Deficient; CITES – Appendix II.



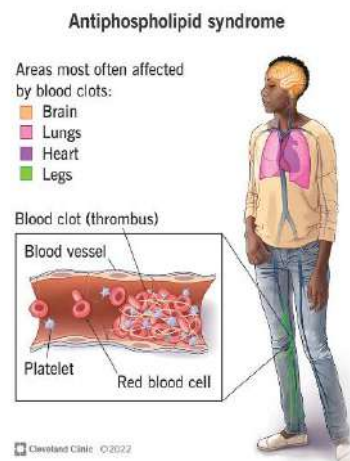
Raulane Festival

- **Location:** Kalpa, Kinnaur district, Himachal Pradesh.
- **Season:** Winter or early spring.
- **Age:** Approx. 5,000-year-old tradition.
- **Belief:** Honours celestial fairies *Saunis*—protector spirits during harsh winters.
- **Ritual:** Two men symbolically “marry” as Raula (groom) & Raulane (bride), becoming vessels for Saunis.
- **Features:** Heavy woollen attire, masks, meditative dance at Nagin Narayan Temple; strong community participation.



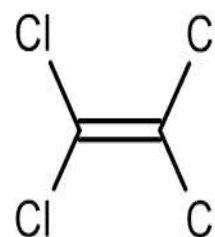
Antiphospholipid Syndrome (APS)

- **Type:** Rare autoimmune disorder.
- **Cause:** Abnormal antibodies against phospholipid-binding proteins → ↑ blood clotting.
- **Effects:** Clots in arteries/veins; risk of **stroke, heart attack, DVT, PE**.
- **Pregnancy:** Miscarriage, stillbirth.
- **Symptoms:** Sometimes asymptomatic.
- **Risk Factors:** More common in women; associated with **SLE** and other autoimmune diseases.
- **Treatment:** No cure; anticoagulants reduce clot risk.



Tetrachloroethylene

- **Also called:** Perchloroethylene / PCE / Perc.
- **Nature:** Clear, colorless, volatile liquid; ether-like odor; non-combustible; insoluble in water.
- **Uses:** Dry cleaning; industrial/household degreasing; chemical intermediate.



- **Health Impacts:** High exposure → dizziness, headache, confusion, nausea, unconsciousness, death.
- **Environment:** Evaporates fast; breaks down slowly in air/water/soil; can contaminate **groundwater** via waste disposal.

Viscose Staple Fibre

- **Nature:** Natural, biodegradable, cotton-like regenerated fibre.
- **Source:** Made from cellulose (wood pulp/cotton linters) → converted to cellulose xanthate → spun into fibre.
- **Features:** Breathable, high moisture absorbency, light, good colour retention, blends well.
- **Uses:** Apparel, home textiles, dress materials, knits, non-woven products.
- **News:** Centre revoked QCO requirement for VSF.



Ratanmahal Wildlife Sanctuary

- **State:** Gujarat (on Gujarat–Madhya Pradesh border)
- **Declared:** 1982
- **Also known as:** *Ratanmahal Sloth Bear Sanctuary* (highest sloth bear population in Gujarat)
- **Latest News:** Tiger sighted after several decades; now permanently present
- **River:** Catchment area of **Panam River**
- **Vegetation:** Dry teak forests; mixed deciduous forests; dry bamboo brakes
- **Flora:** Teak, bamboo, mahuda, sadad, timru, amla, ber, jamun
- **Fauna:** Sloth bear, leopard, four-horned antelope, civets, Loten's sunbird, large green barbet



BvS10 Sindhu

- **What:** Specialised articulated **all-terrain armoured vehicle**
- **Developed by:** L&T (India) + BAE Systems Hägglunds (Sweden)
- **Latest News:** L&T & BAE won Indian Army contract to supply BvS10 Sindhu
- **Origin:** Upgraded, India-specific variant of European BvS10



- **Users of base BvS10:** Austria, France, UK, Netherlands, Sweden, Ukraine; ordered by Germany; selected by US Army (CATV)
- **Features:**
 - Two connected articulated units (for extreme mobility)
 - Amphibious (operates in water/floods)
 - High-altitude, desert, marsh & snow capability
- **Manufacturing:** L&T Armoured Systems Complex, **Hazira, Gujarat**
- **Roles:** Troop carrier, command post, ambulance, recovery, logistics, weaponised variant (multi-role platform)

BIRSA 101

- **What:** India's **first indigenous CRISPR-based gene therapy**
- **Purpose:** Treat **Sickle Cell Disease (SCD)**
- **Launched by:** Union Minister of State for Science & Technology
- **Named after:** Tribal leader **Birsa Munda**
- **Developed by:** **CSIR-IGIB** (Institute of Genomics & Integrative Biology)

Key Features

- Uses **CRISPR-Cas9** to correct SCD-causing mutation
- **One-time infusion** therapy
- Much **more affordable** than global CRISPR treatments

Sickle Cell Disease – Quick Facts

- Genetic disorder causing **sickle-shaped RBCs**
- Leads to pain crises, anaemia, organ damage
- Risk increases if **both parents are carriers**

Indira Gandhi Peace Prize

- **Established:** 1986 by Indira Gandhi Memorial Trust
- **Award:** ₹25 lakh + citation
- **Focus:** Peace, disarmament, development, international cooperation
- **Open to:** Individuals/organisations globally
- **2024 Winner:** **Michelle Bachelet**
- **Notables:** Gorbachev, UNICEF, Carter, Kofi Annan/UN, Merkel, ISRO, Manmohan Singh, Attenborough, Pratham.



Curaçao

- **Location:** Island country in the **south Caribbean Sea**, ~60 km north of **Venezuela**
- **Status:** **Constituent country** of the **Kingdom of the Netherlands**
- **Capital:** **Willemstad** (UNESCO World Heritage Site)
- **Includes:** Curaçao + Klein Curaçao
- **Languages:** **Papiamentu, Dutch, English**
- **Government:** Constitutional monarchy; Dutch monarch as head of state
- **Economy:** Tourism + oil refining
- **Latest News:** Qualified for **2026 FIFA World Cup** — **smallest country ever** to do so
- **Population:** ~156,000 (2023 census)



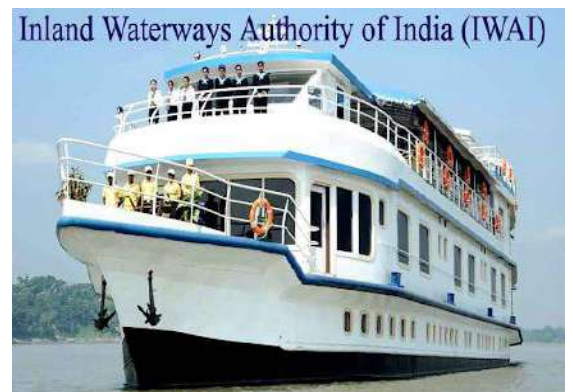
Protidricerus albocapitatus

- Newly discovered owlfly species in **Nedumkayam forest, Malappuram (Kerala)** after **134 years**.
- Belongs to **order Neuroptera**; family **Myrmeleontidae**.
- India now has **37** owlflies; Kerala has **5**.
- **Features:** White tufted head, **clubbed antennae**, bulging eyes.
- **Habitat:** Lateritic grasslands, vegetated village areas.
- **Behaviour:** Active at dusk; aerial predators; release musk-like defence chemical.
- **Reproduction:** Eggs laid in clusters on twig tips with protective shield.



Inland Waterways Authority of India (IWAI)

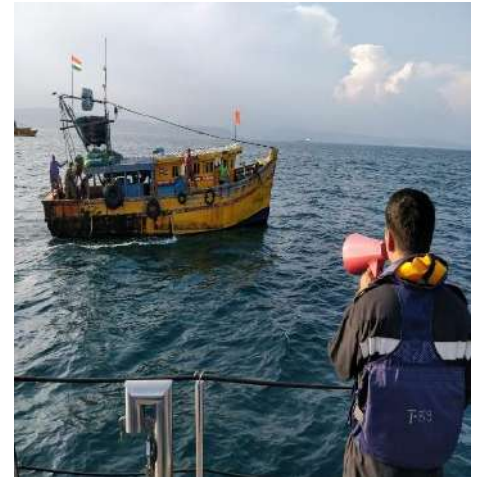
- **Statutory body** under **IWAI Act, 1985**; established **27 Oct 1986**.
- **Nodal Ministry:** Ministry of Ports, Shipping & Waterways.
- **Mandate:** Develop, regulate **inland waterways**; maintain IWT infrastructure on **National Waterways**; conduct feasibility studies; advise Centre & assist States.
- **HQ:** **Noida, Uttar Pradesh**.



- **Regional offices:** Patna, Kolkata, Guwahati, Kochi; multiple sub-offices across major waterway hubs.
- **Latest News:** Signed **₹3,000 crore** agreements to boost cargo, passenger transport & river tourism in the **Northeast**.

Sagar Kavach

- **Biannual coastal security exercise** led by the **Indian Coast Guard (ICG)**.
- Tests preparedness against **asymmetric maritime threats**.
- Participants: **ICG, Indian Navy, State Police, Marine Police, Customs, Fisheries**, etc.
- Uses **Red Team (infiltrators)** vs **Blue Team (responders)** format.
- Focus: **Surveillance, patrols, vehicle checks, simulated attacks**, inter-agency coordination.
- Emphasizes role of **fishermen** as key coastal sentinels for reporting suspicious vessels.



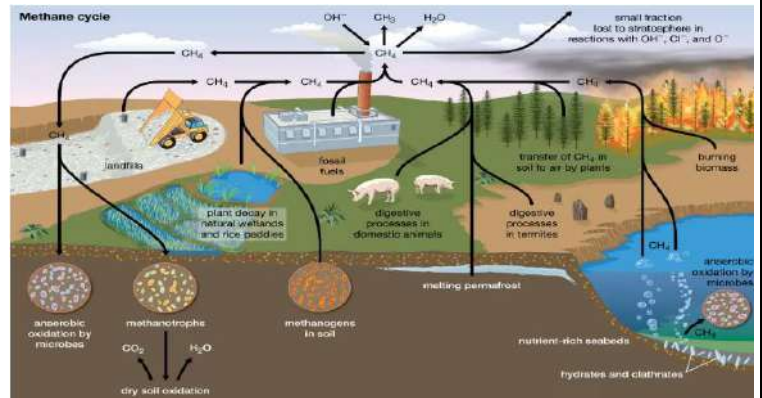
Acanthosis Nigricans

- **Skin condition** with **dark, thick, velvety patches** on **skin folds** (neck, armpits, groin, etc.).
- **Causes:** Obesity, **insulin resistance**, metabolic syndrome, diabetes; rarely linked to malignancies.
- **Symptoms:** Gradual hyperpigmentation, thickened skin, possible itching or odour.
- **Significance:** Early marker for **prediabetes/diabetes**.
- **Treatment:** Manage underlying condition; lightening creams; laser/dermabrasion if needed.

Global Methane Status Report

- **Released by:** UNEP + Climate and Clean Air Coalition (CCAC).
- **Purpose:** Tracks global methane emissions, mitigation progress, and Global Methane Pledge status.
- **2025 Highlights:**
 - Methane levels **>2× pre-industrial**.
 - Expected **24,000 extra deaths & 2.5 Mt crop loss** annually by 2030.

- **India = 3rd-largest emitter**; agriculture contributes **12% of global agri methane**.
- Full NDC implementation can cut emissions by **8% by 2030**.
- **72% mitigation potential** lies in **G20+ countries**.
- **Methane facts:** Main component of natural gas; colorless, odorless; major short-lived climate pollutant causing **~1/3 of current warming**.



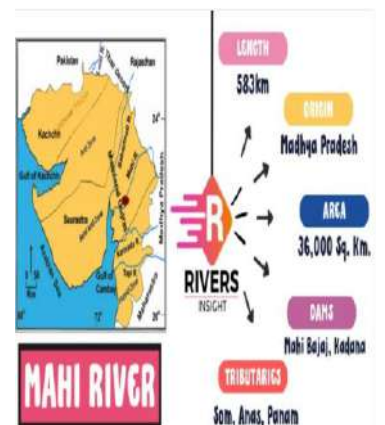
Taningia silasii

- Newly discovered deep-sea squid species from Arabian Sea (~390 m depth, off Kollam coast) by CMFRI.
- Belongs to family **Octopoteuthidae**; 2nd species in **Taningia** genus after *T. danae*.
- Size: ~45 cm (Atlantic relative grows up to 2.3 m, 61.4 kg).
- **No long feeding tentacles** – unique trait.
- Morphology: fewer **gill lamellae**; **oval funnel–mantle cartilage**; distinct **beak** with broadened lower wing.
- **11% genetic divergence** from *T. danae* (DNA barcoding).



Mahi River

- Major **west-flowing interstate river**: flows through **MP → Rajasthan → Gujarat**.
- Origin: **Vindhya Range**, MP (~500 m).
- Length: **583 km**; Drainage area: **34,842 sq km**.
- Makes a **U-shaped loop** in Rajasthan (Vagad/Banswara region).
- Drains into **Gulf of Khambhat** (Arabian Sea) via wide estuary.
- Bounded by: **Aravallis (N/NW)**, **Malwa Plateau (E)**, **Vindhya (S)**, **Gulf of Khambhat (W)**.
- Silt deposition → **thinning of Gulf of Khambhat**, decline of old ports.
- Riverbed low → **limited irrigation use**.
- Tributaries: **Som, Jakham, Anas, Panam, Eru, Nori, Chap, Moran, Bhadar**.
- Major project: **Mahi Bajaj Sagar Dam**.
- **Latest news:** Gambhira-Mujpur bridge collapse in Gujarat; vehicles fell into Mahi river, **11 deaths**.



Sukhna Wildlife Sanctuary

- **Chandigarh**, near **Sukhna Lake**; **Shivalik foothills**.
- **Established 1998, 2600 ha**; created via **afforestation** for soil conservation.
- **Unstable, erosion-prone** Shivalik sandy soil; **~150 water bodies**.
- **Habitats**: Forests, grasslands, wetlands.
- **Notable fauna**: **Sambar clusters (largest in India)**, wild boar, jackal, jungle cat, porcupine.
- **Birds**: Peacock, hill myna, drongo; migratory birds.
- **Latest news**: **9-day wildlife census** underway.

Eco-sensitive zone compromised for real estate



Sangai Festival

- **Manipur's annual festival** (started **2010**), named after **Sangai** (state animal).
- Showcases **culture, dance, music, indigenous arts**; **Ras Leela** is the highlight.
- **2025 theme**: *Where blossoms breathe harmony*.
- **Latest news**: Began amid **IDP and NGO protests** affecting attendance.

Sangai (Eld's Deer)

- **Endemic to Keibul Lamjao National Park**, Loktak Lake (phumdi).
- **Critically Endangered** (IUCN); **Schedule I** (WPA 1972).
- Medium-sized deer with **distinct long brow-tine antlers**; high cultural significance.



Sulphur Dioxide (SO₂)

- **Colorless, pungent gas**; dissolves easily in water.
- Used in **chemical manufacturing, paper pulping, metal/food processing**.
- Major sources: **Coal/oil burning, smelters, volcanoes**.
- Impacts: **Human health hazard, acid rain, air pollution, climate effects**.
- **Latest news**: 15 of 35 power units near Delhi lack **FGD systems**.



FGD (Flue Gas Desulphurisation)

- Removes **SO₂** from flue gases.
- Uses **limestone/lime/ammonia** for neutralization.

African Grey Parrot

- **Scientific Name:** *Psittacus erithacus*
- **Habitat:** West & Central Africa; rainforests, woodlands, savannahs, forest edges.
- **Features:** Medium-sized grey parrot; black bill; white facial mask; yellow eyes; red tail; strong mimicking ability.
- **Lifespan:** 50+ years
- **Conservation Status:** Endangered – IUCN
- **Threats:** Illegal pet trade, habitat loss.
- **Note:** No registered breeders/authorised sellers in India; highly trafficked species.



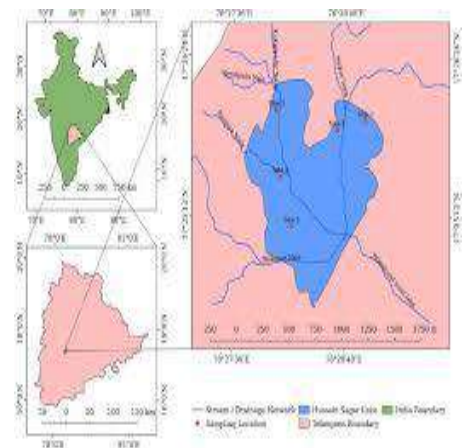
Moss

- **Division:** Bryophyta (non-vascular, spore-bearing land plants).
- **Age:** Among earliest land plants; existed since Permian period.
- **Species:** 10,000+ types; main groups – **peat moss**, **granite moss**, **true moss**.
- **Distribution:** Worldwide except saltwater; thrives in damp, shady habitats.
- **Reproduction:** By **spores** (not seeds).
- **Ecological Roles:**
 - Break down rock → release nutrients.
 - Prevent soil erosion.
 - Regulate water and nutrient cycles.
 - Indicators of **CO₂ pollution** and **acid rain**.
- **Latest News:** Scientists found moss can **survive prolonged space travel**.



Hussain Sagar Lake

- **Type:** Artificial lake, Hyderabad (Telangana).
- **Built:** 1562 by **Hussain Shah Wali** during **Ibrahim Quli Qutub Shah's** reign.
- **River System:** On a tributary of **River Musi**.
- **Area:** ~5.7 sq. km; one of Asia's largest man-made lakes.
- **Notable Feature:** Giant **monolithic Buddha statue** at the centre.
- **Other Names:** **Tank Bund**; historically linked Hyderabad & Secunderabad.



- **Unique Fact:** World's largest **heart-shaped mark** among natural/artificial heart-shaped lakes.
- **Past Use:** Drinking water + irrigation till 1930.
- **Current Issues:** Pollution from untreated sewage & industrial effluents; algal blooms; foul odour.
- **Latest News:** HMDA to use **advanced bioremediation** (enzyme solutions + **biochar Bokashi balls**) to clean the lake.

Limestone

- **Sedimentary CaCO_3 rock** (calcite/aragonite); may contain **dolomite** + minor clays/iron/quartz.
- Occurs from **Pre-Cambrian–Recent** (not in **Gondwana**).
- **India:** Largest in **Karnataka**, then **AP, Rajasthan, Gujarat, Meghalaya, Chhattisgarh**; major producers same six states.
- **Uses:** Cement (main), steel flux, glass/ceramics, chemicals, agriculture, chalk/paints/cosmetics.
- **News:** J&K launches **first limestone block auction**.



Exercise AUSINDEX

- **Bilateral naval exercise** between **India–Australia** (since **2015, biennial**).
- **Aim:** Enhance **interoperability** & deepen maritime strategic partnership.
- **2025 News:** **INS Sahyadri** took part in **AUSINDEX 2025** in the **Northern Pacific**.
- **Focus Areas:** Anti-submarine warfare, gunnery drills, advanced flying ops.
- **Partners (2025):** **INS Sahyadri** & **HMAS Ballarat**.
- **Other India–Australia Exercises:**
 - **AUSTRA HIND** (Army)
 - **Pitch Black** (Air exercise, multilateral)
 - **Malabar** (Naval, with US & Japan)
- **Quad** naval cooperation



Pazhayar River

- **Location:** Major river in **Kanniyakumari district**, Tamil Nadu.
- **Origin:** **Mahendragiri hills** (altitude ~800 m).
- **Course:** Flows **southwest**; joins **Arabian Sea** near **Manakudi**.
- **Length:** ~40 km.

- **Tributaries:** Alathurayar, Poigaiyar, Thadaveyar, Koya Odai, Ulakkaruviyar.
- **Dams:** Includes Chattuppythur, Chettothoppu, Cholanmkattu, Kutty, Kumari, Mission, Pallikondam, Pillaipetha, Salari, Veerapuli, Veeranarayanamangalam.
- **Ecology:** Manakudi Estuary—rich in mangroves, birds, marine life; ecologically sensitive.
- **Issue (2025):** Severe sewage discharge & pollution in Nagercoil stretch.



Auramine O

- **What it is:** Synthetic **yellow industrial dye** made from **dimethylaniline + formaldehyde**.
- **Appearance:** Yellow **flakes/powder**; easily soluble in solvents.
- **Food Use:** **Not permitted** as a food colour in India, EU, USA.
- **Industrial Uses:** Textiles, leather, printing inks, paper, microbiological **fluorescent staining**.
- **Health Impacts:** Causes **liver & kidney damage**, **spleen enlargement**, **mutagenic effects**, **possible carcinogen** (IARC: *possibly carcinogenic to humans*).
- **Global Regulation:** Treated strictly as an **industrial dye**; detection in food triggers **recalls & import alerts**.
- **Current Issue (India):** Rising cases of **chemical food adulteration** using Auramine O.



Capital Gains Account Scheme (CGAS), 1988

- **Purpose:** Helps taxpayers claim **exemption on long-term capital gains** when reinvestment is delayed.
- **Legal Basis:** **Section 54** (and related sections) of the Income Tax Act—reinvestment allowed within **3 years**.
- **Need for CGAS:** If reinvestment not possible before **ITR due date**, capital gains can be **temporarily deposited** in CGAS.
- **Eligibility:** Any taxpayer with **long-term capital gains**—**Individuals, HUFs, Companies, Trusts**.
- **Short-term CG:** **Not eligible** for CGAS exemption.
- **Use of Funds:** Must reinvest within stipulated time; otherwise becomes **taxable** in year of expiry.

Capital Gains Accounts (Second Amendment) Scheme, 2025

- **Expansion of Banks:** 19 major **private banks** (non-rural branches) authorised for CGAS deposits.
- **Non-rural branch:** Population **10,000+** (2011 Census).
- **Electronic Mode Defined:** Includes **UPI, IMPS, NEFT, RTGS, net banking, debit/credit cards, BHIM/Aadhaar Pay**, etc.

HAMMER Weapon System

- **Full Form:** **Highly Agile and Manoeuvrable Munition Extended Range (HAMMER)**.
- **Type:** **Air-to-ground precision-guided weapon**; also called a **glide bomb**.
- **Developer:** **Safran** (France).
- **Range:** Up to **70 km**.
- **Compatibility:** Fits **250 kg, 500 kg, 1,000 kg** standard bombs; used on **Rafale** and **LCA Tejas**.
- **Key Features:**
 - **Jamming-resistant**
 - **High accuracy**
 - **Modular design**
 - Can be launched from **low altitudes**
 - **Penetrates fortified targets**
 - **Difficult to intercept**
- **Latest News (2025):** **BEL + Safran** signed JV to **produce HAMMER in India**.



Precision-Guided Weapon

- Guided “**smart bombs**” designed to hit **point targets** with minimal collateral damage.
- Components: **Guidance system + payload + fins**.

Postojna Cave

- **Location:** Western **Slovenia**.
- **Length:** **~24 km**, formed by **Pivka River** over millions of years.
- **Geology:** **Limestone cave**; growth rate **~1 cm per 100 years**.
- **Discovery & Tourism:**
 - Officially discovered in **1800s**; graffiti dates to **1200s**.
 - Opened for tourists in **1819**.



- **Unique Feature:** Only karst cave with a railway (~140 years old).
- **Biodiversity:** Home to **Proteus anguinus** – blind, colorless, 30 cm amphibian with lungs & gills; feeds on snails and worms.
- **Scientific Research:** Used to study **stalagmite growth equations** (Poland, USA, Slovenia).

Abujhmadiya Tribe

- **Location:** Abujmarh region, Chhattisgarh
- **Classification:** Sub-group of Gond tribe; **Particularly Vulnerable Tribal Group (PVTG)**
- **Language:** Abuj Maria, Hindi, Chhattisgarhi
- **Culture & Beliefs:** Animism; worship of nature spirits; women value **Godana (tattoo) as permanent jewel**
- **Festivals:** Saja Festival (agriculture/nature), Bastar Dussehra
- **Economy:** Subsistence agriculture (rice, maize, pulses), hunting, fishing, forest produce
- **Social Structure:** Clan-based, patriarchal
- **Current Events:** Increasing participation in **Bastar Olympics**



Hoya dawodiensis

- **Type:** New plant species
- **Discovery:** Vijaynagar region, Changlang district, Arunachal Pradesh
- **Habitat:** Remote, biologically rich region; accessible only by air or multi-day trek
- **Genus Info (Hoya):** Tropical flowering plants, also called **wax plants** or **porcelain flowers**
- **Distribution:** Native to tropical/subtropical Asia, Australia, Pacific Islands; can be grown indoors elsewhere
- **Ecology:** Thrives in bright indirect light, well-draining soil, high humidity; waxy leaves help tolerate dry air
- **Significance:** Adds to Arunachal Pradesh's biodiversity and plant discoveries



Manchurian Walnut Tree

Type: Hardy deciduous tree, long-lived (up to 300 years)

Distribution: Manchuria (China), Korean Peninsula, Far East Russia

Soil & Climate: Well-drained fertile soil, neutral pH, extremely cold-resistant (up to -45°C)

Growth: Can reach 30 m; bears fruit at 7–10 years; fast growth (≈2 m/year for first 20 years)

Applications:

Medicinal: Analgesic, antifungal, antiparasitic uses

Food & Wood: Green fruits for jams; wood for furniture

- **Recent News:** Leaves show **weed-killing potential**



Cuban Gar

- **Scientific Name:** *Atractosteus tristoechus*; also called manjuarí
- **Family:** Lepisosteidae (gars, ~100 million years old)
- **Habitat:** Tropical freshwater and brackish water; lakes, rivers, tributaries, backwaters in western Cuba and Isla de la Juventud
- **Characteristics:**
 - Tolerates high ammonia/nitrate
 - Can breathe atmospheric air in low-oxygen water
 - Ambush predator: feeds on small fish and aquatic crustaceans
- **Threats:** Habitat loss, invasive species (African walking catfish)
- **Conservation Status:** Critically Endangered (IUCN)
- **Recent News:** Restoration efforts in **Cuba's Zapata Swamp**



Ningaloo Reef

- **Location:** Western Australia, East Indian Ocean coast
- **Type:** Fringing coral reef; **Australia's largest**
- **Size:** Extends 300 km; area ~50 sq.km
- **Biodiversity:**
 - ~250 corals (200 hard corals)
 - 500+ fish species
 - Mega fauna: manta rays, whale sharks, humpback whales, dugongs, sea turtles, potato cod
- **Significance:** Pristine, long, and narrow reef; supports temperate & tropical marine life
- **Tourism:** Popular for snorkeling & scuba diving
- **Conservation Status:** **UNESCO World Heritage Site**



Recent News: ~70% of corals have died in a recent survey

Arunachalesvara Temple

- **Location:** Base of Arunachala Hill, Tiruvannamalai, Tamil Nadu
- **Deity:** Lord Arunachalesvara (form of Shiva)
- **History:** Origin in ancient scriptures; current structure from **early Cholas (9th century AD)**; later expanded by **Cholas, Hoysalas, Vijayanagar Nayakas**
- **Architecture:** Dravidian style; **25-acre complex**; 4 main gateways (gopurams)
- **Rajagopuram:** Eastern side, **217 ft**, among tallest in India (built by Nayakas)
- **Other features:** **Nine gopurams** with intricate carvings; **thousand-pillar hall**
- **Recent News:** Encroachments removed for Karthigai Deepam festival road space



Aloe Vera

- **Scientific Name:** *Aloe barbadensis* Mill
- **Family:** Aloaceae
- **Type:** Succulent plant with thick, fleshy, water-storing leaves
- **Native Range:** Arid regions of Arabian Peninsula (Oman, Yemen, Saudi Arabia)
- **Cultivation:** Warm regions globally, including India, North Africa, Canary Islands, SW USA
- **Features:** Short stem, pointed green leaves; gel in leaves rich in **vitamins, minerals, antioxidants**
- **Uses:**
 - Medicinal: Antibacterial, antiviral, antiseptic; skin injury treatment
 - Environmental: Soil stabilization and erosion control in arid regions
- **Recent Finding:** Plant molecules may block enzymes linked to **Alzheimer's disease**



Grey Seal

- **Scientific Name/Family:** Large seal, family Phocidae
- **Other Names:** Atlantic seal, horsehead seal
- **Distribution:** Both shores of the **North Atlantic Ocean**, coastal areas mid-Atlantic to Baltic Sea
- **Habitat:** Coastal waters; land: rocky coasts, islands, sandbars, ice shelves, icebergs

- **Conservation Status:** IUCN – Least Concern
- **Appearance:** Males ~10 ft; females smaller; pups have white lanugo fur for warmth
- **Behavior:** Diurnal; exhibits **bottling** (vertical position in water)
- **Diet:** Carnivorous, mostly benthic/demersal fish
- **Lifespan:** 25–35 years
- **Recent Finding:** Seal milk contains **332 oligosaccharides**



Vitamin B12 (Cobalamin)

- **Type:** Water-soluble; stored in liver (2–5 yrs)
- **Functions:** Nerve health, RBC formation, DNA synthesis
- **Sources:** Animal foods; absent in unfortified plants
- **Deficiency Causes:** Vegetarian/vegan diet, age, digestive disorders, surgery
- **Symptoms:** Fatigue, nerve damage, anemia, skin changes

Tex-RAMPS Scheme

- **Full Name:** Textiles Focused Research, Assessment, Monitoring, Planning & Start-up (Tex-RAMPS) Scheme
- **Type:** Central Sector Scheme, fully funded by Ministry of Textiles
- **Outlay:** ₹305 crore (FY 2025-26 to FY 2030-31)
- **Purpose:** Strengthen research, data systems, innovation, and capacity in the textile sector
- **Key Components:**
 - **Research & Innovation:** Smart textiles, sustainability, process efficiency, emerging tech
 - **Data & Analytics:** Employment assessments, supply chain mapping, India-Size study
 - **ITSS:** Integrated Textiles Statistical System for real-time monitoring
 - **Capacity Development:** Workshops, best practices, sectoral events
- **Start-up Support:** Incubators, hackathons, academia-industry collaborations for textile start-ups