INSIGHTSIAS

SIMPLIFYING IAS EXAM PREPARATION

AFRICAN GREY PARROT

The African grey parrot (Psittacus erithacus) is a medium-sized, highly intelligent parrot considered the best mimic among all bird species, often called the “Einstein of the bird world.”

INSIGHTS CURRENT AFFAIRS

NOVEMBER 2025

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INSIDE

GENERAL STUDIES – 1

GENERAL STUDIES – 2

Topics: Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.

Topics: Important International institutions, agencies and fora, their structure, mandate.

GENERAL STUDIES – 3

Topics: Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment.

Topics: Inclusive growth and issues arising from it.

Topics: Major crops cropping patterns in various parts of the country, different types of irrigation and irrigation systems storage, transport and marketing of agricultural produce and issues and related constraints; e-technology in the aid of farmers.

Topics: Issues related to direct and indirect farm subsidies and minimum support prices; Public Distribution System- objectives, functioning, limitations, revamping; issues of buffer stocks and food security; Technology missions; economics of animal-rearing.

Topics: Infrastructure: Energy, Ports, Roads, Airports, Railways etc.

Topics: Science and Technology- developments and their applications and effects in everyday life Achievements of Indians in science & technology; indigenization of technology and developing new technology.

Topics: Awareness in the fields of IT, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights.

Topics: Conservation related issues, environmental pollution and degradation, environmental impact assessment.

GENERAL STUDIES – 2; FACTS FOR PRELIMS

FACTS FOR PRELIMS; GENERAL STUDIES – 3

Sports

Miscellaneous

Mapping

GENERAL STUDIES – 1

Topics: Social empowerment, communalism, regionalism & secularism.

DIGITAL DIVIDE ACROSS CASTE AND CLASS

Context:

A new MOSPI study (MIS 79th round) highlights deep digital divide patterns across caste, class, gender, and rural-urban lines in India.

About Digital Divide Across Caste and Class:

Trends & Data on Digital Divide:

- **Caste Divide**: Individuals without ICT skills — STs (89.49%), SCs (86.62%), OBCs (81.73%), Others (73.71%) — showing persistent caste-linked deprivation.
- **Gender Divide**: ICT skills nationally — Men (22.78%) vs Women (13.91%); in UP — Men (14.62%) vs Women (6.93%).
- **Class/Income Divide:** Access to a computer with internet — Poorest 20% (6.8%) vs Richest 20% (66.3%), a ten-fold gap.
- **Rural–Urban Divide:** ICT skills highly concentrated among urban households; rural areas face low device availability, poor infrastructure, and low digital exposure.
- **Schooling Divide:** Private ICSE/CBSE schools teach coding from Class 3; government schools often lack electricity or computers even in Class 8.

Factors Causing the Digital Divide:

1. **Caste-linked structural exclusion** leading to poor school infrastructure, fewer devices, and delayed ICT introduction in public schools.
2. **Income disparity & consumption inequality** restricting access to digital devices, internet, and home learning environments.
3. **Rural infrastructural gaps**—poor electricity, weak broadband, and resource-starved schools in rural/semi-rural India.
4. **Weak training ecosystem** with low-quality skilling centres, limited formal training, and reliance on informal apprenticeships.
5. **Educational inequalities**—urban private schools provide early ICT training; government schools lack basic labs and trained teachers.
6. **Household digital literacy deficit**—first-generation learners receive little parental support for ICT learning.
7. **Institutional apathy**—Dalit-majority settlements receive weaker investment, low-quality schools, and delayed digital infrastructure.

Implications of the Digital Divide:

1. **Unequal access to jobs**—ICT skills strongly correlate with regular salaried employment; marginalised groups remain trapped in low-wage work.
2. **Weak participation in digital economy** despite smartphone ownership; "ownership ≠ capability" leads to under-utilisation of digital tools.
3. **Widening caste and class inequality** as better-off groups move ahead in digital skilling, compounding historical disadvantages.
4. **Low productivity and poor competitiveness** due to limited availability of digitally skilled workers in rural and low-income regions.
5. **Gender exclusion from future-ready jobs**, restricting women's mobility, income, and professional participation.
6. **Intergenerational disadvantage**, as children from marginalised groups remain several steps behind even when they enter higher education.

Challenges in Eradicating the Digital Divide:

1. **Persistent structural caste discrimination** affecting quality of schooling, access to devices, and public investment.
2. **Resource constraints in government schools**, including lack of computers, trained ICT teachers, and stable electricity.

3. **Low digital capability despite high smartphone ownership**, with very limited hands-on digital learning opportunities.
4. **Fragmented skilling ecosystem** lacking baseline assessments, outcome evaluation, and alignment with labour market needs.
5. **Uneven public expenditure**—ICT projects often bypass backward regions or are implemented poorly.
6. **Data limitations**—current surveys offer static snapshots and fail to track long-term, generational disadvantage.

Way Ahead:

1. **Bridge school-level digital gaps** by universalising computer labs, trained ICT faculty, and reliable electricity in government schools.
2. **Introduce digital skilling early** in government and rural schools to match the exposure enjoyed by private schools.
3. **Targeted digital inclusion for SC/ST, OBC, and women** through scholarships, community digital centres, and device subsidies.
4. **Strengthen formal skilling infrastructure** with industry-linked courses, evaluation systems, and rural training hubs.
5. **Develop digital public infrastructure for skilling**—open-source learning platforms in regional languages with hands-on content.
6. **Track digital inequality longitudinally** via continuous MIS rounds to capture generational changes and policy impact.
7. **Promote home-based digital capability** by supporting shared devices, low-cost laptops, and community learning models.

Conclusion:

India's digital transformation risks becoming exclusionary unless structural caste, class, and rural barriers are actively dismantled. A combination of inclusive schooling, targeted skilling, and equitable public investment is essential to ensure that technology becomes a bridge, not a barrier, for India's marginalised communities.

Topics: Distribution of key natural resources across the world (including South Asia and the Indian subcontinent)

STRATEGIC VULNERABILITIES OF GLOBAL CRITICAL MINERAL SUPPLY CHAINS

Context: Recent supply disruptions—especially China's export restrictions on antimony, a key input for semiconductors and defence systems—have highlighted the strategic vulnerabilities of global critical mineral supply chains.

About Strategic Vulnerabilities of Global Critical Mineral Supply Chains:

What are Critical Minerals?

- Critical minerals are **strategic, non-fuel mineral resources** essential for high-tech manufacturing, clean energy, semiconductors, defence systems, and advanced electronics, whose supply chains face **high risk of disruption**.
- They include **lithium, cobalt, nickel, antimony, rare earth elements, graphite, gallium**, etc., and are vital for national security, green transition and advanced technology industries.

Why Critical Minerals are Important?

Energy Transition: Required for solar panels, lithium-ion batteries, EVs, wind turbines and hydrogen technologies.

National Security: Crucial for missiles, jet systems, radar, telecom, semiconductors and high-energy defence systems.

Economic Competitiveness: Countries controlling mineral supply chains dominate future industries (AI, robotics, clean tech, electronics).

Strategic Autonomy: Reduces dependence on

single suppliers like China, enhancing national and industrial resilience.

Trends in Critical Mineral Geopolitics:

- **Export Controls Rising:** China restricted exports of antimony, gallium and germanium; Russia tightened control of palladium; Indonesia banned nickel ore exports.
- **Surging Demand:** EV and renewable energy boom has pushed global demand for critical minerals up by over 300% in a decade (IEA 2024).
- **Price Volatility:** Antimony prices surged nearly 10x after China's 2024 restrictions, revealing fragile supply chains.
- **Allied Coordination:** U.S.–Australia, EU–Canada and Quad are forming mineral alliances for secure supply.
- **Shift to Mineral-specific Strategies:** Countries increasingly mapping **each mineral's** supply bottlenecks (DARPA-supported Critical Minerals Forum).

Challenges to Critical Mineral Security:

- **Geopolitical Concentration:** China, Russia, Tajikistan and DRC dominate mining and processing of many minerals, creating single-supplier dependence.
- **Underinvestment in Mining:** Low prices for decades discouraged exploration and production; mining capacity lags behind rising demand.
- **Environmental & Social Risks:** Mining often causes pollution, land conflict and ecosystem damage, making expansion politically sensitive.
- **Opaque Supply Chains:** Hidden subsidies, unregulated artisanal mining, and monopolistic price manipulation distort markets.
- **Slow Permitting Processes:** U.S. and EU mining approvals take 7–10 years, delaying domestic production.
- **Refining–Mining Mismatch:** Refining capacity exists, but raw ore supply (mining) is the bottleneck for minerals like antimony.

Initiatives Taken:

- **Global:**
  - **U.S. Executive Order on Mineral Security:** Faster permitting, stockpiling, and domestic mining support.
  - **UK Critical Minerals Strategy:** Mapping vulnerabilities and supply partnerships.
  - **Allied Frameworks:** U.S.–Australia, EU–Canada, Japan–EU, Quad collaboration on rare earths and battery minerals.
- **India:**
  - **Critical Minerals List (2023):** Identified 30 minerals essential for strategic sectors.
  - **National Mineral Exploration Trust (NMET):** Boosting exploration funding.
  - **KABIL Joint Venture:** Securing mineral assets abroad (Argentina, Australia, Chile).
  - **PLI Schemes:** Supporting battery manufacturing, solar PV, and EV ecosystem to reduce import dependence.

Way Forward (Recommendations):

- **Mineral-Specific Strategies:** Avoid one-size-fits-all; customise policy by mineral (antimony, lithium, gallium, etc.).
- **Long-term Offtake Agreements:** Provide price stability to producers and reduce dependence on volatile spot markets.
- **Allied Supply Chains:** India, U.S., EU, Japan, Australia must build "trusted mineral corridors" and joint reserves.
- **Expanding Ethical Mining:** Strengthen standards, improve transparency and support ESG-compliant mining.
- **Accelerate Domestic Exploration:** Fast-track permits, use AI/remote sensing, and incentivise private-sector mining.
- **Invest in Refining & Recycling:** Boost processing capacity and develop circular economy systems for lithium, cobalt and rare earths.
- **Strategic Stockpiles:** Build national reserves of key minerals like germanium, gallium, antimony, cobalt and nickel.

Conclusion:

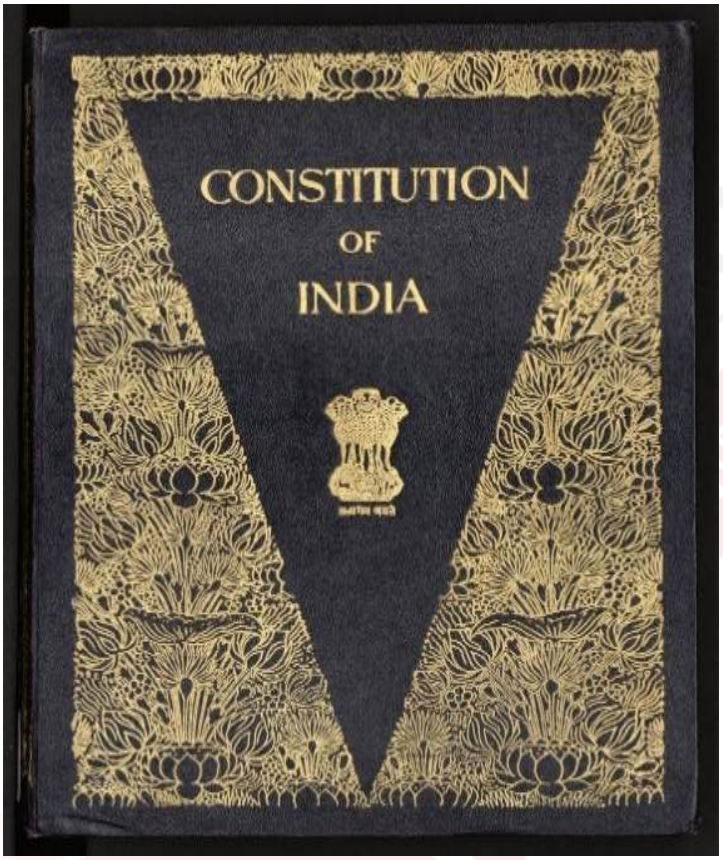
Critical minerals are now at the heart of geopolitical competition, industrial competitiveness and national security. Countries that secure reliable mineral supply chains will lead the clean-tech and defence industries of the future. India must adopt a proactive, diversified and cooperative strategy to avoid future vulnerabilities and ensure economic and strategic resilience.

GENERAL STUDIES – 2

Topics: Indian Constitution- historical underpinnings, evolution, features, amendments, significant provisions and basic structure; Comparison of the Indian constitutional scheme with that of other countries.

INDIAN CONSTITUTION AT 76: WHY IT STILL OUTPACES WESTERN MODELS

Context: India marks the 76th anniversary of the adoption of the Constitution, prompting renewed reflection on its evolution and contemporary relevance.



About Indian Constitution at 76: Why It Still Outpaces Western Models

Indian Constitution Ahead of Its Time:

- India adopted universal adult franchise in 1950 when countries like the US and Australia still denied voting rights to many communities.
- It confronted caste hierarchy from the outset through Articles 15(2), 17 and 23 which targeted discrimination, untouchability and bonded labour in both state and private domains.
- The Constitution institutionalised affirmative action in 1950 for Scheduled Castes and Scheduled Tribes which was decades earlier than affirmative action frameworks in the US or South Africa.
- It recognised that social power in India did not lie only with the state but also with communities, caste groups and local hierarchies which required constitutional checks.

Indian Constitution vs Western Constitutional Models:

- Western constitutions mainly restrict state power while India expanded constitutional rights to shield citizens from societal oppression, especially caste-based exclusion.
- Western models rarely included group-differentiated protections at the founding stage while India guaranteed minority cultural and educational rights through Articles 29 and 30.
- Many Western democracies incorporated anti-discrimination protections later in the 1960s and 1970s while India embedded them in the original text through Articles 14 to 17.
- Unlike rigid liberal constitutions, India combined liberal rights with a transformative agenda of social reform through Directive Principles, affirmative action and state-led socio-economic restructuring.

Evolution of the Constitution Since 1950:

- The Supreme Court expanded the meaning of Article 21 into a cluster of rights including privacy (Puttaswamy), environment (Subhash Kumar), education (Mohini Jain) and legal aid (Hussainara Khatoon).
- The Basic Structure Doctrine created in 1973 through Kesavananda Bharati protected democracy, secularism, judicial review and federalism from arbitrary amendment.
- Social justice provisions evolved through the Mandal reforms, 77th and 103rd Constitutional Amendments and ongoing debates on sub-categorisation of OBCs.
- Expansion of minority rights, disability rights, transgender rights and privacy rights emerged through progressive judicial interpretation.
- Federalism strengthened through GST Council jurisprudence, Sarkaria and Punchhi Commission inputs and cooperative-federal mechanisms after economic liberalisation.

Key Challenges to the Indian Constitution Today:

- Caste discrimination, manual scavenging and residential segregation remain prevalent despite constitutional abolitions and anti-atrocity laws.
- Consolidation of executive power risks weakening independent institutions such as the Election Commission, CVC, CBI and regulatory bodies.
- Emergency-era provisions and broad preventive detention powers still allow the state significant coercive authority.
- Balancing religious freedom with gender justice remains difficult as seen in debates around personal laws, Sabarimala and triple talaq.
- Growing digital surveillance, algorithmic decision-making and weak data protection frameworks create new threats to privacy and civil liberties.
- Rising majoritarian narratives challenge the plural ethos that Articles 25 to 30 were designed to uphold.

Way Ahead:

- Strengthen autonomy of constitutional institutions through transparent appointments, fixed tenures and independent funding norms.
- Expand constitutional literacy movements through NCERT revisions, university modules, digital platforms and Constitution Clubs in schools.
- Update privacy, data protection and algorithmic accountability laws in alignment with evolving interpretations of Article 21.
- Implement stronger anti-discrimination laws covering housing, employment and algorithmic bias along with targeted caste-equity audits.
- Promote participatory federalism in which States play a central role in digital governance, climate policy and welfare delivery.
- Expand minority-rights jurisprudence and reinforce linguistic and cultural protections in the face of homogenising pressures.

Conclusion:

India's Constitution was a transformative project that imagined equality in a deeply unequal society. Its endurance reflects both its visionary design and the institutions that constantly reinterpret it. As India moves toward 2047, constitutional morality, pluralism and social justice must remain the compass for national progress.

STRENGTHENING LEGAL AID MECHANISM IN INDIA

Context: Prime Minister of India, at the National Conference on Strengthening Legal Aid Delivery Mechanisms, emphasized ensuring "ease of justice" through accessible, affordable, and inclusive legal services for all citizens.

About Strengthening Legal Aid Mechanism in India:

- ***What it is?***
  - Legal aid refers to **free legal assistance** provided to those unable to afford legal representation, ensuring equality before the law.
- **Launched in:** Institutionalized through the **Legal Services Authorities Act, 1987** (implemented in **1995**) under the guidance of **Justice V.R. Krishna Iyer**.
- **Aim:** To ensure that no person is denied justice due to economic or social disadvantage, as envisioned in Article 39A of the Constitution.
- **Key Features:**
  - Free legal representation in courts for economically weaker sections (EWS) and marginalized groups.
  - Provision of legal advice, mediation, and awareness through National (NALSA), State, and District Legal Services Authorities (DLSA).
  - Integration with digital platforms such as Tele-Law and Nyaya Bandhu for remote legal access.
  - Legal literacy programs through universities, NGOs, and paralegal volunteers across rural India.

Need for a Strong Legal Aid Mechanism in India

1. **Access to Justice:** Around **70% of India's population** lives in rural areas where legal

infrastructure is sparse, making affordable access to justice crucial for equality before law.

2. **Backlog Reduction:** India has over **4.5 crore pending cases** (as of 2025); community-based legal aid and mediation could reduce pendency by **30–35%** in civil and family disputes.
3. **Social Inclusion:** Over **80% of undertrial prisoners** come from economically weaker backgrounds—legal aid ensures representation for **women, SC/ST, minorities**, and marginalized citizens.
4. **Legal Awareness:** According to **NALSA (2024)**, only **1 in 5 eligible citizens** are aware of free legal aid rights—grassroots legal literacy can bridge this awareness gap.
5. **Constitutional Mandate:** **Article 39A** of the Constitution directs the State to provide free legal aid to promote **social, economic, and political justice** as part of the welfare model.

Initiatives Taken So Far:

1. **NALSA and DLSAs:** A four-tier legal aid network (national to taluk) has handled over 8 lakh cases in the last three years, ensuring justice at the doorstep.
2. **Tele-Law Services:** Operational in 1.3 lakh Common Service Centres, this initiative has provided over 45 lakh free legal consultations since its launch in 2017.
3. **Nyaya Bandhu Platform:** A Ministry of Law initiative (2019) connecting 11,000+ pro bono advocates with low-income litigants for representation in court.
4. **Community Mediation (Mediation Act, 2023):** Introduced structured mediation mechanisms—aiming to settle 70% of petty civil and family disputes outside courts.
5. **Translation of Judgments:** Over 80,000 Supreme Court and High Court judgments translated into 18 Indian languages via the e-Courts Mission Mode Project.
6. **Legal Awareness Drives:** 2,500+ legal literacy camps organized by law universities and NGOs under NALSA's Pan-India Awareness Campaign (2024).

Challenges Associated:

- **Low Awareness:** Nearly **75% of rural citizens** remain unaware of their entitlement to free legal aid under the Legal Services Authorities Act, 1987.
- **Quality of Representation:** Only **20% of empanelled legal aid lawyers** undergo formal capacity training, leading to inconsistent service quality.
- **Infrastructure Gaps:** Around **40% of district courts** lack dedicated legal aid clinics or mediation centers, especially in northeastern and tribal regions.
- **Digital Divide:** Poor digital literacy and limited internet coverage in **25% of rural areas** limit the reach of Tele-Law and online grievance systems.
- **High Case Pendency:** Average case disposal time exceeds **6 years** in lower courts; inadequate manpower and procedural delays add to congestion.

Way Ahead:

- **Institutional Strengthening:** Increase NALSA and DLSA funding by 25%, ensuring district-level legal aid centers with trained paralegal staff.
- **Professional Quality Standards:** Introduce mandatory certification and continuous legal education for all empanelled legal aid lawyers.
- **Digital Legal Infrastructure:** Expand AI-driven translation, e-filing, and mobile legal helpdesks for faster case management and inclusivity.
- **Grassroots Legal Literacy:** Integrate legal literacy modules in NEP 2020 curriculum and panchayat-level awareness campaigns.
- **Collaborative Frameworks:** Partner with law universities, bar councils, and private firms to expand pro bono networks and mediation facilities.

Conclusion:

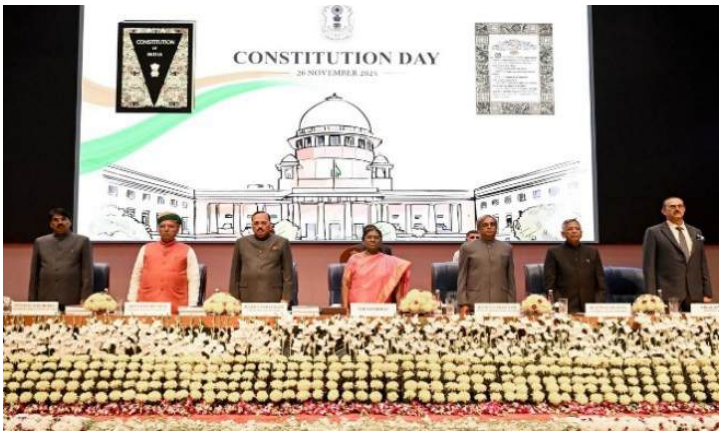
Legal aid is the bedrock of democratic justice, not a welfare gesture. Strengthening it through technology, awareness, and institutional reforms will ensure that justice in India is not a privilege of the few, but a right for all—aligning with the vision of Viksit Bharat 2047 and true social equity.

Topics: Separation of powers between various organs dispute redressal mechanisms and institutions.

CJI CALLS FOR NATIONAL JUDICIAL POLICY

Context: Chief Justice of India (CJI) Surya Kant has

called for a uniform national judicial policy to reduce inconsistent rulings across High Courts and Supreme Court Benches.



About CJI Calls for National Judicial Policy:

What It Is?

A national judicial policy would act as a common guiding framework for all courts to follow uniform standards. It aims to bring consistent interpretation of laws across 25 High Courts and SC Benches. Helps courts speak in "one rhythm" on major constitutional and legal issues.

Need For Consistent National Judicial Policy:

- **Divergent Interpretations:** Different High Courts often given conflicting rulings, creating confusion for citizens and institutions.
- **Multiple SC Benches Differ:** Inconsistent orders from separate Benches reduce certainty in national policies and governance.
- **Heavy Pendency:** With 5.4 crore pending cases, standardised case management is essential across all tiers of judiciary.
- **Barriers to Justice:** High costs, language gaps, long distances and delays prevent marginalised groups from accessing courts.
- **Uneven Infrastructure:** Court facilities, technology and staffing vary widely between states, affecting equal justice.
- **Need for Judicial Harmony:** A unified approach ensures courts follow the same constitutional principles while acting independently

Initiatives Taken:

- **Mediation Promotion:** The judiciary is pushing structured mediation and training to reduce litigation and settle disputes faster.
- **Digital Justice Tools:** Courts now use e-filing, virtual hearings, transcripts and multilingual digital platforms to improve access.
- **Strengthening Arbitration:** India has upgraded arbitration centres and aligned procedures with global best practices.
- **International Cooperation:** Judicial exchanges help courts learn modern practices and improve cross-border legal coordination.
- **Focus on Infrastructure:** Emphasis is on modern court complexes, better staffing and technological upgrades to reduce delays.

Challenges Associated:

- **Federal Structure Complexity:** Diverse state laws, languages and local practices make it difficult to enforce a uniform judicial system across India.
  Eg: Madras High Court in 2024 rejected Tamil Nadu's proposal to use Tamil in proceedings, insisting English remain the sole court language.
- **Judicial Independence Concerns:** A national policy must not dilute High Courts' constitutional autonomy under Articles 226/225 or allow executive overreach.
  Eg: SC struck down parts of the Tribunal Reforms Act (2021) for undermining judicial independence in appointments and tenure.
- **Infrastructure Gaps:** Uneven infrastructure—poor connectivity, lack of staff, basic facilities—makes uniform digital and procedural standards impossible.
  Eg: 2025 Satgawan (Jharkhand) reported frequent internet collapse; 26% courts still lack ladies' toilets and many have no power backup.
- **Judge Shortage:** Massive vacancies and overwhelming caseloads make it impossible to achieve uniform timelines, case-flow management or speedy disposal.
  Eg: Allahabad HC in 2025 ran with nearly 50% vacancies, leaving single judges hearing 80–100 cases per day.
- **Resistance to Change:** Lawyers and court staff often oppose sweeping reforms—especially digital ones—implemented without training or support systems.
  Eg: Thoothukudi and Puducherry lawyers boycotted courts in 2023 over mandatory e-filing, citing lack of training and infrastructure.
- **Digital Divide:** Technology-heavy reforms risk excluding rural and marginalised populations who lack devices, literacy, or stable data access.
  Eg: A WebEx glitch delayed Delhi HC proceedings by 45 minutes, while SC/ST communities in Kurnool lacked basic devices for virtual hearings.

Way Forward:

- **Draft a National Judicial Policy:** SC, HCs and Law Ministry must jointly create a framework balancing uniformity and autonomy.
- **Harmonise Court Procedures:** Standard rules on listing, case timelines, precedents and documentation can reduce divergence.
- **Strengthen Lower Judiciary:** More judges, staff, training and infrastructure are essential for uniform justice at the grassroots.
- **Expand Tech Access:** Digital platforms must be inclusive, secure, multilingual and accessible even in remote districts.
- **Scale Up ADR & Mediation:** Mandatory pre-litigation mediation can significantly reduce the court burden and ensure faster relief.
- **Higher Coordination:** Regular judicial conferences and structured communication will align SC and HC approaches.

Conclusion:

A national judicial policy can bring clarity, predictability and fairness across India's justice system. By harmonising judicial behaviour and improving access, it strengthens citizens' trust in courts. As the CJI noted, constitutional rights gain meaning only when justice is timely, consistent and accessible to all.

SUPREME COURT STRUCK DOWN KEY PROVISIONS OF THE TRIBUNAL REFORMS ACT, 2021

Context: The Supreme Court struck down key provisions of the Tribunal Reforms Act, 2021 as unconstitutional for violating judicial independence and the doctrine of separation of powers.

- The Court also directed the Union Government to establish a National Tribunal Commission within four months and restored the earlier safeguards laid down in the **Madras Bar Association (MBA) IV & V judgments**.

About Supreme Court struck down key provisions of the Tribunal Reforms Act, 2021:

What is the Tribunal Reforms Act, 2021?

- Enacted on 13 August 2021, it sought to restructure and rationalise the tribunal system by abolishing several appellate tribunals and consolidating provisions on appointments, tenure and service conditions of tribunal members.
- It replaced the Tribunal Reforms Ordinance, 2021 and became the primary statute governing many central tribunals.

Aims of the Act:

- To reduce delay by shifting many appellate functions from tribunals to High Courts.
- To standardise appointments and service conditions across tribunals.
- To enhance administrative efficiency and accountability by giving the Centre a more central role in managing tribunals.

Key Features:

- **Abolition of Tribunals**: Dissolved bodies like the Film Certification Appellate Tribunal, Intellectual Property Appellate Board, Airport Appellate Tribunal, etc., transferring their jurisdiction to High Courts / other courts.
- **Centralised Appointments**: Chairpersons and Members to be appointed by the Central Government on recommendation of a Search-cum-Selection Committee chaired by the CJI or nominee.
- **Tenure & Age**:
  - Chairperson – 4-year term or till 70 years (whichever earlier).
  - Members – 4-year term or till 67 years.
  - Minimum age for appointment fixed at **50 years**, excluding younger practitioners.
- **Executive Rule-Making Power**: Centre empowered to frame rules on salaries, allowances and service conditions and to amend the Schedule (list of tribunals) by notification.
- **Transitional Provisions**: On abolition, members ceased office; pending cases shifted to High Courts/other courts.

Supreme Court Judgment On The Act (2025):

- The Court held that the Act violates constitutional principles of separation of powers and judicial independence and amounts to an impermissible

"legislative override" of binding Supreme Court decisions (especially MBA IV & V).

- It struck down the impugned provisions that:
  - Re-introduced a **4-year tenure**,
  - Imposed **minimum age 50 years**,
  - Allowed a panel of two names per vacancy for the government to choose from,
  - Tied service conditions to equivalent civil servants.

Key Reasoning:

- Parliament cannot re-enact, in slightly altered form, provisions already struck down, without curing the underlying constitutional defects.
- Judicial directions on minimum tenure, eligibility of advocates with 10 years' practice, composition and role of selection committees are not "abstract principles" but constitutional requirements flowing from Articles 323A–323B, Article 14 and the basic structure (judicial independence).
- The Act tried to restore executive dominance over tribunals where the Union is often the largest litigant, undermining institutional autonomy.

Directions Issued:

- **National Tribunal Commission** to be constituted within **4 months** as an "essential structural safeguard" for tribunal independence, appointments, administration and oversight.
- Till a new law consistent with earlier judgments is enacted, directions in Madras Bar Association (MBA IV & V) on tenure, eligibility, age limits, and composition of selection committees will continue to govern.
- Appointments already made pursuant to selections completed before the Act came into force are protected and governed by the parent statutes and MBA IV & V, not by the truncated tenure in the Act.

Arguments In Favour of the Tribunal Reforms Act:

1. **Streamlining & Rationalisation:** Supporters argued that abolishing small, under-utilised tribunals and shifting work to High Courts would reduce fragmentation and improve consistency of judicial review.
2. **Uniformity & Administrative Clarity:** A single law with common rules on appointments and service conditions was projected as bringing predictability and uniform standards across multiple tribunals.
3. **Executive Efficiency in Appointments:** Greater Central control was justified on grounds of speed and coordination—a single nodal authority supposedly prevents delays caused by multiple ministries and bodies.
4. **Experience-Based Age Threshold:** The 50-year minimum age was defended as ensuring that only mature, experienced candidates (often retired judges/bureaucrats) preside over complex technical disputes.
5. **Shorter, Fixed Tenure:** A 4-year tenure was portrayed as enabling performance review and rotation, preventing tribunals from becoming a "permanent sinecure" for select individuals.

Arguments Against the Tribunal Reforms Act:

1. **Violation of Judicial Independence:** Short 4-year tenures and heavy executive control over re-appointments were seen as creating dependence on the government, especially when the Union is a key litigant before these bodies.
2. **Re-Enactment of Struck-Down Provisions:** The Act brought back, in tweaked language, the same tenure and age rules already invalidated in MBA IV & V, amounting to a direct challenge to the Court's authority.
3. **Exclusion of Younger Talent:** The 50-year age bar blocks capable lawyers and domain experts in their 40s, weakening diversity and dynamism in tribunal composition.
4. **Executive Dominance in Appointments & Service Conditions:** Giving the Centre a decisive say in appointments, service rules, salaries and allowances undermines the arm's-length distance required for neutral adjudication.
5. **Burdening High Courts, Weakening Specialisation:** Abolishing specialised tribunals and offloading cases to already overburdened High Courts was criticised as hurting access to justice and diluting technical expertise.

Way Ahead:

1. **Enact a Fresh, Constitution-Compliant Tribunal Law:** Parliament should legislate in line with MBA IV & V and the 2025 judgment—ensuring minimum **5-year tenure**, reasonable age limits, and security of service.

2. **Establish and Empower National Tribunal Commission:** The proposed Commission must handle appointments, evaluation, infrastructure and administration of all tribunals, insulating them from day-to-day ministerial control.
3. **Balance Between Specialisation and Court Oversight:** Maintain core specialised tribunals where technical expertise is crucial, while ensuring High Courts retain judicial supervision through appeals/judicial review.
4. **Transparent, Merit-Based Appointments:** Clear criteria, public notifications, short-lists, and reasoned decisions by selection committees can enhance legitimacy and public trust.
5. **Strengthen Infrastructure & Digital Systems:** Better staffing, digital case management, and timelines will make tribunals genuinely effective forums for speedy and specialised justice.

Conclusion:

The Supreme Court's verdict re-asserts that tribunal reform cannot be used as a backdoor to expand executive control over adjudication. By striking down the 2021 Act, the Court has reaffirmed constitutional supremacy and the centrality of judicial independence in our institutional design. Going forward, a robust National Tribunal Commission and a fresh, constitutionally aligned statute can turn tribunals into genuine instruments of speedy, specialised and impartial justice.

INDIAN LOWER JUDICIARY

Context: A Supreme Court Constitution Bench recently linked stagnation in the subordinate judiciary to massive pendency and procedural inefficiencies, with 4.69 crore cases pending in district courts.

About Indian Lower Judiciary:

Governance Structure:

- **Constitutional Basis:** Articles **233–237** assign recruitment, appointment, control, and administrative supervision of the subordinate judiciary jointly to High Courts and State Governments, ensuring federal balance in judicial governance.
- **Three-Tier Subordinate Court System:**
  - **District & Sessions Courts** exercise both civil and criminal jurisdiction, functioning as the highest trial courts in a district under a District Judge who supervises all subordinate judicial work.
  - **Senior Civil Judge / Chief Judicial Magistrate** courts handle mid-level civil disputes and serious criminal cases, forming the backbone of intermediate adjudication.
  - **Civil Judge (Junior Division) / Judicial Magistrate First Class** deal with lower-value civil suits and routine criminal cases, forming the first point of contact for most litigants.
- **Administrative Control:**
  - High Courts oversee inspections, postings, promotions, discipline and ensure uniform judicial standards across districts.
  - State Governments manage court buildings, financial outlays, personnel support, and help conduct judicial service exams through PSCs.
- **Recruitment Pathways:**
  - **Lower Judicial Service** recruits fresh law graduates (0–7 years' experience) who start as Civil Judges and grow through departmental exams.
  - **Higher Judicial Service** recruits experienced advocates (7+ years at the bar) directly as District Judges to infuse professional experience into higher trial courts.

Trends in the Lower Judiciary:

- **Massive Pendency:**
  - With **4.69 crore cases pending**, the district judiciary handles nearly 90% of India's total caseload, creating structural stress on disposal capacity.

- **Vacancies & Capacity Gap:**
  - Against a sanctioned strength of 25,843 judges, only 21,122 are working, leaving a persistent **18.3% vacancy** that cripples disposal rates.
  - India has only **21 judges per million** people despite the Law Commission's recommendation of 50 per million—one of the lowest ratios globally.
- **Rising Litigation Load:**
  - Each district judge handles nearly **1,000–1,500 new filings annually**, apart from a large backlog, overwhelming their working bandwidth.
  - With **77% of India's total pendency** lying in subordinate courts, systemic pressure remains concentrated at the foundational tier.
- **Digital Trends:**
  - Digitisation of **506 crore pages** and **3.65 crore VC hearings** show progress, but uneven adoption limits full transformation.
  - Only **21 Virtual Courts** across 17 States indicate slow scaling of technology-driven adjudication.
- **Case Disposal Time:**
  - Civil disputes take **5–10 years** on average, while land cases stretch to **20–30 years**, eroding public faith in justice.
  - Criminal trials suffer from **42% adjournment rates**, delaying convictions and enabling systemic abuse.

Initiatives Taken:

1. **National Mission for Justice Delivery & Legal Reforms:** Aims at reducing arrears through coordinated procedural reforms, improved infrastructure, and enhanced accountability across judicial tiers.
2. **Judicial Infrastructure Expansion:** Court halls increased to 22,372 and residential units to 19,851, funded by over ₹12,101 crore under the Centrally Sponsored Scheme.
3. **e-Courts Mission Mode Project (Phase III):** Enabled IT upgradation in 18,735 courts, WAN connectivity, AI-driven tools, and 1,814 e-Sewa Kendras to enhance citizen access.
4. **Fast Track Courts & Special Mechanisms:** 865 FTCs and 725 FTSC/POCSO courts handled over 3.34 lakh cases, prioritising crimes against women, children, and vulnerable groups.
5. **Legislative Reforms:** Amendments to NI Act, Commercial Courts Act, Arbitration Act, and the Mediation Act streamline pre-trial stages and promote faster settlements.

Key Problems in Subordinate Courts:

- **Structural & Procedural Overload:** Judges spend nearly **two hours daily** on clerical work like calling cases and processing summons, reducing effective time for trials and judgments.
- **Inexperienced Judicial Officers:** Many new judges enter without courtroom exposure, producing weak orders; SC observed **"lack of basic knowledge"** among some recruits.
- **Archaic CPC & Procedural Bottlenecks:** Multi-stage decrees, 106 rules under Order XXI, and mandatory pre-suit mediation create avoidable delays and are exploited by litigants.
- **Infrastructure & Human Resource Gaps:** Persistent judge vacancies, lack of stenographers, outdated record rooms, and unstable connectivity hinder efficient case handling.
- **Legislative Ambiguities Increasing Litigation:** New Rent Act ambiguities and unavoidable cooling-off periods in mutual divorce petitions cause unnecessary filings and procedural congestion.
- **Execution Delays:** Since **70% of civil cases are delayed in execution**, decrees take **3–7 years** to materialise, making justice ineffective despite judgments.

Way Ahead:

- **Dedicated "Ministerial Courts":** A specialised process court in each district can handle filings, summons, and ex-parte evidence, freeing core courts for substantive hearings.
- **Mandatory Apprenticeship for New Judges:** A **6–12-month High Court attachment** will train new judges in drafting, order-writing, and courtroom culture before independent posting.
- **Deep Reforms in CPC Execution:** Merging decree stages, compulsory asset disclosure, and digital execution portals can cut years of procedural delay.
- **AI-Based Case Triage & Listing:** AI can prioritise old cases, track adjournment misuse, create smart cause lists, and significantly reduce human-driven inefficiencies.
- **Human Resource Expansion:** India urgently requires **10,000+ additional judges** to meet

even minimum ratios and ensure timely case disposal at the district level.

- **Legislative Simplification:** Removing mandatory mediation timelines, rationalising cooling-off periods, and clarifying rent laws can unclog courts at the entry stage.

Conclusion:

India's lower judiciary is the backbone of justice delivery, yet it remains overburdened by archaic procedures, staffing shortages, and structural inefficiencies. Without deep procedural reform, modern digital management, and a professionalised subordinate bench, pendency cannot decline. A data-driven, technology-enabled model is now essential to restore public trust and ensure timely justice at the grassroots.

Topics: Salient features of the Representation of People's Act.

MODEL CODE OF CONDUCT (MCC)

Context: The Model Code of Conduct (MCC) has resurfaced in debate after alleged violations during the Bihar elections, where welfare cash disbursals under a newly launched scheme coincided with polling dates — raising questions about fairness and electoral ethics.

About Model Code of Conduct (MCC):

- **What it is?**
  - A set of guidelines issued by the Election Commission of India (ECI) to ensure free, fair, and ethical elections by regulating political conduct during polls.
- **Objective:** To maintain a **level playing field** among political parties and prevent misuse of official machinery for electoral advantage.
- **History of the Model Code of Conduct (MCC)**
  - **1960 – Origin:** First introduced during the **Kerala Assembly elections** as a voluntary code to regulate political conduct.
  - **1962 – National Adoption:** Circulated by the **Election Commission of India** to all recognized political parties and States during the **Lok Sabha elections,** gaining all-party consensus.
  - **1979–1991 – Institutionalization:** Gradually evolved through multiple elections and began **strict enforcement post-1991** to curb corruption and misuse of power.
  - **2013 – Legal Refinement:** **Revised comprehensively** after the ***S. Subramaniam Balaji vs. State of Tamil Nadu*** **case,** with new **guidelines on election manifestos** to prevent misuse of freebies.

Key Features:

1. **General Conduct:** Parties must avoid communal appeals or personal attacks; propaganda through religious places is banned.
2. **Party in Power Restrictions:** Ministers cannot announce new projects, financial grants, or make ad-hoc appointments after election announcement.
3. **Campaign Discipline:** Ban on bribing, intimidation, or distributing liquor within 48 hours before polling.
4. **Use of Government Machinery:** Public media, transport, and rest houses cannot be used for partisan purposes.
5. **Election Manifestos:** Parties must justify financial feasibility of promises and avoid freebies that distort voter choice.
6. **Meetings and Processions:** Prior police permissions are mandatory to prevent clashes and maintain order.

Need for a Strong Model Code of Conduct (MCC):

- **Ensure electoral integrity:** A robust MCC safeguards the free and fair nature of elections by curbing misuse of administrative power, state funds, and media influence during campaigns.
- **Prevent misuse of state machinery:** Strengthening MCC deters ruling parties from announcing projects or cash transfers that unfairly sway voter sentiment near elections.

  Eg: The Bihar Mukhyamantri Mahila Rojgar Yojana (2025) was criticised for influencing voters through pre-poll disbursals.

- **Curb populist and freebie politics:** A stringent MCC prevents unsustainable welfare promises that burden public exchequers for electoral gain.
- **Promote ethical competition:** It ensures a **level playing field** where candidates compete on ideas and performance, not state-funded advantages.
- **Preserve voter confidence:** By guaranteeing impartiality, a strong MCC reinforces citizens' trust in democratic institutions and the credibility of electoral outcomes.

Challenges Associated with MCC:

- **Non-binding framework:** MCC is a voluntary code without legal enforceability, reducing the Election Commission's ability to impose punitive measures.
- **Circumvention through ongoing schemes:** Governments often relabel or accelerate schemes under the guise of continuity, violating MCC in spirit but not in law.

  Eg: Telangana's rebranded subsidy program (2023) continued disbursals despite the model code's restrictions.
- **Slow judicial redressal:** Legal cases on MCC violations move sluggishly, **outliving the election cycle**, rendering enforcement toothless.

  Eg: Complaints from the 2019 Lok Sabha polls were still under inquiry two years later.
- **Digital and AI manipulation:** The rise of AI-generated propaganda and deepfakes undermines traditional MCC oversight mechanisms.
- **Political non-cooperation:** Ruling parties resist stricter MCC norms citing executive independence and governance continuity, weakening EC's institutional authority.

Way Ahead:

- **Give MCC statutory backing:** Enact a **Model Code of Conduct Act** linking MCC with the Representation of the People Act, 1951 to make violations legally punishable. **Eg:** A similar legal codification exists in the UK's *Electoral Administration Act (2006)* ensuring accountability.
- **Create fast-track MCC tribunals:** Establish **dedicated election benches** to dispose of complaints within the poll period, ensuring real-time justice.
- **Leverage digital surveillance:** Deploy **AI-based tools and social media analytics** to track online propaganda, hate speech, and deepfake dissemination.

  Eg: The ECI's "cVIGIL" app and proposed "AI-Monitor" platform can detect MCC violations instantly.
- **Enhance transparency and accountability:** Mandate public disclosure of all MCC violation reports and EC actions within a fixed 48-hour window.
- **Institutionalize ethical leadership:** Introduce mandatory ethics and electoral integrity training for political functionaries to foster democratic responsibility.

Conclusion:

A strengthened MCC is essential to protect the sanctity of India's democratic process from populist distortions and power misuse. Legal authority, technological innovation, and ethical political culture together can transform the MCC from a moral guideline into a true guarantor of electoral fairness and integrity.

Topics: Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

INDIA AI GOVERNANCE GUIDELINES

Context: MeitY has released the India AI Governance Guidelines—a national, pro-innovation framework to enable safe, trusted AI adoption across sectors.

About India AI Governance Guidelines:

- **What it is?**
  - A four-part governance blueprint that balances rapid AI adoption with safety, trust, and accountability—without a heavy, one-size-fits-all law.
- **Published by:** Drafted for the **Ministry of Electronics & IT (MeitY)** by a committee constituted in July 2025.
- **Aim:** Advance **Viksit Bharat 2047** goals by democratizing AI benefits while mitigating harms like deepfakes, bias, and security threats through agile, sector-aware governance.

Key features in the guidelines:

1. **Seven Sutras (principles):** Trust; People First; Innovation over Restraint; Fairness & Equity; Accountability; Understandable by Design; Safety, Resilience & Sustainability.
2. **Six Pillars:** Infrastructure; Capacity Building; Policy & Regulation; Risk Mitigation; Accountability; Institutions.
3. **Action Plan with timelines:** Short/medium/long-term steps—standards, incident systems, sandboxes, legal gap-fixes, DPI-AI integration.
4. **Institutional architecture:** **AI Governance Group (AIGG)**, supported by a **Technology & Policy Expert Committee (TPEC)**; **AI Safety Institute (AISI)** for testing, standards, and safety R&D.
5. **Pro-innovation, sector-led regulation:** Use existing laws; add **targeted amendments** (e.g., IT Act classifications, copyright/TDM, DPDP rules) rather than an over-arching AI Act now.
6. **Risk tools:** India-specific **risk taxonomy**, **AI incident database**, **voluntary commitments**, **techno-legal** measures (watermarking/provenance, privacy-enhancing tech, DEPA-style consent for training), human-in-the-loop for loss-of-control risks.
7. **Accountability levers:** **Graded liability** by role/risk, **transparency reports**, **grievance redressal**, peer and auditor oversight.
8. **Enablement at scale:** Compute/data access (AIKosh, subsidised GPUs), DPI-first solutions, MSME incentives and toolkits.

Need for strong guidelines

- **Fast-rising risks:** India needs guardrails against deepfakes, CSAM and non-consensual imagery, plus bypass-prone authentication tools—alongside vigilance for emerging AI capabilities and national-security implications.
- **Trust as a precondition for adoption:** The Guidelines put "Trust is the foundation" at the core, requiring understandable disclosures and accountability so uptake doesn't stall as systems scale.
- **India-specific context:** Provisions target harms to vulnerable groups, reflect multilingual and last-mile realities, and prioritise DPI-at-scale plus broader access to data and compute.

Challenges associated

- **Regulatory coherence:** Clarify liability across the AI value chain under the IT Act, and align DPDP rules and sectoral laws with AI lifecycles and due-diligence duties.
- **Copyright & training data:** India must reconcile innovation-friendly text-and-data-mining flexibilities with creators' rights as policy evolves.
- **Content authentication limits:** Watermarking/C2PA and forensic attribution aid provenance, but can be defeated and raise privacy trade-offs—so they're necessary yet insufficient.
- **Capacity gaps:** Effective governance needs regulator/LEA training and institutional capacity so obligations don't overburden MSMEs and frontline deployers.
- **Data/compute access & quality:** Inclusive AI demands representative Indian datasets and affordable evaluation compute to run robust safety tests.
- **Incident-reporting culture:** Build a tiered AI-incident system and incentives so organisations report failures without chilling disclosure.

Way ahead:

- **Stand up institutions:** Notify the AIGG and TPEC, fully resource the AISI, and issue a master circular mapping applicable laws and responsibilities.
- **Codify standards:** Develop practical guidelines, codes, metrics and testing frameworks, and use sandboxes in sensitive sectors to iterate safely.
- **Close legal gaps:** Pursue targeted amendments on classification, liability and DPDP interfaces for AI workflows, keeping enforcement sector-led.
- **Build capacity:** National skilling for officials

and operators, with toolkits and awareness so compliance is practicable across India's deployment contexts.

- **Operationalise safety plumbing:** Launch the AI-incidents database, transparent grievance routes and reporting—complemented by provenance/authentication where proportionate.
- **DPI + AI at scale:** Leverage DPI to deliver inclusive, privacy-preserving AI services by expanding equitable access to key inputs.
- **Global diplomacy:** Use AISI to represent India in the international Safety Institutes network and shape interoperable norms.

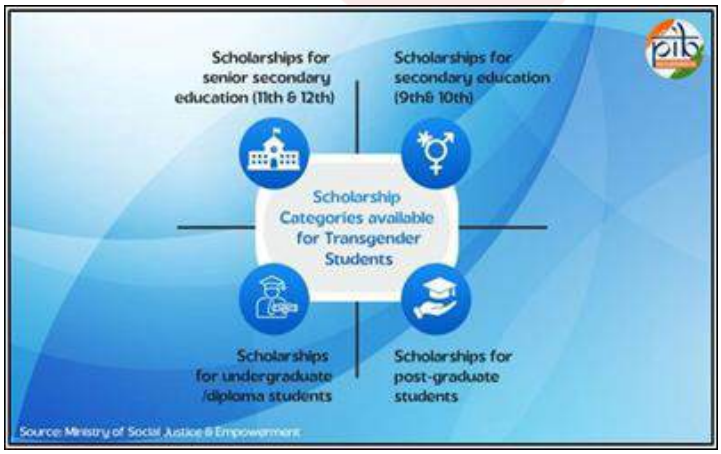
Conclusion:

The India AI Governance Guidelines mark a decisive step toward building a responsible, innovation-led AI ecosystem rooted in trust and inclusion. By combining flexible governance with sectoral accountability, India balances progress with protection. If effectively implemented, these guidelines can make AI a cornerstone of **Viksit Bharat 2047**, ensuring technology remains human-centric, ethical, and empowering.

Topics: Welfare schemes for vulnerable sections of the population by the Centre and States and the performance of these schemes.

TRANSGENDER RIGHTS IN INDIA

Context: India has announced major reforms and welfare initiatives for transgender persons, alongside global attention shifting to India as the U.S. under Trump 2.0 rolls back transgender rights.



About Transgender Rights in India:

Status of Transgender Persons in India:

- India had **4.87 lakh self-declared transgender persons** (Census 2011), though the actual population is estimated to be much higher due to stigma and under-reporting.
- India legally recognises a **third gender**, and has introduced protection laws, but social acceptance, healthcare access, and livelihood opportunities remain limited.
- Growing demand for **gender-affirming healthcare**, with India's private sector witnessing rising medical tourism potential.
- Digital inclusion increasing through the **National Portal**, yet large regional disparities persist in legal documentation and welfare access.

Constitutional Provisions:

- **Article 14:** Right to equality applicable to "any person," including transgender individuals.
- **Article 15 & 16:** Prohibit discrimination based on sex → interpreted to include gender identity.
- **Article 19:** Freedom of expression protects the right to express one's gender identity.
- **Article 21:** Right to dignity, privacy, health, and personal autonomy.
- **NALSA (2014):** Recognised transgender persons as the **third gender**, affirmed right to self-identification, and directed affirmative action.

Initiatives Taken for Transgender Persons:

1. **Transgender Persons (Protection of Rights) Act, 2019:** Legal recognition, non-discrimination, inclusive education, healthcare obligations, complaint officers, and punishment for offences.
2. **Transgender Persons (Protection of Rights) Rules, 2020:** Mandate Transgender Protection Cells, Welfare Boards, and simplified certification processes.
3. **National Council for Transgender Persons:** Statutory body advising government, monitoring schemes, and redressing grievances.
4. **National Portal for Transgender Persons (2020):** Online self-identification certificate, ID card issuance, and access to schemes in multiple languages.
5. **SMILE Scheme (2022):** Livelihood, scholarships, skill training, Ayushman Bharat TG Plus health coverage, and **Garima Greh** shelters in 20+ states.
6. **Equal Opportunity Policy:** Mandates equitable employment practices for transgender persons in public and private institutions.

Challenges Faced by Transgender Persons in India:

- **Social Stigma & Violence:** Transgender persons face routine discrimination, abuse, family rejection, and exclusion from schools and workplaces, which pushes many into unsafe environments and limits their social mobility.
- **Healthcare Barriers:** Lack of trained professionals, limited gender-affirming services, high medical costs, and poor insurance coverage prevent transgender persons from accessing safe, dignified, and continuous healthcare.
- **Documentation Issues:** Complex, inconsistent processes for updating gender in ID documents restrict access to welfare schemes, education, employment, banking, and housing, creating barriers across the life cycle.
- **Economic Marginalisation:** Low formal employment, limited skilling programmes, and exclusion from mainstream labour markets force many into informal or unsafe livelihoods such as begging or sex work.
- **Housing & Safety:** High homelessness, family abandonment, and discrimination in renting push many transgender persons into unsafe shelters or community-based living with minimal protection and dignity.
- **Inadequate Funding:** Budget allocations for transgender welfare remain low across ministries, resulting in weak implementation of schemes, poor outreach, and limited rehabilitation or skilling programmes.

Way Ahead:

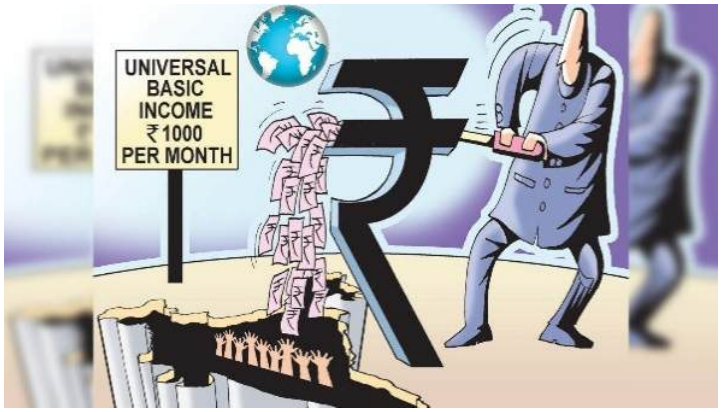
- **Strict Implementation of the 2019 Act & 2020 Rules:** States must operationalise protection cells, welfare boards, grievance redressal systems, and anti-discrimination mandates to ensure uniform rights enforcement across India.
- **Expand Ayushman Bharat TG Plus & Hospital Services:** Full rollout of TG Plus with gender-affirming surgeries, hormone therapy, counselling, and post-operative care in government hospitals can drastically reduce medical and financial vulnerability.
- **Integrate Transgender Healthcare into Medical Curricula:** Mandatory LGBTQIA+ competencies and dedicated training for surgeons, endocrinologists, nurses, and counsellors will ensure sensitive, specialised, and evidence-based healthcare.
- **Establish National Centres of Excellence & Promote Medical Tourism:** Centres specialising in gender-affirmation, research, training, and community care can position India as a global hub for affordable, high-quality transgender healthcare.
- **Create a Robust National Strategy with Greater Funding:** A unified, well-funded policy with inter-ministerial coordination can address livelihood, health, housing, and social protection needs with long-term measurable outcomes.
- **Strengthen Legal Frameworks for Documentation & Inclusion:** Simplifying ID changes, enforcing anti-discrimination laws, and mandating inclusive hiring practices can ensure equal citizenship, workplace dignity, and social acceptance.

Conclusion:

India stands at a pivotal moment where legal recognition and welfare reforms must translate into real, lived equality for transgender persons. With robust policy implementation and investment in healthcare, skilling, and social protection, India can become a global leader in transgender rights. The opportunity now is to build a dignified, inclusive ecosystem where every transgender person can thrive with autonomy and respect.

REDRAW WELFARE ARCHITECTURE: PLACE A UBI IN THE CENTRE

Context: The proposal to place Universal Basic Income (UBI) at the centre of India's welfare architecture has gained renewed attention amid growing income inequality, automation-driven job losses, and welfare inefficiencies.



About Redraw Welfare Architecture: Place a UBI in the Centre

- **What is UBI?**
  - Universal Basic Income (UBI) is a

periodic, unconditional cash transfer given to all citizens, regardless of income or employment status, ensuring a **minimum level of economic security**.

- **Features of UBI:**
  - **Universality:** Covers all citizens without discrimination or means-testing.
  - **Unconditionality:** No work requirement or eligibility conditions attached.
  - **Direct Transfer Mechanism:** Uses **Aadhaar-linked Direct Benefit Transfer (DBT)** for efficient, corruption-free disbursal.
  - **Rights-Based Design:** Recognizes income security as a **citizenship right**, not charity or welfare.
  - **Simplification of Welfare:** Replaces fragmented, overlapping schemes with a single, streamlined safety net.

Need for UBI in India:

- **Rising Inequality:** India's **wealth Gini index (75)** reflects one of the highest global inequality levels; top 10% control **77% of national wealth** (WID, 2023).
- **Jobless Growth:** Despite **8.4% GDP growth (2023–24)**, unemployment and informal work persist; **automation may displace 69% of Indian jobs (McKinsey)**.
- **Fragmented Welfare System:** Over **400 welfare schemes** face **leakages and duplication** (NITI Aayog, 2022); UBI offers administrative efficiency and inclusiveness.
- **Social Stress:** India ranks **126/137** in the **World Happiness Report (2023)**, showing economic growth without well-being.
- **Unpaid Care Work:** Recognizes invisible economic contributions, particularly by **women**, estimated to account for **13% of India's GDP (ILO)**.

Global Evidence Supporting UBI:

- **India (Madhya Pradesh Pilot, SEWA 2011–13):** Recipients showed better nutrition (↑25%), higher school attendance (↑12%), and small business creation (↑17%).
- **Finland (2017–19):** Participants reported improved mental well-being and employment stability.
- **Kenya (GiveDirectly Program):** Long-term UBI transfers led to 40% increase in food security and local enterprise growth.
- **Iran (2011 Reform):** Replaced subsidies with cash transfers, reducing poverty without inflationary effects.

Challenges Associated with UBI:

- **Fiscal Burden:** Implementing a UBI of ₹7,620 per person annually would cost about 5% of India's GDP, creating pressure on public finances and necessitating restructuring of subsidies, higher taxes, or borrowing to maintain fiscal sustainability.
- **Targeting Dilemma:** While universality promotes inclusion, it risks benefit dilution as the rich and poor receive the same amount; thus, a phased or quasi-universal rollout is crucial to preserve redistributive justice.
- **Inflation Concerns:** A sudden increase in disposable income could raise local demand faster than supply, triggering price inflation in food and essential goods if not accompanied by production growth.
- **Digital Divide:** Inadequate banking access, poor internet connectivity, and low digital literacy in rural and tribal areas may exclude many citizens from receiving cash transfers through the DBT system.
- **Political Will:** Transitioning from populist, targeted subsidies to a universal rights-based income system demands strong bipartisan support, fiscal discipline, and administrative reform—often difficult in election-driven politics.

Way Ahead:

- **Phased Implementation:** Start with vulnerable groups—women, elderly, and informal workers—before scaling up nationwide, allowing gradual adaptation and fiscal assessment.
- **Integrate with Existing Schemes:** UBI should complement, not replace, essential welfare schemes like PDS and MGNREGA, ensuring food and livelihood security remain intact during the transition.
- **Progressive Financing:** Introduce wealth, carbon, and inheritance taxes, while cutting inefficient subsidies to create sustainable fiscal space for UBI without burdening the poor.
- **Strengthen DBT Infrastructure:** Upgrade the Aadhaar–Jan Dhan–Mobile (JAM) trinity, ensuring real-time transfer accuracy, grievance redressal, and digital accessibility for remote

populations.

- **Institutional Backing:** Form an Independent Social Security Commission to assess fiscal feasibility, monitor rollout, and ensure transparency, accountability, and periodic evaluation of UBI outcomes.

Conclusion:

A **Universal Basic Income** can become the foundation of India's 21st-century welfare state — simple, inclusive, and empowering. It offers a **safety net amid automation, inequality, and job uncertainty**, while reinforcing dignity and citizenship. The question is no longer "Can India afford UBI?" but rather "Can India afford the cost of economic insecurity without it?"

Topics: Issues relating to development and management of Social Sector/Services relating to Health, Education, Human Resources.

BRIDGING INDIA'S NUMERACY GAP

Context: A recent opinion piece highlights India's widening numeracy gap, despite improvements under the NIPUN Bharat Mission.

About Bridging India's Numeracy Gap:

What is the Numeracy Gap?

- The persistent difference between children's literacy skills (reading) and numeracy skills (math skills like division, place value, operations) at the foundational level.
- **ASER 2024:** 48.7% of Class 5 students can read fluently, but only 30.7% can solve basic division → ~18% gap.

Trends in India's Literacy–Numeracy Divide:

1. ASER 2024 shows 48.7% of Class 5 students can read a Class 2 text, but only 30.7% can solve a basic division problem — an **18-percentage point gap**.
2. ASER 2024 finds more than **50% of Class 8 students** cannot perform basic division, showing stagnation and cumulative learning gaps.
3. Post-pandemic surveys (ASER 2022, 2023, 2024) confirm **slower recovery in numeracy** compared to literacy, especially among rural and low-income students.
4. States like Kerala, Himachal Pradesh, and Punjab show high reading proficiency but continued weaknesses in **fractions, decimals, and multi-digit division**.
5. NCERT's NAS (2021, 2023) reports **national math proficiency below 45%**, significantly lower than countries participating in **TIMSS and PISA**, reflecting systemic challenges.

Reasons for India Lagging in Numeracy:

- **Hierarchical nature of Mathematics:** Math builds layer by layer; when early concepts like place value or number sense are unclear, students cannot grasp later topics like decimals, fractions or division, causing learning gaps to widen rapidly.
- **Syllabus-driven, pace-based teaching:** Teachers often follow the textbook calendar rather than students' learning levels, pushing the class ahead even when most learners haven't mastered the basics — leading to cumulative deficits.
- **Lack of structured remedial support:** Most schools lack systematic catch-up programmes or differentiated instruction, so children who fall behind in early grades continue to lag throughout upper primary.
- **Real-life disconnect in math learning:** Studies (J-PAL) show children who score well in school tests struggle to apply math in practical settings and vice-versa, highlighting poor transfer of knowledge between classroom and real-life contexts.
- **Teacher capacity and pedagogy gaps:** Many teachers have limited exposure to activity-based, conceptual numeracy teaching, resulting in rote-led instruction that fails to build deep mathematical understanding.
- COVID-19 learning disruptions: School closures disproportionately affected rural and low-

income students, sharply widening pre-existing foundational math gaps and delaying mastery of Class 1–5 competencies.

Impact of Poor Numeracy:

- **High failure rates in Maths and Science:** Weak foundational numeracy makes algebra, physics, geometry and problem-solving difficult, leading to significantly higher failure rates in these subjects in Class 10 board exams.
- Early adolescent **dropout:** As concepts become more abstract in Classes 6–9, children with foundational gaps cannot follow classroom teaching, pushing many to exit school before reaching the board exam stage.
- **Reduced access to higher education (especially STEM):** Students who cannot clear Maths in Class 10 or 12 lose eligibility for science streams, technical diplomas, engineering and competitive exams that require quantitative ability.
- **Lower employability and financial literacy:** Poor numeracy affects everyday skills such as budgeting, measurement, digital payments, and logical reasoning — limiting success in both formal employment and informal livelihoods.
- **Long-term economic and productivity loss:** A workforce with weak numeracy reduces national productivity, innovation capacity and readiness for a skill-based economy, threatening India's demographic dividend.

Initiatives Taken:

- **NIPUN Bharat Mission (2021)**: National programme for Foundational Literacy & Numeracy for Classes 1–3.
- **Teaching at the Right Level (TaRL)**: Level-based instruction model adopted by several States.
- **PARAKH Rashtirya Survekshan**: Nationwide assessment to track foundational learning.
- **State-level programmes**:
  - Karnataka: Kalika Chetarike
  - Uttar Pradesh: Mission Prerna
  - Dadra & Nagar Haveli & Daman & Diu: Extended FLN to upper primary, improving outcomes
- **Activity-based learning kits, math manipulatives**, digital FLN tools, teacher training modules.

Way Ahead:

- **Extend FLN support up to Class 8**: Because nearly half of middle-grade students still cannot do basic division, extending foundational interventions beyond Class 3 ensures continuity and prevents learning gaps from widening further in upper primary.
- **Introduce FLN+ skills:** Strengthening these higher-order numeracy skills is essential since they form the backbone of board-exam math and significantly influence future readiness in science, commerce, and vocational pathways.
- **Shift to learning-level–based instruction**: Teaching should match students' actual competency levels—not rigid grade syllabi—so that slow learners receive the scaffolding needed to catch up instead of being left behind year after year.
- **Strengthen remedial learning, peer learning, and math labs**: Dedicated remedial periods, peer tutoring groups, and hands-on math labs can help rebuild foundational concepts through practice, concrete objects, and personalised support.
- **Integrate real-life mathematical contexts**: Embedding concepts like budgeting, measurement, discounts, and market arithmetic makes math relevant and enables children to transfer classroom learning to real-world situations effectively.
- **Improve teacher training in conceptual and activity-based pedagogy**: Teachers need continuous professional development to use manipulatives, visual tools, games, and child-centric methods that build conceptual understanding rather than rote procedural skills.

Conclusion:

India's numeracy gap threatens long-term learning, employability, and economic mobility. Strengthening FLN beyond early grades and adopting learner-centric teaching is essential. A coordinated national push on numeracy—parallel to literacy—is now critical for inclusive educational and economic progress.

GLOBAL TB REPORT 2025

Context: The WHO Global Tuberculosis Report 2025, shows that India remains the country with the highest

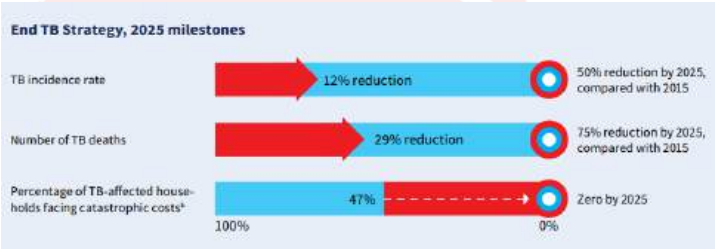
TB burden (25% of global cases) despite achieving a 21% reduction in incidence since 2015.

About Global TB Report 2025:

- **What it is?**
  - The annual global assessment of tuberculosis trends, prevention, diagnosis, and treatment at global, regional, and national levels.
- **Published by:** World Health Organization (WHO).
- **Aim:** To track progress towards the End TB Strategy (2015–2035), which targets a 90% reduction in TB deaths and 80% reduction in incidence by 2030, and guide evidence-based national TB control policies.

Global Trends in TB:

1. **Global Incidence:** TB incidence declined by **1.7% between 2023 and 2024**, reaching **131 cases per 100,000 population**, reversing pandemic-related setbacks.
2. **Regional Patterns:** Declines continued in the **African, South-East Asian, Eastern Mediterranean, and European Regions**, while the **Americas** saw a fourth consecutive rise due to under-detection.
3. **Geographical Burden: South-East Asia (34%), Western Pacific (27%)**, and **Africa (25%)** accounted for the bulk of global TB cases.
4. **High-Burden Nations:** Eight countries made up **67% of global cases** — led by **India (25%)**, Indonesia (10%), and the Philippines (6.8%).
5. **Drug Resistance:** Global multidrug-resistant (MDR) TB remains a major threat, with modest progress in detection and treatment.
6. **Funding Gap:** International TB financing has stagnated since 2020, and donor cuts from 2025 threaten national programs.



TB Trends in India:

1. **Incidence Rate:** India's TB incidence fell from **195 (2023) to 187 per 100,000 (2024)** — a 21% reduction since 2015, compared to a **global decline of 12%**.
2. **Case Detection:** India diagnosed **2.61 million of an estimated 2.7 million** cases in 2024, sharply reducing the "missing cases" gap.
3. **Mortality:** TB deaths dropped from **28 (2015) to 21 per 100,000 (2024)**, though still above the **target of 3 per 100,000 by 2025**.
4. **Drug Resistance:** India accounted for **32% of global MDR-TB cases**, though incidence is gradually declining.
5. **Policy Momentum:** The government's *Ni-kshay 2.0* and *TB-Mukt Bharat* initiatives have improved **treatment coverage (92%)** and expanded **upfront molecular diagnostics**.

Initiatives to Reduce TB:

- **Global Level:**
  - **End TB Strategy (WHO, 2015–2035):** Global framework to cut TB deaths by 90% and incidence by 80% by 2030.
  - **UN High-Level Meetings (2018, 2023):** Renewed global commitments, including targets for funding, vaccine development, and universal access to TB care.
  - **Global Fund & Stop TB Partnership:** Strengthen resource mobilization, surveillance, and innovation.
  - **New WHO Guidelines (2024–25):** Updated guidance on **diagnosis, MDR-TB treatment, and TB–diabetes comorbidity** management.
- **India Level:**
  - **National Strategic Plan for TB Elimination (2017–2025):** Targets an **80% incidence reduction by 2025**, ahead of global goals.
  - **Ni-kshay Poshan Yojana:** Nutritional support for TB patients.
  - **Pradhan Mantri TB Mukt Bharat Abhiyan:** Community engagement and corporate participation in patient adoption.
  - **Expanded Diagnostics:** Rollout of **Truenat and CBNAAT** molecular tests nationwide.

Challenges to TB Reduction:

- **Persistent Undernutrition:** Malnutrition remains a major driver of TB vulnerability, especially among low-income groups, weakening

immunity and sustaining disease transmission.

- **Rising MDR-TB Burden:** Multidrug-resistant TB cases continue to strain health systems due to limited access to newer, shorter, and less toxic treatment regimens.
- **Funding Stagnation:** Global and national TB programs face declining donor funding, threatening continuity of diagnostics, treatment, and community outreach initiatives.
- **Weak Surveillance:** Inadequate reporting from rural and private sectors leads to under-detection and delayed treatment, undermining national elimination goals.
- **Limited Vaccine Pipeline:** Despite promising candidates, no new TB vaccine has yet reached large-scale rollout, slowing prevention efforts in high-burden countries.

Recommendations:

- **Accelerate Vaccine R&D:** Prioritize global and domestic investment in next-generation TB vaccines, fast-tracking trials and equitable access frameworks.
- **Expand Molecular Diagnostics:** Scale up Truenat, CBNAAT, and LAMP-based tests for rapid, accurate detection in high-risk and remote districts.
- **Ensure Sustainable Financing:** Increase domestic TB funding through national health budgets and blended finance models to reduce donor dependency.
- **Strengthen Nutrition & Social Support:** Link TB programs with food security and welfare schemes to address poverty, malnutrition, and stigma barriers.
- **Integrate Digital Surveillance:** Use AI-enabled platforms and real-time data analytics for better case tracking, treatment adherence, and outcome monitoring.

Conclusion:

The *WHO Global TB Report 2025* highlights that despite steady progress, **TB remains the world's deadliest** infectious disease. India's strong decline in incidence and mortality is commendable but insufficient to meet the **2025 elimination target**. Achieving a **TB-free world** demands accelerated vaccine development, robust financing, and holistic health–nutrition–poverty interventions.

DOES INDIA NEED NUTRITIONAL TRANSFORMATION?

Context: India is witnessing a growing debate on nutritional transformation driven by the rise of functional foods and smart proteins, as the government explores biotech-based solutions to shift from food security to nutritional security under the BioE3 policy framework.

About Does India need nutritional transformation?

What are Functional Foods?

- **Definition:** Functional foods are **nutrient-enriched or fortified foods** designed not just to provide energy but to improve health and prevent diseases. They often contain added vitamins, minerals, antioxidants, or bioactive compounds that support immunity, digestion, or heart health.

  Eg: Vitamin-enriched rice, omega-3 fortified milk, probiotic yogurt.
- **Technologies Used:**
  - **Nutrigenomics:** Studies how food interacts with genes to enhance health outcomes.
  - **Biofortification:** Increases the nutritional content of crops during their growth (e.g., iron-rich or zinc-rich cereals).
  - **Bioprocessing:** Uses microorganisms or enzymes to improve nutrient absorption and shelf life.
  - **3D Food Printing:** Customises food shape, texture, and nutrient content, especially useful for healthcare diets.
- **Examples from India:**
  - **Zinc-Enriched Rice** developed by the *Indian Institute of Rice Research (IIRR), Hyderabad*, helps combat zinc deficiency.
  - **Iron-Rich Pearl Millet** bred at *ICRISAT*

improves iron intake in rural diets.

- **Private Sector Innovations:** Companies such as *Tata Consumer Products, ITC, and Marico* are producing fortified staples and health-oriented food lines that target both rural nutrition and urban wellness markets.

What are Smart Proteins?

- **Definition:** Smart proteins are **sustainably produced proteins derived through biotechnology**, offering alternatives to conventional meat, dairy, and eggs. They aim to meet global protein needs while reducing environmental impact and animal dependency.
- **Major Types:**
  - **Plant-Based Proteins:** Extracted and restructured from legumes, cereals, or oilseeds to mimic the taste and texture of meat and dairy.

    Eg: Soy, pea, or mung bean–based meat substitutes.
  - **Fermentation-Derived Proteins:** Produced using microbes (yeast, fungi, bacteria) to generate protein ingredients, enzymes, or fats identical to those found in animal products.

    Eg: Precision fermentation used to create milk proteins without cows.
  - **Cultivated Meat:** Made by growing real animal cells in controlled bioreactors — providing genuine meat without animal slaughter.
- **India's Emerging Ecosystem:**
  - **Startup Growth:** Over **70 startups**, such as GoodDot, Blue Tribe Foods, and Evo Foods, market around **377 plant-based and alternative protein products**.
  - **Government Support:** The Department of Biotechnology (DBT) and Biotechnology Industry Research Assistance Council (BIRAC) are funding R&D in cultivated and fermentation-based proteins.
  - **Research Milestone:** The Centre for Cellular and Molecular Biology (CCMB) received a **₹4.5 crore DBT grant** to advance cultivated meat research.

Why Nutritional Transformation is Needed?

- **Persistent malnutrition:** Over **35% of children are stunted** and **57% of women are anaemic** (NFHS-5), showing that food sufficiency hasn't translated into nutrition security, necessitating a shift to micronutrient-rich diets.
- **Protein deficiency crisis:** Average Indian protein intake is **47 g/day vs ICMR's 60 g/day norm**, leaving both rural and urban populations vulnerable to low immunity and chronic diseases, underscoring the need for alternative protein sources.
- **Evolving dietary aspirations:** With rising incomes, India's consumers demand **nutrient-dense and ethically produced foods**, as reflected in the booming **$25 billion functional food market projected by 2030**.
- **Environmental sustainability concerns:** Traditional livestock farming drives **14.5% of global GHG emissions** and stresses water and land ecosystems, making **smart proteins and biofortified crops** key to climate-resilient nutrition.
- **Economic and health rationale:** Malnutrition drains **$12 billion annually in lost productivity** (World Bank, 2023); investing in **bio-fortification and precision nutrition** can transform health outcomes and boost India's bioeconomy.

Global Experience

1. **Singapore:** Became the **first country to approve cultivated chicken (2020)**, signalling regulatory openness toward sustainable and slaughter-free protein sources.
2. **European Union:** Through its **"Farm to Fork" strategy**, the EU is heavily investing in sustainable protein production and transparent food systems to achieve carbon neutrality.

Significance:

- **Health:** Addresses India's **hidden hunger** by improving access to nutrient-dense, protein-rich foods essential for public health.
- **Economy:** Taps into a booming **$85–240 billion global smart protein market by 2030**, creating jobs in biotech, agriculture, and logistics.
- **Sustainability:** Reduces the environmental footprint by cutting **livestock-related emissions, land use, and freshwater dependency**.
- **Equity:** Ensures that **nutrition innovations reach all strata** of society, bridging the rural–urban divide and promoting inclusive well-being.

Way Forward for India:

- **National Framework under FSSAI:** Establish

clear definitions, safety norms, and labelling guidelines for **functional and novel foods** to ensure consumer trust and industry compliance.

- **Policy Coordination:** Foster synergy among **Agriculture, Biotechnology, and Health Ministries** to align innovation, regulation, and nutrition goals under one vision.
- **Public-Private Partnerships:** Strengthen **biomanufacturing and precision fermentation** through PPPs, ensuring both scalability and affordability in next-gen nutrition technologies.
- **Public Awareness:** Combat scepticism about **lab-grown foods** through transparent communication, awareness drives, and evidence-based education campaigns.
- **Farmer Inclusion & Skill Development:** Train farmers and workers for the **bioeconomy**, integrating them into alternative protein and biofortification value chains for inclusive growth.

Conclusion:

India's next food revolution lies not in quantity but in quality — nourishing people while sustaining the planet. By integrating biotechnology, clear regulation, and public awareness, functional foods and smart proteins can bridge the nutrition gap. A science-led, inclusive approach can make India a global hub for sustainable nutrition and food innovation.

Topics: Role of civil services in a democracy.

STRUCTURAL GAPS BETWEEN UPSC AND STATE PSCS

Context: The 2025 National Conference of Chairpersons of State Public Service Commissions (PSCs) is being hosted by the Telangana PSC on December 19–20 to address recurring issues in recruitment.

About Structural Gaps Between UPSC and State PSCs:

Historical Background of PSCs:

1. **Montagu–Chelmsford Reforms (1918):** Proposed an **independent, merit-based, politically insulated** recruitment authority to counter colonial bias and ensure fair entry of Indians into civil services.
2. **First Public Service Commission (1926):** Established to regulate recruitment for the Union; marked the beginning of a **permanent and professionalised** service commission framework.
3. **Government of India Act, 1935:** Mandated separate PSCs for each province, institutionalising a **federal recruitment mechanism** that formed the foundation for present UPSC–State PSC structure.
4. **Continuation in the Constitution (1950):** Constituent Assembly retained PSCs under **Articles 315–323**, recognising their role in ensuring neutrality, fairness, and depoliticised recruitment.

Structural Difference: UPSC vs State PSCs:

Aspect	UPSC	State PSCs
Appointment Process	Merit-Based Appointments — Members selected for experience, seniority, and neutrality, ensuring professionalism and reduced political interference.	Politicised Appointments — Often influenced by ruling parties, compromising independence, credibility, and expertise standards.
Representation Norms	Representation Across Zones — Mandatory zonal distribution ensures pan-India perspectives and minimises regional bias.	Lack of Representation Norms — No fixed criteria on age, qualifications, or experience; appointments may lack administrative depth.

Aspect	UPSC	State PSCs
Administrative Framework	Dedicated Personnel Ministry (DoPT) — Ensures systematic manpower planning, timely vacancy notifications, and consistency in exam cycles.	No Dedicated Personnel Ministry — Poor workforce planning leads to irregular notifications, backlog of vacancies, and delays.
Resource Availability	Financial & Administrative Stability — Central resources support reliable recruitment, strong exam systems, and quick grievance redressal.	Fiscal Constraints — States face funding shortages, extend retirement ages, and defer recruitments, resulting in erratic exam schedules.

Issues / Problems in State PSCs:

- **Irregular Revision of Syllabus:** Syllabi remain outdated as PSCs rarely form expert committees, weakening alignment with current affairs, modern academics, and UPSC standards.
- **Limited Academic Pool:** Dependence on in-state experts restricts diversity, impacting quality of question papers and moderation processes.
- **Evaluation & Moderation Weaknesses:** Lack of strong inter-se moderation leads to uneven scoring and subjective evaluation, prompting frequent judicial intervention.
- **Reservation & Zonal Complexity:** Incorporating vertical, horizontal, and regional quotas requires complex calculations, often resulting in errors and litigation.
- **Poor Translation Mechanisms:** Weak English-to-regional language translations distort meanings, causing ambiguity, unfair advantage, and paper cancellations.
- **Transparency vs Confidentiality Imbalance:** Frequent leaks, mismanagement, and slow grievance responses fuel loss of trust and repeated exam cancellations.

Recommendations for Reform:

- **Create a Dedicated State Personnel Ministry:** A DoPT-like body should publish a **5-year recruitment calendar**, ensuring predictable vacancies and annual exam cycles.
- **Constitutional Amendment on PSC Membership:** Fix minimum age at **55 years** and maximum at **65**, with defined qualifications to ensure experienced, apolitical, and competent members.
- **Panel-Based Appointment System:** States should maintain a vetted panel of eminent administrators and professionals, selected for **integrity, domain expertise, and neutrality**.
- **Periodic Syllabus Revision:** Revise syllabi every **3–5 years**, place drafts in public domain, and align with UPSC trends to enhance objectivity and clarity.
- **Mixed Exam Pattern:** Retain **objective prelims**, but use **objective + descriptive mains** to balance analytical testing with fair evaluation and reduced subjectivity.
- **Improve Translation & Question Setting:** Use **tech-enabled secure translation** plus human review to ensure accuracy; vary patterns regularly to reduce AI-driven formulaic answers.
- **Strengthen PSC Secretariat Leadership:** Secretary must be an officer with experience in **school/board exam systems**, ensuring rigorous supervision and procedural integrity.

Conclusion:

State PSCs require urgent structural and procedural reforms to match the credibility and efficiency of the UPSC. Instituting transparent appointments, modernised syllabi, and predictable exam cycles can restore aspirants' trust. A professionally managed, depoliticised system will ensure merit-based recruitment and strengthen administrative capacity at the State level.

BRIDGING THE GENDER GAP IN CIVIL SERVICES

Context: UPSC's decade-long data (2010–2021) reveals that women constitute less than 40% of Civil Services aspirants, while transgender participation remains negligible, exposing persistent gender disparities in one of India's most prestigious examinations.

About Bridging the Gender Gap in Civil Services:

Trends and Data (2010–2021):

- Female participation rose from **23.4% in 2010** to **32.98% in 2021**, indicating slow progress yet staying below 40%.

- In **2021**, women made up **32.98% of prelims candidates**, 14.75% cleared prelims, and only **15.66% (201 women)** appeared in the final merit list.
- **Transgender participation** remains below **0.001%**, with only 4 candidates appearing in 2021 and none qualifying for later stages.
- Despite legal inclusion of the *third gender* in 2016, meaningful participation remains absent.

UPSC Women Participation Trends (2010-2021)

Year	Total Candidates	Women Appeared	% Women
2010	280,901	65,738	23.40%
2011	254,466	60,529	23.78%
2012	283,632	64,489	22.74%
2013	332,362	78,194	23.53%
2014	462,909	111,477	24.08%
2015	478,033	116,923	24.46%
2016	474,808	121,882	25.67%
2017	469,685	127,536	27.15%
2018	504,218	142,527	28.27%
2019	579,756	179,121	30.90%
2020	493,113	152,723	30.97%
2021	510,438	168,352	32.98%

Factors Behind Low Gender Representation:

- **Social constraints and patriarchy:** Cultural norms and early marriage expectations continue to restrict women's mobility and preparation time — **over 60% of female aspirants cite familial or societal pressure** as a deterrent (CSDS Youth Survey, 2023).
- **Financial inequality in education:** High coaching costs (₹2–3 lakh annually) limit access; **rural women's education spending is 30% lower than men's**, reducing their ability to compete (NSO Education Report, 2022).
- **Safety and mobility barriers:** Many women avoid relocating to hubs like Delhi due to security fears — **India ranks 127/146 in Global Gender Gap Report 2024 (WEF)** for mobility freedom.
- **Psychological and social burden:** Aspirants face time-bound marriage pressure; **40% of women drop preparation by age 27** (Vision IAS Survey, 2024), reflecting gendered expectations of "settling down."
- **Institutional and policy gaps:** UPSC lacks targeted facilities such as gender hostels, counselling, or mentorship; **only 15% of coaching institutes offer women's hostels or safety provisions**, limiting inclusivity.

Emerging Social Change:

- **Steady upward trend:** Women's participation in UPSC rose from **23.4% in 2010 to 32.98% in 2021**, showing slow but consistent empowerment through education access and awareness.
- **Inspirational visibility:** Role models like **IAS Ira Singhal and IPS Rema Rajeshwari** have challenged stereotypes, motivating more women from Tier-II and Tier-III towns.
- **Government empowerment schemes:** Initiatives such as **PM-DAKSH** and **Mission Karmayogi** include women's capacity-building components, strengthening their representation in public service.
- **Legal inclusion of transgender aspirants:** The **Transgender Persons (Protection of Rights) Act, 2019** enabled inclusion in UPSC forms (since 2016), symbolising an evolving rights-based framework.
- **Social awareness through education:** NEP 2020's emphasis on gender inclusion and career counselling in higher education is gradually transforming societal perceptions of women's professional roles.

Importance of Gender-Balanced Representation in Civil Services:

- **Diverse governance lens:** Women officers bring **community-oriented perspectives**, improving welfare delivery and social policy sensitivity (World Bank Gender and Gov. Report, 2024).
- **Policy inclusivity and empathy:** Studies show **states with higher female bureaucratic presence achieve better health and education indicators** (UNDP India, 2023).
- **Curbing corruption and bias:** Female officers are statistically less likely to engage in rent-seeking behaviour, promoting integrity in governance (NCAER, 2022).
- **Symbolic leadership impact:** Visible women leaders like **Smita Sabharwal (IAS)** normalize female authority, inspiring broader participation in governance and politics.
- **Administrative resilience:** A balanced bureaucracy ensures **representative decision-making**, crucial for gender justice in programmes like Beti Bachao, Jal Jeevan, and PM Awas Yojana.

Way Ahead:

- **Targeted scholarships & mentorship:** Launch **Women-in-Administration Fellowships** under DoPT to fund coaching and mentorship for women and transgender aspirants.

- **Transparent gender data:** Mandate **UPSC Annual Diversity Reports** disaggregated by gender and region to track equity outcomes.
- **Work-life flexibility in service:** Institutionalise **creche facilities, flexible postings, and sabbatical options** for women officers to balance motherhood and service demands.
- **Inclusive preparation infrastructure:** Expand **state-run coaching centres and women's hostels** in district HQs, reducing dependence on metro-based institutes.
- **Societal reorientation:** Integrate **gender-sensitivity modules in schools and media campaigns** to challenge patriarchal notions linking women's worth solely to marriage.

Conclusion:

Gender diversity in the civil services is not a symbolic pursuit but a democratic necessity. True equality in governance begins with equal opportunity in entry. Empowering women and transgender aspirants through systemic, social, and institutional reforms will create a bureaucracy that reflects India's real social fabric.

Topics: India and its neighbourhood- relations.

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Topics: Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.

INDIA AFRICA BILATERAL RELATIONS

Context: India's renewed diplomatic push towards Africa has triggered debate after experts highlighted the need to "connect, build and revive" India–Africa ties ahead of the next India–Africa Forum Summit (IAFS-IV).

About India Africa Bilateral Relations:

Historical Evolution of India–Africa Ties:

- **Civilisational Links:** Centuries-old Indian Ocean trade in gold, spices and textiles built deep sociocultural links, reinforced by Gujarati merchant networks and shared experiences of colonial exploitation.
- **Political Solidarity:** India championed African liberation movements through NAM, supported anti-apartheid struggles, and coordinated decolonisation diplomacy at the UN throughout

the Cold War.

- **Post-1990s Phase:** Economic reforms shifted India's Africa policy toward investments, ITEC-driven capacity building, and joint positions in WTO, climate negotiations and UN Security Council reform efforts.
- **Contemporary Phase (2015–2025):** IAFS-III united all 54 African nations; India opened 17 new embassies, scaled digital and development partnerships, and secured AU's permanent membership in the G20 in 2023.

Key Areas of Cooperation:

A. Trade & Investment:

- **Growing Economic Ties:** India–Africa trade crossed $100 billion (2024–25), making India the continent's 3rd-largest trading partner, though still far behind China's $280+ billion trade footprint.
- **Indian Investments:** India's cumulative FDI in Africa stands at $75 billion, focusing on telecom, hydrocarbons, pharma, infrastructure and digital services aligned with Africa's growth priorities.
- **Duty-Free Tariff Preference:** India's DFTP scheme grants 98.2% tariff-free access to 38 African LDCs, significantly boosting African exports in textiles, agro-products and minerals.

B. Development Partnership:

- **Lines of Credit (LoCs):** India's $10 billion LoC commitment supports 189 projects in 42 countries across power generation, irrigation, drinking water, rail connectivity and rural electrification.
- **Digital Tele-Education & Tele-Medicine:** The e-VBAB platform provides digital classrooms and medical consultations across Africa, reducing learning and healthcare gaps in remote regions.

C. Capacity Building:

- **Training & Human Capital:** 40,000+ Africans trained under ITEC, ICCR and the Pan-African e-Network now serve as ministers, policymakers and entrepreneurs, forming an enduring human bridge.
- **IIT-M Zanzibar Campus:** India's first overseas IIT campus in Zanzibar (2023) symbolises co-creation in higher education, offering advanced programmes in data science and AI.

D. Maritime & Security Cooperation

- **AI-KEYME Naval Exercise:** In 2025, India and nine African navies held AI-KEYME, strengthening interoperability in anti-piracy, humanitarian aid and Western Indian Ocean maritime security.
- **Peacekeeping Collaboration:** India remains a major troop contributor to UN missions in Africa, especially in Congo, Sudan and South Sudan, enhancing its credibility as a security partner.

E. Digital & FinTech Partnership:

- **Digital Public Infrastructure (DPI):** African countries are exploring India's UPI, Aadhaar-like identity solutions and digital stack to modernise payments, identity verification and public service delivery.

F. Energy & Climate Cooperation

- **Solar & Green Energy:** African nations partner with India under the International Solar Alliance, while collaborations in green hydrogen, EV ecosystems and blue economy corridors gain traction.

Challenges In India–Africa Relations:

- **Chinese Dominance:** China–Africa trade exceeds $280+ billion and dominates ports, railways, mining and defence sectors, overshadowing India's relatively smaller economic footprint.
- **Slow Execution of Indian Projects:** LoC-funded projects face delays due to strict tendering norms, capacity constraints in African agencies and India's cumbersome bureaucratic processes.
- **Loss of Diplomatic Momentum:** No IAFS meeting since 2015 has diluted institutional continuity, while Africa increasingly engages with actors offering faster financing and delivery.
- **Weak Financial Muscle of Indian Firms:** Most Indian private companies lack the deep capital reserves required to match Chinese state-backed mega infrastructure investments.
- **Political & Security Volatility:** Conflicts in Sudan, Sahel insurgencies and instability in Horn of Africa threaten Indian investments, supply chains and diaspora security.
- **Poor Connectivity:** Lack of direct shipping lines, air connectivity and digital corridors elevates logistical costs and limits deeper integration in trade and data exchange.

Way Ahead:

- **Revive IAFS-IV:** Institutionalise IAFS as a regular summit, create a permanent Secretariat and renew political momentum for a unified India–Africa engagement roadmap.
- **Build an India–Africa Digital Corridor:** Jointly develop DPI architecture—UPI–Afripay linkages, DigiLocker-style document systems and tele-health networks to serve the wider Global South.
- **Co-Invest in Strategic Future Sectors:** Partner with Namibia/Morocco on green hydrogen, DRC/Zambia on EV battery minerals, and Kenya–Nigeria hubs on digital startups and AI innovation.
- **Accelerate LoC Delivery:** Establish a single-window LoC monitoring dashboard, fix deadlines, and empower local project execution teams to reduce long-standing implementation delays.
- **Strengthen Maritime Security Architecture:** Make AI-KEYME annual, enhance Western Indian Ocean coordination, and sign logistics support agreements with Kenya, Mauritius and Tanzania.
- **Deepen People-to-People Connect:** Double ITEC and ICCR scholarships, expand India-linked institutions like IIT-M Zanzibar, and support African students and entrepreneurs in Indian ecosystems.

Conclusion:

India–Africa ties stand at a pivotal moment, driven by shared demographics, development priorities and a shifting global order. A decade after IAFS-III, the partnership now needs stronger institutions and co-created growth rather than transactional exchanges. If India can connect, build and revive key frameworks, this relationship will anchor the Global South's rise in the 21st century.

REVISITING RESTRAINT: INDIA AND THE NEW NUCLEAR ORDER

Context: U.S. President Donald Trump's announcement about potentially resuming nuclear testing has reignited global debates on arms control, prompting calls for India to re-evaluate its voluntary moratorium on nuclear tests amid a shifting global strategic landscape.

About Revisiting Restraint: India and the New Nuclear Order

Shifting Global Nuclear Order:

- The **post–Cold War consensus on nuclear restraint** is weakening as major powers modernise their arsenals.
- **Russia** has withdrawn from key arms-control treaties and revived test-site activity in the Arctic.
- **China** is rapidly expanding its nuclear stockpile, building **missile silos and testing infrastructure** at Lop Nur.
- **The U.S.**, citing doubts about simulation-based reliability, is reconsidering its long-standing test moratorium.
- The **Comprehensive Nuclear-Test-Ban Treaty (CTBT)** remains unratified by major powers, eroding trust in the global non-testing regime.

India's Nuclear Testing History and Legacy:

- **1974 – Pokhran-I ("Smiling Buddha"):** India's first nuclear test marked its entry into the nuclear club for peaceful purposes.
- **1998 – Pokhran-II:** India conducted five tests under Operation Shakti, validating multiple fission and fusion devices.
- Post-1998, India declared a **voluntary moratorium** on testing and adopted the **No First Use (NFU)** doctrine under **credible minimum deterrence (CMD)**.
- This restraint earned India **international legitimacy**, leading to the **civil nuclear deals**, end of sanctions, and recognition as a **responsible nuclear power**.

Factors Leading to Renewed Testing Push:

- **Eroding Global Restraint:** Major powers' moves toward re-testing reduce the credibility of voluntary moratoriums.
- **Technological Obsolescence:** India's

nuclear designs were last validated in 1998; advancements in materials and delivery systems demand revalidation.

- **Regional Security Dynamics:** China's expansion and Pakistan's tactical diversification increase pressure on India's deterrence credibility.
- **Uncertain Simulation Reliability:** Computer models and subcritical tests cannot fully replace physical data.
- **Strategic Signalling:** Testing could reaffirm deterrence credibility and technological maturity amid shifting global alignments.

Challenges Associated with Nuclear Testing:

- **Diplomatic Fallout:** Testing could trigger **global condemnation, sanctions**, and jeopardise India's diplomatic capital.
- **Erosion of Moral Standing:** India's image as a **responsible and restrained nuclear power** could suffer internationally.
- **Economic Costs:** Renewed sanctions or trade restrictions may impact investment and technology inflows.
- **Environmental Risks:** Even underground tests carry radiation and ecological hazards in arid test zones.
- **Arms Race Escalation:** Testing might provoke regional reactions from **China and Pakistan**, heightening instability.

India's Strategic Concerns:

- India's **credible minimum deterrence** depends on maintaining confidence in weapon reliability and performance.
- **Agni-V, submarine-launched missiles, and upcoming MIRV systems** require assurance of yield, miniaturisation, and precision.
- Without periodic validation, the **credibility of deterrence weakens**, affecting India's posture in South Asia and beyond.
- India must balance **restraint with readiness**, ensuring **strategic autonomy** in an uncertain global order.

Way Ahead:

- **Strategic Review:** Establish a high-level national commission to assess deterrence credibility under evolving threats.
- **Enhanced Simulation & Subcritical Testing:** Invest in advanced computing, materials research, and non-explosive validation facilities.
- **Diplomatic Preparedness:** Maintain transparency and dialogue to avoid isolation if testing ever becomes necessary.
- **Regional Stability Framework:** Pursue **confidence-building measures** with China and Pakistan while ensuring technological parity.
- **Ethical Consistency:** Any future action must align with India's **NFU** and **credible minimum deterrence** principles — testing only for validation, not aggression.

Conclusion:

India's restraint since 1998 reflected **maturity and responsibility**, but unexamined restraint risks strategic stagnation. In an era of shifting power equations, India must balance **ethical restraint with scientific readiness**. The true test of strategic autonomy lies not in denial of change, but in **readiness to adapt without compromising moral credibility**.

BRICS IS CHALLENGING SWIFT: BUILDING A MULTIPOLAR FINANCIAL ARCHITECTURE

Context: At the 16th BRICS Summit in Kazan (2024), member nations unveiled the BRICS Cross-Border Payments Initiative — "BRICS Pay", signalling an intent to reduce dependence on the U.S.-controlled SWIFT system.

About BRICS is Challenging SWIFT: Building a Multipolar Financial Architecture

Context and Background:

1. **Western dominance in global finance:** For decades, global financial flows have been controlled by Western-led institutions and the **SWIFT network**, which connects over **11,000 banks in 200+ countries**, enabling secure international money transfers under U.S.–EU influence.
2. **Exposure to geopolitical sanctions:** The 2022 exclusion of Russia from SWIFT after its Ukraine

invasion exposed the vulnerability of developing economies to Western financial sanctions and unilateral decisions, prompting calls for alternative systems.

3. **BRICS' strategic response:** In response, BRICS nations (Brazil, Russia, India, China, South Africa)—later joined by Iran and other BRICS+ partners—initiated steps to create parallel financial infrastructures that safeguard monetary autonomy.
4. **Institutional groundwork (2014 Fortaleza Summit):** The formation of the New Development Bank (NDB) and the Contingent Reserve Arrangement (CRA) in 2014 marked the first effort by developing nations to establish independent financial institutions outside Western control.
5. **Advancing monetary multipolarity (Kazan Declaration 2024):** The 16th BRICS Summit in Kazan (2024) formally advanced this agenda by operationalising BRICS Pay, underscoring a collective drive toward monetary multipolarity, digital sovereignty, and reduced dollar dependence.

Understanding BRICS Pay:

- **What is BRICS Pay?**
  - BRICS Pay is a decentralised, interoperable digital payment platform developed under the BRICS Business Council, designed to enable fast, secure, and low-cost cross-border transactions among BRICS+ nations.
- **Core Architecture**
  - **Interoperable systems:** Connects national platforms such as India's UPI, China's CIPS, Russia's SPFS, and Brazil's Pix, ensuring cross-compatibility and scalability.
  - **Decentralised Messaging System (DCMS):** Offers a secure alternative to SWIFT's centralised messaging, minimising vulnerabilities and single-point failures.
  - **Multi-currency support:** Enables direct settlements in **local currencies**, reducing foreign exchange risks and dollar dependency.
  - **DAO Governance Model:** Decentralised and transparent decision-making, allowing all members equitable participation.
  - **Regulatory alignment:** Fully compliant with **KYC/AML norms**, ensuring global legitimacy and financial transparency.

Goals and Mission

- Promote **financial sovereignty without isolation**.
- Ensure **inclusive growth** by lowering transaction costs and enabling SME participation.
- Support UN SDGs **(1, 8, 9, 10)** — financial inclusion, innovation, and poverty reduction.
- Foster a **resilient alternative architecture**, not to replace SWIFT but to diversify and democratise global finance.

Comparative Analysis: SWIFT vs. BRICS Pay:

Aspect	SWIFT	BRICS Pay
Control	G10 central banks (mainly U.S. and EU)	BRICS Business Council (decentralised governance)
Architecture	Centralised	Decentralised (no single point of failure)
Currency Basis	Dollar-dominated	Multi-currency, local settlements
Inclusivity	Favors Western compliance frameworks	Focused on Global South inclusion
Objective	Global interoperability for Western-led trade	Sovereign financial connectivity within BRICS+
Approach	Monopoly-oriented	Multipolar, interoperable, SDG-aligned

Opportunities Created by BRICS Pay:

- **Financial Autonomy for the Global South:** Enables emerging economies to transact independently, reducing exposure to sanctions or unilateral policy shifts.
- **Boost to South–South Trade:** Local currency settlements can lower costs and enhance intra-BRICS trade, currently valued at **over $600 billion annually**.
- **Digital Diplomacy:** Projects like UPI, Pix, and CIPS serve as instruments of **soft power**, promoting digital trust and shared infrastructure.

- **Alignment with Sustainable Finance:** By integrating with SDGs and climate-linked payments, BRICS Pay could foster **green fintech ecosystems**.
- **Stimulus for Fintech Innovation:** Encourages indigenous blockchain, cybersecurity, and cross-border fintech collaborations among BRICS start-ups.

Challenges in Realising BRICS Pay:

- **Divergent National Ambitions:** India, China, and Russia each seek to globalise their own payment systems (UPI, CIPS, SPFS), potentially causing **strategic overlap**.
- **Technical Interoperability:** Harmonising different digital architectures and data standards poses complex engineering challenges.
- **Geopolitical Trust Deficit:** Political frictions (e.g., India-China tensions) could slow down consensus on governance models.
- **Regulatory and Legal Barriers:** Cross-jurisdictional KYC, anti-money-laundering norms, and data localisation laws need harmonisation.
- **Western Retaliation Risks:** Threats of sanctions or tariffs (e.g., U.S. warning post-2024 BRICS currency discussions) may deter early adoption.
- **Limited Acceptance Beyond BRICS:** Global credibility will depend on cooperation with neutral partners (ASEAN, African Union, SCO) to expand user base.

The Way Forward:

- **Incremental Integration:** Begin with bilateral settlements (e.g., India–Russia, China–Brazil) before scaling up to full BRICS interoperability.
- **Institutional Backing:** Link BRICS Pay with the New Development Bank for liquidity support and risk insurance.
- **Digital Diplomacy Framework:** Build technical and legal harmonisation under a "BRICS Fintech Charter" to ensure common standards.
- **Diversified Technology Stack:** Incorporate blockchain-based auditing, AI-powered fraud detection, and cybersecurity protocols for trust building.
- **Global Outreach:** Extend the platform to BRICS+ members (e.g., Saudi Arabia, UAE, Egypt) to anchor it in global trade corridors.
- **Balancing Autonomy with Inclusion:** Maintain openness to Western interoperability — ensuring complementarity, not confrontation.

Conclusion:

BRICS' pursuit of financial sovereignty through BRICS Pay is an act of diversification, not defiance. By creating a decentralised, interoperable, and compliant network, it aims to make global finance more balanced and inclusive. If implemented with technological and diplomatic prudence, BRICS Pay could usher in a multipolar monetary order where sovereignty and interdependence coexist.

Topics: Important International institutions, agencies and fora, their structure, mandate.

STRUCTURAL GAPS BETWEEN UPSC AND STATE PSCS

Context: The 2025 National Conference of Chairpersons of State Public Service Commissions (PSCs) is being hosted by the Telangana PSC on December 19–20 to address recurring issues in recruitment.

About Structural Gaps Between UPSC and State PSCs:

Historical Background of PSCs:

5. **Montagu–Chelmsford Reforms (1918):** Proposed an **independent, merit-based, politically insulated** recruitment authority to counter colonial bias and ensure fair entry of Indians into civil services.
6. **First Public Service Commission (1926):** Established to regulate recruitment for the Union; marked the beginning of a **permanent and professionalised** service commission framework.
7. **Government of India Act, 1935:** Mandated separate PSCs for each province, institutionalising a **federal recruitment mechanism** that formed the foundation for present UPSC–State PSC structure.

8. **Continuation in the Constitution (1950):** Constituent Assembly retained PSCs under **Articles 315–323**, recognising their role in ensuring neutrality, fairness, and depoliticised recruitment.

Structural Difference: UPSC vs State PSCs:

Aspect	UPSC	State PSCs
Appointment Process	Merit-Based Appointments — Members selected for experience, seniority, and neutrality, ensuring professionalism and reduced political interference.	Politicised Appointments — Often influenced by ruling parties, compromising independence, credibility, and expertise standards.
Representation Norms	Representation Across Zones — Mandatory zonal distribution ensures pan-India perspectives and minimises regional bias.	Lack of Representation Norms — No fixed criteria on age, qualifications, or experience; appointments may lack administrative depth.
Administrative Framework	Dedicated Personnel Ministry (DoPT) — Ensures systematic manpower planning, timely vacancy notifications, and consistency in exam cycles.	No Dedicated Personnel Ministry — Poor workforce planning leads to irregular notifications, backlog of vacancies, and delays.
Resource Availability	Financial & Administrative Stability — Central resources support reliable recruitment, strong exam systems, and quick grievance redressal.	Fiscal Constraints — States face funding shortages, extend retirement ages, and defer recruitments, resulting in erratic exam schedules.

Issues / Problems in State PSCs:

- **Irregular Revision of Syllabus:** Syllabi remain outdated as PSCs rarely form expert committees, weakening alignment with current affairs, modern academics, and UPSC standards.
- **Limited Academic Pool:** Dependence on in-state experts restricts diversity, impacting quality of question papers and moderation processes.
- **Evaluation & Moderation Weaknesses:** Lack of strong inter-se moderation leads to uneven scoring and subjective evaluation, prompting frequent judicial intervention.
- **Reservation & Zonal Complexity:** Incorporating vertical, horizontal, and regional quotas requires complex calculations, often resulting in errors and litigation.
- **Poor Translation Mechanisms:** Weak English-to-regional language translations distort meanings, causing ambiguity, unfair advantage, and paper cancellations.
- **Transparency vs Confidentiality Imbalance:** Frequent leaks, mismanagement, and slow grievance responses fuel loss of trust and repeated exam cancellations.

Recommendations for Reform:

- **Create a Dedicated State Personnel Ministry:** A DoPT-like body should publish a **5-year recruitment calendar**, ensuring predictable vacancies and annual exam cycles.
- **Constitutional Amendment on PSC Membership:** Fix minimum age at **55 years** and maximum at **65**, with defined qualifications to ensure experienced, apolitical, and competent members.
- **Panel-Based Appointment System:** States should maintain a vetted panel of eminent administrators and professionals, selected for

integrity, domain expertise, and neutrality.

- **Periodic Syllabus Revision:** Revise syllabi every **3–5 years**, place drafts in public domain, and align with UPSC trends to enhance objectivity and clarity.
- **Mixed Exam Pattern:** Retain **objective prelims**, but use **objective + descriptive mains** to balance analytical testing with fair evaluation and reduced subjectivity.
- **Improve Translation & Question Setting:** Use **tech-enabled secure translation** plus human review to ensure accuracy; vary patterns regularly to reduce AI-driven formulaic answers.
- **Strengthen PSC Secretariat Leadership:** Secretary must be an officer with experience in **school/board exam systems**, ensuring rigorous supervision and procedural integrity.

Conclusion:

State PSCs require urgent structural and procedural reforms to match the credibility and efficiency of the UPSC. Instituting transparent appointments, modernised syllabi, and predictable exam cycles can restore aspirants' trust. A professionally managed, depoliticised system will ensure merit-based recruitment and strengthen administrative capacity at the State level.

UN AT 80 – DECLINE OF GLOBAL GOVERNANCE AND RISE OF NEW MULTILATERALISM

Context: As the **United Nations turns 80**, concerns grow over its diminishing relevance in maintaining peace and security. While **Ban Ki-Moon** calls for urgent reform, thinkers like argue that the UN's original purpose has eroded, and that a **new multilateralism** is essential for a multipolar world order.

Background

Founded in **1945** after World War II to prevent future wars, the UN began with 51 members and now has **193**, symbolising near-universal membership. Yet its dual structure—**"one nation, one vote"** coupled with the **P-5 veto**—has created an enduring imbalance between democratic equality and power privilege.

Major Successes of the UN

1. **Peacekeeping and conflict resolution** – Over **70 peacekeeping missions** since 1948 reduced conflict in **Bosnia (1990s)**, **Cambodia (1992)** and **Mozambique (1994)**.
   Eg: The UN Transitional Authority in Cambodia (UNTAC) restored democracy and oversaw successful elections in 1993.
2. **Humanitarian and development assistance** – Bodies like **WFP, WHO, UNICEF and UNHCR** deliver vital food, health and refugee support.
   Eg: During the 2023 Sudan crisis, WFP fed nearly 6 million displaced people amid famine risk.
3. **Global norm-building** – Key instruments like **UDHR (1948)**, **Paris Climate Agreement (2015)** and **SDGs (2015)** established shared frameworks for rights and sustainability.
   Eg: India's National SDG Index (NITI Aayog) tracks local implementation of global goals.
4. **Nuclear non-proliferation** – The UN facilitated **NPT (1968)**, **CTBT (1996)** and mediated the **North Korea nuclear freeze (1994)**.
   Eg: IAEA monitoring under UN auspices has slowed Iran's weaponisation efforts.
5. **Diplomatic platform for small nations** – Provides equal visibility to smaller or developing states.
   Eg: Small island states like **Fiji and Tuvalu** used UN platforms to push climate-loss compensation at COP-28.

Persistent Challenges and Failures

1. **Veto paralysis** – The **P-5 veto** obstructs consensus; Russia (161 vetoes) and the US (95) block accountability on crises.
   Eg: In 2024, Russia vetoed a Security Council resolution calling for a Gaza ceasefire.

2. **Selective human-rights enforcement** – States with poor rights records often head UN committees, reducing credibility.
   Eg: In 2023, Iran chaired a UN Human Rights Social Forum even amid domestic crackdowns.
3. **Failure to prevent conflicts** – Inability to stop wars in **Rwanda (1994)**, **Iraq (2003)**, **Syria (2011-)**, and **Ukraine (2022-)** exposes core weakness.
   Eg: UN peacekeepers' passive role during Rwanda's genocide led to 800,000 deaths despite prior warnings.
4. **Reform fatigue and apathy** – Declining global engagement, with only **43 heads of government** attending UNGA-2025.
   Eg: Neither **Xi Jinping** nor **Vladimir Putin** has attended the UNGA more than once in the last decade.
5. **Unrealistic reform models** – Expansion of permanent members or abolition of veto lacks consensus among major blocs.
   Eg: The **G-4 proposal** (India, Germany, Japan, Brazil) remains stalled for 20 years.

Rise of a New Multilateralism

1. **Shift to multipolarity** – Power diffusion across **Asia, Africa and Latin America** challenges Western-centric governance.
   Eg: India-Brazil-South Africa (IBSA) and **BRICS+** reflect growing southern coalitions.
2. **Issue-based coalitions** – Flexible forums like **G-20**, **Quad**, and **BRICS** address climate, health, and trade where UN stagnates.
   Eg: The G-20 Delhi Declaration (2023) reached consensus on digital public infrastructure and debt relief, unlike UN forums.
3. **Networked global governance** – Multilayered cooperation among regional and functional institutions replaces UN centrality.
   Eg: ASEAN's Regional Forum and AU's Peace and Security Council now manage local crises more effectively than the UN.

India's Vision and Role

1. **Reformed multilateralism** – India advocates a **democratic and representative UN,** echoing its **G-20 Presidency (2023)** call for "One Earth, One Family, One Future."
2. **Developmental diplomacy** – Initiatives like **International Solar Alliance**, **CDRI**, and **Vaccine Maitri** link technology and humanitarianism.
3. **Voice of the Global South** – Hosted the **Global South Summit (2023)** to shape equitable global decision-making.
4. **Strategic autonomy and norm-setting** – Balances relations across blocs while promoting **human-centric globalisation**.

Way Forward

1. **Pragmatic reform** – Prioritise transparency, financial accountability, and restraint on veto use rather than mere expansion.
   Eg: The France-Mexico proposal (2015) for voluntary veto suspension in mass-atrocity cases can be revived.
2. **Regional empowerment** – Strengthen **AU, ASEAN, SAARC-plus** and other regional security frameworks for faster conflict response.
3. **Functional multilateralism** – Build coalitions around specific issues like **climate finance**, **pandemic preparedness**, and **AI governance**.
4. **Inclusive global governance** – Rebalance power toward the Global South; integrate **Agenda 2030** goals into trade and finance regimes.
5. **Leadership for a new charter** – Like Roosevelt-Churchill's **Atlantic Charter (1941)** birthed the UN, new visionary statesmen must design a framework for the 21st century's multipolar order.

Conclusion

The UN today mirrors the **League of Nations' decay** in the 1930s. Rather than clinging to obsolete structures, nations must **reimagine multilateralism** anchored in accountability, inclusivity, and shared responsibility. The call is not to abandon global governance but to **reinvent it**—transforming the UN's legacy into a **new cooperative order** suited for today's realities.

GENERAL STUDIES – 3

Topics: Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment.

INDIA'S LABOUR REFORMS

Context: The Government highlighted the progress of India's labour reforms through the implementation of four Labour Codes aimed at simplifying compliance and strengthening worker welfare.

About India's Labour Reforms:

What it is?

India's labour reforms consolidate 29 complex and outdated labour legislations into **four integrated Labour Codes** to streamline compliance, enhance worker protection, and promote a business-friendly environment.

This overhaul modernises labour regulation to match today's economic realities and digital economy needs.

Key Reasons for Reforms:

- **Multiplicity of laws:** Overlapping provisions and 29 sector-specific laws caused compliance burden and confusion.
- **Fragmented enforcement:** Multiple authorities created procedural complexity and weak enforcement.
- **Outdated legal framework:** Many laws were drafted during pre-Independence era and needed modernization.
- **Need for ease of doing business:** Simplified processes like single registration, license, and return were required.
- **Employment generation:** Simplified labour governance promotes investment and job creation.

Labour codes and its Features:

1. **Key Features Code on Wages, 2019:**
   - **Universal Minimum Wage:** Ensures minimum wages for all workers across organized and unorganized sectors for wider wage protection.
   - **National Floor Wage:** Sets a central floor wage preventing States from fixing wages below a uniform baseline for fair nationwide standards.
   - **Gender-Neutral Pay:** Prohibits wage discrimination across gender, including transgender workers, ensuring equal pay for similar work.
   - **Overtime at 2x Rate:** Mandates overtime wages at twice the normal rate for work beyond standard hours to safeguard fair compensation.
   - **Inspector-cum-Facilitator:** Replaces traditional inspectors with facilitators who guide employers toward compliance rather than penal focus.
   - **Decriminalized Offences:** Converts minor violations into monetary penalties, promoting compliance-friendly and non-punitive governance.
2. **Key Features Industrial Relations Code, 2020:**
   - **Fixed-Term Employment:** Allows time-bound contracts with full benefits, including gratuity after one year, reducing contract labour misuse.
   - **Re-skilling Fund:** Provides 15 days' wages for retrenched workers to aid quick skilling and improve post-retrenchment employability.
   - **Trade Union Recognition:** Recognizes a union with 51% membership or forms a negotiating council, improving collective bargaining clarity.
   - **Higher Layoff Threshold:** Raises approval requirement from 100 to 300 workers, offering flexibility to firms while preserving worker rights.
   - **Strike Notice Rule:** Enforces a 14-day notice for strikes/lockouts to reduce disruptions and encourage negotiation-based conflict resolution.
   - **Expanded Definitions:** Broadens "industry" and "worker" categories to cover journalists, sales staff, and

supervisory employees upto ₹18,000.

3. **Key Features Code on Social Security, 2020:**
   - **Universal Social Security:** Extends life, health, maternity and old-age benefits to unorganized, gig, and platform workers through flexible schemes.
   - **ESIC & EPF Expansion:** Removes notified-area limits, making ESIC universal while ensuring EPF inquiries are time-bound and transparent.
   - **Social Security Fund:** Creates a dedicated fund for gig/unorganized workers, financed through aggregator contributions and penalties.
   - **Self-Assessed Cess:** Allows builders to self-assess construction cess digitally, reducing delays and discretionary inspections.
   - **Gratuity for FTEs:** Grants gratuity to fixed-term employees after one year, improving social protection for project-based workers.
   - **Uniform Wage Definition:** Standardizes wage components to curb under-reporting and ensure accurate EPF, ESIC, and gratuity calculations.
4. **Key Features Occupational Safety, Health & Working Conditions Code, 2020:**
   - **Single Registration/Return:** Replaces multiple registrations with one unified system to reduce compliance burden and improve efficiency.
   - **Migrant Worker Benefits:** Expands coverage to self-migrated workers with annual travel allowance and nationwide portability of entitlements.
   - **Women's Night Work:** Permits women to work night shifts with consent and safety provisions, promoting inclusion and workforce equality.
   - **National Worker Database:** Creates a digital database for unorganised and migrant workers to enable benefits delivery and skill mapping.
   - **Working Hours Limit:** Caps working hours at 8 hours/day and 48 hours/week, ensuring rest, safety, and global labour-standard alignment.
   - **Safety Committees:** Establishments with 500+ workers must form joint employer–employee safety committees to strengthen workplace governance.
   - **Decriminalized Penalties:** Converts minor offences into compounding/fines, ensuring compliance without harsh criminal proceedings.

Significance Of Labour Codes:

- **Simplifies India's labour regulation** into a unified, predictable framework.
- **Boosts ease of doing business** through single registration, single return, and digital inspections.
- **Strengthens worker welfare** with universal minimum wages, safety norms, and expanded social security.
- **Supports formalisation** through transparent contracts, appointment letters, and EPF/ESIC expansion.
- **Promotes employment and investment** by giving industries flexibility while retaining worker protection.
- **Enables modern workforce practices** such as work-from-home, fixed-term employment, and gig worker coverage.

Conclusion:

India's four Labour Codes represent a landmark shift towards a modern, equitable, and simplified labour governance framework. They balance worker protection with industrial flexibility and transparency, fostering a future-ready labour ecosystem. These reforms strengthen India's growth trajectory by promoting formalisation, job creation, and sustainable economic development.

THE INDIA SKILLS REPORT 2026

Context: The India Skills Report 2026 shows India's employability rate rising to 56.35% (from 54.81%), signalling a rapid improvement in how "job-ready" the youth are.

About The India Skills Report 2026:

- **What it is?**
  - The **India Skills Report 2026** is an annual nationwide assessment of India's workforce readiness, prepared by **ETS, CII, AICTE, AIU and Taggd**, based on surveys of students, recent graduates and employers across key sectors.
- **Aim:**
  - To measure **employability** and skill gaps across education streams, sectors and regions.
  - To map **emerging trends** in AI, gig work, digital fluency and hiring patterns.
  - To help **policymakers, academia and industry** align curricula, training and recruitment with the demands of the future of work.

Key Trends Identified in the Report:

1. **Rising Employability:**
   - Overall employability has increased to **56.35%** (from ~54.8%), almost a **10-percentage point jump in about 4 years**, indicating more youth are job-ready and aligned with industry needs.
2. **Women Surpass Men in Employability:**
   - **Women: 54% vs Men: 51.5%** – first time in years that women's employability overtakes men's, especially in **BFSI, education, healthcare** and in **Tier-2/ Tier-3 cities**.
3. **Tech & AI at the Core:**
   - **Computer Science (80%)** and **IT engineers (78%)** top employability metrics, driven by roles in **AI, data analytics, automation, cloud, cybersecurity**.
   - India already holds a significant share of global AI talent, and AI tools are widely used in recruitment and daily work.
4. **Skills > Degrees – Micro-credentials on the rise:**
   - Industry and institutions are converging through **micro-credentials, stackable certificates and experiential learning**, moving towards a **"skills-first" hiring culture**, not just degree-based recruitment.
5. **Booming Gig & Freelance Economy:**
   - **Gig hiring grew ~38%**, and gigs now form around **16% of all jobs**, with the gig workforce projected to reach **tens of millions by 2030**, giving workers more flexibility and diversified income streams.
6. **High Appetite for Internships & Practical Exposure:**
   - Around **92.8% of students** seek internships or hands-on exposure, especially high in **Karnataka, Madhya Pradesh, Tamil Nadu**, reflecting demand for real-world learning and industry projects.
7. **Hiring Intent is Strong, Especially in IT:**
   - Companies plan to hire **40% more people** next year (up from 29%).
   - **IT sector** leads fresher hiring at **35%** (vs 14% cross-industry last year), followed by **BFSI, manufacturing, pharma/ healthcare, FMCG**.
8. **Streams & Vocational Pathways Getting Stronger:**
   - **Commerce grads**: employability up to **62.81%** (from 55%) – driven by BFSI & fintech.
   - **Science: ~61%, Arts: ~55.55%** – benefitting from digital and interdisciplinary roles.
   - **ITI: 45.95%** (up from 41%) and **polytechnic: 32.92%** – showing gradual success of **vocational skilling**.

Opportunities for India in the Skills Landscape:

- **Becoming a Global Talent Powerhouse:** Large, young population + rising employability + English & digital fluency position India as a **primary supplier of skilled talent** to the world.
- **Leadership in AI & Emerging Tech:** Strong base in **computer science, IT, data, cloud and AI** opens space for India to build **indigenous AI products** and capture high-value global technology work.
- **Demographic Dividend with Skills, Not Just Numbers:** With a large share of youth, a skills-first orientation can convert demographic size into **productivity, innovation and entrepreneurship**.
- **Tier-2 & Tier-3 Cities as New Skill Hubs:** Growing employability and women's participation in smaller cities can **decongest metros**, spread growth and create **regional innovation clusters**.
- **Rise of Flexible Work Models:** Gig work, remote work and freelancing enable Indians to **work**

globally while staying local, earning in diverse markets and time zones.

- **Deepening Industry–Academia Linkages:** Micro-credentials, internships and industry projects create **continuous pipelines** from campus to corporate, reducing onboarding costs and mismatch.

Challenges highlighted in the Report:

- **Access & Equity Gaps:** Advanced skills in **AI, data, automation** remain more accessible in metros and elite institutions; **rural and Tier-3 learners** still face infrastructure, cost and exposure barriers.
- **Soft Skills & Critical Thinking Deficits:** Persistent concerns around **communication skills, problem-solving, teamwork and critical thinking** despite technical competence, especially for first-gen learners.
- **Industry–Curriculum Mismatch:** Many curricula lag behind rapidly changing tech (AI, green energy, quantum, biotech), leading to **time-lag between learning and market demand**.
- **Digital Divide & Cost of New Tech:** Devices, high-speed internet and access to advanced labs or tools are still **unevenly distributed**, making high-end skilling **expensive or inaccessible** for many.
- **Over-reliance on Foreign Tech & Platforms:** Heavy dependence on **non-Indian AI tools and platforms** risks value capture going abroad, while India mostly supplies labour instead of owning IP.
- **Gig Work Without Safety Nets:** Gig and freelance roles can mean **income volatility, lack of social security and weak bargaining power**, especially for youth with little financial literacy.

Way Ahead:

- **Curriculum Reform: Skills-First & Interdisciplinary:** Embed **AI, data, digital skills, climate & sustainability** across disciplines, with **majors + minors** and flexibility to mix tech and non-tech domains.
- **Strengthen Vocational & Community-Based Skilling:** Scale **ITI, polytechnic and NSDC-led programs**, link them to local industry clusters, and build **affordable, modular courses** in emerging sectors.
- **Democratise Access to Digital & AI Learning:** Expand **online platforms, SWAYAM-type courses, blended learning**, and subsidise access to devices and connectivity, particularly in **rural and Tier-3 areas**.
- **Boost Industry–Academia Collaboration:** Make **internships, apprenticeships, live projects and credit-based industry training** mandatory and mainstream, not optional add-ons.
- **Invest in Faculty Upskilling:** Continuous **faculty development** in AI, data science, green tech, biotech, and pedagogy so that teachers can translate new technologies into classroom and lab practice.
- **Focus on Soft Skills & Holistic Development:** Integrate **communication, critical thinking, ethics, teamwork and leadership** into all programmes through clubs, projects, debates, community work.
- **Promote Indigenous Tech & Multilingual Tools:** Incentivise creation of **Indian AI platforms, low-cost EdTech, and multilingual content**, ensuring that India is not just a user but also a **creator of technology**.

Conclusion:

The India Skills Report 2026 shows that India is not just adding more graduates, but building more employable, tech-ready professionals. If India can bridge access gaps, update curricula, and scale high-quality skilling to every region and social group, its youth can truly power a skills-first, innovation-led economy. Handled well, this momentum can turn India into a global talent hub by 2047, with growth that is not only faster, but also more inclusive and resilient

INDIA'S IT DREAM IS AT A CROSSROADS

Context: India's IT sector, once the driver of global outsourcing success, is facing its sharpest disruption yet with mass layoffs, automation-led restructuring, and skill redundancy.

About India's IT dream is at a crossroads:

Current IT Landscape in India:

- India's IT industry contributes **7% to GDP**, employing over **6 million people** and earning **$280 billion annually**.
- Once a global symbol of digital outsourcing, the sector now faces **AI-driven transformation** and **shrinking job security.**
- Traditional IT models—built on bulk hiring and coding for global clients—are giving way to **AI-led, high-value service delivery**.

Causes of the Current Crisis:

- **AI and Automation:** Agentic AI and generative tools automate routine coding, testing, and reporting tasks, reducing manpower needs.
- **Restrictive Global Policies:** Higher **H-1B visa fees** and localisation pressures in the U.S. make foreign operations costlier for Indian firms.
- **Tightening Client Budgets:** Economic slowdown in the **U.S. and Europe** has reduced outsourcing contracts and spending.
- **Skill Obsolescence:** Legacy skills such as **SAP ECC, Java, and mainframes** are being replaced by AI, cloud, and cybersecurity expertise.
- **Shift in Business Models:** The **assembly-line model** of mass deployment is obsolete — clients now demand specialised, agile teams.

Opportunities for India:

- **AI Upskilling Revolution:** India can build the world's largest AI-skilled workforce, as firms like TCS retrain 5 lakh+ employees.
- **Deep-Tech Startups:** With over 1,000+ AI and SaaS startups, India can shift from IT services to product and innovation leadership.
- **Curriculum Reform:** Overhauling engineering education to include machine learning, AI ethics, and product thinking can future-proof talent.
- **Global Collaboration:** Partnerships on data governance, digital trade, and visa facilitation can preserve India's IT competitiveness.
- **Diversification:** Expansion into cybersecurity, cloud architecture, and AI consulting can generate new revenue streams.

Challenges Associated:

- **Job Displacement:** Mid-level professionals face **skill redundancy and layoffs** without adequate safety nets.
- **Digital Inequality:** Uneven access to AI tools and learning infrastructure across regions limits inclusivity.
- **Low R&D Investment:** India invests **<1% of GDP in R&D**, hindering tech innovation and global competitiveness.
- **Curricular Lag:** Most colleges still teach **outdated programming models** rather than AI-integrated skillsets.
- **Mental and Economic Stress:** Lack of **career transition support** exacerbates worker vulnerability and productivity loss.

Way Ahead:

- **AI-Centric Skilling:** Launch a **National AI Upskilling Mission** linking academia, corporates, and government incentives.
- **Education Reform:** Mandate AI and data science as **core subjects** in engineering and vocational institutions.
- **Public–Private Innovation Hubs:** Establish **AI research parks and deep-tech incubators** to foster product-based growth.
- **Worker Protection:** Introduce **6–9 months' severance pay** and retraining funds for laid-off IT professionals.
- **Policy Modernisation:** Promote **data sovereignty, export incentives, and global tech alliances** for long-term resilience.

Conclusion:

India's IT story is not ending — it is evolving from **outsourcing manpower to creating mindpower**. If the nation aligns **policy, skilling, and innovation**, it can reclaim leadership in the global AI revolution. With vision and courage, India's IT "rose" may have lost some petals — but its roots remain strong and full of promise.

Topics: Inclusive growth and issues arising from it.

EXPLOITED WORKERS, A LABOUR POLICY'S EMPTY PROMISES

Context: The ongoing debate around the draft Shram Shakti Niti 2025 has intensified concerns over weak social protection and enforcement.

- Critics argue that despite its "future-ready" vision, the policy fails to address the systemic

rights violations and precarious conditions faced by millions of informal workers.

About Exploited Workers, a Labour Policy's Empty Promises:

What is Labour exploitation?

- **Labour exploitation** refers to the **unjust or coercive treatment of workers**, where individuals are denied fair wages, safe working conditions, and legal rights.
- It often involves **forced labour, excessive hours, or contract manipulation**, leaving workers trapped in dependency or debt.
- Fundamentally, it violates the principles of **dignity, equality, and freedom** enshrined in labour and human rights laws.

Key Observations on Worker Exploitation:

- **Modern Slavery Scale:** India is home to over **11 million forced labourers**, the highest in the world, reflecting the chronic vulnerability of workers deprived of contractual and legal protection mechanisms.
- **Informal Workforce Dominance:** Nearly **90% of the workforce** remains outside formal employment, excluded from provident fund, health insurance, or pension coverage, exposing the fragility of India's labour system.
- **Systemic Rights Violations:** The arbitrary reclassification of employees as "daily wagers" enables wage theft and denial of benefits, violating **Articles 14 (Equality), 16 (Equal Opportunity), and 23 (Prohibition of Forced Labour)** of the Constitution.
- **Union Decline:** The growing dependence on contractors and casual labour has weakened trade unions, eroding collective bargaining and diminishing the workers' capacity to negotiate fair conditions.
- **ILO Non-Compliance:** India's weak adherence to **ILO Conventions 29 and 155** on forced labour and occupational safety undermines global commitments and moral credibility in labour governance.

Key Features of draft Shram Shakti Niti 2025:

1. **Unified Vision and Mission:** Envisions a world of work where every labourer enjoys dignity, safety, and opportunity through seven core objectives — universal social security, occupational safety, gender and youth empowerment, future-readiness, and green jobs.
2. **Digital Public Infrastructure for Employment:** The National Career Service (NCS) will evolve into India's Employment DPI, offering transparent, AI-driven job matching, credential verification, and career guidance across Tier-II and Tier-III cities.
3. **Universal Social Security:** Establishment of a Universal Social Security Account integrating EPFO, ESIC, PM-JAY, and e-Shram, ensuring portable and lifelong protection for every worker.
4. **Women and Youth Empowerment:** Targets 35% female workforce participation by 2030, while promoting flexible work models, childcare, entrepreneurship, and vocational pathways for youth.
5. **Ease of Compliance and Formalisation:** Launch of a single-window digital compliance portal with risk-based self-certification to reduce paperwork and enhance trust-based governance.
6. **Technology and Green Transitions:** Promotes AI-enabled workplace safety systems, digital upskilling, and creation of green and sustainable jobs in line with India's climate goals.
7. **Convergence and Good Governance:** Establishes a three-tier institutional structure—National, State, and District Labour Missions—with data-driven dashboards and annual Labour & Employment Policy Evaluation Index (LEPEI) for performance tracking.
8. **Labour and Employment Stack:** Creates a unified digital backbone integrating worker identities, enterprise databases, and social-security entitlements for paperless and portable governance.
9. **Tripartite Dialogue & Cooperative Federalism:** Ensures Centre–State coordination and dialogue among government, employers, and workers to promote participatory policy implementation.

Gaps in Shram Shakti Niti 2025:

- **Funding Void:** The proposed **Universal Social Security Account** merges existing schemes but provides no clarity on funding sources or employer contributions, risking unsustainable implementation.
- **Digital Exclusion:** Dependence on digital IDs and e-platforms risks excluding women, elderly, and low-literacy workers in rural areas, thereby deepening inequality and violating **Article 15** on non-discrimination.
- **Weak Enforcement:** While targeting "zero workplace fatalities by 2047," the absence of adequate labour inspectors, penalties, and monitoring mechanisms renders this goal aspirational rather than actionable.
- **Gender Gaps:** The aim of achieving **35% female labour participation by 2030** lacks mandatory quotas, childcare infrastructure, and maternity benefits, undermining substantive gender equity.
- **AI and Gig Economy Risks:** Integration of AI for job matching and skill mapping through the **National Career Service** lacks ethical guidelines or bias audits, risking caste, regional, and gender-based discrimination.

Way Ahead:

- **Pilot-Based Implementation:** The government must initiate pilot projects in diverse sectors to test inclusivity and administrative feasibility before national deployment of Shram Shakti Niti 2025.
- **Tripartite Participation:** Ensuring a governance model that involves **government, employers, and unions** will restore accountability and shared ownership in labour reforms.
- **Offline Accessibility:** Providing offline enrolment, grievance redressal, and awareness campaigns will safeguard digitally excluded workers and enhance social security outreach.
- **Ethical and Algorithmic Oversight:** Union-vetted audits and bias checks in AI systems must be institutionalised to prevent discrimination in digital labour governance platforms.
- **Dedicated Funding and Enforcement:** Establishing a legally mandated **social security corpus** and strengthening inspection capacity are essential to translate policy commitments into tangible protection.

Conclusion:

The **Shram Shakti Niti 2025** aspires to build a resilient and equitable labour ecosystem, yet its promise falters without financial credibility, institutional oversight, and inclusivity. A rights-driven policy must prioritize workers' dignity over administrative efficiency. India's true labour reform will be measured not by dashboards or slogans, but by the restoration of **justice, fairness, and human dignity** in the world of work.

Topics: Major crops cropping patterns in various parts of the country, different types of irrigation and irrigation systems storage, transport and marketing of agricultural produce and issues and related constraints; e-technology in the aid of farmers.

ARTIFICIAL INTELLIGENCE FOR AGRICULTURAL TRANSFORMATION

Context: A new World Bank–led report "Harnessing Artificial Intelligence for Agricultural Transformation" outlines how AI can be responsibly scaled across agrifood systems, especially in low- and middle-income countries.

About Artificial Intelligence for Agricultural Transformation:

Current trends of AI in agriculture:

- **Shift to GenAI & multimodal AI:** New models combine text, images, satellite data and sensor feeds to give natural-language, local-language advisories and predictive insights for farmers.
- **Systems-level adoption:** AI is now used across the value chain—crop discovery, advisory, insurance, logistics and market intelligence—rather than in isolated pilots.
- **Rapid growth in investments:** The AI-in-agriculture market (~US$1.5 bn in 2023) is projected to reach about US$10.2 bn by 2032.
- **LMIC-focused experiments:** Numerous projects in Africa and Asia now use AI for hyperlocal weather, pest diagnosis, and input optimisation tailored to smallholders.
- **"Small AI" on phones:** Lightweight models that run on basic smartphones or offline devices are emerging to serve farmers in low-connectivity environments.

Opportunities of AI in agriculture:

- **Higher yields & input efficiency:** AI-based precision farming, irrigation, and fertilizer tools can cut chemical use (up to ~95% in some drone-based pilots) while raising yields by 20–30%.
- **Climate resilience:** AI helps breed climate-resilient varieties, model climate risks, and plan cropping patterns using high-resolution agro-ecological and weather data.
- **Better incomes & market access:** Projects like Saagu Baagu in India show AI advisories can raise farmer income per acre, improve quality and reduce input costs, while tools like Hello Tractor optimise machinery access.
- **Inclusive finance & risk mitigation:** Alternative credit scoring, AI-based micro-insurance and climate-indexed products can expand formal finance to previously unbanked smallholders.
- **Smarter public policy:** Governments can use AI for early-warning systems, yield and price forecasting, and targeted subsidies, improving food-security planning and resource allocation.

Initiatives already taken:

- **Global AI roadmap by World Bank & partners:** The report itself, with 60 use cases, gives a structured roadmap for LMICs on applications, governance and investments.
- **Research institutions using AI:** IRRI, CIMMYT and others use ML and computer vision to speed up phenotyping and genebank screening, tripling the number of accessions screened while cutting costs.
- **Data coalitions & exchanges:** Ethiopia's "Coalition of the Willing" and India's Agricultural Data Exchange (ADeX) create shared data layers to train local AI models while protecting sovereignty.
- **Public–private digital platforms:** Initiatives like the Agriculture Information Exchange Platform (AIEP) in Kenya and Bihar pilot GenAI advisory tools in multiple local languages for tens of thousands of users.

Key challenges associated:

- **Digital divide & infrastructure gaps:** Only a small share of rural populations in regions like Sub-Saharan Africa have reliable internet and electricity, limiting AI deployment and real-time services.
- **Data bias and scarcity:** Most training data comes from high-income regions; local crops, soils and indigenous practices are under-represented, leading to biased or irrelevant recommendations.
- **Low human capital & trust:** Many farmers, especially women and older farmers, lack digital skills; distrust of automated advice and language barriers can slow adoption.
- **Weak governance & regulation:** Clear rules on data ownership, privacy, algorithmic transparency and liability for AI errors are still evolving in most LMICs.
- **Risk of exclusion & concentration:** Without safeguards, AI could deepen inequalities, create vendor lock-in, or favour large agribusinesses over smallholders in access to insights, finance and markets.

Way ahead:

- **Adopt national AI strategies with agri focus:** Countries should explicitly integrate agriculture into AI strategies, with budgets, timelines and links to food-security, climate and nutrition goals.
- **Invest in digital public infrastructure & connectivity:** Expand rural broadband, green data centres, and interoperable registries so that AI tools can plug into common, publicly

governed rails.

- **Build inclusive data ecosystems:** Support Agricultural Data Exchange Nodes and FAIR/ open data principles so local data (crops, soils, weather, practices) can safely train context-specific models.
- **Strengthen skills and extension systems:** Train farmers, extension workers and agri-startups in digital and AI literacy, using local-language, multimodal interfaces and train-the-trainer models.
- **Create robust governance & ethical frameworks:** Enact laws on data rights, transparency, environmental standards and accountability for AI, using sandboxes and participatory policy-making.

Conclusion:

AI has the potential to significantly boost productivity, resilience, and efficiency across agrifood systems. However, to realise these gains, countries must bridge digital infrastructure gaps, strengthen data ecosystems, build farmer-level capacities, and ensure robust governance.

NITI AAYOG UNVEILS REIMAGINING AGRICULTURE REPORT

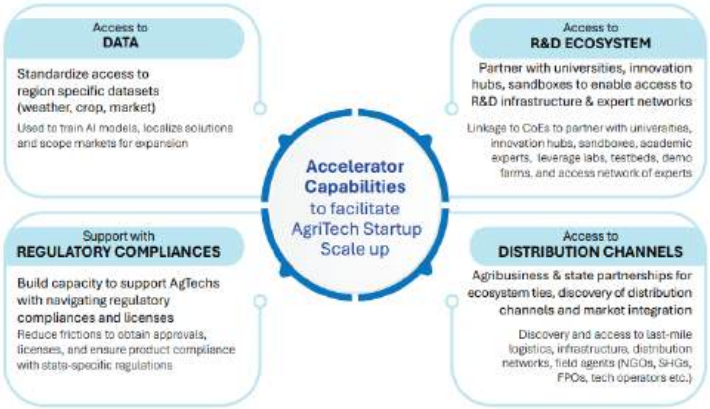
Context: NITI Aayog's Frontier Tech Hub launched the roadmap "Reimagining Agriculture: A Roadmap for Frontier Technology Led Transformation" in Gandhinagar, outlining a 2047 vision for tech-driven, inclusive, and resilient agriculture.

About NITI Aayog Unveils Reimagining Agriculture Report:

- **Vision Document:** The roadmap serves as a **strategic blueprint** to integrate **frontier technologies** — AI, IoT, drones, digital twins, agentic AI, and bio-innovation — into Indian agriculture to enhance productivity, sustainability, and farmer incomes.
- **Three-Pillar Framework:** It proposes a **Digital Agriculture Mission 2.0** anchored on three pillars —
  - **Enhance** foundational systems through data ecosystems and last-mile enablement.
  - **Reimagine** agri-innovation and talent systems through R&D and skill development.
  - **Converge** industry knowledge with policymaking for coherence and scalability.
- **Farmer Archetypes:** It classifies Indian farmers into **Aspiring (70–80%)**, **Transitioning (15–20%)**, and **Advanced (1–2%)** groups, offering **customized strategies** for each category to ensure equitable transformation.

Current Indian Agricultural Landscape:

- **Foundation of Livelihoods:** Agriculture employs **45.8% of India's workforce** and produces nearly **1 billion tonnes** of food annually, forming the backbone of food security and inclusive growth.
- **Persistent Issues:**
  - **Fragmented landholdings:** 86% are smallholders with <1 ha average.
  - **Low mechanisation:** Resource-intensive practices increase vulnerability.
  - **Post-harvest losses:** Exceed **USD 18 billion annually**, eroding incomes.
  - **Digital and financial gaps:** Limited access to credit, insurance, and digital.
- **Climate Pressure:** Erratic rainfall, soil degradation, and declining groundwater further weaken productivity and resilience.



Opportunities for Frontier Tech in Agriculture:

- **AI & Predictive Analytics:** Helps deliver real-time, precision-based advisories for weather, pest control, and yield forecasting — as seen in **Telangana's pilot**, which achieved a **21% yield rise** and **9% input reduction**.
- **Climate-Resilient Seeds:** Frontier gene-editing tools like **CRISPR** and biofortification enhance crop tolerance to drought, heat, and pests while improving nutritional value.
- **Smart Mechanisation:** Integrating **drones, IoT sensors, and digital twins** enables precision

sowing, irrigation, and fertilisation — optimising resource use and cutting manual labour.

- **Blockchain & Data Sovereignty:** Establishes **transparent farm-to-fork traceability**, ensures fair pricing, and safeguards farmer data ownership in digital value chains.
- **AgriTech Start-ups:** India's **1,000+ start-ups** are scaling AI, robotics, and fintech-led innovations that boost efficiency, connect farmers to markets, and democratise technology access.

Initiatives Taken So Far:

1. **Digital Agriculture Mission (2021–25):** Builds a **unified digital framework** integrating farmer databases, land records, and input services for data-driven decision-making.
2. **National Mission on Sustainable Agriculture:** Promotes **climate-smart practices** like integrated nutrient management and resilient cropping to ensure sustainability.
3. **Kisan Drone Scheme:** Uses **drones for precision spraying and mapping**, reducing input costs and enhancing productivity in pest and nutrient management.
4. **PM-Kisan and eNAM:** Strengthen **financial inclusion and market integration** through direct income support and digital agri-marketplace expansion.
5. **AgriStack & Agri Accelerator Fund:** Develops a **digital infrastructure backbone** and supports innovation-led start-ups for smart, scalable agricultural transformation.

Challenges to Agricultural Transformation:

1. **Data Silos:** Absence of **standardised and interoperable data systems** hampers integration of digital services and real-time analytics.
2. **Trust Deficit:** Low **digital literacy and skepticism** among smallholders limit participation in tech-driven schemes.
3. **'Phygital Divide':** Poor connectivity, logistics, and digital infrastructure slow technology diffusion in rural India.
4. **Talent Gaps:** Lack of **AI–agriculture skill fusion** constrains rural workforce readiness for smart farming ecosystems.
5. **Funding Constraints:** Inadequate **patient capital** and risk-tolerant financing deter deep-tech and early-stage agri innovation.

Key Recommendations by NITI Aayog:

- **Digital Agriculture Mission 2.0:** Establish a **360° data ecosystem** integrating AI-based advisories, digital twins, and AgriTech accelerators for farmer-centric innovation.
- **Translational R&D:** Promote **cross-disciplinary, mission-oriented research** linking labs to fields to accelerate technology adoption.
- **Agri-Talent Ecosystem:** Train **AI-literate farmers and agri-entrepreneurs** through tech skilling and digital literacy initiatives.
- **Institutional Convergence:** Create **centres of excellence** and foresight units to align public policy, academia, and industry innovation pipelines.
- **Inclusive Financing:** Develop **AI-powered credit and insurance models** leveraging alternative data for risk assessment and financial inclusion.

Conclusion:

NITI Aayog's roadmap positions India at the threshold of an **Intelligent Agricultural Revolution**, where **data becomes the new soil and AI the nervous system**. By aligning policy, innovation, and inclusion, India can transform agriculture from subsistence to sophistication — ensuring productivity with sustainability and prosperity with resilience by Viksit Bharat 2047.

FAO RELEASED THE STATE OF FOOD AND AGRICULTURE 2025 REPORT

Context: The Food and Agriculture Organization (FAO) released The State of Food and Agriculture 2025 report titled "Addressing Land Degradation Across Landholding Scales," highlighting how human-induced land degradation undermines global food production.

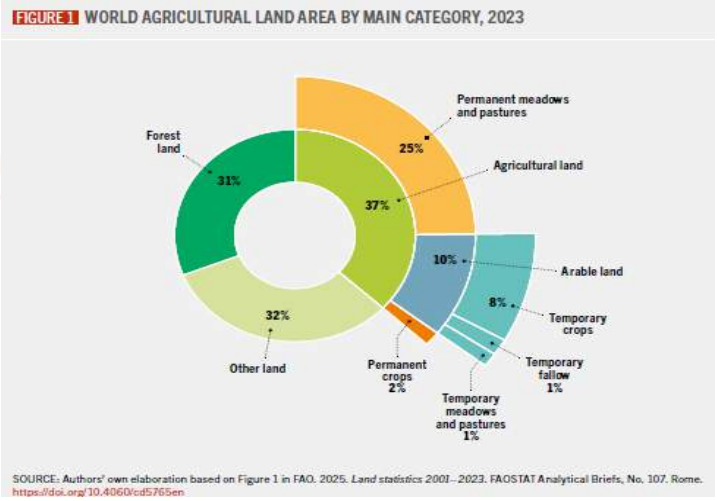
About FAO released The State of Food and Agriculture 2025 report:

- **What it is?**
  - An annual flagship publication of the **FAO**, assessing global agricultural and food systems performance.
- **Published by:** Food and Agriculture Organization (FAO), Rome (2025).
- **Aim:** To examine human-induced land degradation and its implications for agricultural productivity, livelihoods, and environmental sustainability, while guiding policies to avoid, reduce, and reverse degradation across scales

Key Trends Identified in the FAO Report:

1. **Global Cropland Decline:** About **20% of the world's cropland** shows declining productivity due to human-induced degradation, including **soil erosion and organic carbon loss**, particularly across Asia, Africa, and Latin America.
2. **Regional Yield Gap Severity:** Yield gaps for **10 major crops** reach up to **70% below potential levels** in **sub-Saharan Africa and South Asia**, linked to low soil fertility, nutrient depletion, and limited access to inputs.
3. **Soil Organic Carbon Loss:** Global decline in **soil organic carbon (SOC)** is reducing water retention and microbial activity, weakening resilience to **droughts and floods** in semi-arid regions.
4. **Smallholder Constraints:** Small farms under **2 hectares** represent **84% of all farms** but hold only **12% of farmland**, leaving them vulnerable to land degradation due to poor access to finance and technology.
5. **Large Farm Impacts:** The **top 1% of farms control over 70% of agricultural land**, often intensifying degradation through monocropping and excessive fertilizer use, yet having more resources for restoration.
6. **Land Abandonment Expansion:** From **1992 to 2015**, over **60 million hectares** of cropland were abandoned globally—mainly in **Eastern Europe, Central Asia, and South America**—due to yield decline and migration.
7. **Climate–Degradation Nexus:** Degraded soils now emit significant **greenhouse gases**, worsening climate change; FAO links this to **reduced productivity, carbon sequestration, and SDG 15.3 setbacks** in land neutrality.

FIGURE 1 WORLD AGRICULTURAL LAND AREA BY MAIN CATEGORY, 2023



SOURCE: Authors' own elaboration based on Figure 1 in FAO. 2025. *Land statistics 2001–2023*. FAOSTAT Analytical Briefs, No. 107. Rome. https://doi.org/10.4060/cd5765en

Analysis — Success and Gaps:

Successes:

- **Land Degradation Debt Model:** FAO 2025 introduces a **machine learning-based model** comparing current and natural soil states, revealing a **30% loss in tree cover, 20% loss in biomass carbon**, and a fourfold rise in soil erosion due to human activity — offering the most accurate global assessment yet.
- **Quantifying Global Economic Costs:** The report estimates the **global cost of land degradation at around USD 300 billion annually**, with **over three-fourths of losses from land-use and cover change**, establishing land restoration as an essential public investment priority.
- **Yield Gap and Socioeconomic Risk Correlation:** A **10% increase in degradation debt widens agricultural yield gaps by 2%**, particularly in **Southeast Asia and Western Europe**, showing that intensive cultivation hides underlying soil fertility decline and rising vulnerability.
- **Multi-Scale Policy Design:** Through the **GAEZ v5 global dataset**, FAO links land degradation data to farm-size structures, enabling **scale-sensitive restoration policies** that balance interventions for both smallholders and large commercial farms.

Gaps / Failures

- **Weak Institutional and Monitoring Capacity:** Low-income nations face **limited technical and satellite-monitoring capacity** to track land degradation, unlike advanced models such as **Inner Mongolia's satellite-based grazing regulation system**, which shows measurable success.
- **Inadequate Financing and Coordination:** Although **USD 19 billion** has been pledged under initiatives like the **Great Green Wall**, poor donor coordination, weak national alignment, and short project cycles cause **restoration fatigue** and inconsistent outcomes.
- **Limited Integration with Climate and Livelihood Goals:** Land restoration projects are poorly aligned with **SDG 13 (Climate Action)** and **SDG 8 (Decent Work)**, rarely embedding **gender-sensitive livelihood benefits**, which reduces their social and economic inclusiveness.
- **Underrepresentation of Indigenous Stewardship:** Despite proven ecological success in **East African pastoral and Latin American community systems, indigenous land governance models** remain marginal in formal policy, limiting culturally rooted restoration

outcomes.

Challenges Identified:

- **Land Inequality:** Top **1% of farms control over 70% of global farmland**, limiting equitable access to restoration finance and technology.
- **Investment Deficit:** Less than **15% of agricultural investment** is directed toward sustainable land management practices.
- **Policy Fragmentation:** Disconnect between **land, water, and energy policies** leads to inconsistent regional implementation.
- **Data and Knowledge Gaps:** Weak monitoring of **soil carbon, erosion, and biodiversity** impedes global reporting on SDG 15.3.
- **Climate Shocks:** Frequent **droughts and floods** are intensifying land degradation, particularly in semi-arid zones of Africa and Asia.

FAO Recommendations:

- **Scale-Specific Interventions:** Tailor restoration policies by farm size—**incentivize smallholders** through payments for ecosystem services, and **regulate large-scale farms** for sustainable input use.
- **Invest in Land Restoration:** Expand **public–private partnerships** for carbon farming and regenerative agriculture, using models tested in Latin America and sub-Saharan Africa.
- **Empower Local and Indigenous Actors:** Integrate **community-led and gender-inclusive** restoration projects into national strategies.
- **Enhance Global Monitoring:** Establish a **Global Land Degradation Data Hub** integrating remote sensing and ground data for real-time tracking.
- **Align with SDGs:** Link national restoration policies to **SDG 2 (Zero Hunger), SDG 13 (Climate Action)**, and **SDG 15 (Life on Land)** for policy coherence.

Conclusion:

The 2025 FAO report confirms that land degradation threatens nearly one-fifth of global cropland, with smallholders and developing nations hit hardest. It calls for science-driven, equity-centered, and scale-sensitive solutions to close yield gaps and restore soil health. Without immediate action, global food security and climate targets could face irreversible setbacks by 2030.

Topics: Issues related to direct and indirect farm subsidies and minimum support prices; Public Distribution System- objectives, functioning, limitations, revamping; issues of buffer stocks and food security; Technology missions; economics of animal-rearing.

INDIA'S FISHERIES & AQUACULTURE

Context: World Fisheries Day 2025 highlighted India's rapid rise in fisheries and aquaculture and the FAO's call for renewed commitment to "India's Blue Transformation".

- The FAO representative noted that despite India becoming the world's **2nd-largest aquaculture producer**, sustainability gaps and ecosystem pressures require urgent policy strengthening.

About India's Fisheries & Aquaculture:

Trends / Data:

1. **Rapid Output Growth (1980s → 2023):** India's total aquatic production rose from **2.44 million tonnes (1980s)** to **17.54 million tonnes (2022–23)**, reflecting a seven-fold expansion driven mainly by inland aquaculture.
2. **India as Global Aquaculture Leader:** According to **FAO SOFIA 2024**, India contributed **10.23 million tonnes** of aquatic animals, becoming the **world's 2nd-largest aquaculture producer** after China.
3. **Shrimp & Marine Export Strength:** Marine

products exports increased **11.08%**, from **USD 0.81 bn (Oct 2024)** to **USD 0.90 bn (Oct 2025)**, driven by high-value shrimp aquaculture and better value-addition.

4. **Inland Aquaculture Driving Growth:** Between 2013–14 and 2024–25, total fish output doubled from **96 lakh tonnes to 195 lakh tonnes**, with **inland fisheries alone growing 140%**, becoming India's key production engine.
5. **Sectoral Base & Livelihood Footprint:** India sustains **30 million livelihoods**, with **3,477 coastal fishing villages** producing **72% of national output**, showing high dependence on coastal ecosystem stability.

Opportunities For India:

1. **Global Seafood Market Expansion:** India's competitive labour, strong shrimp sector, and GST cuts (12%→5% on key fish products) create a cost advantage for expanding presence in markets like the U.S., EU, and East Asia.
2. **Blue Economy Potential Through EEZ Rules:** New **Sustainable Harnessing of EEZ Rules (2025)** open deep-sea fishing opportunities for Fish Farmer Producer Organisations, unlocking underutilised high-value pelagic stocks.
3. **Digital Governance for Traceability:** Platforms like **ReALCraft**, NFDP and the National Traceability Framework can help India meet global compliance norms, improving export premiums and reducing rejection risks.
4. **Climate-Resilient Aquaculture Models:** FAO-supported projects in **Andhra Pradesh** demonstrate climate-resilient pond systems that reduce footprint, offering models for replication across other coastal States.
5. **Women-Centric Growth Opportunities:** Schemes under PMMSY provide **60% assistance to women**, enabling their entry into value-addition, retail fish kiosks, and processing units—strengthening inclusive sectoral growth.

Initiatives Taken:

1. **PM Matsya Sampada Yojana (PMMSY):** With **₹20,312 crore** outlay (2020–26), PMMSY created **730 cold storages**, **26,348 transport facilities**, **6,410 kiosks**, boosting national logistics and reducing post-harvest loss.
2. **Climate-Resilient Coastal Fishermen Villages:** 100 existing coastal villages are being upgraded into **Climate-Resilient CFVs**, adding cyclone-resilient housing, early warning systems, and livelihood diversification support.
3. **EEZ Sustainable Harnessing Rules, 2025:** Rules provide priority access to cooperatives for deep-sea fishing, introduce a **digital Access-Pass via ReALCraft**, and ban destructive practices to protect marine biodiversity.
4. **Marine Fisheries Census 2025:** Using **VyAS-NAV, BHARAT, SUTRA apps**, the census geo-references **1.2 million households** across 5,000 villages, creating real-time socio-economic datasets for targeted policy.
5. **Fisheries Infrastructure Development (FIDF):** FIDF (₹7,522 crore corpus) finances ports, cold chains and aquaculture parks; **178 projects worth ₹6,369 crore** were approved by July 2025 with interest subvention support.

Challenges Associated:

1. **Overfishing & Stock Decline:** Intensive coastal fishing and juvenile catch deplete nearshore stocks, reducing availability of species like sardines and mackerel across Western and Eastern coasts.
2. **Habitat Degradation & Pollution:** Seagrass loss, coastal sedimentation, and harbour pollution undermine nursery grounds, reducing recruitment of commercially valuable species in high-density coasts.
3. **IUU Fishing Pressure:** Illegal and unregulated fishing vessels frequently operate beyond permitted zones, bypassing catch reporting and undermining fair access for small-scale fishers.
4. **Post-Harvest Losses & Poor Cold Chains:** Despite improvements, India still loses **15–20%** of fish post-harvest, lowering export quality due to gaps in hygienic handling, grading, and value-addition practices.
5. **Limited Access to Credit & Insurance:** Small-scale fishers face difficulty obtaining boat repair loans, affordable insurance, and working capital despite PM-MKSSY incentives, restricting technological upgrades.

Way Ahead:

1. **Strengthen Science-Based Stock Management:** Adopt zone-wise stock assessments, seasonal closures, and mesh-size regulation to restore declining coastal stocks and align with FAO's ecosystem-based approaches.
2. **Expand Deep-Sea Fisheries Capacity:** Modernise cooperative-owned vessels, promote onboard cold storage, and expand training for deep-

sea navigation to shift pressure away from overfished coastal waters.

3. **Build National Traceability & Certification Systems:** Implement the **National Framework on Traceability** across exporters, landing sites, and hatcheries to meet EU/U.S. standards and increase export competitiveness.
4. **Strengthen Aquaculture Biosecurity:** Enforce hatchery certification, disease-free seed systems, and water quality monitoring to reduce disease outbreaks and enhance productivity in inland aquaculture.
5. **Invest in Climate-Resilient Infrastructure:** Upgrade harbours with smart-harbour guidelines, cyclone-resilient structures, early warning systems, and climate-adaptive pond designs to reduce climate vulnerability.

Conclusion:

India's fisheries and aquaculture are entering a transformative phase marked by rapid growth, digital governance, and global market expansion. Sustained policy reforms, climate-resilient practices, and science-driven management can convert this momentum into long-term sectoral stability. With inclusive support for small fishers and strong institutional backing, India can lead a resilient and globally competitive blue economy.

Topics: Infrastructure: Energy, Ports, Roads, Airports, Railways etc.

POWERING INDIA'S GREEN TRANSITION AND STRATEGIC SELF-RELIANCE

Context: India has launched the National Critical Mineral Mission (2025) to build self-reliance in the exploration, mining, and processing of rare earth and critical minerals that are vital for clean energy, electronics, and defence technologies.

About Powering India's Green Transition and Strategic Self-Reliance:

Importance of Rare Earths and Critical Minerals:

- **Backbone of Modern Technology:** Power electronics, EVs, wind turbines, solar panels, and digital infrastructure.
- **Enabler of Green Transition:** Essential for achieving global climate targets and net-zero commitments.
- **Strategic Resource:** Critical for national defence, aerospace, and advanced communication systems.
- **Economic Driver:** Integral to the clean-tech value chain, boosting innovation and manufacturing competitiveness.

Difference between Rare Earth Elements (REEs) and Critical Minerals

Aspect	Rare Earth Elements (REEs)	Critical Minerals
Definition	17 metallic elements with similar properties, often found together	Broader group defined by economic importance & supply risk
Use	Magnets, lasers, EV motors, wind turbines	EV batteries, solar cells, semiconductors, defence equipment
Scope	Subset of critical minerals	Includes REEs + others like lithium, cobalt, nickel, graphite
Supply Risk	Highly concentrated (mostly China)	Varies across elements but globally vulnerable

India's Context and Climate Goals:

- India targets a **45% reduction in emissions intensity by 2030** and aims for **net-zero emissions by 2070**, aligning with global climate goals.
- To achieve this, India needs **secure access to critical minerals** for renewable energy, battery storage, and EV expansion.
- Although India ranks **5th globally in rare earth reserves**, it lacks large-scale refining, magnet,

and downstream processing capacity.

- The **National Critical Mineral Mission (2025)** ensures supply chain security, industrial competitiveness, and strategic self-reliance.

Applications:

- **Renewable Energy:** Minerals like silicon, indium, and gallium power solar panels, while neodymium and dysprosium enable high-efficiency wind turbines.
- **Electric Vehicles & Storage:** Lithium, cobalt, and nickel are essential for lithium-ion batteries driving EVs and grid storage systems.
- **Electronics:** Copper, tungsten, and tin are vital for semiconductors, printed circuits, and microprocessors in high-tech manufacturing.
- **Defence & Aerospace:** Titanium and rare earth magnets are used in jet engines, missiles, and satellite communication systems.
- **Medical Equipment:** Critical minerals form components in MRI scanners, pacemakers, and diagnostic imaging technologies.

Challenges Associated:

- **High Import Dependence:** Over 60% of the world's refining capacity lies in China, posing geopolitical and supply risks.
- **Technology Gaps:** India lacks advanced refining, metallisation, and magnet-making infrastructure to process critical minerals efficiently.
- **Environmental Concerns:** Mining and refining can cause soil and water pollution, demanding strict ecological safeguards.
- **Regulatory Delays:** Slow clearances and fragmented governance across agencies hinder timely project execution.
- **Funding & Skill Deficit:** Capital-heavy exploration and limited technical expertise slow innovation and industrial scalability.

Initiatives Taken:

- **National Critical Mineral Mission (2025):** Aims for end-to-end value creation—exploration, mining, processing, and recycling.
- **MMDR Act Amendment (2023):** Added 24 critical minerals for centralised auction and improved transparency in allocation.
- **KABIL JV:** Secured lithium assets in **Argentina** and partnered with **Australia** for strategic critical mineral collaborations.
- **Customs Duty Exemption (2025):** Reduces input costs for domestic processing and encourages industrial-scale refining.
- **Processing Parks & Recycling:** Promotes circular economy models and value addition across the mineral supply chain.

Way Ahead:

- **Develop Domestic Value Chain:** Build capacity from exploration to magnet and battery component manufacturing.
- **Foster R&D & Startups:** Encourage innovation in refining, separation, and recycling technologies through targeted funding.
- **Diversify Imports:** Establish strategic partnerships with resource-rich nations to reduce overdependence on China.
- **Environmental Safeguards:** Enforce sustainable mining practices and strengthen recovery from secondary sources.
- **Policy Integration:** Align mineral strategy with Make in India, Green Hydrogen Mission, and energy transition policies.

Conclusion:

Critical minerals are the **foundation of India's green and digital economy**, linking climate goals with strategic autonomy. The mission represents a **shift from dependence to resilience**, ensuring long-term sustainability and technological leadership. By investing in exploration, innovation, and circularity, India can become a global hub for green-critical mineral value chains.

Topics: Science and Technology- developments and their applications and effects in everyday life Achievements of Indians in science & technology; indigenization of technology and developing new technology.

DEFENCE ATMANIRBHARTA: RECORD PRODUCTION AND EXPORTS

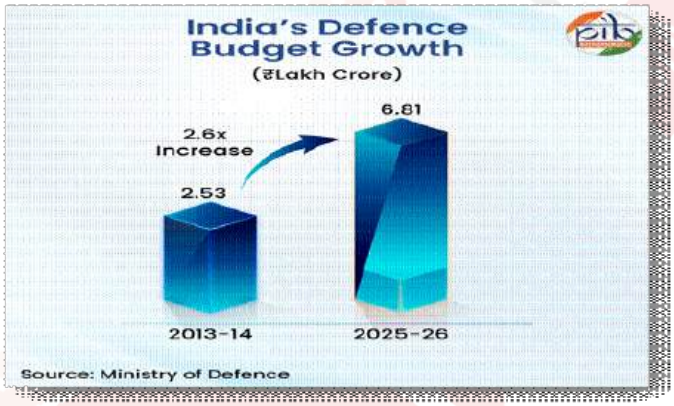
Context: India recorded its highest-ever defence production and exports in FY 2024–25 under the Atmanirbhar Bharat initiative, marking a major shift towards indigenous manufacturing.

- The Government announced ambitious targets to reach **₹3 lakh crore production** and ₹50,000 crore exports by 2029, signalling India's rise as a global defence exporter.

About Defence Atmanirbharta: Record Production and Exports

Trends / Key Statistics of India's Defence Industry:

1. **Record Defence Production:** Indigenous defence manufacturing touched **₹1,27,434 crore in FY 2023–24**, rising sharply from ₹46,429 crore in 2014–15—a 174% growth driven by sustained policy reforms.
2. **Highest Ever Overall Output:** India's total defence production for FY 2024–25 reached **₹1.54 lakh crore**, reflecting continuous annual expansion across DPSUs, private firms, and MSMEs.
3. **Rising Defence Exports:** Exports climbed to **₹23,622 crore in FY 2024–25**, up from less than ₹1,000 crore in 2014, showing India's growing global competitiveness and platform reliability.
4. **Private Sector Participation:** The private sector's share grew from **21% to 23%** within a year as over **16,000 MSMEs** entered the supply chain producing high-value sub-systems and components.
5. **Massive Domestic Procurement:** In FY 2024–25, the Ministry of Defence signed **193 contracts worth ₹2.09 lakh crore**, with 177 contracts awarded to domestic companies, boosting self-reliance.



Opportunities for India's Defence Industry:

1. **Defence Industrial Corridors:** UPDIC and TNDIC attracted **₹9,145 crore actual investment** with ₹66,423 crore potential, creating clusters for aerospace, land systems, and advanced manufacturing.
2. **Expanding Export Markets:** India now exports defence products to **80–100 countries**, offering opportunities to expand partnerships through training, maintenance, logistics, and technology packages.
3. **High FDI Inflow Potential:** Liberalised norms allowing **74% automatic FDI and 100% through approval** make India a preferred destination for foreign OEM collaboration and technology transfer.
4. **Digital Export Authorisations:** An end-to-end digital portal issued **1,762 export approvals in FY 2024–25**, reducing clearance time, improving transparency, and raising exporter participation by 17%.
5. **Innovation Ecosystem:** Schemes like the **₹1 lakh crore RDI Scheme**, iDEX grants, and DRDO's TDF (₹500 crore) offer huge opportunities for start-ups and academia to co-develop next-gen defence tech.

Government Initiatives:

- **Defence Acquisition Procedure (DAP) 2020** prioritises *Buy Indian–IDDM*, speeds clearances, integrates advanced tech (AI, robotics, cyber).
- **Defence Procurement Manual (DPM) 2025** streamlines ₹1 lakh crore revenue procurement with uniform rules and digital processes.
- **Positive Indigenisation Lists** ban imports of thousands of items, encouraging domestic production.
- **Reorganisation of Ordnance Factories** into seven DPSUs to improve autonomy and efficiency.
- **Export Facilitation Reforms:** Open General Export Licences, simplified SOPs, digital authorisation, and export promotion cell.

Challenges Associated with India's Defence Industry:

1. **Shallow Technological Base:** India still lacks indigenous capability in high-end propulsion, sensors, materials, and electronics, leading to **58% of procurement through licensed production**.
2. **Insufficient Production Scale:** Despite improvements, domestic output is still too low to meet annual procurement needs, keeping India dependent on foreign OEMs for major platforms.
3. **Export Limitations of DPSUs:** DPSUs have struggled internationally—examples include **HAL's Tejas losing to Korean KF-21** and GRSE losing major global tenders, impacting export ambitions.
4. **Policy–Implementation Gap:** Many reforms

announced since 2014 see slow on-ground execution due to bureaucratic delays, lengthy negotiations, and multi-layered compliance pathways.

5. **Dependence on Imported Components:** India relies heavily on foreign suppliers for speciality steels, composites, servos, avionics, and electronics, creating supply-chain vulnerabilities.

Way Ahead:

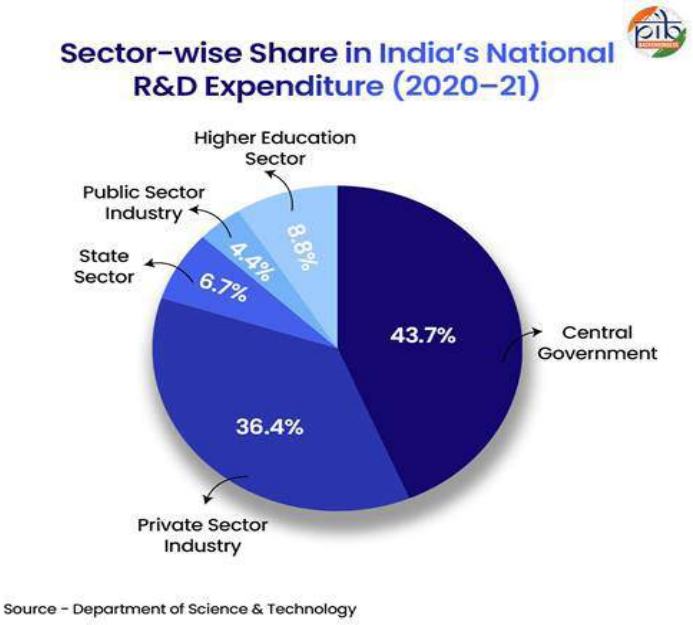
1. **Build Deep-Tech Capability:** Increase investments in propulsion, stealth materials, seeker technology, and advanced sensors to reduce dependence on foreign components and raise export competitiveness.
2. **Strengthen Private Industry:** Offer long-term procurement commitments, testing infrastructure, and transparent competition so private firms and MSMEs can scale production and innovate freely.
3. **Boost R&D Spending:** Raise defence R&D allocation from <1% to 8–10% of the defence budget, matching global defence leaders and enabling India to design complex strategic platforms.
4. **Expand Export Diplomacy:** Use concessional finance, maintenance hubs, and joint training to enhance India's attractiveness in African, ASEAN, and Middle Eastern defence markets.
5. **Accelerate Procurement Reforms:** Introduce single-window clearances, real-time PMUs, and digital monitoring to cut procurement delays and ensure timely delivery to the Armed Forces.

Conclusion:

India's defence sector has entered a decisive phase of self-reliance with record production, exports, and ecosystem growth. To sustain this momentum, India must expand deep-tech capacity, accelerate private-sector participation, and strengthen global partnerships. With consistent reforms, India is poised to emerge as a major global defence manufacturing hub by 2030.

THE RESEARCH, DEVELOPMENT AND INNOVATION (RDI) SCHEME

Context: Prime Minister of India inaugurated the Emerging Science & Technology Innovation Conclave (ESTIC) 2025 at Bharat Mandapam, New Delhi, and launched the ₹1 lakh-crore Research, Development, and Innovation (RDI) Scheme Fund to boost private investment in high-risk, high-impact R&D projects.



About India Leap in R &D:

India's R&D Push:

- **Strategic pivot:** India is making a decisive shift toward an **innovation-driven economy**, strengthening collaboration between academia, industry, and government to pursue high-risk, high-impact technologies.
- **GERD trend:** The nation's **Gross Expenditure on R&D** has doubled from **₹60,196.75 crore in 2010–11 to ₹1,27,380.96 crore in 2020–21**, though it still remains **below 0.7% of GDP**, far lower than global leaders.
- **Funding mix:** The **Central Government contributes about 43.7%** of total R&D spending, with the **government sector accounting for 64%** and the **private sector 36%**, showing the need for greater corporate participation.
- **Human capital:** India awarded **40,813 doctorates in 2018–19**, with **60% in Science and Technology**, ranking **third globally** in S&E PhDs and highlighting strong potential for research expansion.
- **Innovation output:** Patent filings in India **tripled from 24,326 in 2020–21 to 68,176 in 2024–25**, reflecting a surge in domestic innovation and intellectual property creation.

About The Research, Development & Innovation (RDI) Scheme:

What it is?

- A landmark ₹1 lakh-crore corpus, launched on November 3, 2025, to fund and refinance private-sector research, development, and innovation (RDI) projects through long-tenure, low or zero-interest loans—promoting bold, high-risk scientific ventures.

Aim: To **de-risk high-TRL and high-impact projects**, attract **private capital** into frontier technologies, and accelerate the **lab-to-market transition** in areas critical to national competitiveness and self-reliance.

Features:

- **Long-term capital access:** Offers flexible, long-duration financing to encourage private R&D in high-risk, deep-tech sectors that usually lack commercial funding support.
- **Deep-Tech Fund of Funds:** Creates a **dedicated fund ecosystem** to back start-ups and innovation-driven enterprises working on cutting-edge technologies like AI, semiconductors, and biotechnology.
- **Critical technology acquisition:** Supports companies in **procuring or developing strategic technologies** vital for national security, energy, and digital sovereignty.
- **Innovation pipeline strengthening:** Provides **growth and risk capital** for translating prototypes into scalable, market-ready products, ensuring faster commercialisation.
- **Industry–academia collaboration:** Incentivises **joint R&D ventures** between private firms, universities, and research institutions to enhance knowledge exchange and innovation efficiency.
- **Focus on sunrise sectors:** Targets emerging areas such as **quantum tech, green hydrogen, space, bioengineering, and next-gen communication**, aligning with India's Viksit Bharat 2047 vision.

Initiatives Taken So Far:

- **ANRF (Act 2023; operational 2024):** Mobilise **₹50,000 cr (2023–28)**; **₹14,000 cr** public + non-governmental sources; tighten **academia–industry** links.
- **National Quantum Mission (₹6,003.65 cr):** Quantum computing, comms, materials—**2023–31** timeline for domestic platforms.
- **National Supercomputing Mission:** Indigenous HPC + **5 training centres** (Pune, Kharagpur, Chennai, Palakkad, Goa) to scale compute skills.
- **India Semiconductor Mission (PLI ₹76,000 cr):** **10 projects** cleared; **₹1.60 lakh cr** investments incl. **first SiC fab (Odisha)**.
- **Deep Ocean Mission (₹4,077 cr):** Blue-economy tech, resource mapping, marine biodiversity for sustainable exploitation.
- **IndiaAI Mission (₹10,371.92 cr):** Compute scaled to **38,000 GPUs**; AI innovation, governance, and skilling stack.
- **AIM 2.0 (till Mar 2028; ₹2,750 cr):** Extend **ATLs/ AICs**, MSME engagement, school-to-startup innovation pipeline.

Challenges Associated:

- **Low R&D intensity:** **GERD <0.7% of GDP** vs global avg **~1.8%**; constrains frontier infrastructure and long-horizon science.
- **Private under-investment:** **~36% private share** (vs >70% in R&D leaders) due to risk aversion and long payback cycles.
- **Fragmented translation:** Weak **university–industry** collaboration slows **tech transfer** and productisation.
- **Talent & autonomy gaps:** Research careers less attractive; institutional **bureaucracy** and limited **operational autonomy**.
- **Innovation depth:** High patents, but **domestic ownership/commercialisation** and **global partnerships** need scaling.

Way Ahead:

- **Lift GERD to 2%+ of GDP:** Stage-wise targets; ring-fenced **mission budgets** and stable multi-year grants.
- **Crowd-in private capital:** Expand **RDI corpus**, tax credits for **BERD**, outcome-linked procurement, and **co-funded challenge grants**.
- **Supercharge translation:** IP acceleration funds, tech transfer offices, standard IPR/royalty norms, and sandboxed regulation.
- **Talent flywheel:** **Tenure-track** hiring, global fellowships, **reverse-brain-drain** chairs, and performance-based autonomy.
- **Globalisation of labs:** Big-science partnerships, open-data platforms, and **standards leadership** in AI/quantum/6G.

Conclusion:

India has built strong innovation rails and is now backing them with risk-tolerant capital via the ₹1 lakh-cr RDI Scheme. To convert scale into scientific depth,

India must raise R&D intensity, crowd-in private BERD, and fast-track translation. With coherent funding, autonomy, and global linkages, India can move from islands of excellence to a continent of innovation by 2047.

Topics: Awareness in the fields of IT, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights.

PRECISION BIOTHERAPEUTICS

Context: The rise of next-generation precision biotherapeutics—driven by breakthroughs in genomics, CRISPR, and personalised medicine—has positioned India to transform treatment for genetic, metabolic, and cancer disorders.

About Precision Biotherapeutics:

What are Precision Biotherapeutics?

- **Precision biotherapeutics** are medical interventions—drugs, biologics, or gene-based therapies—designed specifically around an individual's genetic, molecular, or cellular profile instead of a one-size-fits-all approach.
- **Key Features:**
  - Tailor-made therapies based on genomics, proteomics, and molecular diagnostics.
  - Uses tools like CRISPR gene editing, mRNA therapeutics, monoclonal antibodies, and CAR-T therapy.
  - Focus on *cause correction* rather than symptomatic relief.
  - AI and big-data analytics enable high-precision drug design and response prediction.

How Precision Biotherapeutics Work?

- **Genomic Profiling:** Sequencing a patient's DNA/RNA reveals specific mutations or biomarkers that drive the disease, enabling clinicians to pinpoint its exact biological origin for targeted intervention.
- **Molecular Target Identification:** Advanced molecular biology identifies the faulty pathways, proteins, or genes responsible for the condition, helping scientists design therapies that precisely hit the disease mechanism.
- **Therapeutic Design:** Using CRISPR, mRNA constructs, or targeted biologics, researchers create therapies that correct, silence, or modify the malfunctioning gene or molecular pathway causing the illness.
- **Personalised Dosing & Delivery:** AI and computational models analyse patient data to optimise dosage, predict drug interactions, and customise delivery systems for the safest and most effective therapeutic response.
- **Feedback Loop:** Real-time clinical and genomic data from the patient feed back into the system, refining treatment plans and making the therapy adaptive, predictive, and continuously personalised.

Applications of Precision Biotherapeutics:

- **Cancer Care:** Genomic tumour profiling, CAR-T cell engineering, and tailor-made monoclonal antibodies enable highly targeted cancer therapies with greater efficacy and fewer systemic side effects.
- **Genetic Disorders:** CRISPR and gene-replacement techniques allow correction of faulty genes in conditions like thalassemia or SMA, offering the possibility of long-term, near-curative outcomes.
- **Cardio-metabolic Diseases:** RNA-based drugs and molecular diagnostics personalise treatment for diabetes, lipid disorders, and hypertension by addressing the patient's unique biological risk patterns.
- **Rare Diseases:** Customised gene, enzyme-replacement, and RNA therapies offer treatment options for ultra-rare disorders, where conventional pharmaceuticals often fail to produce meaningful outcomes.
- **Infectious Diseases:** mRNA platforms rapidly generate vaccines matched to emerging

viral strains, improving outbreak response and enabling patient-specific immunological protection.

Challenges in Precision Biotherapeutics:

- **Regulatory Gaps:** India lacks an integrated regulatory pathway for gene, cell, and nucleic-acid therapies, resulting in uncertainty that slows clinical translation and investment.
- **High Costs:** Precision drugs require complex development and manufacturing, making them prohibitively expensive for most patients and widening existing healthcare inequities.
- **Limited Biomanufacturing:** India has insufficient GMP-compliant facilities for biologics, vectors, and cell therapies, restricting domestic production and increasing dependence on imports.
- **Data Privacy Risks:** Genomic information is highly sensitive, and without strong legal frameworks, it risks misuse for discrimination, surveillance, or unethical commercial exploitation.
- **Low Clinical Trial Capacity:** Advanced trials involving genomics, cell engineering, or molecular profiling remain limited, reducing India's ability to evaluate and scale next-generation therapies.

Way Ahead:

- **National Regulatory Pathway:** A CDSCO-led, specialised framework for evaluating gene, cell, and mRNA therapies will provide clarity, accelerate approvals, and build trust for innovators and clinicians.
- **Biobanking & Genomic Data Law:** A dedicated legal framework is essential to protect genomic privacy, standardise consent, and enable ethical, high-quality biobanking for research and clinical use.
- **Expand Biomanufacturing Hubs:** Public-private GMP clusters for biologics, viral vectors, and mRNA platforms will reduce costs, build domestic capacity, and ensure uninterrupted supply of advanced therapies.
- **Integrate into Public Health:** Inclusion of precision therapies for cancer and rare diseases under Ayushman Bharat can improve equity while supporting early adoption until production costs fall.
- **National Bioethics Commission:** A central authority is needed to oversee ethical issues around gene editing, consent, data use, equity, and patient safety in this rapidly advancing domain.

Conclusion:

Precision biotherapeutics mark a paradigm shift from generalised treatments to deeply personalised, genetics-driven healthcare. For India, they offer the dual promise of better health outcomes and global leadership in affordable biotech. With the right regulation, bioethics, and investment, India can democratise precision medicine for millions.

Topics: Conservation related issues, environmental pollution and degradation, environmental impact assessment.

GLOBAL METHANE STATUS REPORT 2025

Context: The 2025 Global Methane Status Report, released by UNEP, serves as a mid-term evaluation of the Global Methane Pledge, revealing that while projected emissions growth has slowed, current commitments will fail to meet the 2030 target.

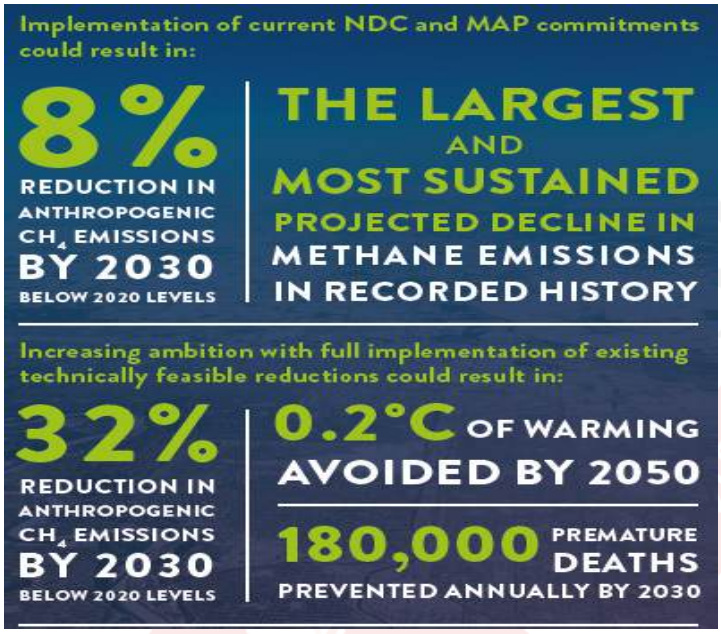
About Global Methane Status Report 2025:

Key Summary of the Report:

1. **Revised Baseline:** The Current Legislation Emissions (CLE) scenario projects 2030 emissions at 369 Mt, which is 14 Mt (4%) lower than the 2021 pre-Pledge baseline, due to slower gas market growth and new waste regulations in Europe and North America.
2. **Ambition Gap:** Full implementation of current NDCs and Methane Action Plans (MAPs) would reduce emissions by only 8% below 2020 levels by 2030, far short of the GMP's 30% target.
3. **Technically Feasible Pathway:** Implementing all Maximum Technically Feasible Reductions (MTFR) could cut emissions by 32% by 2030 (131 Mt), avoiding **0.2°C of warming by 2050** and over **180,000 premature deaths annually** by 2030.
4. **Cost-Effectiveness:** Over 80% (109 Mt/yr) of the MTFR potential is available at a low cost

(<$1,000/t CH_4), with the waste sector offering net savings of $9 billion annually through vaporized biogas.

5. **Sectoral Potential:** The energy sector holds 72% of the 2030 technical mitigation potential, followed by agriculture (18%) and waste (10%).
6. **Geographical Focus:** The G20+ group (which includes the EU-24, Norway, Switzerland, Iceland, and New Zealand) is responsible for 65% of emissions and 72% of the global mitigation potential.
7. **Policy Progress:** 127 countries (65% of Paris Agreement parties) now include methane measures in NDCs, a 38% increase from pre-2020, but only **six countries (Canada, Japan, Moldova, Norway, USA, Vietnam)** have national targets directly comparable to the GMP.



Major Sources of Methane Emission:

- **Agriculture (42%, 146 Mt):** Dominated by enteric fermentation from livestock (76% of agricultural emissions) and rice cultivation (21%).
- **Energy (38%, 135 Mt):** Comprises oil and gas production (64 Mt from upstream, 17 Mt from downstream) and coal mining (43 Mt).
- **Waste (20%, 71 Mt):** Primarily from municipal solid waste in landfills (37 Mt) and wastewater (30 Mt from domestic and industrial).

Implications Across the Globe:

1. **Health & Productivity:** The CLE scenario would cause 24,000 additional premature deaths, 2.5 Mt of crop losses (maize, rice, soy, wheat), and 6.9 million lost labour hours annually by 2030 due to ground-level ozone.
2. **Regional Disparities:** Emissions in non-G20+ regions (Africa, Latin America, parts of Asia) are projected to rise 16% by 2030 and 53% by 2050, driven by population growth, expanding livestock, and improved waste collection without concurrent mitigation.
3. **Data Integrity Crisis:** Persistent underreporting, especially in the fossil fuel sector, compromises policy effectiveness. Studies in Mexico and Australia show measured emissions can be double the official inventory estimates.
4. **Locked-in Emissions:** Methane from waste decomposes over decades. Without pre-2030 investment in landfill gas capture and organic waste diversion, significant mitigation potential for 2040-2050 will be lost.
5. **Financial Mismatch:** Tracked methane finance averages $13.7 billion/year, but the net annual cost to implement MTFR by 2030 is $127 billion—a massive investment gap.

Recommendations:

1. **Adopt Measurement-Based Regulations:** Scale the use of direct measurement tools (like satellites, airborne surveys) for robust MRV, following models like the **EU Methane Regulation** and **OGMP 2.0** framework.
2. **Implement Sector-Specific "No-Regret" Policies:**
   - **Energy:** Mandate frequent LDAR (Leak Detection and Repair) and ban non-emergency venting.
   - **Waste:** Enforce source separation of organic waste and mandate landfill gas capture.
   - **Agriculture:** Enforce bans on agricultural waste burning and promote intermittent aeration for rice paddies.
3. **Overcome Financial Barriers:** Deploy concessional finance and risk-sharing instruments to support mitigation in developing economies and for National Oil Companies (NOCs). **Repurposing a fraction of the >$635 billion in annual harmful agricultural subsidies** could close the finance gap.
4. **Strengthen National Targets:** Countries must translate GMP participation into **quantified, time-bound national methane reduction targets** within their NDCs, moving beyond vague measures.
5. **Integrate with Decarbonization:** Combine

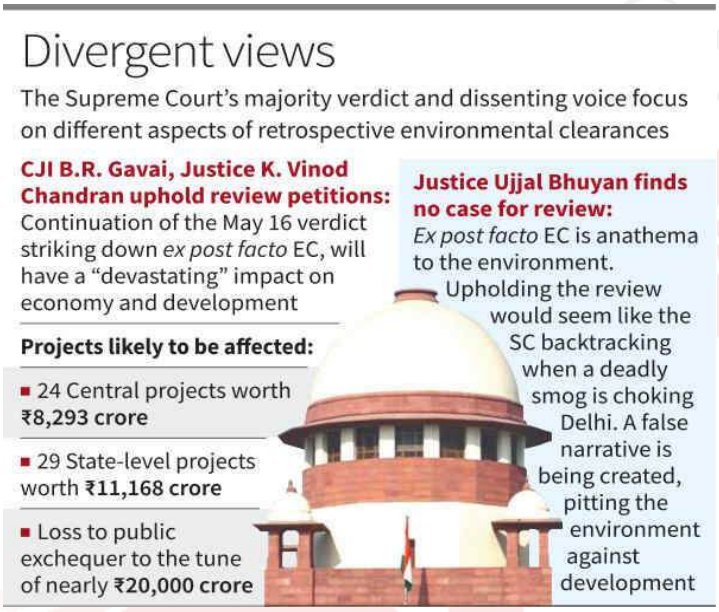
targeted methane controls with deep energy decarbonization and demand-side measures (e.g., sustainable diets) to achieve a **53% reduction by 2050**, aligning with 1.5°C pathways.

Conclusion:

The report confirms the GMP target is technically achievable with existing, low-cost solutions. The primary barrier is no longer technology or cost, but the pace of policy implementation and financial mobilization. The next five years are critical to deploy measures that will deliver immediate climate stabilization and clean air benefits, making methane action the most impactful short-term climate strategy available.

SC RECALLS BAN ON EX-POST FACTO GREEN CLEARANCES

Context: The Supreme Court has recalled its May 16, 2025 Vanashakti judgment that banned the granting of ex post facto (retrospective) environmental clearances (ECs).



About *SC Recalls Ban On Ex-Post Facto Green Clearances*:

What Was the Vanashakti Ruling (May 16, 2025)?

- The two-judge Bench (Justice A.S. Oka & Justice Ujjal Bhuyan) held that granting retrospective environmental clearances violates the **precautionary principle**, which requires environmental harm to be prevented before it occurs.
- It struck down the **2017 MoEFCC notification** and **2021 OMs**, noting that they enabled regularisation of illegal projects that had bypassed prior environmental approvals.
- The Court said the Centre used **"crafty drafting"** to sanitise violations, allowing industries to construct first and seek legal cover later, undermining environmental governance.
- It directed the government **not to issue any future notifications** or circulars permitting ex post facto ECs, ensuring strict enforcement of the Environment Protection Act.
- The verdict emphasised that retrospective ECs are a **"gross illegality"** and an **"anathema to environmental jurisprudence"**, weakening constitutional environmental protections.

What Are Ex Post Facto Green Clearances?

- **Meaning:**
  - These are **after-the-fact environmental approvals** granted to projects that began construction, expansion, or operation without acquiring the mandatory prior EC under EIA 2006 rules.
- **Key Features:**
  - They regularise projects already in violation of environmental norms, effectively converting an illegal act into a legal one after paying compensatory charges.
  - Such approvals involve **penalty-based compliance**, including fines and restoration measures, which serve as corrective—not preventive—mechanisms.
  - Intended for **rare, exceptional situations**, they are often misused as routine escape routes for non-compliant developers.
  - They are commonly invoked in large infrastructure, mining, industrial, and real-estate projects where delays could cause significant financial losses.
  - Critics argue they undermine the **precautionary principle** and encourage developers to start projects illegally, knowing they can regularise violations later.

Recent Verdict Recalling the Ban:

- **Majority View:**
  - The majority recalled the May 16 judgment, holding that its continuation would cause **"devastating consequences"**, including demolition

of vital public projects and wastage of crores of public money.

- They argued that retrospective ECs may be allowed in **exceptional circumstances**, accompanied by heavy penalties, to balance environmental protection with developmental needs.
- The judges highlighted that the matter involves complex constitutional-ecological issues and therefore must be reconsidered by a **larger Bench** for clarity and uniformity.

- **Dissenting View:**
  - Justice Bhuyan rejected the recall, insisting the original judgment must stand because retrospective clearances **reward illegal behaviour** and erode environmental accountability.
  - He termed ex post facto ECs **"an anathema, a curse devoted to evil"**, warning that the Court was diluting decades of strong environmental jurisprudence.
  - Citing Delhi's toxic smog, he stressed that the **precautionary principle cannot be compromised**, especially when pollution has become a daily public health threat.

Why Was There a Ban on Ex Post Facto Clearances Earlier?

- Retrospective approvals violate the **precautionary principle**, which mandates that environmental safeguards must operate before—not after—damage occurs.
- Allowing post-facto approvals encourages **illegal constructions**, as developers may knowingly avoid prior ECs expecting later regularisation.
- Such approvals weaken the **rule of law**, undermining the mandatory requirement of prior clearance under the EIA 2006 framework.
- Environmental harm caused during illegal construction or operation is **irreversible**, and retrospective approvals merely legitimise the damage already inflicted.
- They pose **public health risks**, as air, water, and soil pollution generated during unregulated phases directly impact citizens, especially vulnerable groups.
- Under **Article 21**, a clean environment is part of the right to life, and retrospective ECs diminish this constitutional guarantee by permitting post-hoc legalisation of pollution.

Way Ahead:

- Retrospective approvals, if ever granted, must involve **strict penalisation**, restoration mandates, and long-term ecological compensation to deter future violations.
- Strengthen monitoring through **pre-approval compliance audits**, satellite-based surveillance, and automated alerts to prevent projects from starting illegally.
- Introduce **environmental restoration bonds**, where violators must deposit funds upfront to cover ecological repair, ensuring accountability.
- Make EC violations, penalties, and corrective actions **publicly accessible**, enabling transparency and empowering local communities to monitor compliance.
- Streamline prior EC approvals to reduce delays, ensuring industries are not incentivised to bypass the process for quicker project execution.
- Policy reforms must uphold **sustainable development**, balancing economic progress with inter-generational equity and long-term ecological integrity.

Conclusion:

A balanced environmental regime must protect ecological integrity without paralysing essential public infrastructure. Retrospective clearances, if ever allowed, must remain exceptional and coupled with strict deterrent penalties to prevent misuse. Ultimately, India's environmental jurisprudence must uphold both constitutional environmental rights and responsible, sustainable development for future generations.

CONSERVATION AS COEXISTENCE

Context: A recent analysis highlights that India must shift from exclusionary, top-down wildlife protection towards community-rooted conservation.

- The idea of **"Conservation as Coexistence"** has gained prominence after new evidence showed that biodiversity thrives where local communities remain active stewards.

About Conservation as Coexistence:

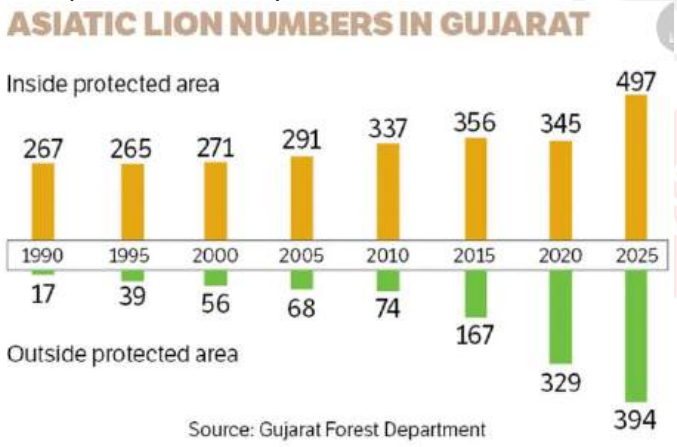
What is Conservation?

- Conservation refers to the sustainable management of ecosystems, species,

and natural resources so they can renew themselves and support both biodiversity and human well-being.

Types of Conservation:

- **Protection-based conservation:** Involves creating strictly regulated zones like national parks and sanctuaries where human activity is restricted to prevent disturbances to wildlife habitats and ecological processes.
- **Community-based conservation:** Local communities manage and protect forests, grazing lands, and water bodies using traditional norms, ensuring sustainable use while maintaining biodiversity.
- **Co-management models:** Government agencies and local communities jointly plan and manage ecosystems, blending statutory authority with indigenous knowledge for balanced conservation outcomes.
- **Landscape-level conservation:** Focuses on protecting ecological networks across farms, forests, wetlands, and corridors beyond protected boundaries to sustain wide-ranging species and ecosystem functions.



Existing Conservation Methods in India:

- **Protected Areas Network:** India designates national parks, wildlife sanctuaries, and tiger reserves to legally safeguard core habitats for flagship species and critical ecosystems.
- **Legal Frameworks:** Strong laws like the WLPA 1972, Forest Conservation Act 1980, and CAMPA regulate diversion, protection, and regeneration of forests through stringent permitting systems.
- **Species-specific Missions:** Flagship programs such as Project Tiger, Project Elephant, and Project Snow Leopard target recovery of vulnerable species through habitat protection and scientific monitoring.
- **Regulatory Tools & Enforcement:** Eco-sensitive zones, anti-poaching squads, and advanced tracking technologies strengthen on-ground enforcement and buffer impacts near protected areas.
- **Expansion & Relocation:** Protected areas are increasingly expanded, with voluntary relocation of human settlements to reduce human–wildlife conflict and improve habitat integrity.

Limitations of Existing Methods:

- **Exclusionary Approach:** Eviction and restrictions imposed on indigenous communities sever traditional stewardship systems that historically safeguarded local biodiversity.
- **Colonial Mindset:** Conservation assumes forests must be "pristine," ignoring that many Indian ecosystems are cultural landscapes shaped by human–nature interactions over centuries.
- **Weak Enforcement:** Mining pressures, encroachment, inadequate manpower, and poor surveillance compromise the ecological security of protected areas.
- **Human–Wildlife Conflict:** Hard boundaries and fencing increase conflict by restricting wildlife movement without addressing the livelihood dependence of local communities.
- **High Financial Cost:** State-led conservation drains crores annually for patrolling and infrastructure, whereas community-managed forests sustain themselves at minimal cost.

Best Case Studies of Coexistence Conservation:

1. **Gir Landscape, Gujarat:** Nearly half of Asiatic lions now thrive outside Gir National Park due to Maldhari pastoralists' tolerance, supported by efficient compensation systems and cultural reverence.
2. **Biate Villages, Jaintia Hills (Meghalaya):** Community-managed jhum landscapes showed no deforestation or species decline, even revealing new bird records—highlighting that traditional land use can sustain biodiversity.

Redefining Conservation in India:

- **Shift to Inclusive Conservation:** Policy must move from fortress-style protection to models that integrate community rights, cultural values, and participatory decision-making.
- **Recognising Indigenous Knowledge:** Traditional ecological practices, such as rotational farming, sacred groves, and species taboos, must be formally integrated into conservation planning.

- **Landscape-scale Governance:** Conservation should expand beyond park boundaries by linking forests, farms, pastures, and wetlands into coherent ecological networks that support wide-ranging species.
- **Shared Governance & FPIC:** Ensuring fair compensation, transparent benefit-sharing, and free, prior, informed consent for local communities builds trust and strengthens long-term conservation outcomes.

Conclusion:

India's ecological future depends on recognising that people are not external threats but essential partners in conservation. True sustainability emerges where cultural practices, livelihoods, and biodiversity reinforce each other. Conservation must evolve into a model of coexistence—rooted in justice, community wisdom, and shared stewardship of the land.

GLOBAL COOLING WATCH 2025 REPORT

Context: The UNEP launched the Global Cooling Watch 2025 report at COP30 in Belém, Brazil, warning that global cooling demand could triple by 2050 under a business-as-usual scenario, potentially doubling emissions and straining power systems.

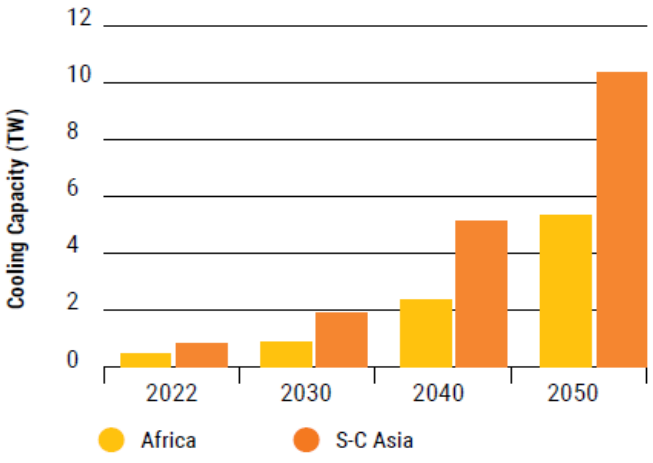
About Global Cooling Watch 2025 Report:

- **What it is?**
  - The Global Cooling Watch 2025 is UNEP's second global assessment on the environmental, economic, and equity dimensions of cooling, providing the scientific foundation for the Global Cooling Pledge.
- **Published by:** United Nations Environment Programme (UNEP) at COP30 (2025).
- **Aim:** To analyse global cooling trends, project future emissions, and propose a "Sustainable Cooling Pathway" to achieve near-zero emissions while ensuring equitable access to cooling worldwide

Key Trends Identified:

1. **Rising Cooling Demand:** Global cooling capacity is projected to rise **2.6 times (22 TW → 58 TW) by 2050**, driven by rapid urbanization, income growth, and intensifying heatwaves, particularly in developing nations.
2. **Emission Surge:** Without strong policy intervention, **cooling-related GHG emissions may reach 10.5 billion tons of CO_2e by 2050**, nearly double 2022 levels, threatening to offset gains from other climate actions.
3. **Developing Country Growth:** Cooling demand in **Article 5 countries** (developing nations) is set to increase **fourfold**, highlighting a widening divide in energy use and infrastructure readiness between rich and poor economies.
4. **Energy Consumption:** Global electricity use for cooling may rise from **5,000 TWh (2022) to 18,000 TWh (2050)**, straining power grids and escalating peak load demands, especially in tropical regions.
5. **Heat Inequality:** Over **2 billion people** in low-income households remain vulnerable to extreme heat exposure due to lack of access to affordable, efficient cooling technologies.
6. **Passive Cooling Potential:** Integrating **passive cooling design**—like reflective roofing and urban greening—can lower indoor temperatures by up to **8°C** and cut energy use by **15–55%**, offering scalable climate adaptation.
7. **HFC Transition:** Phasing down **high-global-warming refrigerants (HFCs)** and adopting **low-GWP alternatives** could eliminate up to **0.4°C of projected global warming** this century.
8. **Global Cooling Pledge Progress:** So far, **72 nations and 80 organizations** have joined the **Global Cooling Pledge**, collectively aiming for a **68% emission reduction in the cooling sector by 2050**.

Figure 4-2 Installed cooling capacity under the BAU Growth scenario, Africa and South-Central Asia



Note: The South-Central Asia region covers Afghanistan, Bangladesh, Bhutan, India, Iran, Iraq, the Kyrgyzstan, Maldives, Nepal, Pakistan, Sri Lanka and Turkmenistan.

Source: Global Cooling Emissions Model

Successes:

- Strengthened **global collaboration** through the Global Cooling Pledge, harmonizing standards and accelerating knowledge sharing among nations.
- Mainstreaming of **passive cooling measures** in building codes and urban policies, especially in Asia and Africa.
- Rapid **technological progress** in hybrid and low-energy cooling systems, improving energy efficiency by up to 50%.
- Enhanced **private sector participation** in manufacturing and financing sustainable cooling technologies.
- Emerging **Tiered Access Frameworks** are improving cooling equity and resilience for low-income and heat-vulnerable populations.

Limitations:

- Persistent **inequality in cooling access**, with millions in tropical developing regions still unprotected from lethal heat exposure.
- **Insufficient adaptation finance**, as current funding meets less than 20% of global cooling resilience needs.
- **Policy fragmentation** across sectors—energy, housing, and environment—hampers unified cooling governance.
- **Delayed HFC phase-down** and poor refrigerant disposal continue to drive high direct emissions.
- Dependence on **fossil-based electricity** undermines gains from efficiency and refrigerant transition efforts.

UNEP Recommendations:

- Adopt a **Sustainable Cooling Pathway** combining passive design, efficient appliances, and rapid clean energy integration.
- **Accelerate refrigerant phase-down** through Kigali Amendment implementation and enforce full lifecycle refrigerant recovery.
- **Mobilize green finance** via concessional lending, PPPs, and climate bonds to expand access to sustainable cooling.
- Mandate **passive cooling standards** in national building and urban planning regulations.
- Ensure **equitable access** by subsidizing efficient cooling for vulnerable communities and heat-stressed regions.

Conclusion:

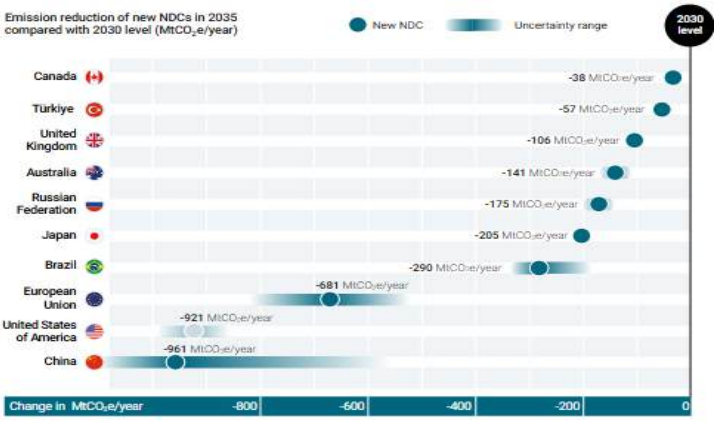
The Global Cooling Watch 2025 underscores that unchecked cooling demand could derail global climate goals. A coordinated shift toward **efficient, equitable, and low-emission cooling** is essential. If implemented urgently, UNEP's pathway could **cut 97% of future emissions** and secure a climate-safe, heat-resilient future.

THE UNEP EMISSIONS GAP REPORT 2025

Context: The UNEP Emissions Gap Report 2025 titled "Off Target" warns that despite new climate pledges, the world remains on course for 2.3–2.5°C warming, far exceeding the Paris Agreement goals.

About The UNEP Emissions Gap Report 2025:

- **What it is?**
  - The 16th edition of UNEP's annual assessment that measures the "gap" between projected emissions and the levels needed to limit global warming.
- **Published by: United Nations Environment Programme (UNEP).**
- **Aim:** To evaluate countries' Nationally Determined Contributions (NDCs), analyse the global temperature trajectory, and recommend actions for aligning with the 1.5°C and 2°C Paris targets.



Key Global Trends in the 2025 Report:

- **Temperature projections:** The world remains on track for **2.3–2.5°C warming with NDCs**, and **2.8°C under current policies**, far exceeding the Paris limits despite incremental progress in pledges.
- **Limited progress:** Adjustments in calculation methods and the U.S. withdrawal from the

Paris Agreement offset minor gains, proving that global ambition has stagnated rather than strengthened.

- **Emissions gap:** To align with the Paris goals, **global emissions must fall by 35% (2°C) or 55% (1.5°C)** from 2019 levels by 2035, a scale of reduction never achieved in human history.
- **Overshoot risk:** The **1.5°C ceiling will likely be breached by 2035**, necessitating rapid negative emissions and technological interventions to stabilize the planet's temperature later this century.
- **Sectoral emissions:** The energy, industry, transport, and agriculture sectors continue to dominate emissions, as fossil fuel dependency outpaces renewable transition gains.
- **Technology readiness:** Solar, wind, and battery technologies are cheaper and scalable, but the financial divide limits their deployment in low-income and developing nations.
- **Geopolitical challenge:** Rising debt, weak climate finance, and fragmented cooperation among major economies are slowing the collective pace of global decarbonization.

Successes Highlighted:

- **Falling temperature projections:** Global temperature projections have **dropped from 3–3.5°C (2015) to ~2.4°C (2025)**, proving gradual but meaningful progress in climate pledges.
- **Technology availability:** The world now witnesses **unprecedented expansion in renewables, electric vehicles, and battery storage**, signaling industrial readiness for decarbonization.
- **Increased NDC coverage:** Nearly 90% of global emissions are now included in national climate pledges, reflecting broader international participation and accountability.

Limitations:

- **Insufficient ambition:** The latest NDC updates reduce projected warming by just **0.1°C**, keeping global temperatures at **2.3–2.5°C**, far from the Paris target of 1.5°C — confirming that political ambition remains weak.
- **Finance gap:** Global climate finance flows need to **triple by 2030** to meet mitigation goals, yet only **one-third of the required funding** is currently mobilized, especially constraining developing nations.
- **Implementation deficit:** Only **nine G20 members** are on track to meet their existing NDCs, indicating a persistent execution lag between announced targets and domestic implementation.
- **Dependence on unproven carbon removals:** The report warns against overreliance on **Carbon Dioxide Removal (CDR)** and **Direct Air Capture (DAC)** technologies, which remain expensive and untested at scale.
- **Geopolitical instability:** Conflicts and energy crises post-2022 have caused **reinvestment in fossil fuels**, with global subsidies surpassing **$1.3 trillion in 2023**, reversing decarbonization progress.

UNEP Recommendations:

- **Accelerate near-term emission cuts:** To stay on track, annual global emissions must fall by **35% for 2°C** and **55% for 1.5°C** by **2035**, requiring immediate phasing out of coal and oil.
- **Mobilize climate finance:** UNEP calls for **restructuring international financial systems**, including debt swaps and concessional financing, to unlock private investment in green sectors.
- **Enhance international cooperation:** The report emphasizes operationalizing the Loss and Damage Fund and enhancing technology sharing frameworks under the Paris Agreement.
- **Mainstream adaptation and resilience:** UNEP urges integrating **climate adaptation** into national budgets and sectoral planning to protect vulnerable communities and ecosystems.
- **Phase out fossil fuel subsidies:** The global economy must redirect fossil subsidies toward renewables, as current subsidies are five times higher than clean energy support.
- **Empower developing economies:** Strengthen access to clean energy innovation funds and capacity-building initiatives to ensure equitable transition pathways.
- **Strengthen monitoring frameworks:** Develop a unified global tracking mechanism for emissions and finance to ensure transparency and accountability in climate action progress.

Conclusion:

The Emissions Gap Report 2025 exposes the widening mismatch between climate ambition and action. To keep the **1.5°C target within reach**, nations must pair technology with political will, deepen

cooperation, and reform global finance. Each fraction of a degree avoided will mean fewer losses, lower risks, and a safer climate future.

SETTING UP AN EARLY WARNING SYSTEM (EWS) FOR THE HIMALAYAS

Context:

The Himalayas are witnessing an alarming rise in climate-induced disasters—from floods and landslides to glacial lake bursts—prompting scientists to call for robust early warning systems (EWS) across the fragile mountain range to reduce loss of life and property.

About Setting Up an Early Warning System (EWS) for the Himalayas

Rising Disaster Trend in the Himalayas:

- Between **1900–2022**, India faced **687 disasters**, of which **240 occurred in the Himalayan belt** (DTE 2024).
- The number of disasters rose sharply—only **5 incidents before 1962**, but **68 between 2013–2022**, accounting for **44% of India's total disasters**.
- **NASA data (2007–2017)** recorded **1,121 landslide events**, reflecting growing instability.
- The region is warming at **0.15°C–0.60°C per decade**, faster than the global average, intensifying snowmelt and flash floods.
- **Extreme weather events**—including cloudbursts, avalanches, and GLOFs—are increasing in both frequency and scale.

Cruciality of Early Warning Systems (EWS):

- **Life-saving Mechanism:** Early alerts allow timely evacuation and response, preventing large-scale loss of life in flood and landslide-prone Himalayan valleys.
- **Disaster Preparedness:** EWS facilitates real-time detection and forecasting of hazards like GLOFs, cloudbursts, and avalanches for rapid action.
- **Scientific Data Backbone:** Creates a continuous, data-driven record for risk modelling, helping design safer infrastructure and mitigation plans.
- **Community Resilience:** Engaging locals in EWS operations builds awareness, accountability, and faster ground-level response during crises.
- **Proven Success:** Successes in Switzerland and China show that early warning and community coordination can avert glacier-related disasters.

Successful International and Domestic Examples:

- **Switzerland:** Local early alerts and community coordination averted glacier-collapse disasters.
- **China (Cirenmaco Lake):** EWS based on **satellite-fed glacial lake monitoring** using unmanned boats.
- **India:** Environment Ministry-funded project to develop **AI-based hailstorm EWS** for apple farmers in the Himalayas.

Role of Artificial Intelligence and Technology:

- **AI-aided models** can process live data into predictive warnings with sub-kilometre accuracy.
- **Satellite links** and **unmanned monitoring boats** can track lake levels and glacier movement (as used by Chinese Academy of Sciences, 2022).
- **Drone surveillance** helps in localized assessments but remains limited by **scale, weather, and cost**.
- **AI-integrated EWS prototypes** are being tested for hailstorm and cloudburst predictions in **Uttarakhand and Himachal Pradesh**.

Challenges to Installing EWS in the Himalayas:

- **Rugged Terrain:** The Himalayas' steep, remote landscapes make sensor installation, calibration, and year-round maintenance difficult.
- **Poor Connectivity:** Many valleys lack telecom and internet access, hindering the real-time transmission of hazard data to control centres.
- **High Cost and Technology Gaps:** The absence of affordable, weather-proof indigenous EWS technology limits large-scale deployment.
- **Fragmented Governance:** Weak inter-agency coordination and overlapping mandates delay decision-making and operational execution.
- **Lack of Community Involvement:** Without local training and ownership, systems remain underused and fail to trigger timely evacuation.

Way Ahead:

- **Develop Indigenous Systems:** Create AI-integrated, solar-powered, and low-cost EWS prototypes designed for Himalayan geography.
- **Valley-Level Coverage:** Deploy EWS networks in every major Himalayan valley, ensuring coordination across borders and watersheds.
- **Integrate AI and Satellite Data:** Use AI forecasting models and satellite imaging to enhance real-time hazard mapping and accuracy.
- **Empower Local Communities:** Train village task forces and youth groups to manage and act on EWS signals independently.
- **Institutional Reform:** Establish a National Himalayan Early Warning Mission (NDMA) to unify research, deployment, and response under one command.

Conclusion:

The Himalayas stand at the frontline of the climate crisis, yet remain poorly equipped with disaster alert systems. Building an integrated, community-driven, and technology-powered **early warning network** is vital for saving lives and ecosystems. Safeguarding the "third pole" must now be treated as a **national climate-security priority.**

Topics: Disaster and management.

INDIA'S DISASTER RESPONSE: CENTRALISATION CONCERNS AND THE ROAD AHEAD

Context: The Wayanad landslides (Kerala, 2024) and the Centre–State mismatch in relief have raised concerns that disaster funds are becoming more centralised and conditional.

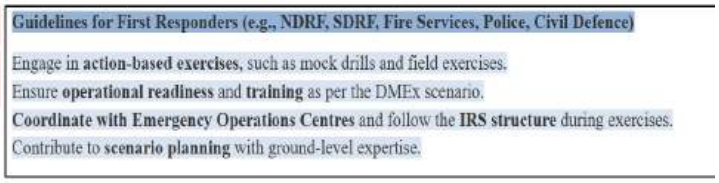
About India's Disaster Response: Centralisation Concerns and the Road Ahead

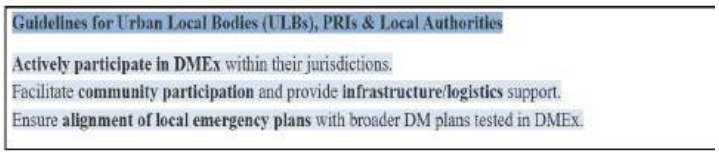
What Is India's Disaster Response?

- It is a **national, multi-level system** created under the Disaster Management Act, 2005 to manage prevention, preparedness, response, relief, and recovery.
- It brings together **Union, State, district, local bodies and specialised forces** to reduce disaster risk and support affected communities.

Existing Disaster Response Models:

1. **Relief-Centric Model (Traditional):**
   - Historically focused on **post-disaster relief and compensation**, not on prevention or resilience.
   - States depended heavily on **central grants** after each major calamity.
2. **Risk Reduction & Preparedness Model (Current Policy Direction):** NPDM 2009 and NDMP 2016/2019 shift emphasis to prevention, mitigation and preparedness.
3. **Institutional Multi-Tier Model:**
   - NDMA leads at national level, with SDMAs and DDMAs implementing at State and district levels.
   - This creates **vertical coordination** from Delhi to Gram Panchayat.
4. **Multi-Hazard Vulnerability Approach:** Recognises that India faces earthquakes, floods, cyclones, landslides, droughts, industrial accidents, etc.
5. **Sendai Framework–Aligned Model:**
   - Aligns Indian policy with **Sendai Framework 2015–2030** on risk reduction and resilience.
   - Stresses **"build back better"**, inclusive response and risk-informed development.





Successes So Far:

1. **Robust Institutions (NDMA, NDRF, SDMAs, DDMAs):** India now has a full legal–institutional chain from national to district level for disaster governance.
2. **Reduced Cyclone Mortality:** Odisha and Andhra Pradesh are often cited as global best practices for cyclone response.
3. **Improved Forecast & Early Warning:**
   - IMD now offers more accurate track and intensity forecasts for cyclones and extreme weather.

- Use of satellites, Doppler radars and SMS alerts has strengthened last-mile communication.

4. **Mock Drills & DMEx Culture:** Large-scale exercises like Suraksha Chakra in Delhi-NCR test responses to major earthquakes.
5. **Volunteer Involvement:** Programs like **Aapda Mitra** train community volunteers for first response. Civil society and local NGOs are increasingly embedded in planning and drills.

Challenges Associated with India's Disaster Response:

1. **Centralisation & Fiscal Asymmetry:**
   - Centre often releases **much less than assessed losses**, forcing States to borrow or cut other spending.
   - Negotiated, delayed NDRF support weakens **trust in cooperative federalism**.
2. **Outdated Relief Norms & Inadequate Compensation:** Fixed amounts for death and house damage do not match present-day costs of rebuilding.
3. **Ambiguity and Discretion in 'Severe Disaster' Tag:** "Severe" disaster is not clearly defined, enabling subjective decisions on NDRF eligibility.
4. **Procedural Delays & Bureaucratic Layers:** Relief depends on memorandums, central teams, high-level approvals and file movement. This delays fund release at a time when speed is most critical.
5. **Weak Risk-Based Allocation Criteria:** Finance Commission uses population and area rather than hazard maps and exposure indices. Vulnerability is approximated by poverty, not by scientific risk assessment.
6. **Capacity and Implementation Gaps at Local Level:** DDMA/ULB capacities in planning, GIS, and enforcement remain uneven across states.

Way Ahead:

1. **Rules-Based, Trigger-Linked Financing:**
   - Use **objective indicators** (rainfall thresholds, per capita loss, loss–GSDP ratio) to trigger aid.
   - This reduces political discretion and ensures predictable, timely relief.
2. **Revise Norms & Expand Eligible Uses of Funds:**
   - Periodically revise compensation norms to reflect **real reconstruction costs**.
   - Allow SDRF/NDRF to also support livelihood restoration and basic rebuilding, not just immediate relief.
3. **Empower States, Districts and Local Bodies:**
   - Give SDMAs and DDMAs greater **operational control** over funds and planning.
   - Strengthen ULBs and panchayats with training, EOCs and clear local response protocols.
4. **Develop a National Disaster Vulnerability Index:**
   - Combine hazard, exposure, population density, ecology and socio-economic vulnerability.
   - Use this index to prioritise funds and mitigation projects transparently.
5. **Mainstream Risk Reduction into Development:**
   - Enforce building codes, zoning laws, CRZ norms and floodplain regulation strictly.
   - Make all major infrastructure climate and disaster resilient by design.
6. **Strengthen Cooperative Federalism & Trust:**
   - Institutionalise **Centre–State consultation** on criteria, triggers and norms.
   - Keep Union's role as supportive and rules-based, not ad hoc and discretionary.

Conclusion:

India has built a strong legal and institutional base for disaster management, but its financing and federal practices lag behind its ambitions. As climate shocks intensify, disaster response must shift from negotiated, discretionary relief to a transparent, rules-based partnership. Only then can India's federal system protect both lives and the constitutional spirit of cooperative, resilient governance in times of crisis.

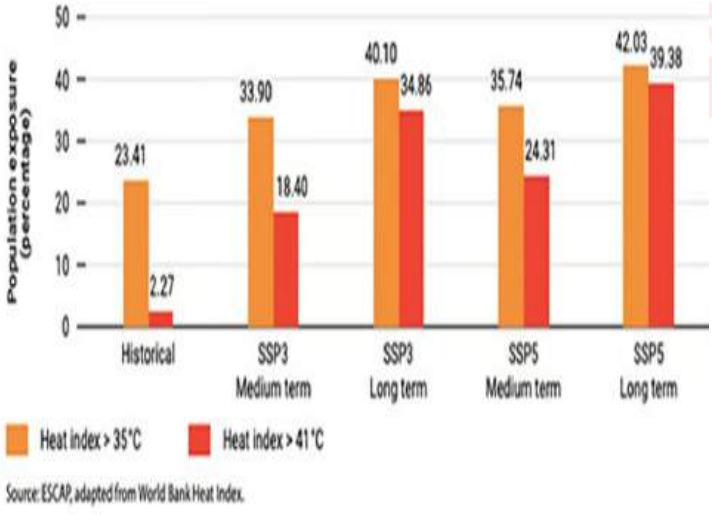
THE UN ESCAP ASIA-PACIFIC DISASTER REPORT 2025

Context: The UN ESCAP Asia-Pacific Disaster Report 2025 warns that Asian megacities—Delhi, Karachi, Dhaka, Manila, Shanghai, Seoul—could face 2–7°C extra heat due to the urban heat island effect, pushing temperatures far beyond global warming averages.

About The UN ESCAP Asia-Pacific Disaster Report 2025:

Key Findings in Report:

- **Urban Heat Amplification (UHI Effect):**
  - Even if global warming stabilises at 1.5–2°C, cities may heat by **+7°C** due to dense concrete, limited green cover, and high waste heat from vehicles and ACs.
  - Megacities like **Delhi, Karachi, Dhaka** are projected to experience **high localised heat stress** far beyond rural surroundings.
- **Chronic Heat Exposure in South Asia:**
  - India, Pakistan, Bangladesh: **300+ days** with heat index >35°C; over **200 days** above 41°C in several regions.
  - Heat index includes humidity, making it a better indicator of *felt temperature*.
- **Rapid Rise in Extreme Heat Events:**
  - 2024 was the **hottest year on record**, with Bangladesh's April–May heatwave affecting **33 million people**.
  - India's long heatwave in 2024 caused **~700 deaths**, the second deadliest event in the region.
- **Population Exposure Trends:**
  - Over **40%** of South Asia's population will face heat index >35°C and 41°C in both medium- and long-term scenarios.
  - Exposure will worsen regardless of climate policy due to continued urbanisation.



Source: ESCAP, adapted from World Bank Heat Index.

- **Compounding Threat: Heat + Pollution**
  - High heat intensifies **wildfires, droughts, PM10/PM2.5 load**, and releases VOCs.
  - Heat and pollution amplify cardiovascular and respiratory risks in a dangerous feedback loop.
- **Sectoral and Economic Impacts:**
  - Heat-related working-hour losses in Asia projected to rise from **3.75 million to 8.1 million full-time job equivalents by 2030**.
  - Annual climate-related economic loss may rise to **$498 billion** under high-emissions scenarios.

Why South Asia Is Most at Risk?

- **High Humidity + High Temperature:** Humid conditions amplify "felt heat," pushing heat index above 35–41°C for 300+ days a year.
- **Dense Urbanisation:** Fast-growing megacities like Delhi, Dhaka and Karachi trap heat through concrete, vehicles and limited green cover.
- **Large Outdoor Workforce:** Millions rely on labour-intensive sectors—agriculture, construction—where exposure to heat is unavoidable.
- **Low Adaptation Capacity:** Limited access to cooling, reliable electricity, clean water and heat shelters heightens vulnerability.
- **High Population Density:** Even moderate heatwaves impact tens of millions due to crowded settlements and poor housing.
- **Poverty & Inequality:** Heat amplifies socio-economic disadvantages, making the poor disproportionately exposed and unprotected.

Challenges in Reducing Heat Risk:

- **Weak Heat Action Plans:** Many state and city heat plans lack funding, scientific grounding and legal backing for enforcement.
- **Poor Urban Planning:** Concrete-dominated cities leave little room for trees, ventilation corridors or blue-green infrastructure.
- **Digital & Monitoring Gaps:** Only half of global meteorological systems issue heat warnings; localised forecasts remain limited.
- **Insufficient Healthcare Systems:** Heat emergency units, hydration centres and rapid-response teams are inadequate in many districts.
- **Labour Protection Weakness:** Outdoor workers lack mandatory shade breaks, adjusted hours, or employer accountability during heatwaves.
- **Electricity & Water Stress:** Power outages and water shortages increase risk when cooling becomes essential for survival.

Way Forward:

- **National Heat-Health Warning Network:** Ensure district-level forecasts, heat alerts, and last-mile communication in local languages.

- **Heat-Sensitive Urban Design:** Promote cool roofs, reflective surfaces, urban forests, shaded corridors and permeable pavements.
- **Protect Workers Legally:** Mandate heat safety protocols—rest breaks, water access, shift changes—during extreme heat days.
- Climate-Resilient Agriculture**:** Adopt heat-tolerant crop varieties, micro-irrigation, agroforestry and weather-indexed insurance.
- **Strengthen Local Health Systems:** Establish cooling shelters, mobile clinics, hydration kiosks, and emergency heat-response teams.
- **Expand Social Safety Nets:** Provide subsidised cooling appliances, water access, and targeted support for vulnerable households

Conclusion:

Extreme heat is emerging as the fastest-growing climate threat in Asia, with South Asia at the epicentre due to its demographic, ecological and socio-economic vulnerabilities. Without urgent adaptation measures—urban redesign, labour protection, and robust warning systems—heatwaves will become chronic humanitarian crises. A proactive, science-driven, equity-focused strategy is essential to protect lives, livelihoods and long-term climate resilience.

Topics: Challenges to internal security through communication networks, role of media and social networking sites in internal security challenges, basics of cyber security; money-laundering and its prevention

WHITE COLLAR TERRORISM

Context: The Faridabad terror module bust — involving the arrest of doctors and engineers with 3,000 kg of explosives — has exposed a new wave of "white-collar terrorism."

About White Collar Terrorism:

What is White-Collar Terrorism?

- White-collar terrorism refers to acts of violent extremism or radical activity planned and executed by educated, skilled professionals such as doctors, engineers, or academics.
- Unlike traditional terrorists, these individuals exploit their intellectual and technical expertise to design sophisticated attacks, spread ideology, and evade detection — blending seamlessly into mainstream society while advancing extremist agendas.

Key Features:

1. **Educated Radicalism:** Involvement of highly educated professionals from urban or middle-class backgrounds.
2. **Ideological Motivation:** Radicalisation driven by perceived moral or ideological injustice rather than poverty or illiteracy.
3. **Technological Sophistication:** Use of advanced knowledge in engineering, IT, or medicine for terror logistics and propaganda.
4. **Digital Radicalisation:** Recruitment and networking through online echo chambers and encrypted platforms.
5. **Societal Camouflage:** Ability to integrate within normal institutions, making intelligence detection difficult.
6. **Moral Justification:** Violence rationalised as a "moral" or "spiritual duty" rather than crime.

What Is the Issue?

- **Educated radicals in terror ranks:** Extremist groups now attract skilled professionals from urban middle-class families.

  Eg: ISIS chief Abu Bakr al-Baghdadi (PhD) and Al-Qaeda's Ayman al-Zawahiri (surgeon) exemplify this trend.

- **Ideological alienation and humiliation:** Radicalisation stems from moral anger and a quest for higher purpose, not poverty.

  Eg: Psychologist Fathali Moghaddam shows educated minds turn violent when dignity feels

attacked.

- **Digital echo-chambers:** Online networks create validation loops that normalise extremist ideas among professionals.

  Eg: The Hamburg Cell of 9/11 hijackers bonded through university chat forums in Germany.

- **Moral inversion of intellect:** Educated extremists justify violence as ethical duty or spiritual service.

  Eg: Faridabad suspects claimed their bomb-making was a "moral act" for religious justice.

- **Global and cross-ideological spread:** Educated radicals have emerged across nationalist, religious, and separatist causes.

  Eg: The LTTE in Sri Lanka and IRA in Ireland both relied on university-educated cadres.

Its Implications:

- **Collapse of professional trust:** Terror involvement by doctors or engineers erodes faith in elite professions.

  Eg: The Faridabad case deeply shook India's medical community and public confidence.

- **Technological sophistication in terror:** Educated extremists enhance planning, bomb-making, and online propaganda.

  Eg: The 9/11 hijackers used aviation and architectural expertise for coordinated attacks.

- **Intelligence detection difficulty:** White-collar terrorists blend easily into society, evading traditional profiling.

  Eg: Urban professionals with spotless records rarely appear in security databases.

- **Moral polarisation in society:** Their ideological arrogance deepens mistrust and glorifies violence as virtue.

  Eg: The Pulwama attacker's affluent family celebrated him as a martyr, not a criminal.

- **International terror linkages:** Educated recruits exploit global academic and financial networks for coordination.

  Eg: UK-trained Sudanese doctors joined ISIS hospitals, merging skill with ideology.

How to Tackle the Situation?

- **Ethics-based education reform:** Include moral reasoning and civic empathy in all levels of schooling.

  Eg: NEP 2020 promotes value-based and multidisciplinary ethical learning.

- **Community and family vigilance:** Encourage early detection of radical behaviour through social counselling.

  Eg: Kerala's Operation Pigeon integrates family awareness with digital monitoring.

- **Targeted de-radicalisation therapy:** Use psychological counselling and social reintegration to counter extremist pull.

  Eg: The UK Prevent Strategy combines mentorship and behavioural therapy.

- **Digital monitoring with safeguards:** Employ AI tools to flag extremist content while protecting privacy rights.

  Eg: Europol's IRU tracks online radical propaganda across Europe.

- **Strengthen professional accountability:** Enforce strict ethical codes and disciplinary oversight in high-risk sectors.

  Eg: The National Medical Commission 2023 introduced mandatory ethics modules for doctors.

- **Promote civic dialogue and inclusion:** Provide legitimate forums for dissent to prevent ideological isolation.

  Eg: District-level youth councils in J&K reduced radicalisation through debate spaces.

Conclusion:

White-collar terrorism shows that conviction, not ignorance, fuels extremism. India needs to counter it through ethical education, digital vigilance, and civic inclusion to neutralise both bombs and beliefs.

GENERAL STUDIES – 4

ENVIRONMENTAL ETHICS IN INDIAN PHILOSOPHY

Context: Article in news revisited how Ayurveda and ancient Indian philosophy embed environmental ethics in the triad of water, soil, and spirit—a timely reminder as India advances climate resilience and sustainable farming goals.

About Environmental Ethics in Indian Philosophy:

What it is?

- It is a moral framework that perceives nature not as a resource but as an extension of consciousness—where caring for the Earth is a sacred duty (*Dharma*).

Features:

1. **Holistic worldview:** The *Pancha Mahabhutas* (earth, water, fire, air, space) link human health with planetary balance.
2. **Moral stewardship:** Protecting nature is self-care; harm to soil, water, or air is harm to one's own being.
3. **Ahimsa and interdependence:** Every creature, element, and microbe deserves non-violence and respect.
4. **Spiritual ecology:** Environmental degradation is seen as both ecological and psychological imbalance.
5. **Sustainability as spirituality:** Practices such as rain-water harvesting, seasonal cropping, and sacred groves arose from this ethos.

Various Indian Philosophies on Environment

Vedic & Upanishadic Thought:

- The Vedic worldview sees the universe as a sacred organism where humans, gods, and nature form one moral continuum. The hymn *"Mata Bhumih Putro Aham Prithivyah"* enshrines ecological kinship—Earth as mother, humanity as child—urging stewardship over exploitation.

Ayurveda:

- Ayurveda treats environmental health as the foundation of human health, where disturbed *doshas* mirror polluted ecosystems. Soil (*Bhoomi Devi*), water, and air are living entities whose purity sustains both body and spirit.

Jainism:

- Jain philosophy extends *Ahimsa* beyond human life to include earth, air, and water—each possessing consciousness. By practising *Aparigraha* (non-possession), Jains model ethical restraint and compassionate coexistence with all forms of being.

Buddhism:

- Buddhism perceives nature through *Pratītyasamutpāda* (dependent origination)—all beings arise in mutual interdependence. Compassion (*Karuna*) is extended to the planet, framing sustainability as mindfulness in action.

Sikhism:

- Sikhism sanctifies ecological balance through Guru Nanak's verse, *"Pavan Guru, Pani Pita, Mata Dharat Mahat,"* teaching that air, water, and earth are divine teachers of humility and care. Environmental stewardship thus becomes an act of devotion (*Seva*).

Other Environmental Philosophies (Western Approaches)

- **Deep Ecology (Arne Næss):** Deep Ecology argues that all living beings—humans, animals, and plants—have *intrinsic value* independent of human use. It calls for a radical shift from anthropocentrism to *ecocentrism*, emphasising self-realisation through unity with nature. **Eg:** Norway's wilderness protection policies and global rewilding movements reflect this philosophy's influence.
- Utilitarian Environmentalism **(John Stuart Mill):**

Grounded in the principle of "the greatest good for the greatest number," this view weighs environmental decisions by their net benefit to human welfare. While pragmatic, it risks valuing ecosystems only for utility. **Eg:** Modern cost-benefit analyses in climate policy and renewable energy subsidies follow this utilitarian logic.

- **Ecofeminism (Vandana Shiva, Val Plumwood):** Ecofeminism parallels the exploitation of nature with the oppression of women, calling for nurturing, care-based ethics to heal both. It stresses interconnectedness, empathy, and cooperative coexistence.

Challenges Associated:

- **Commodification of spirituality:** The sacred principles of *Ahimsa* and *Dharma* are being reduced to commercial eco-labels, turning reverence into marketing. This erodes the intrinsic moral relationship between humanity and nature that Indian philosophy upholds.
- **Urban alienation:** Modern lifestyles cut individuals off from the rhythms of nature—seasons, soil, and sky—creating a spiritual void and apathy toward ecological suffering. Without this inner connection, environmentalism becomes intellectual, not ethical.
- **Policy–practice gap:** Environmental laws often measure compliance in statistics, not conscience. Without moral education and community participation, governance fails to awaken a sense of sacred duty (*Kartavya*) toward the Earth.
- **Cultural dilution:** Ritual pollution through plastics, chemicals, and unrestrained consumption contradicts the original Vedic purity codes that sanctified rivers and forests. Sacred traditions lose moral authenticity when detached from ecological discipline.
- **Climate modernity dilemma:** India faces the ethical tension between material progress and ecological restraint—how to grow without greed. True modernity lies in harmonising prosperity with *Prakriti*, not in mastering or exploiting it.

Way Ahead:

- **Integrate ethics into education:** Embed *Vedic ecology*, *Panchabhuta harmony*, and *Ahimsa ethics* in the NEP 2020 curriculum to nurture ecological conscience from childhood—transforming sustainability into a moral habit, not a syllabus.
- **Policy fusion:** Blend science with spirituality by linking Ayurveda's balance principles to missions like *Jal Jeevan*, *Namami Gange*, and PM-PRANAM—ensuring that ecological policy is guided by compassion as much as by compliance.
- **Community stewardship:** Empower local temples, panchayats, and faith-based trusts to become custodians of rivers, forests, and sacred groves. Ethical decentralisation reconnects spirituality with service (*Seva*) to the Earth.
- **Modern technology for ancient wisdom:** Use AI, GIS, and satellite mapping to protect sacred natural sites, medicinal plant habitats, and traditional water systems—where modern innovation becomes an instrument of *Sanatan* preservation, not destruction.
- **Global advocacy:** Project India's *Ecological Dharma* at COP-30 and UNESCO as a civilisational philosophy of restraint and reverence—demonstrating that environmental ethics is not merely a policy choice, but a moral destiny for humankind.

Conclusion:

Indian philosophy teaches that Prakriti (Nature) and Atman (Self) are reflections of one consciousness. Restoring that unity transforms environmental protection into spiritual evolution. By aligning **water, soil, and spirit**, India can pioneer a global ethic of compassionate sustainability.

MEDIA ETHICS

Context: Leaked hospital footage of veteran actor Dharmendra, widely circulated by paparazzi and some media outlets, triggered a public outcry over intrusion into privacy and "death rumours".

About Media Ethics:

- Media ethics is the set of moral principles and professional standards that guide journalists and media organizations in how they gather, produce, and publish information, balancing freedom of expression with responsibility to the public.
- **Core Features:**
    - **Truth & Accuracy:** Information must be verified before publication, presented in proper context, and corrected when wrong; respect for truth and the public's right to know is the first duty of the journalist.
    - **Objectivity & Fairness:** Reports should distinguish fact from opinion, present multiple perspectives where relevant, and avoid deliberate bias or sensational distortion.
    - **Independence & Integrity:** Journalists should resist political, corporate, or personal pressures, avoid conflicts of interest, and not accept bribes or favours that influence coverage.
    - **Respect for Privacy & Dignity:** Media should avoid unnecessary intrusion into private life, particularly in moments of grief, illness, or vulnerability, unless a clear and overriding public interest justifies disclosure.
    - **Accountability to the Public:** Primary responsibility is owed to citizens, not governments or owners; mechanisms like corrections, ombudsmen, and press councils help maintain credibility and answerability.

Need for Strong Media Ethics in Modern Times:

- **24x7 Breaking-News Culture:** The race to be "first" often overrides the duty to be "right", leading to half-verified stories and serious harm.
  E.g. In Nov 2025, false rumours of Dharmendra's death ran across channels before verification, forcing his family into public damage control.
- **Digital Virality & social media:** One unethical clip or misleading headline can reach millions in minutes, making corrections too late to undo the damage.
  E.g. A brutal video from Myanmar was mislabelled as Manipur violence, inflaming tensions before fact-checkers could debunk it.
- **Trust Deficit in Institutions:** Sensational, partisan coverage erodes trust in media, weakening democracy that depends on shared facts and rational debate.
  E.g. The 2024 Reuters Digital News Report flagged declining trust in Indian news, amid polarised coverage of elections and political arrests.
- **Infotainment & TRP Pressure:** Commercial competition pushes channels towards emotional, intrusive "infotainment" instead of sober, public-interest journalism.
  E.g. The leaked ICU video of an ailing Dharmendra in Nov 2025 was aired for shock value, not public interest, triggering outrage over dignity.
- **Vulnerability of Celebrities & Ordinary Citizens:** High-profile figures, victims, children and patients face voyeuristic coverage that amounts to secondary victimisation.
  E.g. After Sushant Singh Rajput's death, channels aired body images and private chats, violating his and his family's privacy and dignity.

Reasons for Decline in Media Ethics:

- **Commercialisation & TRP/Clicks Race:** Ad-driven models reward outrage, glamour and conflict, nudging newsrooms towards sensationalism and intrusive tactics.
  E.g. Nightly shouting matches in "debates" are crafted to spike TRPs and ad revenue, not to inform viewers meaningfully.
- **Weak Self-Regulation:** Ethical codes exist but enforcement is weak; penalties are too small to deter profitable unethical content.
  E.g. In 2023, the Supreme Court called NBSA fines "toothless" against channels that "go berserk" and earn far more from such broadcasts.
- **Ambiguous "Public Interest" Claims:** Anything that grabs attention is badged as "public interest", even when it is just satisfying voyeuristic curiosity.
  E.g. Channels justified airing Sushant Singh Rajput's psychiatric records as "public interest", widely criticised as pure sensationalism.
- **Competitive Paparazzi Culture:** Freelance paparazzi chase "exclusives" with little ethical oversight, normalising stalking and non-consensual filming.
  E.g. Repeated pleas by Anushka Sharma and Virat Kohli not to photograph their child show how celebrity privacy is routinely violated.
- **Political & Corporate Influence:** Big business

and political interests use ownership and ads to shape narratives, sidelining independent, ethical scrutiny.

E.g. Corporate takeovers like that of NDTV sparked concerns that editorial lines could bend towards owners' political–business interests.

- **Audience Fatigue & Normalisation:** Constant exposure to unethical formats desensitises viewers, turning once-shocking practices into accepted "industry norms."

  E.g. Prime-time shouting matches, once outrageous, are now routine, signalling how audiences and channels have normalised toxic news culture.

Way Ahead:

- **Strengthen Self-Regulation:** News organisations should adopt and actually enforce detailed ethics codes, correction policies, and internal review mechanisms; industry-wide press councils must be more active and visible.
- **Clear Privacy Protocols:** Media houses must define red lines—no filming in ICUs, no publication of sensitive medical images or grief moments without explicit consent and demonstrable public-interest justification.
- **Ethics Training & Newsroom Culture:** Regular ethics workshops, case-study discussions (like this Dharmendra episode), and editorial checks should be embedded into daily journalistic practice.
- **Transparency & Accountability:** Visible correction boxes, ombudsmen, public editors, reader feedback columns, and open apologies should become routine tools of accountability.
- **Digital & Paparazzi Guidelines:** Platform-specific and paparazzi-specific norms—on chasing, filming, children, medical spaces, funerals, and homes—must be jointly framed and enforced by media associations.
- **Media Literacy for Citizens:** Educating audiences to question sources, reject voyeuristic content, and support ethical outlets increases pressure on media to behave responsibly.

Conclusion:

Episodes like the leaked Dharmendra hospital video show how, without ethics, the right to report can turn into a licence to violate dignity. Media freedom is non-negotiable, but it must travel with truthfulness, restraint, and respect for privacy. Only a culture of strong self-regulation, public scrutiny, and ethical newsroom leadership can ensure that journalism serves people, not just profit.

EDUCATIONAL EXCELLENCE WITHOUT ETHICS

Context: A series of recent incidents—caste humiliation in elite services, violence by professionals, and ethical collapse in institutions—has renewed debate on the dangers of excellence without ethics.

About Educational Excellence Without Ethics:

Why Education Cannot Be Ethically Neutral?

- **Education shapes power, not just skill:** Professionals wield structural power, and without ethics their decisions can magnify injustice and harm.
- **Knowledge without conscience is dangerous:** Brilliant minds without moral grounding often justify cruelty or corruption as "efficiency."

  E.g. The toxic corporate culture revealed after the EY Pune work-pressure death showed intellect without empathy.
- **Values guide decisions under pressure:** Only internal ethics—not rules—ensures integrity in ambiguous situations.

  E.g. The 2023 NEET paper leak network exposed how students used loopholes when values were absent.

Symptoms of Excellence Without Ethics in India:

- **Toxic professional conduct:** Educated individuals engage in caste humiliation, bullying and abuse of authority.

  E.g. Casteist harassment reported in elite institutes like IITs and medical colleges in 2023–24.

- **Human beings reduced to instruments:** People become file numbers or "targets" in systems prioritising output over humanity.

  E.g. Hospital complaints during COVID-19 where patients were treated as "beds" rather than humans.

- **Rankings and meritocracy obsession:** NIRF ranks, placements and JEE/NEET scores overshadow value-education and empathy.

  E.g. Coaching hubs openly advertise "AIR ranks" but offer zero socio-emotional learning.

- **Academic dishonesty normalised:** Cheating, proxy projects and plagiarism thrive when outcomes matter more than integrity.

  E.g. Mass cheating and manipulation allegations during NEET-UG 2024 exposed systemic ethical collapse.

- **Insensitivity to inequality:** Privileged students remain detached from rural hardship or labour distress.

  E.g. Urban students mocking migrant workers' struggles during the 2020 lockdown became viral.

Why Ethical Education Matters Specifically for India?

- **High inequality demands high empathy:** A stratified society requires professionals who recognise dignity across caste, class and gender.

  E.g. Insensitive comments by a 2024 IAS trainee towards lower staff highlighted empathy gaps.

- **India's demographic dividend is fragile:** Millions of skilled but ethically shallow youth can worsen corruption and polarisation.

  E.g. Frequent fintech scams engineered by highly educated youth show skill without integrity.

- **Democracy relies on civic morality:** Respect for dissent and diversity must be nurtured early to prevent intolerance.

  E.g. Campus clashes across universities in 2023–24 reflected inability to disagree peacefully.

- **Rule of law needs ethical anchors:** Fairness and humanity must guide administrators beyond procedural legality.

  E.g. The Puja Khedkar UPSC controversy (2024) showed intellectual merit without ethical restraint.

Key Challenges in Building Ethical Education:

- **Exam-centric culture sidelines ethics:** Boards and entrance exams dominate learning, making ethics seem irrelevant.

  E.g. Schools cutting moral science classes to extend JEE/NEET prep hours.

- **Lack of trained ethics educators:** Teachers rarely have tools for case-dialogue, value reasoning or socio-emotional learning.

  E.g. Most CBSE schools assign "value education" to untrained temporary staff.

- **Fragmented implementation of NEP 2020:** Strong intent exists, but no clear curriculum, pedagogy or assessments in ethics.

  E.g. Schools still rely on outdated "moral stories" instead of modern ethics modules.

- **Campus cultures contradict ethics:** Discrimination or patronage in institutions cancels out classroom ethics.

  E.g. Reports of caste bias and harassment at top institutions negate theoretical ethics lessons.

- **Plural society complicates consensus:** Fear of ideological controversy makes institutions dilute value education.

  E.g. Schools dropping discussion on gender or inequality to avoid parental backlash.

Way Forward – Putting Ethics Back at the Heart of Education

1. **National framework for ethical education:**
   - Develop a clear, secular, constitutional-values–based ethics curriculum for K-12 and higher education, with age-appropriate learning outcomes (empathy in early years, dilemmas and critical reasoning in higher classes).
2. **Integration, not isolation:**
   - Embed ethical questions and dilemmas into all subjects:
     - Science → environmental ethics, AI/biotech dilemmas
     - Economics & business → inequality, worker rights, sustainability
     - History & literature → justice, discrimination, courage, non-violence.
3. **Teacher training & support:**
   - Mandatory ethics and SEL training in B.Ed/M.Ed and faculty development; toolkits for case studies, role plays, reflective writing, classroom dialogue.
4. **Campus culture as a "third teacher":**
   - Zero tolerance for bullying, discrimination and harassment; transparent grievance redress; student clubs on ethics, debate, social engagement; honour codes against cheating.
5. **Experiential & community-based learning:**
   - Structured field visits, community projects, rural/urban immersion, internships with NGOs and local governments to connect classroom learning with lived realities.

Conclusion:

India's biggest risk today is not a lack of talent but a surplus of talent *unmoored* from conscience. If schools and universities keep chasing excellence without ethics, they will produce brilliant minds that may break the very society they are meant to build. Reimagining education as the formation of morally conscious, *intellectually capable and socially just* citizens is no longer a luxury; it is a survival imperative for the Republic.

FACTS FOR PRELIMS GENERAL STUDIES – 1

ART AND CULTURE

Architecture

SIRPUR ARCHAEOLOGICAL SITE

Context:

The Chhattisgarh government is preparing the 5th-century Sirpur archaeological site in Mahasamund district for a UNESCO World Heritage nomination, introducing digital exhibits, and battery-operated transport.

About Sirpur Archaeological Site:

What It Is?

- Sirpur is a 5th–12th century multi-religious archaeological city known for its extraordinary concentration of Hindu temples, Buddhist viharas and Jain monuments, revealing the cultural and political vibrancy of Dakshina Kosala.

Location:

- Situated on the **banks of the Mahanadi River**, about 2 hours from Raipur, in Mahasamund district, Chhattisgarh.

History of the Site:

- First identified in **1882** by Alexander Cunningham; major excavations resumed in the **1950s**, expanded in the **1990s** and **2003 onwards**.
- Served as the **capital of Dakshina Kosala** under the **Panduvanshi** and later **Somavamshi** kings (6th–8th century).
- Excavations have revealed:
  - 22 Shiva temples
  - 5 Vishnu temples
  - 10 Buddhist viharas
  - 3 Jain viharas
- Archaeological evidence shows Sirpur was both a **religious centre** and a **flourishing commercial-urban hub** with palaces, markets, residential quarters, stupas and public infrastructure.

Architecture of Sirpur: Sirpur displays a rare blend of Shaiva, Vaishnava, Buddhist and Jain architectural traditions, reflecting deep social harmony and artistic excellence.

Key Architectural Highlights:

- **Lakshmana Temple (7th century):**
  - One of India's finest **brick temples**, built on a stone jagati.
  - Sculpted brick shikhara, intricate door jamb carvings, Vishnu depictions and Maithuna panels.
- **Surang Tila Complex (7th century):**
  - Dramatic **panchayatana** temple set on a **high 9-metre terrace** accessed by 37 steps.
  - Four Shiva shrines with differently coloured lingams and one Ganesha shrine.
  - 32-pillared mandapa and signs of ancient seismic damage.
- **Teevardev Buddha Vihara (8th century):**
  - A large monastery with a **monolithic Avalokiteshvara statue,** inscriptions and ornate door jamb.
  - Shows rare blending of Buddhist and Hindu iconography.
- **Baleshwar Temple (8th century):**
  - Carved pillars, lintels, elegant female figures and a marble Shiva lingam.
- **Gandheshwar Temple (18th century):**
  - A living temple enriched with **reused sculptures** from Sirpur's ruins—Buddha images beside Shiva lingams—symbolising cultural continuity.
- **Urban Planning Features:**
  - Palace complexes, marketplaces, monasteries, stupas, meditation cells,

water systems and a 6th-century market complex.

RED FORT

Context:

A blast occurred near Delhi's Red Fort, resulting in several injuries and reported deaths. Union Home Minister informed that a comprehensive investigation is underway by the Delhi Police, NIA, NSG, and FSL to determine the exact cause of the explosion.

About Red Fort (Lal Qila):

- **What it is?**
  - The Red Fort is a historic Mughal fort and palace complex located in Old Delhi, serving as the main residence of Mughal emperors for nearly 200 years.
  - It represents the zenith of Mughal architecture, blending Persian, Timurid, and Indian styles.
- **Built in:**
  - Commissioned by **Emperor Shah Jahan** in **1639** and completed in **1648**, following his decision to shift the capital from Agra to **Shahjahanabad (Delhi)**.
  - The fort's design was prepared by **Ustad Ahmad Lahori**, the architect of the **Taj Mahal**.
- **History:**
  - The Red Fort was plundered during **Nadir Shah's invasion (1739)** and later used as a **British military garrison** after the **1857 Revolt**.
  - It witnessed the decline of Mughal power, British colonial rule, and later became a symbol of India's freedom.
- **Characteristics of the Fort:**
  - Constructed mainly from **red sandstone**, symbolizing power and grandeur.
  - Enclosed by **2.5 km-long massive defensive walls** along the Yamuna River.
  - Features architectural marvels like **Diwan-i-Aam (Hall of Public Audience)**, **Diwan-i-Khas (Hall of Private Audience)**, **Moti Masjid**, and the **Nahr-i-Behisht (Stream of Paradise)** water channel connecting royal pavilions.
  - The layout reflects Islamic Garden aesthetics (Charbagh concept) infused with **Hindu design motifs**.
- **Important Events in History at Red Fort:**
  - **1739:** Plundered by **Nadir Shah**, who looted the **Peacock Throne** and other treasures.
  - **1857:** Became a key site during the **First War of Independence**; **Bahadur Shah Zafar** was captured and tried here.
  - **1945–46:** Venue for the Indian National Army (INA) trials, symbolizing the final phase of India's freedom struggle.
  - **15 August 1947:** **Jawaharlal Nehru** hoisted the national flag at the **Lahori Gate**, marking India's independence.
  - **2007:** Declared a **UNESCO World Heritage Site** for its cultural and architectural significance.

THE TAJ MAHAL

Context:

The upcoming Hindi film "**The Taj Story**", starring Paresh Rawal, has triggered nationwide controversy for reviving the discredited "Tejo Mahalaya" theory, which claims the Taj Mahal was originally a Shiva temple.

About the Taj Mahal:

What it is?

- The Taj Mahal is a 17th-century white marble mausoleum on the right bank of the Yamuna River in Agra, Uttar Pradesh. It is one of the Seven Wonders of the World and a UNESCO World Heritage Site (1983), celebrated as the pinnacle of Indo-Islamic architecture.

Built during:

- Commissioned in **1632 CE** by **Mughal Emperor Shah Jahan** in memory of his wife **Mumtaz Mahal**, it was completed in **1648 CE**, with additional structures and landscaping finished by **1653 CE** under the supervision of architect **Ustad Ahmad Lahori**.

History:

- Constructed by artisans, calligraphers, inlayers, and masons from across India, Central Asia, and Persia, the Taj represents the zenith of **Mughal craftsmanship**.
- Inscriptions in Arabic, Persian, and Quranic verses document its chronology and spiritual symbolism.

Key Features:

- The **central white marble tomb** stands on a raised square platform with **four minarets** at each corner, symbolizing symmetry and spatial balance.
- The **double-dome chamber** houses the cenotaphs of **Mumtaz Mahal (center)** and **Shah Jahan (west)**; the real graves lie in the **lower crypt**.
- The **pietra dura (inlay)** work, with precious stones depicting intricate floral motifs, exemplifies Persian and Indian artistic fusion.
- The **Charbagh garden** follows the **Timurid-Persian quadripartite design**, divided by water channels symbolizing the rivers of paradise.
- The **main gateway (Darwaza-i-Rauza)** and flanking **mosque and guest house** of red sandstone contrast with the central marble mausoleum, emphasizing visual harmony.

Significance:

- Represents the culmination of Mughal architecture, uniting Persian, Ottoman, and Indian aesthetics into a symbol of eternal love and divine harmony.
- Serves as a testament to 17th-century engineering and design, blending artistic precision with spiritual allegory—reflecting paradise and resurrection.
- Continues to be a global icon of India's cultural heritage, drawing over 6 million visitors annually and inspiring art, literature, and architecture worldwide.

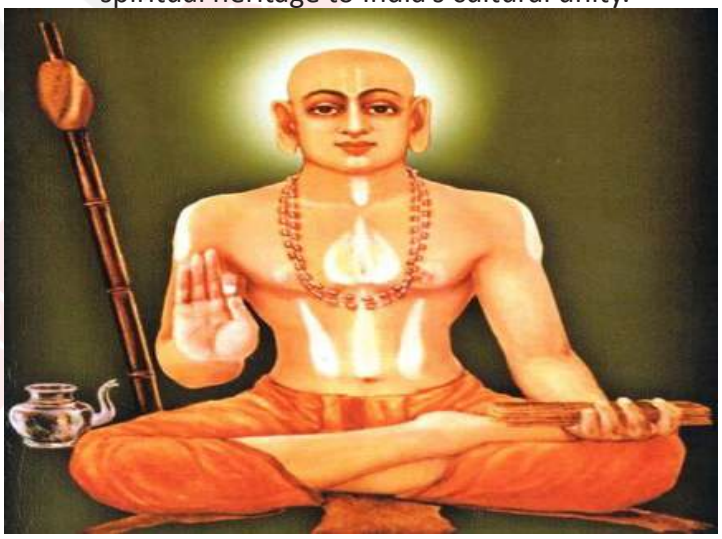
Religion and Festivals

MADHVACHARYA

Context:

Prime Minister Narendra Modi unveiled a 77-feet bronze statue of Lord Rama at the Shree Samsthan Gokarn Partagali Jeevottam Math in Goa.

- He also visited Udupi evoked the legacy of Jagadguru Madhvacharya, linking Udupi's spiritual heritage to India's cultural unity.



About Madhvacharya:

Who He Was?

- Madhvacharya (13th century CE) was a renowned Indian philosopher, theologian and founder of the Dvaita (dualism) school of Vedanta. He is revered as a major Vaishnava acharya and is traditionally regarded as an incarnation of Vayu, the Wind God.

Birth and Early Life:

- Born as **Vāsudeva** in **Pajaka village near Udupi, Karnataka** (1199–1278 CE or 1238–1317 CE, dates debated).
- Exceptional physical strength and intellect—nicknamed **Bhima**.
- Took **Sannyasa as a teenager**, initiated by

Achyutapreksha, receiving the names **Purna Prajna** and later **Ananda Tirtha**.

His Philosophy (Dvaita Vedanta):

- Madhvacharya's school, **Tattvavāda**, is based on *realist dualism*. Key principles:
- **Pancha-Bheda (Five Eternal Distinctions):**
  - God – Soul
  - God – Matter
  - Soul – Matter
  - Soul – Soul
  - Matter – Matter

  These differences are **natural, eternal and real**, rejecting monism.
- **God:**
  - Vishnu/Narayana is the **supreme independent reality** (Svatantra Tattva).
  - All souls and matter are dependent realities.
  - Liberation (moksha) is possible only through Vishnu's grace.
- **Pramānas (Sources of Knowledge):**
  - Accepted **three**:
  - **Pratyaksha** (perception)
  - **Anumāna** (inference)
  - **Śabda** (scriptural testimony)
  - **Bhakti over Jnana**

  Liberation comes through **devotion (bhakti)**, not mere intellectual knowledge.

Contribution to Bhakti Movement:

- Reinforced **personal devotion to Vishnu** and daily remembrance of God (Smarana).
- Rejected Advaita's non-dualism; debated Shankara and Ramanuja traditions.
- Authored **37 Sanskrit works**, including commentaries on:
  - Bhagavad Gita
  - Brahma Sutras (Madhva-bhashya & Anuvyakhyana)
  - Principal Upanishads
  - Bhagavata Purana (Tatparya-nirnaya)
- Founded the **Udupi Krishna Mutt**, establishing the famous **Ashta Mathas** tradition.
- **Inspired later Dvaita scholars:** Jayatirtha, Vyasatirtha, Raghavendra Tirtha.

Textiles

AABHAR ONLINE STORE

Context:

In a bid to promote **local artisans, weavers, and traditional industries**, the **Indian Railways** will patronise the newly launched **'Aabhar' online store**, hosted on the **Government e-Marketplace (GeM)** platform.

About Aabhar' online store

- The **'Aabhar' online store** showcases a range of **gift items** manufactured by **indigenous tribes, handloom weavers, and artisans** under the **One District One Product (ODOP)** and **Geographical Indication (GI)** categories.
- The store is hosted by **GeM** and sources products **exclusively from:**
  - **Central Cottage Industries Emporium (CCIE)**
  - **Khadi and Village Industries Commission (KVIC)**
  - Various **Central and State Handicraft and Handloom Emporiums**
- Promoted under the **'Vocal for Local'** campaign.
- The gift articles and hampers will be used in **official events, ceremonies, and functions** of the Railways.
- The initiative aims to **promote India's rich heritage** through **handlooms, handicrafts, and artisanal goods**, and to provide **market access** to **local artisans, rural entrepreneurs, and women-led enterprises.**
- The **GeM CEO's note** highlighted that the effort supports **sustainable and inclusive economic development.**

Significance

- **Encourages social inclusion:** Provides new market avenues and income opportunities for **marginalised artisans and rural entrepreneurs.**
- **Supports traditional industries:** Promotes **handloom, handicraft, and indigenous products** across India.
- **Aligns with earlier initiatives:** Complements the **'One Station One Product (OSOP)'** scheme that showcases local artefacts, handlooms, and handicrafts at railway stations.
- **Promotes 'Vocal for Local':** Reinforces the commitment to **self-reliance and heritage-based economic growth.**

Miscellaneous

THE MEERUT BUGLE

Context:

The Meerut bugle, traditionally used in India's military parades, ceremonies, and regimental bands, has received a Geographical Indication (GI) tag.

About The Meerut Bugle:

What it is?

- The Meerut bugle is a **brass wind instrument** used in military drills, parades, ceremonies, and signals across the **Army, paramilitary forces, and police units** in India.
- It is known for its commanding sound and cultural association with Indian military tradition.

Origin: Meerut's bugle-making tradition dates back to the **late 19th century**, during the British era, when the instrument became integral to battlefield communication.

Over time, the craft evolved into a specialised local industry, making Meerut one of India's main centres for handmade bugles.

Key Features:

- Handcrafted workmanship using high-quality brass, known for durability and tonal accuracy.
- Used extensively in regimental bands, military academies, and ceremonial events nationwide.
- Represents a living military heritage linking colonial-era communication tools to modern ceremonial functions.

About GI Tag:

What it is?

- A Geographical Indication (GI) tag is a legal certification identifying goods that originate from a specific region and possess qualities, characteristics, or reputation attributable to that place.

Launched under:

- The Geographical Indications of Goods (Registration and Protection) Act, 1999.
- Implemented from September 2003.

Organisation Responsible:

- Geographical Indications Registry, Chennai
- Under the Office of the Controller General of Patents, Designs & Trade Marks, Ministry of Commerce & Industry.

Aim:

- To **protect traditional products**, crafts, and agricultural items tied to specific regions.
- To prevent misuse or imitation of regional products.
- To enhance market value, livelihood opportunities, and global recognition of authentic local goods.

Key Features:

- Grants exclusive rights to authorised producers from the region.
- Ensures authenticity, making counterfeits legally punishable.
- Boosts rural development, preserves traditional craftsmanship, and promotes sustainable local economies.
- Helps GI products gain visibility in global exhibitions, trade fairs, and export markets.

- India currently has 605 GI-tagged products across handicrafts, agriculture, food, manufactured goods, and natural products.

UNESCO CREATIVE CITIES NETWORK (UCCN)

Context:

At the 43rd UNESCO General Conference in Uzbekistan (2025), Lucknow was declared a UNESCO Creative City of Gastronomy, celebrating its rich Awadhi cuisine, culinary heritage, and cultural diplomacy through food.

About UNESCO Creative Cities Network (UCCN):

What it is?

- The UNESCO Creative Cities Network (UCCN) is a global platform of cities that use creativity and cultural industries as key drivers for sustainable urban development.

Established in: 2004 by UNESCO to promote **international cooperation** among cities investing in culture and creativity as tools for inclusive growth.

Aim:

- To strengthen collaboration among cities, foster cultural innovation, and integrate creativity in local development policies—supporting SDGs, especially Goal 11 (Sustainable Cities and Communities).

Key Features:

- Brings together **350+ cities** worldwide from 7 creative fields — **Gastronomy, Literature, Music, Film, Design, Crafts & Folk Arts, and Media Arts**.
- Promotes **cultural exchange, knowledge-sharing, and capacity-building** among member cities.
- Encourages **creative economy growth**, sustainable tourism, and inclusive urban planning.
- Recognizes and protects **intangible cultural heritage** while aligning with UNESCO's global cultural agenda.
- Cities commit to **collaborative international projects** and periodic progress reporting to maintain designation.

Indian Cities Recognized under UCCN:

City	Field of Recognition	Year
Jaipur	Crafts and Folk Arts	2015
Varanasi	Music	2015
Chennai	Music	2017
Mumbai	Film	2019
Hyderabad	Gastronomy	2019
Srinagar	Crafts and Folk Arts	2021
Kozhikode	Literature	2023
Gwalior	Music	2023
Lucknow	Gastronomy	2025

MEDIEVAL HISTORY

Vijayanagara Kingdom

GOLD COINS FROM THE VIJAYANAGARA-ERA UNEARTHED

Context:

Over 100 gold coins from the Vijayanagara era were unearthed inside an earthen pot during restoration works at a Later Chola-period Shiva temple in Kovilur, Tiruvannamalai district, Tamil Nadu.

About Gold coins from the Vijayanagara-era unearthed:

What it is?

- A total of **103 punch-marked gold coins** of

varying sizes and shapes were discovered during excavation near the sanctum sanctorum of the **Kovilur Shiva temple** atop the Jawadhu Hills.

Discovery:

- Officials from the Tamil Nadu State Archaeology Department (TNSAD) and Revenue Department secured the site and transferred the coins to the district treasury under the provisions of the **Indian Treasure Trove Act, 1878**.
- The coins carry the **boar emblem**, a symbol of **Vijayanagara royal authority**, and are believed to be **devotional offerings** minted during the reigns of rulers such as **Harihara II or Krishnadevaraya** (14th–16th centuries CE).
- Archaeologists estimate the coins to be approximately 5 mm in size, made of pure gold, and possibly issued as temple endowments or donations.

About Numismatics of the Vijayanagara Empire:

Origin:

- The Vijayanagara Empire (1336–1646 CE) was founded by Harihara I and Bukka I, inspired by the sage Vidyaranya, to defend Hindu kingdoms in South India.
- Its capital at Hampi became a major political, economic, and religious hub. The empire issued one of the most sophisticated monetary systems in medieval India.

Key Features of Vijayanagara Coinage:

- **Metal Composition:** Predominantly **gold pagodas (gadyanas)**, half and quarter pagodas, along with **silver taras** and **copper jitals**. Gold was reserved for religious offerings and royal use.

  Eg: Krishnadevaraya's gold Balakrishna pagoda (3.3 gm) with Devanagari legend "Sri Pratapa Krishna Raya."
- **Artistic Imagery:** Coins bore images of **Hindu deities**—Siva-Parvati (Uma-Maheshwara), Vishnu-Lakshmi, Balakrishna, or Gandaberunda (double-headed eagle)—reflecting royal devotion and temple culture.
- **Legends and Language:** Inscribed in **Devanagari, Kannada, or Tamil**, often featuring the ruler's name and honorifics such as "Sri Pratapa" (valiant).
- **Symbolism:** The **boar emblem (Varaha)**—an avatar of Vishnu—was used as the state symbol on royal coins and seals, representing divine sanction to rule.
- **Economic Role:** Vijayanagara coinage served both as **temple wealth and trade currency**, circulating widely across South India, Sri Lanka, and the Indian Ocean trade routes.

Important Terminologies and Miscellaneous Medieval History

SRI GURU TEGH BAHADUR

Context:

President of India attended the 350th anniversary commemoration of Sri Guru Tegh Bahadur at the Red Fort, New Delhi.

About Sri Guru Tegh Bahadur:

Who he was?

Sri Guru Tegh Bahadur (1621–1675) was the ninth Guru of Sikhism, known for his fearlessness, spiritual depth, and ultimate sacrifice to defend the freedom of conscience.

- Born as Tyag Mal in Amritsar, he was the youngest son of Guru Hargobind Sahib, the sixth Guru.

Early Life:

- Born on **1 April 1621** at Amritsar; trained in **martial skills, scriptures, archery, horsemanship**, and classical texts like the Vedas/Upanishads.
- Displayed exceptional bravery in the **Battle of Kartarpur (1634)**; earned the title **"Tegh Bahadur"** (Brave of the Sword).
- Married **Mata Gujri** (1632); lived at **Bakala** for over 20 years, meditating in seclusion.

Installation as the Ninth Guru:

- Before his death, Guru Har Krishan uttered

"Baba Bakale", pointing to his successor in Bakala.

- Over **22 claimants** tried to occupy the guruship until **Makhan Shah Labana** identified Tegh Bahadur as the true Guru by testing his divine knowledge of a secret offering vow.
- In **August 1664**, a Sikh congregation led by **Diwan Dargha Mal** formally installed him as the ninth Guru.

Major Works & Contributions:

- **Extensive Preaching Journeys:**
  - Travelled across **Punjab, UP, Bengal, Bihar, Assam**, and **Dhaka**, spreading Guru Nanak's message.
  - Established centres of Sikh teaching; dug wells, started **langars**, and supported poor communities.
- **Founding of Anandpur Sahib:**
  - Purchased land from Rani Champa of Bilaspur; founded **Chakk Nanaki** (later **Anandpur Sahib**) in 1665–72, which became a major Sikh centre.
- **Social-Reformist Role:**
  - Condemned casteism, fanaticism, ritualism, and tyranny.
  - Strengthened Sikh identity through a philosophy rooted in **fearlessness (nirbhau)** and **freedom from enmity (nirvair)**.
- **Spiritual & Literary Contributions:**
  - Composed **59 Shabads** and **57 Shaloks** across 15 Raagas.
  - His hymns form an integral part of **Guru Granth Sahib**, added by Guru Gobind Singh.

Conflict with Aurangzeb & Execution:

- Under Aurangzeb's rule, forcible conversions and religious persecutions increased.
- **Kashmiri Pandits**, led by **Pandit Kirpa Ram**, sought Guru Tegh Bahadur's protection.
- Guru decided to **sacrifice himself** to uphold **religious freedom**—a stand unique in world history.
- **Arrest & Torture:**
  - Arrested at Ropar; imprisoned at Sirhind and later Delhi.
  - His companions—**Bhai Mati Das, Bhai Sati Das, Bhai Dayala**—were brutally executed in his presence.
- **Martyrdom (11 November 1675):**
  - He refused to:
    - Convert to Islam
    - Perform miracles
  - Was **publicly beheaded** at Chandni Chowk (now **Gurdwara Sis Ganj Sahib**).
  - His body was cremated secretly at the site of **Gurdwara Rakab Ganj Sahib**.

MODERN HISTORY

Important Personalities

SILVER JUBILEE OF PPV&FRA ACT

Context:

Union Agriculture Minister presented the Plant Genome Saviour Awards in New Delhi to mark the Silver Jubilee of the Protection of Plant Varieties and Farmers' Rights (PPV&FRA) Act, 2001.

About Silver Jubilee of PPV&FRA Act:

What it is?

- India's first **sui generis** legal framework (enacted in **2001**) for protecting the rights of **farmers and plant breeders**, ensuring equitable benefit-sharing and seed sovereignty.

Launched in: **2001**, under the Ministry of Agriculture & Farmers' Welfare; Authority operational since **2005**.

Aim: To establish a balanced system that encourages innovation in plant breeding while recognizing farmers' role in conserving genetic diversity.

Key Features:

- **Farmers' Rights (Section 39):** Farmers can save, use, sow, resow, exchange, and share seeds of registered varieties; they are also eligible for **compensation** for non-performance of varieties.
- **Breeders' Rights:** Exclusive rights to produce, sell, or license protected varieties, ensuring intellectual property protection for innovation.
- **Registration Criteria (DUS):** Varieties must meet Distinctness, Uniformity, and Stability standards; 57 crop species notified for registration.

- **National Gene Fund:** Created to channel benefit-sharing fees and support in-situ conservation and rewarding farmers.
- **Researchers' Exemption:** Allows use of registered varieties for experimentation and varietal development, ensuring open scientific access.
- **Benefit-Sharing & Protection:** Recognition of community knowledge through National Register of Plant Varieties (NRPV) and legal remedy for biopiracy.

About Plant Genome Saviour Awards:

- **What it is?**
  - A national recognition scheme instituted by PPV&FRA to honour farmers and communities preserving traditional and endangered plant varieties.
- **Origin:** Introduced under Section 39(1)(iii) of the PPV&FRA Act to reward grassroots conservationists of genetic resources.
- **Awarded to:**
  - Individual farmers and community seed groups engaged in conserving indigenous landraces and wild relatives of crops.
  - 2025 recipients include **Community Seed Bank (Telangana), Mithilanchal Makhana Producers' Association (Bihar)**, and CRS-Na Dihing Tenga Unyan Committee (Assam), among others.

JANJATIYA GAURAV VARSH 2025

Context:

Nationwide celebrations under Janjatiya Gaurav Varsh 2025 are underway to mark the 150th birth anniversary of Bhagwan Birsa Munda and 150 years of "Vande Mataram".

About Janjatiya Gaurav Varsh 2025:

What it is?

- Janjatiya Gaurav Varsh 2025 is a nationwide year-long celebration dedicated to honouring the legacy of tribal freedom fighters—especially Bhagwan Birsa Munda, known as Dharti Aaba—and commemorating 150 years of the national song "Vande Mataram."
- It seeks to promote awareness of India's tribal contributions to nation-building and cultural identity.

Organisations Involved:

- Ministry of Tribal Affairs (MoTA) is the nodal agency.
- Supported by Tribal Research Institutes (TRIs), State Governments, Eklavya Model Residential Schools (EMRS), and cultural bodies.

Aim:

- To celebrate India's tribal heritage, resilience, and patriotism while deepening national pride and fostering cultural inclusivity in line with the vision of Sabka Saath, Sabka Vikas, Sabka Vishwas, Sabka Prayas.

Key Features:

1. **Cultural Commemoration:** Mass events, exhibitions, and Janjati Gaurav Yatras showcasing tribal heroes and their contributions to India's freedom struggle.
2. **Educational Outreach:** Competitions, literacy workshops, and museum visits to promote awareness of tribal history among students.
3. **Community Empowerment:** Activities like digital and financial literacy programmes in EMRS schools to enhance tribal socio-economic inclusion.
4. **National Integration:** Mass singing of Vande Mataram, sports meets, and art exhibitions across States to foster unity and pride.
5. **Inclusive Development Focus:** Events across states such as **Jharkhand, Odisha, Gujarat, Nagaland, and Ladakh**, blending traditional culture with modern aspirations.
6. **Major Highlight:** The Janjati Gaurav Yatra (Tribal Pride March) from Ambaji and Umargam to the Statue of Unity (Ektanagar), symbolising national unity through tribal heritage.

Miscellaneous

150 YEARS OF VANDE MATARAM

Context:

Prime Minister of India inaugurated the year-long celebrations marking 150 years of the National Song "Vande Mataram" in New Delhi on 7th November 2025.

About 150 Years of Vande Mataram:

What it is?

- A national commemorative initiative (2025–26) to celebrate the **150th anniversary of "Vande Mataram"**, connecting citizens—especially youth—with its revolutionary and spiritual essence that united India's freedom struggle.

Origin:

- Written by **Bankimchandra Chatterji** on **7th November 1875 (Akshaya Navami)**, the song first appeared in his literary journal Bangadarshan as part of the novel **Anandamath**, portraying the Motherland as divine, strong, and nurturing.

History & Essence:

- "Vande Mataram" evolved from a poetic invocation to a **national mantra of resistance**. In **1896**, Rabindranath Tagore sang it publicly at the Calcutta Congress Session.
- Its lyrical imagery—"Sujalam, Sufalam, Malayaja Sheetalam"—celebrated India's natural and moral beauty, envisioning a free, prosperous nation.

Features:

1. Symbol of unity blending **spiritual devotion and national identity**.
2. Recognized by the **Constituent Assembly (1950)** as having **equal honour** with the National Anthem.
3. Represents the **civilizational idea of Bharat**—balance between moral strength, knowledge, and courage.

Role in the Freedom Struggle:

- Became a **rallying cry during the Swadeshi Andolan (1905)** and anti-Partition protests in Bengal.
- Banned by the British for its revolutionary power, yet **echoed across marches, prisons, and gallows**.
- Revered by leaders like **Sri Aurobindo** (as a mantra of awakening) and **Mahatma Gandhi** (as the vision of undivided India).
- The slogan **"Vande Mataram"** unified diverse regions, faiths, and languages under one patriotic spirit.

About Vande Mataram Movement:

- **What it is?**
  - A **regional resistance movement** in **Gulbarga (Karnataka)** during the **Hyderabad-Karnataka freedom struggle (1948)**, inspired by the slogan "Vande Mataram" to oppose the Nizam's autocratic rule.
- **History:**
  - On **9th November 1948**, freedom leaders like **Dr. Sharanabasappa** and **Qadeer Dargah** led peaceful marches chanting Vande Mataram, facing violent repression by the Nizam's police.
  - Despite attacks, the movement spread across the region and culminated in unity pledges presented to **Sardar Vallabhbhai Patel**, who later praised their courage and integrated the region into the Indian Union.

GEOGRAPHY

Origin and Evolution of Universe

THE RARE EARTH HYPOTHESIS

Context: Recent data from NASA's Kepler and James Webb Space Telescopes (JWST) suggest that while Earth-sized planets in habitable zones are common, the specific conditions required for complex life remain extremely rare, reviving interest in the Rare Earth Hypothesis.

About the Rare Earth Hypothesis:

What it is?

- The Rare Earth Hypothesis posits that while microbial life might be widespread across the universe, complex, multicellular life is exceptionally uncommon due to the need for a unique and finely tuned set of planetary, stellar, and cosmic conditions.

Propounded by:

- Proposed by **Peter Ward (palaeontologist)** and **Donald Brownlee (astronomer)** in their 2000 book "Rare Earth: Why Complex Life is Uncommon in the Universe."

Aim:

- To explain why Earth-like complex ecosystems may be an extraordinary rarity in the cosmos despite the abundance of stars and planets.

Key Features:

- **Multiple Conditions Required:** Complex life depends on a rare combination of factors — stable climate, plate tectonics, magnetic field, atmospheric regulation, and a protective gas giant (like Jupiter).
- **Habitable Zone Constraint:** Not enough to be in a "habitable zone"; the planet's composition, orbit, and atmosphere must also remain stable over billions of years.
- **Planetary System Architecture:** Giant planets can either shield inner planets from impacts or destabilize them depending on mass and orbit.
- **Climate Stability:** Long-term carbon-silicate cycling and plate tectonics are vital to maintain a life-supporting atmosphere.
- **Atmospheric Retention:** Only few planets, particularly around Sun-like stars, can sustain thick atmospheres against stellar radiation.

Significance:

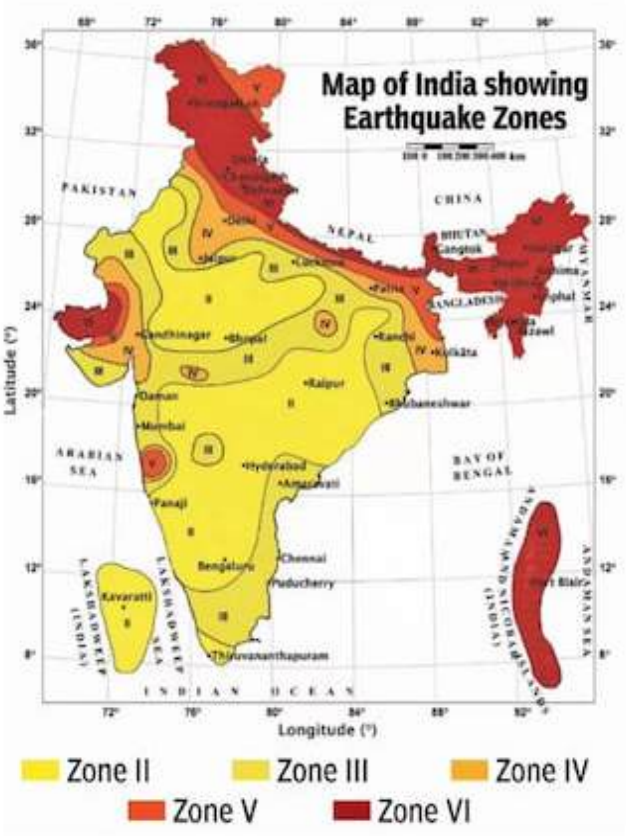
Challenges the Copernican Principle (that Earth is not special) by suggesting Earth's conditions are uniquely fine-tuned for complex life.

Guides astrobiology and exoplanet research, focusing on planetary systems with Earth-like stability.

Geomorphology

INDIA REVISED EARTHQUAKE DESIGN CODE, 2025

Context: India has released a radically updated seismic zonation map under the revised Earthquake Design Code (2025), placing the entire Himalayan arc in a newly created highest-risk Zone VI for the first time.



About India Revised Earthquake Design Code, 2025:

What is the Seismic Zonation Map?

- A seismic zonation map classifies different regions of India based on their **earthquake hazard potential**, helping determine how strong structures must be to withstand earthquakes.

Published by:

- The updated map is issued by the **Bureau of Indian Standards (BIS)** as part of the revised

Earthquake Design Code, 2025 (IS 1893).

- It uses internationally accepted ***Probabilistic Seismic Hazard Assessment*** **(PSHA)** methods.

Key Features of the Revised Zonation Map:

1. **Introduction of Highest-Risk Zone VI:**
   - Entire Himalayan arc (J&K–Ladakh to Arunachal) placed in **Zone VI**, the **most hazardous zone**, for the first time.
   - Recognises consistent, extreme tectonic stress along the Indian–Eurasian plate boundary.
2. **61% of India Now in Moderate to High Hazard Zones:**
   - A major jump from older estimates relying mainly on past epicentres.
   - Reflects scientific modelling of fault segments, locked sections, and rupture potential.
3. **Boundary Towns Auto-Upgraded to Higher-Risk Zone:**
   - If a city lies on the border of two zones, it defaults to the **higher-risk** one.
   - Moves away from administrative lines to **geological realities**.
4. **Inclusion of Rupture Propagation Southward:**
   - Acknowledges that Himalayan Frontal Thrust ruptures may extend south to populated foothill regions like **Dehradun (near Mohand)**.
5. **Mandatory Structural & Non-Structural Safety:**
   - New norms for anchoring parapets, ceilings, tanks, façades, HVAC units, etc., if their weight exceeds 1% of total load.
   - Buildings near active faults must withstand **pulse-like ground motions** typical of near-fault quakes.
6. **New Soil & Ground-Response Requirements:**
   - Detailed provisions for **liquefaction, soil flexibility, site-specific shaking spectra**.
   - Encourages geotechnical investigations before major construction.
7. **Exposure Mapping (PEMA Method):**
   - Incorporates **population density**, infrastructure concentration and socioeconomic vulnerability.
   - Integrates impact-based assessment with geological hazard.

Significance:

- **Improved Earthquake Preparedness:** Accurate hazard modelling ensures stronger building codes for at-risk regions, especially the Himalayas.
- **Retrofitting Imperative:** Old structures, especially in Himalayan towns, must be retrofitted, including schools, hospitals, and bridges.
- **Uniformity Across the Himalayan Arc:** Fixes decades of underestimation due to inconsistent older maps (Zones IV & V), despite identical tectonics.

HAYLI GUBBI VOLCANO

Context:

A massive volcanic ash cloud from Ethiopia's Hayli Gubbi volcano—which erupted after nearly 10,000 years—has drifted toward India, raising concerns over air quality and aviation.

About Hayli Gubbi Volcano:

What it is?

- Hayli Gubbi is a **shield volcano** in Ethiopia's Afar Region, known for broad, gently sloping volcanic structures formed by low-viscosity basaltic lava typical of the East African Rift system.

Located In: It lies in the **Afar Depression of Ethiopia**, at the southern end of the **Erta Ale volcanic range**, one

of the most active tectonic and volcanic zones in the world.

History Background:

- No confirmed eruptions for **~10,000–12,000 years** (Holocene).
- On **23 November 2025**, a sudden **sub-plinian eruption** produced an ash plume reaching **45,000 ft** (FL450).
- The plume drifted across **Red Sea, Yemen, Oman**, and then moved east toward western India.

Key Features:

- **Shield volcano type**—broad, low-gradient, large lava fields.
- Part of the **divergent plate boundary** where the African Plate is rifting.
- Eruption produced **volcanic ash, SO_2, glass shards, and rock particles** transported at high altitudes (15,000–45,000 ft).
- Classified as **sub-plinian** due to vertical column height and ash dispersal scale.

Other Major Volcanoes in Africa:

- **Mount Nyiragongo (DR Congo)** – One of the world's fastest lava flows.
- **Mount Silali (Kenya)** – Extinct caldera volcano.
- **Dabbahu Volcano (Ethiopia)** – Rift-related fissure eruptions.
- **Mount Alayta (Ethiopia)** – Part of Afar Rift.
- **Ardoukoba (Djibouti)** – Erupted in 1978.
- **Mallahle (Ethiopia)** – Stratovolcano.
- **Asavyo (Ethiopia)** – Volcanic field within Afar rift.

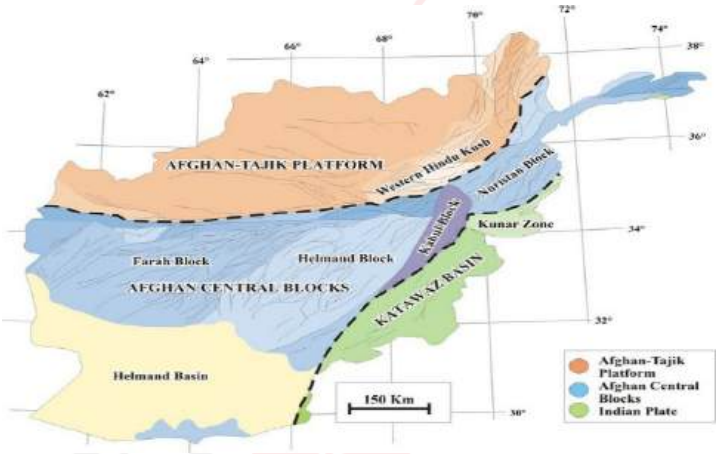
Impact on India:

- **Air Quality:**
  - Ash is at **high altitudes**, limiting ground-level mixing; Delhi is unlikely to see major AQI deterioration.
  - Skies may appear **hazy/darker** but pollutants will remain mostly aloft.
- **Health & Climate:**
  - SO_2 can contribute to **acid rain** regionally, but concentrations over India appear limited.
  - Volcanic particles may briefly affect **solar radiation** and **visibility**.

AFGHANISTAN EARTHQUAKE 2025

Context:

A magnitude 6.3 earthquake struck northern Afghanistan near Mazare Sharif, adding to a series of recent deadly quakes in the country and raising urgent concerns about seismic risk and preparedness.



About Afghanistan Earthquake 2025:

What is Earthquake?

- An earthquake is a sudden shaking of the ground caused by the slip of rock blocks past each other along a fault line. The point inside the Earth where the quake begins is called the hypocenter, and the point directly above it on the surface is the epicenter.

How It Occurs?

- The Earth's crust is divided into **tectonic plates** that constantly move.
- When these plates **collide, slide, or diverge**, stress builds up along **faults**.
- Once the accumulated energy overcomes friction, the rocks **suddenly release energy** in the form of **seismic waves**, shaking the ground.

How It Is Measured?

- **Instrument:** Seismograph records ground motion; its output is a seismogram.
- **Magnitude:** Indicates energy released; measured on the Richter or Moment Magnitude (Mw) scale.
- **Intensity:** Refers to the degree of shaking at different locations, measured by the Modified Mercalli Scale.
- **Triangulation method:** Used to locate the epicenter using P (primary) and S (secondary) wave data from three or more stations.

Key Features:

- **Foreshocks:** These are smaller tremors that occur in the same area shortly before the main earthquake, caused by the gradual buildup of stress along a fault line.
- **Mainshock:** It is the largest and most powerful earthquake in a sequence, releasing the maximum accumulated energy and causing the greatest ground shaking.
- **Aftershocks:** These are smaller quakes that follow the mainshock as the crust adjusts to the new stress balance, often continuing for weeks or even months.
- **Seismic Waves:** The energy released during a quake travel outward as **P-waves** (fast, compressional) and **S-waves** (slower, shear), shaking the ground as they pass through.

Why Afghanistan Is So Prone to Earthquakes?

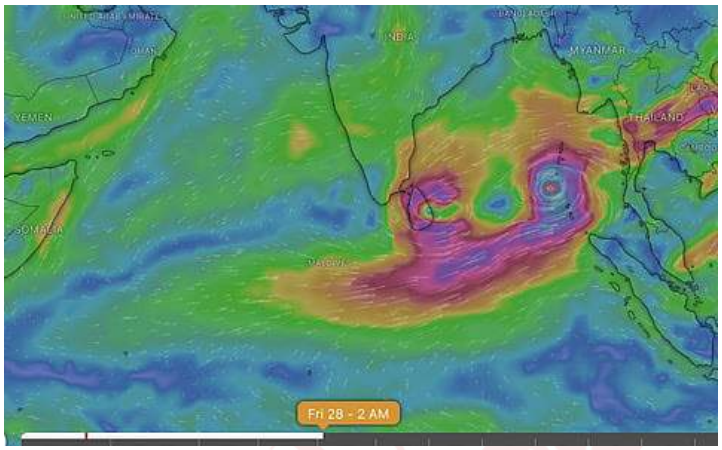
- **Tectonic Collision Zone:** Afghanistan sits where the **Indian, Eurasian, and Arabian plates** collide, and the constant northward push of the Indian plate creates intense crustal stress leading to frequent quakes.
- **Complex Fault Network:** The nation lies atop active faults like the **Chaman**, **Hari Rud**, and **Badakhshan** faults, where continuous plate movement triggers frequent seismic slips.
- **Mountainous Terrain and Landslides:** Steep, fragile mountain slopes amplify ground shaking and cause **landslides**, compounding quake-related losses.
- **Poor Infrastructure and Construction Practices:** Traditional **mud-brick houses** lack quake-resistant design, collapsing easily even during moderate seismic activity.
- **Limited Monitoring and Preparedness:** Afghanistan lacks **modern seismic networks** and **early warning systems**, preventing timely alerts and disaster mitigation.

Climatology

FUJIWHARA EFFECT

Context:

Two potential cyclonic storms are forming in the Bay of Bengal, with global forecast models indicating a possible Fujiwhara interaction between them.



About Fujiwhara Effect:

What is the Fujiwhara Effect?

- A rare meteorological phenomenon where two nearby cyclonic systems begin to rotate around a common centre due to interaction of their wind circulations.
- Identified by Sakuhei Fujiwhara (1921), it occurs mostly in the tropical cyclone belt when storms are within ~1,400 km of each other.

Factors Aiding Its Occurrence:

- **Proximity of two cyclones** within a threshold distance (typically <1400 km in the Indian Ocean).
- **Similar rotational direction** (counter-clockwise in the Northern Hemisphere).
- **Favourable sea surface temperatures** >26°C supporting sustained convection.
- **Low vertical wind shear** allowing stable cyclone structure.

How it forms?

- **Close Formation:** Two cyclones forming within ~1400 km begin influencing each other's wind fields and natural movement patterns due to proximity.
- **Wind Interaction:** Their outer rainbands and upper-level winds overlap, creating deformation zones that gradually pull the systems toward each other.
- **Coupled Circulation:** The interacting winds generate a shared pivot point, forcing both cyclones to rotate in curved, mutually influenced paths.
- **Orbiting:** If one storm is stronger, the weaker one revolves around it and may eventually be absorbed due to energy imbalance.
- **Merger:** When centres move very close, the

vortices fuse into a single, larger cyclone with enhanced convection and stronger winds.
- **Weakening:** Competition for heat and moisture can deprive the weaker cyclone of inflow, triggering rapid weakening or dissipation.
- **Deflection:** If interaction is weak, storms may push each other onto diverging paths, adding significant uncertainty to forecasts.

Key features:
- **Mutual Rotation:** Both cyclones circle a common centre anti-clockwise, altering their original trajectories and movement speed.
- **Energy Transfer:** The stronger system can steal momentum or moisture from the weaker one, reshaping their relative strengths.
- **Track Uncertainty:** Steering winds get disrupted, making prediction of landfall, intensity, and movement highly challenging for meteorological agencies.
- **Possible Fusion:** Close approach may cause the cyclones to merge into a more intense system with higher rainfall and damaging winds.
- **Stalling:** Storms may slow down or stall during interaction, prolonging rainfall events and increasing flood risks.

Implications:
- **Forecast Challenges:** High uncertainty delays accurate warnings for landfall and complicates planning for evacuation and relief operations.
- **Heavy Rainfall:** Prolonged interaction increases rainfall over TN, Andhra, Odisha, Bengal, Sri Lanka, and Myanmar, worsening flood potential.
- **Intensification Risk:** Energy transfer or merger can rapidly strengthen one system, raising threats of severe winds, storm surge, and coastal damage.

COLD WAVE

Context:
A cold wave has gripped parts of Telangana, with districts like Kohir and Yalal recording temperatures near 8°C—3–5°C below normal.

About Cold Wave:
What is a Cold Wave?
- A cold wave refers to a sharp and unusual drop in minimum temperatures, severe enough to cause physiological stress or danger to humans. It is declared when temperatures fall below defined IMD thresholds in plains or hilly regions.

IMD Criteria for Cold Wave:
- **Plains:**
  - Minimum temperature **≤10°C** and **departure –4.5°C to –6.4°C** (Cold Wave).
  - Departure **≤ –6.4°C** (Severe Cold Wave).
  - Independent of normal: **≤4°C** (Cold Wave), **≤2°C** (Severe Cold Wave).
- **Hilly regions:** Minimum temperature **0°C or less**.
- **Coastal regions:** Cold wave when departure ≤ –4.5°C and minimum temperature **≤15°C**.
  - Must be observed in **at least two stations for two consecutive days**.

How a Cold Wave Occurs (Mechanism)?
- Cold waves originate when high-pressure systems over North/Northwest India push **cold, dry continental winds** southwards.
- Clear skies and low moisture allow rapid **radiational cooling at night**, dropping temperatures sharply over inland regions like the Deccan plateau.

Key Features of Cold Waves:
- Sharp fall in minimum temperatures at night despite warm days (28–31°C in Telangana).
- Enhanced cooling over rural/open landscapes and elevated plateaus.
- Urban areas like Hyderabad experience milder cooling due to **urban heat island effect**.
- Occur mainly in **post-monsoon and winter months** (Nov–Feb).

Implications of Cold Waves:
- Increases risk of **hypothermia** and **frostbite** among the vulnerable (elderly, homeless, infants).
- Exacerbates pulmonary diseases such as

asthma, COPD, and bronchitis due to dry air.

- Surge in **common respiratory infections** (flu, pneumonia).
- Impacts agriculture through **cold stress** on crops in northern districts.

CYCLONE DITWAH AND CYCLONE SENYAR

Context:

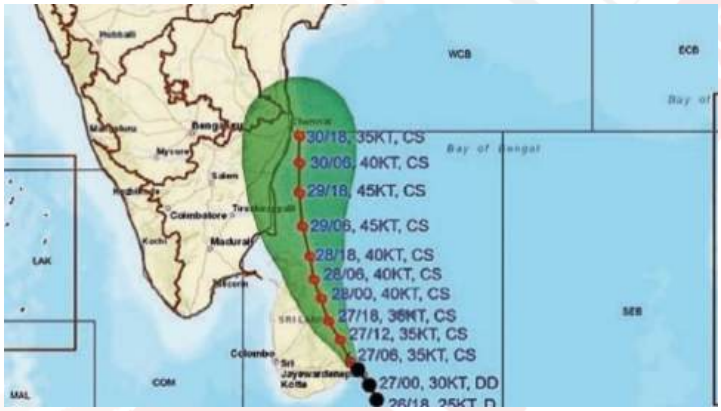
Cyclone Ditwah has formed over the southwest Bay of Bengal and is moving towards Tamil Nadu, Andhra Pradesh and Puducherry.

- Around the same time, a separate system in the Strait of Malacca intensified into **Cyclone Senyar**, triggering very heavy rain over parts of Andaman & Nicobar Islands and South India.

About Cyclone Ditwah and Cyclone Senyar:

About Cyclone Ditwah:

- **What it is & where formed:**
  - Cyclone Ditwah is a tropical cyclonic storm that formed over the southwest Bay of Bengal, rapidly intensifying from a depression to a cyclonic storm in less than 24 hours.
  - It is **Yemen's** recommended name.



About Cyclone Senyar:

- **What it is & where formed:**
  - Cyclone Senyar originated from a low-pressure system near Malaysia/Strait of Malacca over the South Andaman Sea and adjoining region of Bay of Bengal, which intensified into a depression and further strengthened.
  - It is **UAE's** recommended name.
- **Current status:** Senyar later weakened over the Strait of Malacca, but the moisture and remnant circulation helped feed ongoing rain systems over South India and the Bay.

Why More Cyclones Form in Bay of Bengal During Retreating Southwest Monsoon?

1. **Very Warm Sea Surface Temperatures (SSTs)**
   - The Bay of Bengal retains high SSTs (~28–30°C or more) after the summer monsoon, providing huge latent heat, which is the primary fuel for cyclogenesis in October–November.
2. **High Moisture & Humidity:**
   - Abundant moisture inflow from equatorial Indian Ocean and Bay creates a deep, humid troposphere, favourable for strong convection and low-pressure formation.
3. **Shift of ITCZ & Monsoon Trough:**
   - The Inter-Tropical Convergence Zone (ITCZ) and monsoon trough shift southwards over the Bay in the retreating phase, creating a preferred zone of convergence and vorticity for cyclones.
4. **Low Vertical Wind Shear:**
   - In October–early November, upper-level winds become comparatively less hostile over the Bay, with reduced vertical wind shear, allowing nascent systems to organise into depressions and cyclones.
5. **Remnant Monsoon Lows Re-intensify:**
   - Monsoon depressions and lows moving from land back over the warm Bay waters during withdrawal often re-intensify into deep depressions/cyclones, especially in central and southwest Bay.
6. **Bay of Bengal vs Arabian Sea Contrast:**
   - The Bay is smaller, semi-enclosed and receives large river inflows (Ganga–Brahmaputra, etc.), maintaining warmer, stratified surface waters compared to the Arabian Sea, making it more cyclone-prone in this season.

WESTERN DISTURBANCE

Context: The India Meteorological Department (IMD) has forecast that a fresh Western Disturbance will influence weather conditions over northwest India, including Delhi-NCR.

About Western Disturbance:

What it is?

- A Western Disturbance (WD) is an extratropical storm system originating from the Mediterranean region, which brings non-monsoonal winter rain and snow to northwestern India, Pakistan, and the Himalayas. It is driven by the westerly jet streams in the mid-latitudes.

How it Forms?

- **Origin:** It begins in the **Mediterranean Sea** region due to a clash between cold polar air from Europe and warm, moist subtropical air.
- **Cyclogenesis:** This temperature contrast triggers **cyclonic circulation** in the upper atmosphere, creating a low-pressure system.
- **Movement:** The system moves eastward with the **subtropical westerly jet stream**, gaining moisture from the **Mediterranean, Caspian, and Black Seas**.
- **Dissipation:** When it encounters the **Himalayas**, it releases moisture as rain or snow and weakens rapidly thereafter.

Factors Influencing Western Disturbances:

- **Jet Stream Dynamics:** The position and strength of the **subtropical westerly jet stream** determine WD frequency and intensity.
- **Topography:** The **Himalayas** act as a barrier, forcing uplift and precipitation from moisture-laden air masses.
- **Temperature Gradient:** Strong contrasts between polar and tropical air enhance WD formation.
- **Oceanic Conditions:** Variations in Mediterranean and Eurasian sea surface temperatures affect WD development and track.

Impacts on India:

- **Agriculture:** Crucial for Rabi crops, especially wheat and mustard, as they provide much-needed winter moisture across north India.
- **Precipitation:** Cause rain and snow in northwest and Himalayan states, replenishing rivers and groundwater.
- **Weather Conditions:** Lead to cloudy skies, warmer nights, and cold days; sometimes bring fog and cold waves post-passage.
- **Disasters:** Excessive WDs can trigger floods, avalanches, landslides, and crop damage due to heavy precipitation.
- **Air Quality:** The associated rain and wind often improve air quality temporarily by dispersing pollutants in north India.

Impact on Monsoon:

- **Pre-Monsoon Role:** During April–May, WDs contribute to pre-monsoon rainfall, moderating heat buildup in north India.
- **Interaction with Monsoon:** Occasionally, WDs interact with the monsoon trough, leading to heavy precipitation events—as seen in the 2013 Uttarakhand floods.

Transition Effect: Decline of WDs in late spring allows smooth onset of the southwest monsoon from the Bay of Bengal side

Indian and World Human Geography

GEOLOGICAL SURVEY OF INDIA (GSI)

Context: The Union Minister of Coal & Mines inaugurated GSI's International Seminar in Jaipur to mark 175 years of the Geological Survey of India (GSI).

भारतीय भूवैज्ञानिक सर्वेक्षण
GEOLOGICAL SURVEY OF INDIA

About Geological Survey of India (GSI):

What It Is?

- GSI is India's premier **national geoscientific organisation**, responsible for geological surveys, mineral exploration, and creation of national geoscience databases. It functions as an attached office under the **Ministry of Mines**.

Established In: Formally established in **1851**.

- Founded primarily to locate coal resources for expanding Indian Railways during British rule.

Historical Evolution:

- Early 1800s: Initial geological work done by Survey of India and Army officers like **H.W. Voysey** (first geological map of Hyderabad, 1818–23).
- 1837: Committee for "Investigation of Coal and Mineral Resources" created; **John McClelland** used the term "Geological Survey of India" in 1848.
- 1851: Under **Sir Thomas Oldham**, continuous institutional geological work started, marking the true beginning of GSI.
- Over 175 years, it evolved into a national repository of geological and mineral data and a globally respected scientific institution.

Key Functions:

- **Geological Mapping & Surveys:** Systematic mapping of India's surface and subsurface geology (ground, airborne, marine surveys).
- **Mineral Exploration:** Scientific assessment of mineral, energy, and water resources.
- **Geohazard Studies:** Conduct seismotectonic studies, glaciology, climate-change geostudies, and hazard risk investigations.
- **Geotechnical & Geoenvironmental Studies:** Support infrastructure planning, land stability, groundwater, and environmental assessments.
- **National Geoscience Repository:** Maintain spatial databases, remote sensing records, geological archives, museums, and data dissemination platforms.
- **International Collaboration:** Engage with USGS, BGS, Geoscience Australia, polar agencies, and global earth-science missions.
- **Capacity Building & Education:** Partnerships with universities, training institutions; popularising geoscience among students and public.
- **Coordination Role:** Aligns with Central & State agencies for mineral exploration, resource management, and scientific advisory support.

MARINE FISHERIES CENSUS 2025

Context: The Government of India has launched the Marine Fisheries Census (MFC) 2025, marking the country's first fully digital and geo-referenced fisheries census, powered by VYAS mobile applications developed by ICAR–CMFRI.

About Marine Fisheries Census 2025:

What it is?

- The **Marine Fisheries Census 2025** is a **nationwide digital enumeration** of India's marine fishing communities, designed to gather socio-economic and infrastructural data for informed policy planning.

Conducted by: The census is fully funded by the Department of Fisheries, Government of India, and implemented by the ICAR–Central Marine Fisheries Research Institute (CMFRI) with operational support from the Fishery Survey of India (FSI).

Aim: To establish a real-time, evidence-based database on marine fisher households, infrastructure, and socio-economic indicators to strengthen sustainable fisheries management and welfare delivery.

Key Features:

- **Fully Digital Process:** First-ever paperless, geo-referenced enumeration replacing traditional manual surveys.
- **Comprehensive Coverage:** Targets 1.2 million fisher households in 5,000 marine fishing villages across 13 coastal States and UTs.
- **Socio-Economic Insights:** Captures data on income, debt, insurance, and welfare scheme coverage including PMMSY and PM-MKSSY.
- **Drone-Based Support:** Incorporates aerial enumeration of fishing crafts using drones for accuracy and transparency.

About VYAS Apps Suite:

What it is?

- The **VYAS (Vessel and Yield Assessment System)** app ecosystem is a **set of digital tools** enabling end-to-end data collection, validation, and monitoring of the Marine Fisheries Census 2025.

Developed by: The apps were created by the **ICAR–CMFRI** as part of the digital modernisation of India's marine fisheries enumeration process.

Aim: To ensure **real-time, error-free, and transparent census operations**, improving data quality and coordination among field teams, supervisors, and policymakers.

Key Features:

- **Three Dedicated Apps:**
  - **VYAS–NAV:** For validation of **fishing villages and harbours**.
  - **VYAS–BHARAT:** For **household and infrastructure enumeration**.
  - **VYAS–SUTRA:** For **real-time supervision and monitoring** via dashboards.
- **Geo-Referenced Data:** Enables GPS-tagged entries for precise spatial mapping.
- **Multilingual Interface:** Supports multiple Indian languages for inclusive participation.
- **Real-Time Dashboards:** Provides live progress tracking and analytics for administrators.
- **Enhanced Transparency:** Ensures data accuracy and accountability through digital verification and cloud storage.

SOCIETY AND SOCIAL JUSTICE

SILVER JUBILEE OF PPV&FRA ACT

Context: Union Agriculture Minister presented the Plant Genome Saviour Awards in New Delhi to mark the Silver Jubilee of the Protection of Plant Varieties and Farmers' Rights (PPV&FRA) Act, 2001.

About Silver Jubilee of PPV&FRA Act:

What it is?

- India's first **sui generis** legal framework (enacted in **2001**) for protecting the rights of **farmers and plant breeders**, ensuring equitable benefit-sharing and seed sovereignty.

Launched in: **2001**, under the Ministry of Agriculture & Farmers' Welfare; Authority operational since **2005**.

Aim: To establish a balanced system that encourages innovation in plant breeding while recognizing farmers' role in conserving genetic diversity.

Key Features:

- **Farmers' Rights (Section 39):** Farmers can save, use, sow, resow, exchange, and share seeds of registered varieties; they are also eligible for **compensation** for non-performance of varieties.
- **Breeders' Rights:** Exclusive rights to produce, sell, or license protected varieties, ensuring intellectual property protection for innovation.
- **Registration Criteria (DUS):** Varieties must meet Distinctness, Uniformity, and Stability standards; 57 crop species notified for registration.
- **National Gene Fund:** Created to channel benefit-sharing fees and support in-situ conservation and rewarding farmers.
- **Researchers' Exemption:** Allows use of registered varieties for experimentation and varietal development, ensuring open scientific access.
- **Benefit-Sharing & Protection:** Recognition of community knowledge through National Register of Plant Varieties (NRPV) and legal remedy for biopiracy.

About Plant Genome Saviour Awards:

- **What it is?**
  - A national recognition scheme instituted by PPV&FRA to honour farmers and communities preserving traditional and endangered plant varieties.
- **Origin:** Introduced under Section 39(1)(iii) of the PPV&FRA Act to reward grassroots conservationists of genetic resources.
- **Awarded to:**
  - Individual farmers and community seed groups engaged in conserving indigenous landraces and wild relatives of crops.
  - 2025 recipients include **Community Seed Bank (Telangana)**, **Mithilanchal Makhana Producers' Association (Bihar)**, and CRS-Na Dihing Tenga Unyan

Committee (Assam), among others.

2ND WORLD SUMMIT FOR SOCIAL DEVELOPMENT

Context:

Union Minister Dr. Mansukh Mandaviya represented India at the Second World Summit for Social Development (WSSD-2) held in Doha, Qatar, from 4–6 November 2025.

About 2nd World Summit for Social Development:

What it is?

- The World Summit for Social Development (WSSD-2) is a United Nations-convened high-level global forum that brings together world leaders, international organisations, civil society, and experts to reaffirm and renew global commitments to social justice, poverty eradication, and inclusive growth in line with the 2030 Agenda for Sustainable Development.

Organisations Involved: The Summit is organised under the auspices of the United Nations General Assembly (UNGA), in partnership with UN agencies.

- The 2025 edition was **hosted by the State of Qatar**, with participation from over 150 countries.

History:

- The first World Summit for Social Development was held in Copenhagen, Denmark, in 1995, where global leaders adopted the Copenhagen Declaration and Programme of Action.

Aim:

- To accelerate global action for poverty eradication, decent work, and social inclusion.
- To renew international commitment to the principles of equity, justice, and inclusive development.
- To align social policies with the 2030 Agenda and the Sustainable Development Goals (SDGs).

Key Features:

1. **Adoption of the Doha Political Declaration** – reaffirming global solidarity for inclusive growth and social justice.
2. **High-Level Round Tables** – discussions on the "Three Pillars of Social Development":
   - Poverty Eradication
   - Full and Productive Employment and Decent Work for All
   - Social Inclusion
3. **Side Events and Ministerial Dialogues** – focusing on digital inclusion, labour mobility, women's empowerment, and youth engagement.
4. **Participation by India's NITI Aayog** – showcasing initiatives like Self-Help Groups, cooperative models, and National Career Service (NCS) Portal.
5. **Engagement with Global Coalition for Social Justice (ILO)** – reinforcing multilateral collaboration on equitable employment and social protection.

Significance:

- Reaffirms global consensus on reducing inequality and ensuring no one is left behind.
- Provides a platform for developing nations, including India, to share successful models of inclusive growth, skilling, and digital empowerment.
- Strengthens cooperation on labour rights, social security, and youth employment.

GENERAL STUDIES – 2

FACTS FOR PRELIMS

POLITY

Fundamental Rights and Fundamental Duties

DIGITAL PERSONAL DATA PROTECTION (DPDP) RULES, 2025

Context:

The Government of India has officially notified the Digital Personal Data Protection (DPDP) Rules, 2025, operationalising the DPDP Act, 2023.

About Digital Personal Data Protection (DPDP) Rules, 2025:

What it is?

- A set of detailed regulatory rules that implement the Digital Personal Data Protection Act, 2023, laying out operational procedures for personal data processing, consent, safeguards, compliance timelines and oversight mechanisms.

Enforced through: the Data Protection Board of India, a fully digital adjudicatory body.

Aim:

- To protect digital personal data while enabling innovation, ease of compliance and economic growth.
- To define obligations of Data Fiduciaries and rights of Data Principals with transparency and accountability.
- To ensure secure, consent-based, purpose-limited and responsible use of personal data.

Key Features of DPDP Rules, 2025:

- **Phased Implementation (18 months):** Allows organisations, especially MSMEs and startups, adequate time to transition to compliance through a structured timeline.
- **Clear, Simple Consent Notices:** Data Fiduciaries must issue standalone, plain-language consent notices specifying exact purpose and data use, ensuring informed consent.
- **Breach Notification Protocol:** Mandates prompt communication to affected individuals after any data breach, explaining nature of the breach, risks, corrective steps and support contacts.
- **Special Safeguards for Children & Persons with Disabilities:**
  - Verifiable parental consent required for processing children's data.
  - Consent for persons with severe disabilities must come from lawful guardians.
  - Exemptions only for essential services (education, healthcare, safety).
- **Transparency & Accountability Requirements:**
  - Mandatory display of contact details of a designated officer/DPO.
  - Significant Data Fiduciaries require:
    - Independent audits
    - Data Protection Impact Assessments
    - Technology due-diligence
    - Stricter compliance norms
- **Data Principal Rights Strengthened:**
  - Citizens can:
    - Access, correct, update or erase personal data
    - Withdraw consent
    - Nominate another person to exercise rights
  - Data Fiduciaries must respond within **90 days**.
- **Consent Managers:** Must be **Indian entities**, enabling individuals to manage and revoke permissions across platforms through a unified interface.
- **Digital-First Data Protection Board:** Fully online grievance redressal with app-based complaint filing and tracking; appeals lie with TDSAT.
- **Technology-Neutral, SARAL Design:** Follows the SARAL principle—Simple, Accessible,

Rational, Actionable—ensuring clarity, ease of compliance, and flexibility for future technologies.

Parliament and State Legislature

CONSTITUTION 131ST AMENDMENT BILL 2025

Context: The proposed **Constitution (131st Amendment) Bill, 2025** sparked a major political row after it sought to bring Chandigarh under **Article 240**, altering its administrative structure.

About Constitution (131st Amendment) Bill, 2025:

- **What it is?**
  - A draft amendment proposing to include **Chandigarh** under **Article 240**, placing it in the same category as UTs where the President can directly frame regulations.
- **Aim:** To "simplify the Central Government's law-making process for the UT of Chandigarh" and bring uniformity with other UTs lacking legislatures.
- **Key Features:**
  - **Brings Chandigarh under Article 240:** Enables the President to make regulations equivalent to Acts of Parliament, similar to A&N Islands, Lakshadweep, DNHDD and Puducherry (when Assembly is dissolved).
  - **Allows appointment of an independent Administrator:** Opens the possibility of replacing the current system where **Punjab's Governor** serves as Chandigarh's Administrator.
  - **Reduces Punjab's administrative role:** Would mark a structural shift from the historical arrangement given during the **1966 Punjab Reorganisation**, triggering political concerns.

About Chandigarh:

- **History:**
  - **Planned vision of Jawaharlal Nehru:** Conceived as a symbol of modern India's aspirations after Partition— "a new town, unfettered by the traditions of the past."
  - **Designed by Le Corbusier:** The famous French architect developed the master plan, making it one of the world's earliest and finest experiments in modernist urban planning.
- **Post-Partition Background:**
  - **Replacement for Lahore:** After 1947, Punjab lost Lahore to Pakistan; Chandigarh was envisioned as the capital of Indian Punjab.
  - **Refugee rehabilitation:** The city was partly designed to resettle thousands displaced from West Punjab.
- **Site Selection and City Construction:**
  - **Chosen in 1948:** Foothills of the Shivalik's—then part of Ambala district—were selected jointly by the Centre and Punjab Government.
  - **Foundation stone laid in 1952:** Marking the beginning of India's foremost modern city project.
- **Role after the 1966 Punjab Reorganisation:**
  - **Joint capital of Punjab and Haryana:** After Haryana was carved out, Chandigarh was designated as the **shared capital** of both states under the Punjab Reorganisation Act, 1966.
  - **Declared a Union Territory:** The city came directly under Central Government administration while hosting the secretariats and legislatures of both states.

Existing Governance Structure:

- **Administrator of Chandigarh:**
  - Presently, Governor of Punjab holds additional charge as the Administrator of the UT.
  - Earlier (1966–1984), the city had its own independent Chief Commissioner/Chief Secretary, before administration shifted to Punjab's Governor.
- **Administrative Control:**
  - Chandigarh UT functions directly under

the Ministry of Home Affairs (MHA).
- The city has no legislative assembly, and governance is carried out through UT administration officials (Adviser to Administrator, Home Secretary, Finance Secretary, etc.).

Bodies (Constitutional, Statutory, Regulatory Bodies)

CAG'S PLAN FOR TWO NEW CADRES

Context: The Comptroller and Auditor General (CAG) of India has approved the creation of two new specialised cadres — **Central Revenue Audit** (CRA) and **Central Expenditure Audit** (CEA) within its department to enhance centralisation and audit quality from 1st January 2026.

About CAG's Plan for Two New Cadres:

- **What it is?**
  - The CAG plans to restructure its Indian Audit and Accounts Department by creating two new cadres — the **Central Revenue Audit (CRA)** and **Central Expenditure Audit (CEA)** — for improved centralised auditing.
- **Names of the cadres:**
  - **Central Revenue Audit (CRA) Cadre** – will handle specialised audits of Central Government receipts and revenues.
  - **Central Expenditure Audit (CEA) Cadre** – will focus on expenditure audits of ministries and departments.
- **Aim:** To develop domain expertise, improve audit quality, and ensure professional specialisation in government financial audits, leading to greater fiscal accountability and efficiency.
- **Need for reform:**
  - Currently, audits are handled by multiple State Civil Audit offices with dispersed cadre control, causing **fragmentation** and **inefficiency**.
  - The new system will **consolidate over 4,000 audit professionals** (out of 42,000 total staff) and enhance manpower flexibility through all-India transfer liability.

About *the Comptroller and Auditor General (CAG) of India*:

- **What it is?**
  - The **CAG** is a **constitutional authority** (Articles **148–151**) responsible for **auditing the receipts and expenditures** of the Union, States, and other government-funded bodies.
  - It acts as the **"Guardian of the Public Purse"** and ensures financial accountability of the executive to the legislature.
- **Constitutional basis:**
  - **Article 148:** Establishes the CAG of India.
  - **Article 149:** Defines CAG's duties and powers.
  - **Article 150:** Prescribes the form of government accounts.
  - **Article 151:** Deals with audit report submission to the President/Governor.
- **Appointment and tenure:**
  - Appointed by the **President of India** under his hand and seal.
  - Holds office for **6 years or up to age 65**, whichever is earlier.
  - Can be removed only through a **special majority resolution** of Parliament (same as a Supreme Court judge).
- **Key functions (under the 1971 Act):**
  - Audits **all expenditure** from the **Consolidated Fund**, **Contingency Fund**, and **Public Account** of India and States.
  - Audits **Central and State revenues** to ensure proper assessment and collection.
  - Audits **government companies and corporations** under respective statutes.
  - Provides **audit reports** to the **President/**

Governor, which are examined by the **Public Accounts Committee**.
    - Acts as a **guide, friend, and philosopher** to legislative committees.
- **Reports submitted:**
    - **Audit Report on Appropriation Accounts** – checks expenditure vs sanction.
    - **Audit Report on Finance Accounts** – annual receipts and disbursements.
    - **Audit Report on Public Undertakings** – performance of government companies.

THE TRIBUNAL REFORMS ACT, 2021

Context: The Supreme Court expressed strong displeasure over the Union Government's repeated adjournment requests in the Tribunal Reforms Act, 2021 case.

About the Tribunal Reforms Act, 2021:

What it is?

- The Tribunals Reforms Act, 2021, enacted on 13 August 2021, seeks to streamline and rationalize tribunals by abolishing several appellate bodies and transferring their functions to High Courts.
- It replaces the Tribunals Reforms Ordinance, 2021, and consolidates provisions governing appointments, tenure, service conditions, and removal of tribunal members.

Aim:

- To reduce delay in justice delivery by integrating tribunal functions within the existing judicial structure.
- To ensure uniformity in appointments and service conditions across tribunals.
- To enhance administrative efficiency and judicial accountability by limiting executive interference.

Key Features:

- **Abolition of certain tribunals:** Eliminates appellate bodies such as the **Film Certification Appellate Tribunal**, **Intellectual Property Appellate Board**, and **Airport Appellate Tribunal**, transferring jurisdiction to **High Courts**.
- **Centralised Appointments:** Chairpersons and Members are appointed by the **Central Government** on the recommendation of a **Search-cum-Selection Committee** chaired by the **CJI or his nominee**.
- **Tenure and Age Limits:**
    1. **Chairperson**: 4 years or until 70 years of age.
    2. **Members**: 4 years or until 67 years of age.
- **Minimum Age:** Candidates must be **50 years or older** for appointment, excluding younger professionals from consideration.
- **Transitional Provisions:** Members of dissolved tribunals **cease office immediately** and pending cases are **transferred to High Courts**.
- **Power to Amend Schedule:** The **Central Government** may, by notification, amend the list of tribunals covered under the Act.

Issues & Criticism:

- **Violation of Judicial Independence:** The Act reintroduces provisions struck down by the Supreme Court (e.g., in Madras Bar Association v. Union of India, 2021), undermining the principle of separation of powers.
- **Short Tenure:** Four-year terms are viewed as insufficient for judicial independence, increasing potential executive influence.
- **High Minimum Age (50 years):** Prevents younger advocates and scholars from contributing to tribunal jurisprudence.

Executive Dominance: Central Government retains significant control over appointments and reappointments, reducing functional autonomy

Judiciary

53RD CHIEF JUSTICE OF INDIA

Context: Justice Surya Kant is set to take oath as the 53rd Chief Justice of India (CJI) on 24 November 2025 following the retirement of CJI B. R. Gavai.

- His tenure will extend until 9 February 2027, making it one of the longer CJI tenures in recent years.

About 53rd Chief Justice of India:

- **What is the Office of the CJI?**
  - The Chief Justice of India (CJI) is the head of the Indian judiciary and presiding judge of the Supreme Court of India.
  - The office flows from Article 124(1), which establishes a Supreme Court consisting of a CJI and other judges.
- **Constitutional Associated:**
  - **Article 124(1):** Establishes the Supreme Court of India (CJI + other judges).
  - **Article 124(2):** Judges (including CJI) appointed by the **President** by warrant under his hand and seal, after **consultation**.
  - **Article 126:** Appointment of an **Acting CJI** when needed.
  - **Article 127:** Appointment of **ad hoc judges** of the Supreme Court.
  - **Article 128:** **Retired SC judges** can sit and act as judges of the Supreme Court.
- **Procedure for Appointment of the CJI:**
  - **Seniority Principle:** By convention, the senior-most judge of the Supreme Court (by tenure in SC) is considered for appointment as CJI, if found fit.
  - **Initiation by Outgoing CJI:** About one month before retirement, the outgoing CJI recommends the name of the next CJI to the Union Minister of Law & Justice.
  - **Executive Processing:** Law Minister → places file before the Prime Minister → PM advises the President.
  - **Presidential Appointment & Oath:**
    - The President issues the warrant of appointment under Article 124(2).
    - The CJI then takes oath of office before the President of India.
  - **Memorandum of Procedure (MoP):** The **MoP (1999)** codifies this practice: "Appointment to the office of the CJI should be of the seniormost Judge of the Supreme Court considered fit to hold the office."
- **Key Features of the CJI Appointment System:**
  - **Seniority-based & Convention-driven:** Reduces arbitrariness and strengthens judicial independence by limiting political discretion.
  - **Consultative but Executive-formalised:** Though the President/Executive formally appoints, the recommendation flows from the judiciary, especially the outgoing CJI.
  - **Linked to Collegium System:** As CJI heads the collegium, his appointment affects the entire higher judiciary appointments ecosystem.
- **Significance of the CJI's Role:**
  - **Judicial Head & Master of Roster:** Allocates benches, lists cases, and shapes which issues get priority.
  - **Head of Collegium:** Crucial role in appointment and transfer of High Court and Supreme Court judges.
  - **Constitutional Sentinel:** Leads benches deciding on federal disputes, fundamental rights, electoral issues, separation of powers.

SUPREME COURT CLARIFICATION ON GOVERNOR'S POWERS TO ASSENT BILLS

Context: The Supreme Court delivered a landmark five-judge Constitution Bench opinion clarifying the powers of Governors and the President regarding assent to state Bills.

About Supreme Court Clarification on Governor's Powers to Assent Bills:

What it is?

- The case concerns the **constitutional process under Articles 200 and 201**, which govern how Governors and the President act when a Bill passed by a State Legislature is placed before them for assent.
- Multiple States complained that Governors were **withholding or delaying assent**, creating legislative paralysis.

Constitutional Powers of the Governor (Article 200):

When a Bill is presented, the Governor has **only three options**:

Give Assent

Withhold Assent AND return the Bill to the Legislature with recommendations (except Money Bills).

Reserve the Bill for the President's consideration (mandatory in a few cases, discretionary in others).

The Governor cannot "withhold assent simpliciter" — meaning they cannot keep a Bill pending indefinitely without action.

Major Clarifications Provided by the Supreme Court:

- **No indefinite delay:** "Prolonged, unexplained, indefinite inaction" by Governors is unconstitutional and subject to judicial review.
- **No 'deemed assent':**
  - The SC rejected the earlier ruling suggesting that if a Governor delays assent, the Bill becomes law automatically.
  - Article 142 **cannot** be used to bypass constitutional procedure.
- **Discretion exists — but is limited:**
  - While Governors exercise discretion under Article 200, they are **not bound** by Cabinet advice for assent decisions.
  - But this discretion **cannot be misused** to block elected governments.
- **No judicial timelines:** Courts cannot impose fixed deadlines on Governors or the President because the Constitution uses the phrase **"as soon as possible"**.
- **President's powers under Article 201:**
  - Similar to the Governor's powers but operate only when a Bill is reserved.
  - The President's decision is not justiciable, and courts cannot impose timelines.
- **Courts can review ONLY inaction, not the merits:** Courts cannot question why the Governor withheld assent, only whether the process was followed.
- **Validity of Laws not bills:** Courts cannot adjudicate the constitutional validity of a Bill; only a law enacted after assent can be challenged.

Welfare schemes

INTEGRATED CHILD DEVELOPMENT SERVICES (ICDS)

Context: India's flagship Integrated Child Development Services (ICDS) has completed 50 years since its launch in 1975, prompting renewed evaluation of its impact as a lifeline for child nutrition, early learning and maternal health.

About Integrated Child Development Services (ICDS):

What it is?

- ICDS is **India's largest early childhood care and nutrition programme**, providing a package of health, nutrition and pre-school services through Anganwadi Centres to children (0–6 years), pregnant women and lactating mothers.

History:

- Launched on **2 October 1975** in two pilot blocks—**Dharani (Amravati)** and **Dharavi (Mumbai)**—as a centrally sponsored scheme to combat childhood malnutrition and mortality.
- Over five decades, it has expanded nationwide, becoming one of the world's largest community-based child development initiatives, with nearly **14 lakh Anganwadi Centres** countrywide.

Aim:

- Improve nutritional and health status of children (0–6 years).
- Lay foundation for psychological, physical and social development.
- Reduce child mortality, morbidity, malnutrition and school dropouts.
- Ensure inter-departmental coordination for holistic child development.
- Empower mothers through nutrition and health education.

Key Features:

- **Six core services**: Supplementary nutrition, pre-school education, health check-ups, immunisation, referral services, and nutrition-health education.
- **Delivered through Anganwadi Centres** staffed by Anganwadi Workers (AWWs) and Helpers.
- Services converge with **NRHM** for immunisation, ANCs, and health referrals.
- Targets **children below 6**, **pregnant women**, **lactating mothers**, and **women aged 15–45**.
- Maharashtra alone runs **1.10 lakh+ Anganwadi and mini-Anganwadi centres**, reflecting scale and penetration.

Significance:

- A cornerstone of India's fight against child malnutrition, stunting and anaemia, especially in high-burden districts.
- Provides the first point of contact for maternal and child healthcare in rural and tribal regions.
- Crucial for early childhood education, school readiness and socialisation among 3–6-year-olds.

YUVA AI FOR ALL INITIATIVE

Context: The Ministry of Electronics and Information Technology (MeitY) has launched 'YUVA AI for ALL', a free national course to democratize AI literacy.

About YUVA AI for ALL Initiative:

- **What it is?**
  - A **free, 4.5-hour self-paced online course** designed to introduce Artificial Intelligence to a broad audience, with content tailored to the Indian context.
- **Organization Involved:** Launched by **MeitY** under the **IndiaAI Mission**, developed by AI expert Jaspreet Bindra.
- **Aim:** To empower **1 crore (10 million) Indians** with basic AI knowledge and promote ethical, responsible AI adoption.
- **Key Features:**
  - **Completely free** with a **government-certified certificate** upon completion.
  - **Available** on platforms like **FutureSkills Prime**, **iGOT Karmayogi**, and other ed-tech portals.
  - **Six modules** covering AI basics, real-world applications, safety, ethics, and future opportunities.
  - **Uses Indian examples** to make learning relatable and practical.
  - Designed for **self-paced learning**, accessible to students, professionals, and curious learners.
- **Significance:**
  - **Democratizes AI Literacy:** Makes foundational AI education free and accessible to millions, bridging the digital divide.
  - **Builds Future Workforce:** Equips students and professionals with essential AI skills, enhancing employability and readiness for a tech-driven economy.
  - **Promotes Ethical AI:** Focuses on responsible and safe AI use, fostering a informed and conscious approach to technology adoption in India.

Miscellaneous

FIRST JAL SANCHAY JAN BHAGIDARI (JSJB) AWARDS

Context: The Hon'ble President of India, will confer the First Jal Sanchay Jan Bhagidari (JSJB) Awards and the 6th National Water Awards 2025 on 18th November 2025 at Vigyan Bhawan.

About 6th National Water Awards:

- **What it is?**
  - A flagship initiative of the Department of Water Resources, River Development & Ganga Rejuvenation (DoWR, RD & GR) under the Ministry of Jal Shakti, instituted in 2018 to recognize outstanding efforts in water conservation and management.
- **Aim:** To promote **community participation**, awareness, and innovation in water resource management, aligning with the vision of *"Jal Samridh Bharat."*
- **Features:**
  - Awards across **10 categories**, including Best State, District, Village Panchayat, Industry, NGO, and Institution.
  - Evaluation based on **field verification** by **CWC** and **CGWB**.
  - **46 winners** selected out of **751 applications** received via the Rashtriya Puraskar Portal.
- **Rankings (Top Performers):**
  - **Best State:** Maharashtra (1st), Gujarat (2nd), Haryana (3rd)
  - **Best Districts:** Rajnandgaon (Chhattisgarh), Khargone (Madhya Pradesh), Mirzapur (Uttar Pradesh), Tirunelveli (Tamil Nadu), Sepahijala (Tripura)
  - **Best Urban Local Body:** Navi Mumbai, Maharashtra

About First Jal Sanchay Jan Bhagidari (JSJB) Awards:

- **What it is?**
  - A community-driven initiative under the Jal Shakti Abhiyan: Catch the Rain (JSA: CTR) campaign, launched on 6th September 2024 at Surat, Gujarat, promoting grassroots water stewardship.
- **Aim:** To encourage Jan Bhagidari (public participation) and CSR involvement in constructing, rejuvenating, and maintaining artificial recharge and storage structures, thereby ensuring long-term water security and resilience.
- **Features:**
  - Guided by the **3Cs mantra — Community, CSR, and Cost.**
  - Districts encouraged to build **10,000 recharge structures** (3,000 for hilly/ North-Eastern districts).
  - Collaboration between **Ministry of Jal Shakti** and **Ministry of Housing & Urban Affairs** for urban water recharge.
- **Rankings and Recognition:**
  - **100 awardees** selected — including States, 67 Districts, 6 Municipal Corporations, NGOs, industries, and philanthropists.
  - **Top-performing districts** receive ₹2 crore (Category 1), ₹1 crore (Category 2), and ₹25 lakh (Category 3).
- **Ranking:** Telangana, Chhattisgarh, and Rajasthan were ranked the top three states in the JSJB Awards 2025.

THE HIGHER EDUCATION COMMISSION OF INDIA (HECI) BILL 2025

Context: The Centre is set to table the Higher Education Commission of India (HECI) Bill 2025 in the upcoming Winter Session of Parliament, five years after the NEP 2020 recommended a single higher-education regulator.

About The Higher Education Commission of India (HECI) Bill 2025:

What it is?

- A draft law proposing the creation of a single

regulatory authority for all higher education (except medical and legal education) by merging the roles of the University Grants Commission (UGC), All India Council for Technical Education (AICTE), and National Council for Teacher Education (NCTE).

Aim of the Bill:

- To streamline India's higher education regulation by eliminating the existing fragmented structure.
- To implement the vision of NEP 2020, which calls for an integrated, transparent, and less intrusive regulatory framework.

Key Features of the HECI Bill 2025:

- **Single Regulator for All Higher Education:**
  - HECI will subsume UGC (general education), AICTE (technical education), and NCTE (teacher education).
  - Medical and legal education will remain outside its purview.
- **Four Vertical Structure (as per NEP 2020):**
  - **National Higher Education Regulatory Council (NHERC):** Regulation and compliance for all institutions (except medical & legal).
  - **National Accreditation Council (NAC):** Accreditation and quality benchmarking.
  - **General Education Council (GEC):** Learning outcomes, curricular frameworks, academic standards.
  - **Higher Education Grants Council (HEGC):** Funding — though funding powers likely remain with the Ministry, not HECI.
- **Independent, Expert-Based Governance:**
  - Each vertical will function as an autonomous professional body with experts known for integrity and experience.
  - HECI itself will be a small, independent commission overseeing coordination among the verticals.
- **Reduction of Red Tape:**
  - Addresses complaints of the current system being "**mechanistic, heavy-handed, and disempowering**."
  - Aims to eliminate conflict of interest, overlapping jurisdictions, and inconsistent regulation across UGC–AICTE–NCTE.
- **Autonomy for Higher Education Institutions:**
  - Bill seeks to help institutions become independent, self-governing, and academically free.
  - Promotes a transparent, robust accreditation system linked to academic autonomy.
- **Alignment with NEP 2020:**
  - Follows NEP's prescription for **functional separation** of:
    - Regulation
    - Accreditation
    - Funding
    - Academic Standard-Setting

Significance of the HECI Bill 2025:

- **Structural Reform in Higher Education Governance:** Creates a single-window regulatory system, resolving decades-long fragmentation between UGC, AICTE, and NCTE.
- **Enhances Quality and Accountability:** Improves institutional performance through clear standards, outcome-based learning, and professional accreditation mechanisms.
- **Reduces Bureaucratic Overload:** Minimises duplication, delays, conflicting notifications, and overlapping approvals.

BHARAT NCAP 2.0

Context: Bharat NCAP 2.0 draft has been released by the Ministry of Road Transport & Highways (MoRTH), expanding India's crash-safety rating system with new test categories and higher safety benchmarks.

About Draft Bharat NCAP 2.0:

What it is?

- A revised vehicle safety rating programme that evaluates crashworthiness and safety technologies of cars sold in India. It updates the

2023 Bharat NCAP guidelines and introduces new crash tests and assessment verticals.

Launched by: the **Ministry of Road Transport and Highways (MoRTH)**.

- Testing and certification are handled by the **Central Institute of Road Transport (CIRT), Pune**.

Aim:

- To upgrade India's vehicle safety framework to global standards.
- To protect not just occupants but also **pedestrians and vulnerable road users**.
- To encourage manufacturers to adopt advanced safety technologies.

Key Features of Bharat NCAP 2.0:

- **Five Assessment Verticals:** Safe Driving, Accident Avoidance, Crash Protection, Vulnerable Road User Protection (new), Post-Crash Safety (new)
- **Expanded Crash Tests:** Frontal impact, side impact, oblique pole test, full-width frontal test (new), rear impact test (new).
- **Injury Evaluation:** Uses advanced test dummies (ATDs) to measure injury levels in different crash scenarios.
- **Vulnerable Road User Safety:** Includes pedestrian legform tests, adult/child head impact tests; optional checks for autonomous braking in pedestrian and motorcyclist situations.
- **Accident-Avoidance Tech:** Mandatory Electronic Stability Control (ESC); optional Autonomous Emergency Braking (AEBS) earns extra points.
- **Post-Crash Safety:** Checks for fire/electrical safety and ease of occupant escape (doors and seat-belt buckles).
- **Revised Star Ratings:** Higher point thresholds; no 5-star rating if any category scores zero or shows severe injury risk

Significance:

- Brings India closer to global NCAP standards.
- Improves protection for pedestrians, who form over 20% of road-accident deaths.
- Boosts India's aim of reducing road fatalities by 50% by 2030.

E-JAGRITI PLATFORM

Context: The e-Jagriti platform has crossed 2.75 lakh users, including 1,388 NRIs, and delivered record disposal efficiency in 2025, surpassing 2024 benchmarks.

About e-Jagriti Platform:

What it is?

- e-Jagriti is a unified, AI-enabled digital grievance-redressal platform of the **Department of Consumer Affairs**, designed to integrate all consumer dispute-resolution systems into one seamless portal.

Organisation Involved: Developed and operated by the **Department of Consumer Affairs**, Government of India.

Aim: To ensure faster, transparent, accessible, and paperless consumer justice across India and abroad, especially empowering MSME consumers, households, and NRIs with real-time, tech-enabled grievance redressal.

Key Features of e-Jagriti:

- **Unified, Paperless Consumer Courts:** Integrates all legacy systems into one portal, enabling e-filing, digital scrutiny, electronic notices, virtual hearings, secure documents, and role-based dashboards for judges, advocates, and litigants.
- **Global Accessibility for NRIs:** Allows Indian citizens abroad to file, track, and participate in hearings remotely through secure OTP login, encrypted document exchange, virtual courts, and integrated payment gateways.
- **AI-Powered, Multilingual Interface:** Provides chatbot assistance, voice-to-text tools, real-time tracking, smart case routing, and accessibility support for elderly and visually impaired users.
- **High Disposal Efficiency:** In 2025, disposal exceeded filing in many states (e.g., 27,545 cases disposed vs. 27,080 filed in July–August), demonstrating backlog reduction and faster turnaround time.
- **Integrated Communication System:** Over 2 lakh SMS alerts and 12 lakh emails auto-sent for case

updates, notice issuance, OTP verification, and deadlines to ensure procedural transparency.
- **Secure Fee Payments:** Supports PayGov and Bharat Kosh, ensuring safe, traceable, and convenient online payments.

Significance of e-Jagriti:

- **Democratizing Consumer Justice:** Breaks barriers of distance, paperwork, and physical presence, enabling even rural and NRI users to access justice with equal ease.
- **Faster Case Resolution:** Digital workflows, automated notices, and virtual courts significantly reduce pendency and improve efficiency, addressing long-standing delays in consumer courts.

Inclusion & Accessibility: Multilingual interface, voice support, and simplified design make grievance redressal accessible to elderly, differently abled, and low-digital-literacy users

QS ASIA UNIVERSITY RANKINGS 2026

Context: Prime Minister of India hailed India's record performance in the QS Asia University Rankings 2026, where 294 Indian universities were listed — the highest ever.

About QS Asia University Rankings 2026:

What it is?

- The **QS Asia University Rankings** is an **annual regional assessment** that evaluates Asia's leading higher education institutions based on academic reputation, employability, research productivity, and international outlook.

Published by: Compiled by Quacquarelli Symonds (QS), a UK-based higher education analytics firm, known globally for its QS World University Rankings.

Aim:

- To benchmark Asian universities using globally comparable indicators.
- To highlight academic excellence, innovation, and research impact in the region.
- To promote quality, global competitiveness, and collaboration in Asian higher education.

Criteria Used (11 Indicators):

1. **Academic Reputation (30%)** – Based on global survey of academics.
2. **Employer Reputation (20%)** – Assesses employability of graduates.
3. **Faculty/Student Ratio (10%)** – Reflects quality of academic engagement.
4. **International Research Network (10%)** – Evaluates global research partnerships.
5. **Citations per Paper (10%)** – Measures impact of published research.
6. **Papers per Faculty (5%)** – Indicates research productivity.
7. **Staff with PhD (5%)** – Represents academic qualifications.
8. **International Faculty Ratio (2.5%)**
9. **International Student Ratio (2.5%)**
10. **Inbound Exchange Students (2.5%)**
11. **Outbound Exchange Students (2.5%)** – Reflect internationalisation and student mobility.

Key Features (2026 Edition):

- Covers **900+ universities** across Asia.
- India's representation reached an all-time high of **294 institutions**, the **second-highest in Asia** after China.

Top 5 Indian Institutions (QS Asia University Rankings 2026):

1. **IIT Delhi** – Rank 59 (fell from 44th in 2025)
2. **IISc Bengaluru** – Rank 64
3. **IIT Madras** – Rank 70
4. **IIT Bombay** – Rank 71
5. **IIT Kanpur** – Rank 77

Top 5 Universities in Asia (QS Asia University Rankings 2026):

1. **The University of Hong Kong** – Rank 1
2. **Peking University (China)** – Rank 2
3. **Nanyang Technological University (Singapore)** – Rank 3
4. **National University of Singapore (NUS)** – Rank 3 (joint)
5. **Fudan University (China)** – Rank 5

KENDRIYA GRIHMANTRI DAKSHATA

PADAK

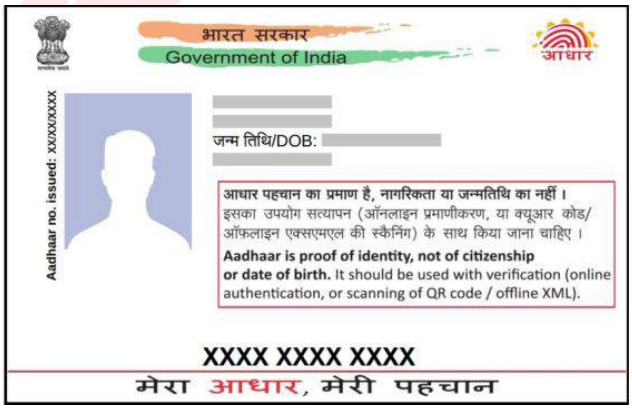
Context: On Sardar Vallabhbhai Patel's birth anniversary (October 31, 2025), the Ministry of Home Affairs (MHA) announced the 'Kendriya Grihmantri Dakshata Padak' for 1,466 police personnel from States, Union Territories, CAPFs, and CPOs to honour excellence.

About Kendriya Grihmantri Dakshata Padak:

- **What it is?**
  - The *Kendriya Grihmantri Dakshata Padak* is a **national-level police award** instituted to recognise **exceptional professionalism, courage, and integrity** in policing and security operations across India.
- **Launched in:** It was instituted by the Ministry of Home Affairs (MHA) through a notification dated 1 February 2024.
- **Ministry:** The award is administered by the Ministry of Home Affairs.
- **Aim:** To promote high professional standards, motivate excellence in policing, and honour officers contributing outstandingly in the fields of Special Operations, Investigation, Intelligence, and Forensic Science.
- **Features:**
  - Awarded annually on **October 31** to commemorate **Sardar Vallabhbhai Patel**, India's first Home Minister.
  - Open to personnel from **State/UT Police, CAPFs, CPOs, Intelligence branches**, and **Forensic Science units**.
  - Recognises **indomitable spirit, operational courage, investigative efficiency, and scientific innovation**.
  - Serves as a **career motivation mechanism**, promoting integrity and efficiency in policing.
  - Recipients selected through a **rigorous evaluation process** for exceptional service contributions.
- **Significance:**
  - Reinforces Patel's legacy as the architect of national unity and strong internal security.
  - Boosts morale, dedication, and accountability among India's 30-lakh-strong police force.
  - Encourages adoption of modern investigative and intelligence techniques in law enforcement.

UIDAI LAUNCHES AADHAAR VISION 2032 FRAMEWORK

Context: The Unique Identification Authority of India (UIDAI) has launched the 'Aadhaar Vision 2032' framework — a decade-long strategic roadmap to modernize India's digital identity system using AI, Blockchain, Quantum Computing, and Advanced Encryption.



About UIDAI launches Aadhaar Vision 2032 Framework:

What it is?

- 'Aadhaar Vision 2032' is a **technological and strategic roadmap** to future-proof India's digital identity infrastructure.
- It envisions a next-generation Aadhaar ecosystem built on innovation, security, and inclusivity to sustain its role as the backbone of India's digital governance and economy.

Launched by: the Unique Identification Authority of India (UIDAI), under the Ministry of Electronics and IT.

- Guided by a High-Level Expert Committee chaired by Neelkanth Mishra.

Aim:

- To strengthen Aadhaar's technology foundation

for the next decade.

- To align with Digital Personal Data Protection (DPDP) Act, 2023 and global cybersecurity standards.

Key Features of Aadhaar Vision 2032:

- **AI-Enabled Authentication:** Artificial Intelligence will be deployed for intelligent identity verification, anomaly detection, and fraud prevention, ensuring faster and more reliable authentication for millions of users simultaneously.
- **Blockchain Integration:** Blockchain technology will be used to enhance transparency, traceability, and immutability in digital transactions, creating a tamper-proof and trust-based Aadhaar data ecosystem.
- **Quantum-Resilient Security:** The framework will adopt quantum-safe cryptographic techniques to future-proof Aadhaar against next-generation cyber threats emerging from quantum computing advancements.
- **Advanced Encryption Mechanisms:** Aadhaar systems will integrate multi-layered, next-gen encryption protocols to strengthen privacy, data integrity, and compliance with global cybersecurity standards.
- **Privacy-by-Design Compliance:** All system upgrades will follow Digital Personal Data Protection (DPDP) Act, 2023 principles, embedding consent-based data use, user control, and minimal data retention.
- **Next-Generation Technology Stack:** UIDAI will overhaul its tech architecture for scalability and interoperability, enabling seamless Aadhaar-linked services across governance, fintech, and welfare platforms.

International Relations

OPERATION SAGAR BANDHU

Context: India has launched Operation Sagar Bandhu to deliver urgent humanitarian assistance to Sri Lanka after Cyclone Ditwah caused severe floods and over 80 deaths.

About Operation Sagar Bandhu:

What it is?

- Operation Sagar Bandhu is India's rapid **Humanitarian Assistance and Disaster Relief (HADR)** mission launched to support Sri Lanka during the devastating floods triggered by Cyclone Ditwah.

Launched By: Government of India

- Coordinated by the Ministry of External Affairs, Indian Navy, and Indian Air Force.

Aim:

- To provide immediate relief and essential supplies to Sri Lanka, ensuring rapid support under India's **Neighbourhood First** and **Vision MAHASAGAR** maritime cooperation frameworks.

Key Features:

- **Immediate deployment** of INS Vikrant, INS Udaigiri, and IAF C-130J aircraft with relief cargo.
- Supplies include **tents, tarpaulins, blankets, hygiene kits, ready-to-eat meals**, and HADR equipment.
- Ensures **sea–air integrated relief** for fast delivery across affected regions.
- Continuous monitoring with readiness for **additional assistance** as the disaster evolves.

Significance:

- Reinforces India's role as the first responder in the Indian Ocean Region.
- Strengthens India–Sri Lanka diplomatic ties at a moment of humanitarian crisis.
- Demonstrates India's expanding capability in HADR logistics, naval deployment, and regional leadership.

FATF EXPANDS ASSET RECOVERY

SCOPE BEYOND GRAFT

Context: The Financial Action Task Force (FATF) has issued new global guidance on asset recovery, expanding its scope beyond corruption to cover crimes like fraud, cyber offences, and money laundering.

About FATF Expands Asset Recovery Scope Beyond Graft:

- **What it is?**
  - A new **340-page FATF guidance** outlining a comprehensive framework for identifying, preserving, managing, and repatriating criminal assets across borders — moving beyond graft to tackle broader economic and financial crimes.
- **New Features:**
  - **Wider coverage:** Expands asset recovery to include fraud, cybercrime, investment scams, and money laundering.
  - **Lifecycle approach:** Follows every stage — from legal framework setup to international cooperation and restitution of assets.
  - **Best practices from India:** Cites ED cases such as Agri Gold (₹6,000 cr restored), IREO realty scam (₹1,800 cr attached), and BitConnect crypto fraud (₹1,646 cr seized).
  - **Victim-centric recovery:** Promotes restitution and compensation for victims, citing India's Rose Valley case.

About FATF:

- **What it is?**
  - An intergovernmental body that sets global standards for combating money laundering, terror financing, and proliferation financing.
- **Established in:** 1989, by G7 member countries at the Paris Summit.
- **Headquarters:** Paris, France.
- **Aim:**
  - To protect global financial systems from criminal misuse and ensure the integrity and stability of the international economy.
- **Functions:**
  - **Set global standards**: Develop and update FATF Recommendations to counter money laundering and terror financing.
  - **Monitor compliance**: Conduct mutual evaluations to assess members' adherence to FATF norms.
  - **Identify high-risk jurisdictions**: Maintain grey and black lists for countries with strategic deficiencies.
  - **Promote cooperation**: Facilitate international collaboration for financial investigations and asset recovery.
  - **Respond to emerging threats**: Tackle new risks like cryptocurrency misuse, cyber laundering, and terror funding networks.
  - **Support UN and G20 mandates**: Align actions with UN Security Council resolutions and global anti-terror frameworks.

INDIA RE-ELECTED TO CODEX EXECUTIVE COMMITTEE

Context: India has been unanimously re-elected to the Executive Committee of the Codex Alimentarius Commission, securing a leadership role for the Asia region until 2027.

About India Re-Elected to Codex Executive Committee:

- **What it is?**
  - India has been re-elected as the Asian regional representative on the Executive Committee (CCEXEC) of the Codex Alimentarius Commission.
- **Term:** The term will last until the conclusion of the 50th Codex Alimentarius Commission (CAC50) in **2027**.
- **Functions in this Role:**
  - Represent technical and trade priorities of Asian countries in global food standard setting.
  - Contribute to discussions on Codex efficiency, future challenges, and the use of technology.
  - Oversee the development of international food standards between full commission sessions.

About Codex Alimentarius Commission (CAC):

- **What it is?**
  - An international intergovernmental body that develops food standards, guidelines, and codes of practice.
- **Established:** May 1963, jointly by the Food and Agriculture Organization (FAO) and the World Health Organization (WHO).
- **Organizational Structure:**
  - **Executive Committee (CCEXEC):** Manages standard development between sessions.
  - **General Subject & Commodity Committees:** Develop specific standards (e.g., pesticides, methods of analysis).
  - **Coordinating Committees:** Facilitate regional coordination.
- **Aim:** To protect consumer health and ensure fair practices in international food trade.
- **Key Features:**
  - It is the global, science-based food standards body established by the FAO and WHO.
  - Its standards are recognized as international references by the WTO's SPS Agreement.
  - The commission operates with 189 members (188 countries and the European Union).
  - India has been a member of this body since 1964.
  - It develops harmonized standards to protect consumer health and ensure fair trade practices.

INDIA'S FIRST-EVER MAJOR LPG IMPORT DEAL WITH THE US

Context: India has finalised its first-ever structured LPG import deal with the US, sourcing 2.2 MTPA—about 10% of annual LPG imports—for 2026.

About India's first-ever major LPG import deal with the US:

What the deal is?

- A one-year structured contract under which Indian PSU refiners will import **2.2 million tonnes per annum (MTPA)** of LPG from the US Gulf Coast in 2026—India's **first formal long-term LPG sourcing contract** from the US.

Nations Involved:

- **India:** IOC, BPCL, HPCL
- **United States:** US Gulf Coast producers (Chevron, Phillips 66, TotalEnergies Trading)

Aim:

- To diversify LPG sourcing beyond West Asian suppliers.
- To strengthen India–US energy partnership, reduce trade imbalances, and improve energy security.

India's LPG Import Profile:

- India imports **~60% of its LPG demand**.
- Around **21 million tonnes** imported in 2024.
- **90% of imports** traditionally sourced from West Asia (UAE, Qatar, Saudi Arabia, Kuwait).
- India is among the **world's fastest-growing LPG markets** due to Ujjwala expansion.

Key Features of the Agreement:

- **Quantity:** 2.2 MTPA (≈10% of India's annual LPG imports).
- **Benchmark:** Based on **US Mont Belvieu** LPG pricing.
- **Suppliers:** Awarded jointly to **Chevron, Phillips 66, and TotalEnergies Trading**.
- **Duration:** Contract year **2026**.

Significance:

- First structured US LPG contract, opening a new energy trade corridor.
- Reduces India's overdependence on West Asian suppliers.
- Strengthens India–US strategic and trade ties, aiding ongoing tariff negotiations.
- Enhances energy security against supply shocks and geopolitical risks.

FIRST BIMSTEC-INDIA MARINE RESEARCH NETWORK (BIMREN) CONFERENCE

Context: Kochi hosted the First BIMSTEC-India Marine Research Network (BIMReN) Conference from November 4–6, 2025, marking a major milestone in advancing regional blue economy cooperation and marine research collaboration among Bay of Bengal nations.

About First BIMSTEC-India Marine Research Network (BIMReN) Conference:

What it is?

- A biennial regional platform under the BIMSTEC framework that promotes joint marine research, sustainable fisheries, and blue economy initiatives through collaboration between India and other BIMSTEC member countries.

Announced in:

- The BIMReN initiative was first announced by Prime Minister of India during the Colombo BIMSTEC Summit in 2022.
- Officially launched in 2024 by the Ministry of External Affairs (MEA), Government of India.

Host (2025): The first biennial conference was hosted by India in Kochi from November 4–6, 2025, bringing together scientists, policymakers, and research institutions from all seven BIMSTEC nations.

Aim:

- To strengthen scientific cooperation in marine research, promote sustainable management of the Bay of Bengal's resources, and enhance regional capacity for blue economy governance aligned with India's Neighbourhood First, Act East, Indo-Pacific, and MAHASAGAR strategies.

Key Features:

- **Institutional Collaboration:** Links 25 research institutions and 50+ scientists across BIMSTEC through twinning grants and split-site PhD fellowships.
- **Focus Areas:** Marine ecosystem health, sustainable fisheries, ocean observation, and technology-driven marine innovation.
- **Knowledge Exchange:** Biennial conferences and joint research programs to harmonize policy and scientific understanding.
- **Youth Engagement:** Encourages young researchers to contribute to marine sustainability and policy development.
- **Regional Integration:** Builds a cooperative framework for data sharing, capacity building, and maritime governance.

Significance:

- Reinforces India's leadership in regional marine science diplomacy and sustainable ocean governance.
- Advances India's vision of MAHASAGAR (Mutual and Holistic Advancement for Security and Growth Across Regions), integrating economy, environment, and diplomacy.

ETHIOPIA TO ADOPT DEENDAYAL ANTYODAYA YOJANA – NATIONAL RURAL LIVELIHOODS MISSION (DAY-NRLM)

Context: Ethiopia has announced plans to adopt India's Deendayal Antyodaya Yojana – National Rural Livelihoods Mission (DAY-NRLM) model to tackle rural poverty and promote women's empowerment.

About Ethiopia to adopt Deendayal Antyodaya Yojana – National Rural Livelihoods Mission (DAY-NRLM):

What it is?

- DAY-NRLM is India's **flagship poverty alleviation and women's empowerment programme** under the **Ministry of Rural Development**, focusing on sustainable livelihoods, financial inclusion, and social mobilization through Self-Help Groups (SHGs).

Launched in: 2011 as National Rural Livelihoods Mission (NRLM) by restructuring the Swarnajayanti Grameen Swarozgar Yojana (SGSY).

- It has been renamed as Deendayal Antyodaya Yojana – NRLM (DAY-NRLM) in 2016.

Aim: To reduce rural poverty by enabling poor households, especially women, to access gainful self-employment and skilled wage opportunities through community institutions, skill training, and access to credit.

History:

- The mission represents a paradigm shift from subsidy-driven programmes to **self-reliance through institution-building**.
- It is jointly funded by the **Centre and States** and is among the **world's largest community-mobilisation programmes**, aligning with SDGs 1 (No Poverty) and 5 (Gender Equality).

Key Features:

1. **Social Mobilization & SHG Formation:** Over 10.05 crore rural women organized into 90.9 lakh SHGs across 28 States and 6 UTs.
2. **Community Resource Persons:** Deployment of Bank Sakhis, Krishi Sakhis, and Pashu Sakhis to deliver last-mile financial, agricultural, and livestock services.
3. **Financial Inclusion:** Over ₹11 lakh crore in collateral-free credit disbursed to SHGs with a 98% repayment rate, making it a global model of credit discipline.
4. **Livelihood Diversification:** Promotion of farm and non-farm activities, including 4.62 crore Mahila Kisans, 1.95 lakh producer groups, and 3.74 lakh rural enterprises supported under SVEP.
5. **Skill Development:** Implementation of **DDU-GKY** (placement-linked training for youth) and **RSETIs** (entrepreneurship training), training over **74 lakh youth** cumulatively by mid-2025.
6. **Sustainable Agriculture:** Creation of 6,000 integrated farming clusters and scaling of agro-ecological practices to improve rural resilience.
7. **Digital Inclusion:** Integration with Direct Benefit Transfer (DBT) and Digital Public Infrastructure to ensure transparency and last-mile delivery.

FRAMEWORK FOR THE U.S.–INDIA MAJOR DEFENCE PARTNERSHIP:

Context: India and the United States have unveiled a **10-year Defence Partnership Framework**, marking a new phase in their strategic cooperation to advance **peace, security, and stability in the Indo-Pacific**.

About Framework for the U.S.–India Major Defence Partnership

A **comprehensive 10-year framework** to deepen collaboration across all defence domains — **land, maritime, air, space, and cyberspace.**

Signed in Kuala Lumpur on the sidelines of the **12th ASEAN Defence Ministers' Meeting-Plus (ADMM-Plus)** by **Defence Minister Rajnath Singh** and **U.S. Secretary of War Pete Hegseth.**

Builds on the **2013 Joint Principles for Defence**

Cooperation and the **2016 recognition of India as a Major Defence Partner (MDP).**

Provides **policy direction** to transform and expand the India–U.S. defence partnership over the next decade.

Objectives and Key Features:

1. **Free, Open, and Rules-Based Indo-Pacific:** Ensures an **open and rules-bound Indo-Pacific region**, safeguarding **maritime security and free flow of commerce.**
    - Reaffirms commitment to **regional peace, sovereignty, and stability.**
2. **Enhanced Interoperability and Coordination:** Strengthens **joint readiness, information sharing, and coordination** across all domains.
    - Aims for **joint response to common security threats** and deterrence against regional instability.
3. **Defence Industry and Technology Collaboration:** Promotes **industrial innovation, R&D, and co-production** through **advanced technology partnerships.**
    - Builds upon the **COMPACT initiative** (*Catalyzing Opportunities for Military Partnership, Accelerated Commerce and Technology*) to drive transformative defence cooperation.
4. **Strategic and Regional Cooperation:** Expands coordination with **like-minded partners through the Quad** and other mechanisms.
    - Focuses on strengthening **collective security architecture** in the Indo-Pacific.
5. **Unified Policy Direction:** Provides a **long-term roadmap** for policy coherence and institutional alignment in bilateral defence cooperation.
    - Lays the foundation for **collective peace, prosperity, and deterrence** in the region.

Significance:

- **Institutionalises Defence Cooperation:** Establishes a **structured 10-year vision** for sustained strategic and military engagement.
- **Strengthens Strategic Deterrence:** Enhances **maritime and regional security architecture** to deter conflict and ensure stability.
- **Deepens Defence Industrial Partnership:** Encourages **technology sharing and joint development**, supporting **defence innovation and industrial capacity.**
- **Reinforces Strategic Trust:** Positions India as a **priority defence partner** for the U.S. and a **pillar of regional stability.**

Current Affairs

UNITED NATIONS SECRETARY-GENERAL

Context: The UN has formally begun the process to elect the next Secretary-General to replace Antonio Guterres when his term ends on 31 December 2026.

- Member states have been invited to submit nominations, with a strong push for selecting the **first woman Secretary-General** in UN history.

About United Nations Secretary-General:

What the UN Secretary-General is?

- The Secretary-General (SG) is the chief administrative officer of the United Nations, as defined under Article 97 of the UN Charter.
- Often described as "equal parts diplomat, advocate, civil servant and CEO", the SG represents the UN globally and serves as its moral voice.

Legal Basis (Governed By):

- **Article 97, UN Charter** – SG appointed by the General Assembly on the recommendation of the Security Council.
- Traditional practices such as **regional rotation**, though not formally binding.

The Selection Procedure Works:

- **Nominations Begin:**
    - Member states nominate candidates after a joint letter from the **UNSC**

President and **UNGA President**.
    - Increasing emphasis on **gender balance** and **regional diversity**.
- **Security Council Screening:**
    - The **15-member UN Security Council** conducts a series of **straw polls** (secret ballots).
    - Each member marks a candidate as **"encourage"**, **"discourage"**, or **"no opinion"**.
    - The five permanent members (P5 — US, UK, China, Russia, France) have **veto power** and their ballots are colour-coded.
- **Security Council Recommendation:**
    - A candidate requires **9 votes and no veto**.
    - A formal **UNSC resolution** recommends one name to the General Assembly.
- **General Assembly Appointment:** The 193-member UNGA votes (usually a formality) to appoint the candidate as the next Secretary-General.
- **Term:** 5-year term, renewable (usually once and Guterres is serving his second).

Functions of the Secretary-General:

- **Administrative & Executive Roles:** Heads the UN Secretariat, supervising over 30,000 staff and managing a core budget (~USD 3.7 billion) and the peacekeeping budget (~USD 5.6 billion).
- **Diplomatic & Mediation Role:**
    - Acts as a **global mediator**, using "good offices" to prevent or resolve conflicts.
    - Appeals to the world community on humanitarian crises, climate, peace and security.
- **Agenda-Setting Role:**
    - Brings issues before the Security Council that threaten international peace (Article 99).
    - Launches global initiatives on development, climate action, human rights, gender equality, and humanitarian relief.
- **Symbolic & Advocacy Role:** Promotes multilateralism, peace, human rights and sustainable development.

28-POINT PEACE PLAN

Context: The United States has privately shared a 28-point draft peace proposal for ending the Russia–Ukraine war with President Volodymyr Zelenskyy, reportedly prepared under former U.S. President Donald Trump's team.

About 28-Point Peace Plan:

What it is?

- A US-drafted, 28-point roadmap aimed at ending the Russia–Ukraine war through a negotiated settlement involving security guarantees, constitutional changes, economic arrangements, and territorial compromises.

Proposed by: Prepared under the strategic framework associated with US President Donald Trump's 2024 foreign-policy team.

Aim:

- To freeze the conflict and prevent further territorial expansion by either side.
- To restructure European security by limiting NATO expansion.
- To rebuild Ukraine's economy with U.S.–EU investment mechanisms.

Key Features of the 28-Point Plan:

- **Security Architecture Reset:**
    - Ukraine must **abandon NATO membership**, enshrine neutrality in its Constitution, and accept permanent restrictions on military size (600,000 troops).
    - NATO must formally guarantee Ukraine will **never be admitted** and must avoid stationing troops on Ukrainian soil.
- **Territorial & Political Concessions:**
    - Ukraine expected to make **unspecified territorial concessions** to Russia.
    - Dialogue between **Russia–Ukraine–Europe** to settle all "ambiguities" of the last 30 years.
- **Western Economic Reconstruction Package:**

- Creation of a **Ukraine Development Fund** for tech, energy, AI, urban rebuilding, and resource extraction.

- **Reintegration of Russia into the Global Economy:**
  - Gradual lifting of sanctions.
  - Russia invited to **rejoin the G8**.
  - U.S.–Russia long-term cooperation in **energy, rare earths, AI, Arctic projects**, etc.
- **Frozen Asset Utilisation:**
  - **$100 billion** in frozen Russian assets used for Ukraine's reconstruction under U.S. management.
  - U.S. receives **50% of profits**; EU adds another $100 billion.

Significance of the Plan:

- Represents the most detailed U.S.-brokered proposal since the war began.
- Could reshape the NATO–Russia–Ukraine security balance for decades.
- Criticised for being Russia-leaning and undermining Ukrainian sovereignty.

G20

Context: South Africa has assumed the G20 Presidency for 2025 with the **theme "Solidarity, Equality, Sustainability"**, unveiling priorities centred on disaster resilience, debt relief, climate finance and just energy transitions.

- This marks the **first G20 Summit hosted on African soil**, coinciding with India's strong advocacy for Global South priorities.

About G20:

What it is?

- The G20 is the world's premier forum for international economic cooperation, bringing together major advanced and emerging economies to coordinate on global economic, developmental, and governance challenges.

History:

- Formed in **1999** after the Asian Financial Crisis as a forum for Finance Ministers and Central Bank Governors.
- Upgraded to **Leaders' Summit level in 2008–09** to coordinate responses to the global financial crisis.
- Over time, expanded its agenda beyond macroeconomics to include climate change, health, energy, development, food systems, digital economy, taxation, and anti-corruption.

Members:

- It comprises 19 countries + European Union (EU) + African Union (AU).
- The members together represent ~85% of global GDP, 75% of world trade, and two-thirds of humanity.

Present G20 Troika (2024–2026):

- Brazil (2024 – previous President)
- South Africa (2025 – current President)
- United States (2026 – next President)

This ensures continuity in agenda-setting.

Functions of the G20:

- Coordinating global macroeconomic policies and financial stability.
- Reforming multilateral institutions (IMF, MDBs).
- Driving climate commitments and energy transitions.
- Strengthening global health systems and pandemic preparedness.
- Ensuring resilient supply chains, sustainable development, and digital governance.
- Facilitating consensus on taxation, anti-corruption, trade, and inclusive growth.

MAJOR NON-NATO ALLY (MNNA)

Context: The United States has officially designated Saudi Arabia as a Major Non-NATO Ally (MNNA), signalling a major upgrade in defence ties after Trump's meeting with Crown Prince Mohammed bin Salman.

About Major Non-NATO Ally (MNNA):

What it is?

- MNNA is a special U.S. strategic designation that grants close defence partners military, financial, and technological privileges—without offering formal NATO-style security guarantees.

History:

- Created under **U.S. law** in the **1980s**.
- Intended to strengthen America's global alliance network outside NATO.

Aim:

- To promote defence collaboration, advanced weapons access, joint training, and security coordination.
- To reinforce U.S. strategic partnerships in geopolitically sensitive regions.

Current MNNA Countries:

- **20 nations** across Asia, Africa, South America, and Oceania.
- Argentina, Australia, Bahrain, Brazil, Colombia, Egypt, Israel, Japan, Jordan, Kenya, Kuwait, Morocco, New Zealand, Pakistan, Philippines, Qatar, South Korea, Thailand, Tunisia, **and now Saudi Arabia**.

Key Features of MNNA Status:

- **Priority Defence Access:** MNNA countries get priority delivery of U.S. Excess Defence Articles and easier access to advanced military equipment.
- **War Reserve Stockpiles:** They can host U.S. War Reserve Stockpiles on their territory, enabling rapid joint military response.
- **Joint R&D Collaboration:** Eligible to conduct cooperative research, development, testing, and evaluation of defence technologies with the U.S.
- **Training & Contracting Benefits:** Can enter bilateral/multilateral training agreements and MNNA firms can bid for U.S. DoD repair and maintenance contracts abroad.
- **Counter-Terror & Special Tech Funding:** Eligible for U.S. funding for counter-terrorism technologies and advanced security research projects.

India's Status:

- India is NOT an MNNA.
- India is designated as a "Major Defence Partner" (MDP) since 2016—a unique category created specifically for India, granting access to high-end U.S. defence technology.

PAKISTAN'S 27TH CONSTITUTIONAL AMENDMENT BILL

Context: Pakistan's President has signed the **27th Constitutional Amendment Bill**, instantly making it part of the Constitution and dramatically reshaping the country's power structure.

About Pakistan's 27th Constitutional Amendment Bill:

What it is?

- A rapidly passed constitutional amendment that **centralises military authority**, elevates the role and immunity of five-star officers (currently Asim Munir), and **creates a new Federal Constitutional Court** above the existing Supreme Court for constitutional matters.

Aim:

- To formalise the military's dominant role in Pakistan's political and security structure.
- To institutionalise a new judicial architecture that limits the Supreme Court's influence over constitutional interpretation.

- To grant permanent legal immunity and expanded authority to top military leadership.

Key Features of the Amendment:

1. **Asim Munir becomes more powerful:**
   - The Army Chief now becomes **Chief of Defence Forces (CDF)**, bringing the Navy and Air Force under his command.
   - All future Army Chiefs will also hold this dual role.
2. **Control over Strategic & Nuclear Assets:**
   - A new **Commander of the National Strategic Command** is created.
   - This official—appointed on the Army Chief's recommendation—will oversee Pakistan's **nuclear and strategic assets**.
3. **Lifelong Immunity for Five-Star Officers:**
   - Five-star officers (a rank held only by Asim Munir and previously Ayub Khan) get:
     i. **Lifelong legal immunity** from any prosecution.
     ii. **Permanent rank and privileges**, remaining in uniform for life.
     iii. Removal only through a **two-thirds majority in Parliament**.
   - This effectively places Munir **above any law or judicial scrutiny**.

Changes to the Judiciary:

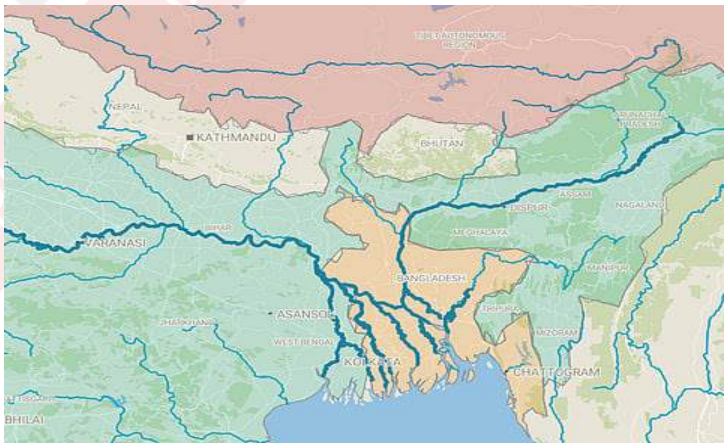
4. **New Federal Constitutional Court (FCC) Created:**
   - Becomes the **highest court** for:
     - Constitutional interpretation
     - Federal–provincial disputes
     - Enforcement of fundamental rights
     - Appeals on constitutional matters
   - Its decisions will be **binding on all other courts**, including the Supreme Court.
5. **Supreme Court's role drastically reduced:**
   - Now becomes mostly a **final appellate court** for civil and criminal cases.
   - Loses authority over constitutional issues, writs, and presidential references.
6. **High Court Judges Can Be Transferred Without Consent:**
   - Judges resisting transfer can be **forced to retire**, affecting judicial independence.

Implications:

- **Consolidation of Military Power:**
  - The amendment formalises military supremacy over civilian institutions.
  - The CDF becomes more powerful than the Prime Minister, President, or Parliament.
- **Erosion of Judicial Independence:**
  - The Supreme Court is sidelined.
  - The new FCC, whose judges are government-appointed, weakens checks on the executive and military.
- **Permanent Legal Shield for the Military Chief:**
  - Immunity ensures Asim Munir cannot be prosecuted—now or in the future—regardless of actions taken

BANGLADESH JOIN UN WATER CONVENTION

Context: Bangladesh became the first South Asian country to accede to the UN Water Convention (2025), aiming to strengthen transboundary water governance.



About Bangladesh Join UN Water Convention:

What it is?

- The Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) is a legally binding international framework promoting equitable and sustainable management of shared water resources and preventing water-related conflicts among riparian nations.

Established in:

- Adopted in **Helsinki in 1992**, the Convention **entered into force in 1996** under the **UNECE (United Nations Economic Commission for Europe)**. Initially regional, it became **open to all UN member states from 2016**.

Key Features:

- **Cooperative Framework:** Mandates nations sharing transboundary waters to cooperate through agreements and joint bodies for sustainable management.
- **Equitable Use Principle:** Ensures reasonable and fair utilization of shared water resources while preventing significant transboundary harm.
- **Conflict Prevention:** Serves as a mechanism for peaceful resolution of water-related disputes and strengthening regional stability.
- **Alignment with SDGs:** Supports SDG 6.5 on integrated water resource management, and indirectly furthers SDGs 2 (food security), 7 (energy), 13 (climate), and 16 (peace, institutions).
- **Global Expansion:** Since 2018, several non-European countries—Chad, Ghana, Iraq, Nigeria, The Gambia, Namibia, and Panama—have joined, expanding its global reach.

India and the UN Water Convention:

- **India is not a signatory** to the Convention, preferring bilateral and basin-level treaties such as the Indus Waters Treaty (1960) and the Ganga Water Sharing Treaty (1996).
- India views multilateral mechanisms like the Water Convention cautiously, citing concerns about externalizing bilateral water issues and losing negotiation flexibility.
- Bangladesh's accession, therefore, could reshape regional water diplomacy, giving it an international legal platform to press for fairer water-sharing agreements with India, especially regarding the Teesta and Ganga rivers.

DOHA POLITICAL DECLARATION

Context: The Second World Summit for Social Development, hosted by Qatar, concluded with the adoption of the Doha Political Declaration, earning wide global praise for advancing social development and aligning it closely with the 2030 Sustainable Development Goals (SDGs).

About Doha Political Declaration:

What it is?

- The Doha Political Declaration is the outcome document adopted at the Second World Summit for Social Development (2025), reaffirming global commitment to eradicate poverty, promote decent work, ensure social inclusion, and integrate these pillars into the broader framework of sustainable development.

Host:

- Hosted by the **State of Qatar** from **November 4–6, 2025**, at the **Qatar National Convention Centre (Doha)**.
- Organized in collaboration with the **United Nations**, bringing together over **8,000 participants** including heads of state, ministers, UN agencies, civil society, academia, and youth representatives.

Key features of the Declaration:

- **Poverty Eradication:** Recognizes elimination of poverty as a **moral and developmental imperative**, essential for equitable progress.
- **Decent Work for All:** Calls for creating **inclusive labor markets** and safe, fair employment opportunities to strengthen economic and social resilience.
- **Social Inclusion:** Promotes inclusion across gender, age, and marginalized groups to ensure no one is left behind in the pursuit of SDGs.
- **Link to Sustainable Development:** Emphasizes that social progress, economic growth, and environmental sustainability are inseparable pillars of human development.
- **Action-Oriented Framework:** Moves from problem diagnosis to implementable commitments and partnerships among governments, private sector, and civil society.
- **Peace and Stability:** Asserts that sustainable development requires peace, noting that conflicts reverse decades of social gains.
- **Global Cooperation:** Urges multilateral collaboration and financial investment to accelerate the 2030 Agenda.
- **Transformative Vision:** Seeks to build just, secure, and resilient societies, guided by shared responsibility and global solidarity.

About Copenhagen Declaration on Social Development:

- **What it is?**

- Adopted at the World Summit for Social Development (Copenhagen, 1995), the Copenhagen Declaration is a landmark UN agreement that placed people-centered social development at the heart of global policymaking.
- It was the **first summit of heads of state** convened by the UN to prioritize poverty eradication, employment generation, and social inclusion as universal goals.

- **Key features:**
  - **Integrated approach to development:** Recognizes that economic growth, social justice, and environmental protection are interdependent pillars of sustainable development.
  - **Human-centric focus:** Declares that people are at the centre of development, entitled to a healthy, productive life in harmony with nature.
  - **Peace and human rights linkage:** Affirms that social justice and peace are mutually reinforcing, and sustainable development is impossible without respect for human rights and equality.
  - **Gender equality and empowerment:** Calls for full participation of women as a prerequisite for equitable and lasting social development.

THE UNITED STATES GOVERNMENT SHUTDOWN

Context: The United States government shutdown entered its 36th day, becoming the longest in U.S. history as Republicans and Democrats failed to reach a budget compromise.

About The United States Government Shutdown:

What it is?

- A **government shutdown** occurs when **Congress fails to pass legislation** to fund federal agencies and programs before the fiscal deadline. Without an approved budget, most non-essential government operations are halted, and millions of federal workers go unpaid.

Why shutdowns occur?

- **Budget impasse:** Political deadlock between **Republicans and Democrats** over funding priorities.
- **In 2025:** Dispute centered on **expanding pandemic-era healthcare subsidies** and opposition to **spending cuts** in social and health programs.
- **Constitutional process:** Congress must approve a **spending bill** and send it to the President for signature; failure to do so leads to shut down.

History:

- **Number of Shutdowns:** Since 1976**, the United States has experienced 22 federal government shutdowns, ranging from** brief funding lapses to prolonged political standoffs.
- **First Shutdown:** The first official shutdown occurred in **1976 during President Gerald Ford's** tenure after Congress failed to pass key spending bills on time.
- **Longest Shutdown:** The 2025 shutdown, lasting 36 days and counting, has become the longest in U.S. history, surpassing the 35-day closure during **Donald Trump's first term (2018–2019).**

Key features:

- **Partial suspension of government services:** Essential functions like defense, border security, and healthcare continue, but most federal offices close.
- **Unpaid federal workers:** Around **1.4 million employees** are furloughed or working without pay.
- **Economic disruption:** Delays in air traffic, halted food assistance programs (SNAP), and closure of national parks and museums.
- **Political standoff:** Republicans seek a "clean resolution" without healthcare subsidies, while Democrats demand inclusion of welfare measures.

FACTS FOR PRELIMS

GENERAL STUDIES – 3

ECONOMY

Financial Markets (Capital Market, Money Market)

SENSEX AND NIFTY RECORD HIGH

Context: Sensex and Nifty are again touching record highs, driven mainly by a narrow set of large-cap heavyweights such as leading banks and Reliance.

About Sensex and Nifty Record High:

- **What is *BSE*?**
  - BSE (Bombay Stock Exchange) is India's and Asia's oldest stock exchange, based on Dalal Street, Mumbai.
- **Brief History of BSE:**
  - Originated in **1870s** as the Native Share and Stock Brokers Association, where brokers literally traded under a **banyan tree** in Mumbai.
  - Formally became the **Bombay Stock Exchange in 1875**, evolving from open-cry floor trading to a fully electronic platform.
  - In **1995**, BSE launched **BOLT (BSE On-Line Trading)**, moving to **screen-based trading** and widening retail participation.

About *NSE*:

What is NSE?

- NSE (National Stock Exchange) is a nationwide, fully electronic stock exchange, created to bring transparency, speed and equal access to all investors.
- It is now India's largest exchange by trading volume.

Brief History of NSE:

- Incorporated in **1992** and recognised as a stock exchange by SEBI in **1993**.
- In **1994**, NSE pioneered **screen-based, order-driven trading** in India with the cash and wholesale debt segments, breaking the old floor-trading cartel mindset.

Difference Between BSE and NSE:

Parameter	BSE (Bombay Stock Exchange)	NSE (National Stock Exchange)
Year of Establishment	1875 — Oldest stock exchange in Asia	1992 — Set up to modernise Indian markets
Flagship Index	Sensex (30 large-cap stocks)	Nifty 50 (50 large-cap stocks)
Trading System	BOLT (BSE Online Trading)	NEAT (National Exchange for Automated Trading)
Trading Volume	Lower compared to NSE	Highest trading volume in India
Liquidity	Moderate; varies across stocks	High liquidity, especially for derivatives
Derivatives Market	Smaller derivatives segment	India's largest derivatives market (F&O dominance)

Industry and Infrastructure

TEX-RAMPS SCHEME

Context: The Government of India has approved the Tex-RAMPS Scheme to strengthen research, innovation and data systems in the textiles sector.

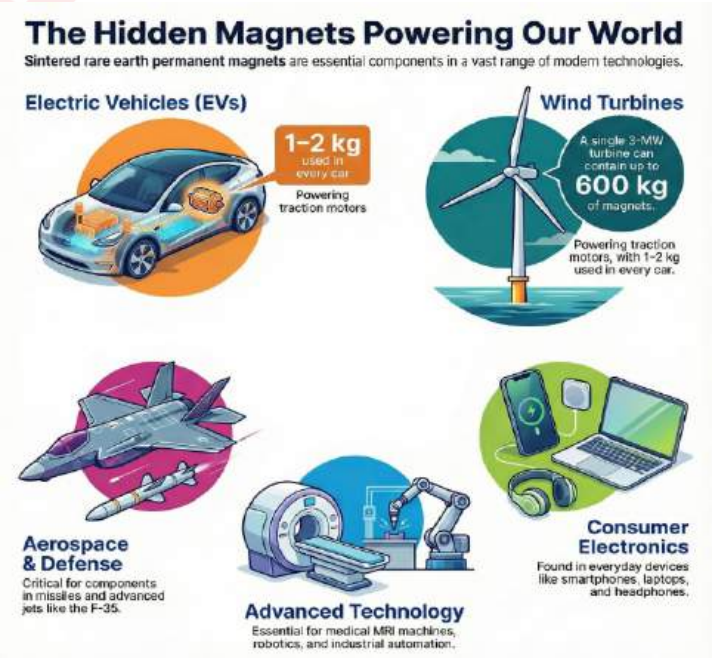
About Tex-Ramps Scheme:

- **What It Is?**
  - A Central Sector Scheme focused on research, assessment, monitoring, planning, and start-up support for the textiles sector.
- **Ministry:** Implemented fully by the **Ministry of Textiles**, Government of India.
- **Aim:** To future-proof India's textiles and apparel ecosystem through innovation, data systems, capacity building and start-up support.
- **Key Components:**
  - **Research & Innovation:** Supports advanced R&D in smart textiles, sustainability, process efficiency and emerging textile technologies.
  - **Data, Analytics & Diagnostics:** Builds strong data systems including employment mapping, supply chain studies and the India-Size project.
  - **Integrated Textiles Statistical System (ITSS):** A real-time analytics platform enabling structured monitoring and evidence-based decisions.
  - **Capacity Development:** Enhances State-level planning, best-practice sharing, workshops and creation of a strong knowledge ecosystem.
  - **Start-up & Innovation Support:** Funds incubators, hackathons and academia–industry partnerships to boost textile entrepreneurship
- **Key Features:**
  - **₹305 crore outlay for 2025–31:** Co-terminus with next Finance Commission cycle for long-term continuity.
  - **Central Sector Scheme:** Fully funded by the Ministry for uniform nationwide implementation.
  - **Focus on smart, sustainable textiles:** Aligns India's textile sector with global technology and green manufacturing trends.
  - **Structured monitoring:** ITSS ensures real-time visibility into sector performance.
- **Significance:**
  - **Boosts Global Competitiveness:** Helps Indian textiles compete on quality, technology and sustainability.
  - **Strengthens R&D Ecosystem:** Creates a robust pipeline of innovations in smart and technical textiles.
  - **Improves Policymaking:** High-quality data enhances sectoral planning and targeted interventions.

SCHEME TO PROMOTE MANUFACTURING OF SINTERED RARE EARTH PERMANENT MAGNETS (REPM)

Context:

The Union Cabinet has approved a ₹7,280-crore Scheme to Promote Manufacturing of Sintered Rare Earth Permanent Magnets (REPM) to reduce import dependence and build India's first integrated REPM ecosystem.



About Scheme to Promote Manufacturing of Sintered Rare Earth Permanent Magnets (REPM):

What the scheme is?

- A **first-of-its-kind national initiative** to develop a complete domestic supply chain—from rare-

earth oxides to metals, alloys and finished high-performance REPMs.

Nodal Ministry: Ministry of Mines (with oversight from Department of Atomic Energy & NITI Aayog)

Targets:

- Establish **6,000 MTPA** of integrated REPM manufacturing capacity
- Select **5 beneficiaries** via global competitive bidding (each up to 1,200 MTPA)
- Build India's **first complete REPM value chain**

Key features:

- **Financial Outlay: ₹7,280 crore**
  - A total of ₹7,280 crore is allocated to build India's first large-scale, end-to-end Rare Earth Permanent Magnet (REPM) manufacturing ecosystem.
- **₹6,450 crore: Sales-linked incentives (for 5 years)**
  - ₹6,450 crore will be disbursed as incentives based on actual magnet sales, encouraging high-quality production and global competitiveness.
- **₹750 crore: Capital subsidy for plant setup**
  - ₹750 crore supports the heavy initial investment needed for oxide-to-metal conversion, alloying, and sintering technologies.
- **Duration: 7 years**
  - The entire scheme runs for 7 years, ensuring enough time for infrastructure creation, capacity building, and sustained production.
- **2-year gestation to build facilities**
  - Manufacturers get two years to construct integrated plants, install metallurgical systems, and stabilise rare-earth processing lines.
- **5-year incentive period**
  - For five years after commissioning, companies receive sales-based incentives to scale production and reduce import dependence.
- **Integrated Manufacturing Covered**
  - The scheme supports the full rare-earth value chain under one roof, promoting efficiency, cost reduction, and supply-chain security.
- **Rare-earth oxides → metals → alloys → sintered REPMs**
  - It enables India to convert raw rare-earth oxides into metals, process them into alloys, and finally produce high-performance NdFeB sintered magnets.

About Sintered Rare Earth Permanent Magnets (REPM):

What They Are?

- REPMs (especially **NdFeB magnets**) are the **strongest commercial magnets** globally, made by sintering rare-earth-based alloys like Neodymium-Iron-Boron.

Current Status in India:

- India has **6.9 million tonnes** REE reserves (5th largest globally)
- Yet contributes **~1%** to global production
- REPM demand is **almost fully import-dependent**
- China controls **~90% of global REPM supply**

Key Features:

- High magnetic strength
- High heat resistance
- Compact size with superior performance
- No viable substitutes in high-performance applications

THE INLAND WATERWAYS AUTHORITY OF INDIA (IWAI)

Context: The Inland Waterways Authority of India (IWAI) signed MoUs worth ₹3,000 crore during India Maritime Week 2025 to boost cargo transport, water-based urban mobility, and river tourism in the Northeast.

About The Inland Waterways Authority of India (IWAI):

- **What it is?**
  - IWAI is a statutory authority under the Inland Waterways Authority of India Act, 1985, responsible for the development, regulation, and maintenance of inland waterways for navigation and shipping.
- **Headquarters:** Noida (Uttar Pradesh), with regional offices in Patna, Kolkata, Guwahati, Varanasi, Bhubaneswar, and Kochi.
- **History:**
  - Established on **27 October 1986** to operationalise National Waterways and develop India's inland water transport (IWT) as a fuel-efficient, cost-effective logistics system.
- **Key Functions:**
  - Developing National Waterways (NW-1 Ganga, NW-2 Brahmaputra, NW-16 Barak, etc.).
  - Fairway development (dredging, channel marking, river training works).
  - Navigation infrastructure: terminals, jetties, Ro-Ro/Ro-Pax services, night navigation systems.
  - **Regulation:** vessel movement, pilotage, and coordination with state IWT departments.

About Waterways in the Northeast:

- **What it is?**
  - A network of major rivers—Brahmaputra, Barak, Subansiri, Lohit, Siang, Tlawng, Chhimtuipui, Imphal, Gumti—identified for inland water transport under the National Waterways Act.
- **Identified Routes:**
  - **National Waterway-2 (Brahmaputra):** Dhubri–Sadiya, main artery for Assam's cargo and passenger movement.
  - **National Waterway-16 (Barak River):** Lakhipur–Bhanga—key route for Manipur, Mizoram, and southern Assam.
  - **Indo-Bangladesh Protocol (IBP) Routes:** Link the Northeast with Bangladesh ports, enabling trade access to Southeast Asia.
  - **Proposed/Developing Routes:** Siang (Arunachal Pradesh), Gumti (Tripura), Doyang & Shilloi Lakes (Nagaland), Tlawng & Chhimtuipui (Mizoram), Umiam & Umngot (Meghalaya).

INDEX OF EIGHT CORE INDUSTRIES

Context: India's core infrastructure output stagnated in October 2025, recording 0% growth—the worst performance in 14 months.

About Index of Eight Core Industries:

What it is?

- The Index of Eight Core Industries (ICI) is a monthly economic indicator that measures the combined and individual performance of eight crucial infrastructure sectors that drive industrial activity in India.

Published by: Office of the Economic Adviser (OEA)

- Ministry of Commerce & Industry, Government of India

History / Background:

- Introduced to track the health of India's industrial base and serve as a leading indicator for Index of Industrial Production (IIP).
- **Base year:** 2011–12, aligned with the base revision of national accounts.
- Over time, it has become a key tool for assessing monthly economic momentum.

Sectors Covered:

The eight core industries are:

Sector	Coal	Crude Oil	Natural Gas	Refinery Products	Fertilizers	Steel	Cement	Electricity	Overall Index
Weight	10.33	8.98	6.88	28.04	2.63	17.92	5.37	19.85	100.00

These sectors collectively make up **40.27% of the weight of the entire IIP**.

Key Features:

- Measures **infra-sector performance**, reflecting the supply-side strength of the economy.
- Published **every month**, offering high-frequency economic insights.
- Helps forecast **IIP growth trends**, influencing policy decisions and industry expectations.
- Tracks both **sectoral performance** (individual industries) and **overall combined index**.
- Acts as an early-warn indicator for slowdown or recovery in industrial output.

NATIONAL INDUSTRIAL CLASSIFICATION (NIC) 2025

Context: The Ministry of Statistics & Programme Implementation launched the National Industrial Classification (NIC) 2025, a major revision to India's economic activity coding system, during the 75th-anniversary celebrations of the National Sample Survey Office (NSSO) in Udaipur.

About National Industrial Classification (NIC) 2025:

- **What it is?**
  - A standardized six-digit classification system for categorizing all economic activities in India, replacing the earlier five-digit NIC-2008.
- **History:** First introduced in 1962, with revisions in 1970, 1987, 1998, 2004, and 2008.
- **Aim:** To reflect India's evolving economic structure, improve granularity, and align with the UN's International Standard Industrial Classification (ISIC) Revision 5.
- **Key Features:**
  - Explicitly includes emerging sectors like **cloud services, blockchain, platform-based services, renewable energy, waste management, and AYUSH**.
  - Introduces new classes for intermediation services (logistics, real estate, food services) and environmental remediation.
  - Will serve as the **standard framework for all official statistics, surveys, and policy design** in India.

About National Sample Survey Office (NSSO):

- **What it is?**
  - India's premier institution for large-scale sample surveys across socio-economic domains.
- **Established:** In 1950 by Prof. P.C. Mahalanobis.
- **Aim:** To collect and analyse nationally representative data on topics like employment, health, education, industries, and prices.
- **Key Features:**
  - Headed by a Director General under the Ministry of Statistics & Programme Implementation.
  - **Comprises four divisions:**
    1. **Survey Design and Research Division (SDRD):** Kolkata-based; designs surveys and methodologies.
    2. **Field Operations Division (FOD):** Manages nationwide data collection through zonal and regional offices.
    3. **Data Processing Division (DPD):** Handles sample selection, software, and data validation.
    4. **Survey Coordination Division (SCD):** Coordinates activities and publishes the journal *Sarvekshana*.
  - Conducts key surveys such as the Annual Survey of Industries (ASI) and Periodic Labour Force Survey (PLFS).

CABINET APPROVES NEW ROYALTY RATES FOR 4 CRITICAL MINERALS

Context: The Union Cabinet has approved the rationalisation of royalty rates for four critical minerals — Graphite, Caesium, Rubidium, and Zirconium — to promote domestic production.

About Cabinet Approves New Royalty Rates for 4 Critical Minerals:

What is Royalty Rate?

- It is a **charge levied by the government** on mineral producers for the extraction of natural resources, calculated as a percentage of the **Average Sale Price (ASP)** of the mineral or on a fixed per-tonne basis.

Law Governing:

- Governed by the **Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act)** and the **Mineral Concession Rules, 1960**, which empower the Central Government to fix or revise royalty rates.

Aim: To ensure fair value capture for the state, encourage exploration and auction of mineral blocks, and promote the availability of critical minerals vital for green technologies and strategic sectors like EVs, nuclear energy, and electronics.

Key Features of the Decision:

- **Graphite:** Royalty will now depend on quality — **2%** for higher-grade (≥80% carbon) and **4%** for lower-grade (<80%) graphite. Earlier, it was a flat per-tonne charge; now it changes with market price.
- **Caesium & Rubidium:** Both will have a **2% royalty** on the value of metal extracted.
- **Zirconium:** Will attract a **1% royalty** on its metal value.
- The new rates will make it **easier to auction** blocks containing these minerals and **discover linked elements** like lithium and rare earths.
- It brings India's royalty structure **in line with international norms (2–4%)**, ensuring fair pricing and more investor interest.

Significance:

- **Reduces Import Dependence:** India currently imports 60% of its graphite requirement; new rates incentivize indigenous mining and processing.
- **Boosts Green Energy Transition:** Critical for EV batteries, nuclear cladding, atomic clocks, and fiber optics—key components in India's clean-tech ecosystem.
- **Supports 'Atmanirbhar Bharat':** Ensures resource security, employment generation, and supply chain resilience.

INDIA'S FIRST MWH-SCALE VANADIUM FLOW BATTERY AT NTPC NETRA

Context: India inaugurated its first MWh-scale Vanadium Redox Flow Battery (VRFB) system of 3 MWh capacity at NTPC NETRA, Greater Noida, marking a breakthrough in long-duration energy storage (LDES) and renewable energy integration.

About India's First MWh-Scale Vanadium Flow Battery at NTPC NETRA:

What it is?

- The Vanadium Redox Flow Battery (VRFB) is an advanced liquid-electrolyte–based energy storage system, designed as a sustainable alternative to lithium-ion batteries for grid-scale storage.
- It enables large-scale, long-duration energy retention crucial for renewable energy stability.

Located in: NTPC NETRA (National Energy Technology Research Alliance), Greater Noida, Uttar Pradesh

Organisation Involved: Developed by NTPC's R&D Centre (NETRA) under the Ministry of Power

Aim: To strengthen India's energy transition and grid resilience by developing indigenous, safe, and long-duration storage technologies that reduce dependence on imported lithium.

Key Features:

- **Capacity:** 3 MWh — India's largest and first-of-its-kind installation
- **Technology:** Uses **vanadium electrolyte** instead of lithium; highly **scalable, safe, and long-lasting**
- **Lifespan:** 15–20 years with minimal degradation
- **Applications:** Supports **renewable energy integration**, microgrids, and industrial storage
- **Eco-friendly:** Enables **recycling of electrolytes** and **non-flammable operation**

Significance:

- Marks India's entry into next-generation, non-lithium energy storage.
- Enhances renewable energy reliability by storing excess solar and wind power.
- Promotes Atmanirbhar Bharat through indigenous clean energy innovation.
- Positions NTPC as a global leader in R&D across green hydrogen, carbon capture, and LDES technologies.

External Sector and International Institutions (BOP, FDI, FII, Capital Account, Currency Devaluation, Depreciation, IMF, WB)

IMF GIVES 'C' GRADE FOR INDIA'S NATIONAL ACCOUNTS STATISTICS

Context: The IMF's latest Article IV review has given India's national accounts statistics a 'C' grade, citing methodological weaknesses.

- Regarding India's main inflation measure, the Consumer Price Index, the IMF graded India a 'B', which means the data provided "have some shortcomings but are broadly adequate for surveillance".

About IMF Gives 'C' Grade for India's National Accounts Statistics:

- **What the Grade Means?**
  - A 'C' grade indicates that while data is available regularly, methodological shortcomings hamper effective economic surveillance and cross-country comparability.
- **Reasons Stated by IMF:**
  - **Outdated Base Year (2011–12):** GDP and CPI rely on an old consumption and production structure that no longer reflects the modern economy.
  - **Use of WPI as Deflators:** Lack of a full Producer Price Index (PPI) forces reliance on wholesale prices, weakening real GDP estimation.
  - **Production vs Expenditure Gaps:** Large and recurring discrepancies suggest under coverage of expenditure data and informal sector activity.
  - **Limited Seasonal Adjustment:** Quarterly GDP lacks robust seasonal adjustment, affecting interpretation of growth trends.
  - **Need for Better Statistical Techniques:** IMF points to scope for improved modelling practices in national accounts.

About India's National Accounts Statistics (NAS):

- **What It Is?**
  - A comprehensive macroeconomic database published by MoSPI that provides GDP, GVA, consumption, savings, investment and related aggregates at current and constant prices.
- **Methodology Used:**
  - **UN System of National Accounts (SNA-2008):** India follows globally accepted standards for compiling macroeconomic aggregates.
  - **Income Approach (Primary):** GDP estimated using incomes earned by households, enterprises and government.
  - **Expenditure Approach (Supplementary):** Estimates GDP based on consumption, investment, government spending and net exports.
  - **Sectoral GVA Method:** Computes value added across agriculture, industry and services at current and constant (2011–12) prices.
- **Key Indicators Published:**
  - **GDP & GVA**—sector-wise and aggregate.
  - **Consumption Expenditure**—private and

government.
- **Gross Capital Formation (GCF)**—machinery, construction, valuables.
- **Savings & Investment Rates** across sectors.
- **National Income, Disposable Income & Per-Capita Indicators.**

IMF TO ALTER CLASSIFICATION OF INDIA'S FOREX FRAMEWORK

Context: The International Monetary Fund is expected to change the way it classifies India's exchange rate regime, potentially describing it as having "crawling peg" like features in its 2025 Article IV report.

About IMF to Alter Classification of India's Forex Framework:

What this issue is about?

- The IMF maintains a **de facto exchange rate regime classification** for all member countries based on how their currencies actually behave in the market, not only on official claims.
- For India, the IMF now likely plans to describe the regime as having **crawling peg type features** because the rupee is allowed to adjust gradually while the RBI still intervenes to smooth volatility.

What governs IMF exchange rate classification?

- The classification is anchored in the **IMF's Articles of Agreement** and its **surveillance mandate** under Article IV.
- IMF staff apply a **uniform global methodology** that looks at the actual path of the currency, the scale and pattern of intervention, and the degree of policy commitment to any exchange rate path.

Types of exchange rate classifications relevant for India:

1. **No separate legal tender:**
   - Use of another country's currency or membership in a currency union.
   - Monetary policy is fully surrendered to the issuing authority of that currency.
2. **Hard pegs and conventional pegs:**
   - Currency board arrangements with a legally fixed conversion rate and full foreign asset backing.
   - **Conventional fixed peg** where the domestic currency is kept within a very narrow band around a central rate using active intervention.
3. **Pegged within horizontal bands:**
   - The exchange rate is allowed to move within a somewhat wider announced band around a central rate.
4. **Crawling pegs:**
   - The central rate is **adjusted periodically in small steps**, often based on inflation differentials with trading partners or preannounced crawl.
   - Gives some flexibility but still constrains monetary policy like a peg.
5. **Crawling bands:**
   - A band around a crawling central rate where both the parity and band move over time.
   - Flexibility depends on how wide the band is.
6. **Managed float with no predetermined path:**
   - Central bank intervenes to smooth volatility but without any announced or systematic path for the currency.
   - Decisions are more judgment based, often linked to reserves, balance of payments and financial stability.
7. **Independently floating:**
   - Exchange rate is mainly market determined.
   - Intervention is limited to moderating excessive short-term fluctuations rather than targeting any level.

EXPORT PROMOTION MISSION (EPM)

Context: The Union Cabinet chaired by Prime Minister of India has approved the Export Promotion Mission (EPM) with an outlay of ₹25,060 crore (2025–26 to

2030–31) to strengthen India's export competitiveness.

About Export Promotion Mission (EPM):

- **What it is?**
  - A **flagship, outcome-based initiative** aimed at creating a unified, technology-driven framework to promote exports, reduce trade barriers, and enhance India's competitiveness in global markets.
- **Launched in:** Announced in the **Union Budget 2025–26** and approved by the Cabinet in **November 2025**.
- **Implemented by:** the Directorate General of Foreign Trade (DGFT) under the Ministry of Commerce and Industry.
- **Term:** To be implemented during **FY 2025–26 to FY 2030–31**, with a total financial outlay of ₹25,060 crore.
- **Aim:** To boost exports through financial and non-financial interventions, consolidate existing export schemes under one mission, and ensure inclusive, sustainable, and regionally balanced export growth aligned with Viksit Bharat @2047.
- **Key Features:**
  - **Two Sub-schemes:**
    1. **Niryat Protsahan** – Enhances access to affordable **trade finance** via interest subvention, export factoring, and credit guarantees for MSMEs.
    2. **Niryat Disha** – Provides **non-financial support** such as export quality improvement, branding, packaging, logistics, trade fairs, and capacity building.
  - **Scheme Integration:** Merges major export-support initiatives like the Interest Equalisation Scheme (IES) and Market Access Initiative (MAI) under one coordinated mechanism.
  - **Digital Implementation:** All applications and fund disbursals managed through an integrated DGFT digital platform linked with trade systems.
  - **Sectoral Focus:** Priority to textiles, leather, gems & jewellery, engineering goods, and marine products, sectors facing global tariff and supply chain pressures.
  - **Impact Goals:** Expand access to trade finance, enhance compliance and certification readiness, promote new market access, and generate employment across manufacturing and logistics.

Miscellaneous

EMPLOYEE'S ENROLMENT SCHEME 2025

Context: The Ministry of Labour and Employment launched the Employee's Enrolment Scheme 2025 to expand EPF coverage and promote voluntary compliance among employers.

About Employee's Enrolment Scheme 2025:

What it is?

- The *Employee's Enrolment Scheme 2025* is a special one-time compliance window under the Employees' Provident Fund Organisation (EPFO) to allow employers to voluntarily enrol eligible employees who were not covered under the EPF between 1 July 2017 and 31 October 2025.

Organisation Involved: Implemented by the Employees' Provident Fund Organisation (EPFO) under the Ministry of Labour and Employment.

Aim:

- To extend social security coverage to all eligible employees under the EPF Act, 1952.
- To encourage voluntary compliance by employers and improve trust between businesses and regulators.
- To promote formalisation of the workforce and ensure financial protection for unregistered employees.

Features:

- **Operational period:** Six months from **1 November 2025 to 30 April 2026**.
- Employers can enrol workers employed between **July 2017–October 2025** who were left out of EPF coverage.
- **Waiver of employee's contribution** if it was not deducted earlier.
- Only **employer's share of contribution** and a **nominal ₹100 penalty** required for compliance.
- Applicable even to establishments under inquiry under **Section 7A** or **Paragraph 26B** of the EPF Act.
- EPFO will not take **suo motu action** for past omissions once voluntary compliance is made.

Significance:

- Expands EPF coverage and strengthens the social security net for millions of workers.
- Encourages ease of doing business by reducing compliance burden and penalties.
- Promotes labour formalisation and aligns with the government's goal of universal social protection.

AGRICULTURE

Agri-marketing

APEDA FACILITATES FIRST EXPORT OF FORTIFIED RICE KERNEL

Context: The Agricultural and Processed Food Products Export Development Authority (APEDA) facilitated the first-ever export of 12 metric tonnes of Fortified Rice Kernel (FRK) from Chhattisgarh to Costa Rica.

About APEDA Facilitates First Export of Fortified Rice Kernel:

What it is?

- Fortified Rice Kernel (FRK) is a **nutritionally enhanced form of rice**, made by blending rice flour with micronutrients like **iron, folic acid, and vitamin B12**, which are then extruded and reshaped to resemble natural rice grains.

Features:

- **Micronutrient Enrichment:** Each kernel provides essential vitamins and minerals vital for combating anaemia and malnutrition.
- **Blending Ratio:** Mixed with regular rice (usually 1:100) to ensure uniform nutrient distribution in the staple.
- **Technological Innovation:** Uses **extrusion technology**, showcasing India's advancement in food fortification.
- **Global Standards Compliance:** Meets **international food safety and fortification norms** for export markets.

About APEDA:

What it is?

- The Agricultural and Processed Food Products Export Development Authority (APEDA) is a statutory body under the Ministry of Commerce and Industry, responsible for promoting and developing the export of agricultural and processed food products.

Established in:

- Formed under the **Agricultural and Processed Food Products Export Development Authority Act, 1985 (Act 2 of 1986)** and operational from **13 February 1986**, replacing the Processed Food Export Promotion Council (PFEPC).

Aim: To promote export-oriented production, enhance quality standards, and diversify India's agri-export base through financial assistance, quality regulation, and market linkage.

Key Functions:

- **Development and Support:** Provide financial and technical assistance for industries related to scheduled export products.
- **Exporter Registration:** Register exporters and monitor quality standards for exports.
- **Quality Control & Inspection:** Oversee meat and processed food inspections to ensure global compliance.
- **Packaging & Marketing:** Improve packaging, branding, and global market access for Indian products.
- **Data and Training:** Collect export statistics, publish trade data, and conduct training in agri-export management.
- **Promotion of Value Addition:** Encourage **fortification, organic certification, and GI-based exports** for higher global competitiveness.

Agri-practices and New Technologies

PUSA DST-1 AND DRR DHAN 100 KAMALA

Context: ICAR has strongly rebutted allegations of bias in the evaluation of two gene-edited rice lines—Pusa DST-1 and DRR Dhan 100 Kamala—under the AICRPR multi-location trials.

About Pusa DST-1 and DRR Dhan 100 Kamala:

What They Are?

- Two gene-edited rice varieties developed as improved versions of popular cultivars MTU1010 and Samba Mahsuri using advanced precision breeding techniques.

Developed By:

- **Pusa DST-1** → Developed by **ICAR–IARI**
- **DRR Dhan 100 Kamala** → Developed by **ICAR–IIRR**

Aim:

- To improve tolerance to salinity and alkalinity stresses (Pusa DST-1).
- To enhance yield, resilience and overall performance under the agro-climatic conditions where Samba Mahsuri is cultivated (DRR Dhan 100 Kamala).

Key Features

- **Pusa DST-1 (Improved MTU1010)**
  - This is a better version of the MTU1010 rice.
  - It can grow well in salty or hard soils where normal rice struggles.
  - It gives more rice per hectare than MTU1010 — about 15% more in alkaline soil and 30% more in coastal salty areas.
  - It is mainly meant for southern states where MTU1010 is usually grown.
- **DRR Dhan 100 Kamala (Improved Samba Mahsuri)**
  - This is a better version of the Samba Mahsuri rice.
  - It gives more rice in both seasons than the original variety.
  - In one season, it gave about 9% more, and in the next, it gave about 22% more than Samba Mahsuri.
  - It works best in places where Samba Mahsuri is already grown.

Significance:

- Validated through rigorous AICRPR blind-coded trials across ~100 sites over 2–3 years.
- Demonstrates India's first successful gene-edited rice lines evaluated under a national protocol.
- Enhances resilience in regions prone to soil alkalinity, salinity and climate stress.

Crops

ADAM CHINI RICE VARIETY

Context: BHU researchers have successfully revived and improved the traditional aromatic black rice variety Adam Chini using mutagenesis, making it shorter, faster-maturing, and higher-yielding without losing its signature aroma.

About Adam Chini Rice Variety:

What it is?

- Adam Chini (also called *Adamchini Chawal*) is a traditional, short-grained, aromatic black rice variety from Eastern Uttar Pradesh, known for its sugar crystal–like grains, strong fragrance, and superior cooking quality.

Region Grown In: Primarily cultivated in Chandauli, Varanasi, Mirzapur, and Sonbhadra districts—forming part of the Vindhya foothill agro-ecosystem.

GI Tag:

- Received Geographical Indication (GI) status on **22 February 2023** (valid till November 2030).
- GI tag proposed by Ishani Agro Producer Company Ltd. and Human Welfare Association of Uttar Pradesh.
- Protects the variety against illegal marketing and ensures premium identity as *Vindhya Black Rice*.

Characteristics:

- Short, scented, bold grains with a strong natural aroma.
- Drought-tolerant and disease-resistant, well-suited to Eastern UP's semi-arid agro-climate.
- Intermediate amylose content—resulting in soft, flavourful cooked rice.
- Traditionally tall (165 cm), long-duration (155 days), and low-yielding (20–23 q/ha).

Improved Features by BHU:

- Height reduced to ~105 cm (mutant-14) and lodging resistance improved.
- Maturity shortened to ~120 days (mutant-19).
- Yield increased to 30–35 q/ha.
- Retains signature aroma and grain quality—often compared as superior even to Basmati.

Significance:

- Enhances farmer income by meeting high export demand from Australia, New Zealand, and niche health-food markets.
- Converts a heritage rice into a commercially viable, climate-resilient crop.
- Strengthens Eastern UP's agro-cultural identity under the GI umbrella.

Schemes and Organizations

DRAFT SEEDS BILL, 2025

Context: The Government of India has released the Draft Seeds Bill, 2025 for public consultation to overhaul India's seed regulation framework.

- It aims to **replace the Seeds Act, 1966 and Seeds (Control) Order, 1983** with a modern, farmer-centric and innovation-driven system.

About Draft Seeds Bill, 2025:

What it is?

- A modern legislation to **regulate seed quality**, protect farmers, and build a **transparent, traceable, and accountable seed ecosystem**, including registration, certification, and QR-based digital tracking.

Background / Need:

- Existing laws (Seeds Act, 1966; Seeds Control Order, 1983) became outdated amid rising hybrids, GM traits, private R&D and global trade.
- Earlier reform attempts (like the 2004 Seeds Bill) stalled.
- The 2025 Draft Bill introduces **digital traceability**, **farmers' rights**, **graded penalties**, and **ease of doing business**.

Aim:

- Ensure high-quality seeds with clear germination, purity and health standards.
- Protect farmers from spurious, misbranded or sub-standard seeds.

- Strengthen transparency through a central Seed Traceability Portal and QR codes.
- Promote private R&D and reduce compliance burden with decriminalised minor offences

Key Features of the Draft Seeds Bill, 2025:

1. Mandatory Registration of Seed Varieties:

- No seed can be sold for sowing unless it is **registered** based on Value for Cultivation and Use (VCU) trials.
- Varieties notified under the **1966 Act are deemed registered**, and existing cultivated varieties get **provisional registration** for 3 years.
- Registration may be suspended or revoked if performance is poor or safety concerns arise.

2. Farmers' Rights Protected:

- Farmers retain the right to **save, use, re-sow, exchange and sell** farm-saved seeds **except under a brand name**.
- They are **exempt from penalties** for selling their own farm seeds.

3. Strong Quality Regulation & Standards:

- Central Government will notify **minimum standards** for germination, purity, traits, and seed health.
- Mandatory **labelling + QR codes** for traceability.
- Misbranded, spurious or sub-standard seeds prohibited.

4. Mandatory Registration Across the Seed Chain:

- **Seed producers**, **seed processing units**, **dealers**, **distributors**, and **plant nurseries** must be registered with State Governments.
- A **Central Accreditation System** allows multi-state companies to be "deemed registered".

5. Certification & Testing Ecosystem Strengthened:

- Creation and recognition of **Seed Certification Agencies** (state or accredited).
- Central & State **Seed Testing Laboratories** established with defined standards.
- Seed Inspectors and Analysts get clear powers for sampling, search, and seizure.

6. Liberalised but Regulated Seed Imports:

- Imports must comply with quarantine regulations and Indian Minimum Seed Certification Standards.
- Unregistered varieties may be imported for **research and trials** with approval.

7. Digital Seed Traceability (SATHI Portal):

- Mandatory onboarding of all producers, dealers, research bodies.
- Ensures end-to-end tracking, transparency, and minimisation of fraud.

8. Graded Penalty System (Decriminalisation + Strict Action)

- **Trivial offences**: warnings + small penalties.
- **Minor offences**: penalties up to ₹2 lakh.
- **Major offences**: penalties up to ₹30 lakh, cancellation of registration, and even **imprisonment** in extreme cases.
- Farmers are exempt from penalties for selling farm-saved seeds.

9. Price Regulation in Emergencies:

- Central Government may fix prices during scarcity, monopolistic pricing, or profiteering situations.

Miscellaneous

NATIONAL GOPAL RATNA AWARDS 2025

Context: The Government of India has announced the National Gopal Ratna Awards 2025, one of the highest honours in the livestock and dairy sector.

About National Gopal Ratna Awards 2025:

What it is?

- A prestigious national award recognising outstanding contributions in the livestock and dairy sector, especially those promoting indigenous cattle and scientific dairying.

Launched in: Established in 2021 under the broader framework of the Rashtriya Gokul Mission (RGM), which itself was launched in December 2014.

Organisation Involved: Conferred by the Department of Animal Husbandry & Dairying, Ministry of Fisheries, Animal Husbandry and Dairying (MoFAHD), Government

of India.

Aim:

- To encourage excellence in dairy farming, indigenous cattle conservation, cooperative dairy development, and scientific breeding services.
- To motivate stakeholders to enhance productivity and improve indigenous breeds.

Features:

- Awards given in **three categories**:
  1. Best Dairy Farmer (Indigenous breeds)
  2. Best Artificial Insemination Technician (AIT)
  3. Best Dairy Cooperative/FPO/MPC
- **Cash prizes:**
  1. ₹5 lakh (1st), ₹3 lakh (2nd), ₹2 lakh (3rd).
  2. Special ₹2 lakh award for NER/Himalayan States.
- AIT category includes **certificate & memento only**.
- Recognises farmers, cooperatives, and technicians using scientific and ethical dairy practices.

Significance:

- Boosts morale of dairy farmers and enhances India's indigenous cattle productivity.
- Strengthens rural livelihoods and contributes to India's dairy self-reliance.
- Supports national priorities like milk quality improvement, breed conservation, and doubling farmer income.

THE RULES FOR SUSTAINABLE HARNESSING OF FISHERIES IN THE EEZ

Context: The Union Government has notified the Rules for Sustainable Harnessing of Fisheries in the Exclusive Economic Zone (EEZ), aimed at empowering fishermen cooperatives and ensuring sustainable, technology-driven deep-sea fishing operations.

About the Rules for Sustainable Harnessing of Fisheries in the EEZ:

What it is?

- A comprehensive regulatory framework for sustainable and inclusive deep-sea fishing within India's Exclusive Economic Zone (EEZ), promoting responsible resource utilisation, digital transparency, and community-led governance in line with India's Blue Economy vision.

Ministry: Formulated and implemented by the Ministry of Fisheries, Animal Husbandry & Dairying, Government of India.

Aim: To unlock the untapped potential of India's vast EEZ, strengthen the livelihoods of small-scale fishers, enhance seafood exports, and ensure ecological sustainability through traceability, value addition, and responsible fishing practices.

Key Features:

1. **Empowering Cooperatives:** Gives priority to Fishermen Cooperative Societies and Fish Farmer Producer Organisations (FFPOs) for managing modern vessels and deep-sea operations.
2. **Mother-and-Child Vessel Concept:** Introduces mid-sea transshipment under RBI monitoring, particularly benefiting Andaman & Nicobar and Lakshadweep Islands, which account for 49% of India's EEZ.
3. **Digital Access Pass System:** Mechanized vessels must obtain a free Access Pass via the ReALCRaft portal, ensuring transparent, paperless operations; traditional crafts are exempt.
4. **Integration and Traceability:** ReALCRaft linked with MPEDA and Export Inspection Council for catch and health certification, enabling eco-labelling and traceable seafood exports.
5. **Capacity Building:** Training, international exposure visits, and access to affordable credit via PM Matsya Sampada Yojana (PMMSY) and

FIDF to strengthen fishers' skills and market access.

6. **Ban on Harmful Practices:** Prohibits LED fishing, pair trawling, and bull trawling; sets minimum legal fish size and develops Fisheries Management Plans for biodiversity conservation.
7. **Mariculture Promotion:** Encourages sea-cage farming and seaweed cultivation to reduce nearshore fishing pressure and diversify livelihoods.
8. **Safety and Coastal Security:** Mandates transponders, Aadhaar/QR-coded Fisher ID cards, and integration with NABHMITRA navigation app for real-time monitoring and safety.
9. **National Action on IUU Fishing:** Framework to deter Illegal, Unreported, and Unregulated (IUU) fishing within Indian waters.
10. **Regulatory Reforms:** Recognises EEZ-origin fish as Indian-origin resources under customs and revenue norms, ensuring national accounting of exports.

ICA WORLD COOPERATIVE MONITOR 2025

Context: The Gujarat Cooperative Milk Marketing Federation (GCMMF), which markets dairy products under the Amul brand, has been ranked No. 1 cooperative in the world in the ICA World Cooperative Monitor 2025, based on GDP per capita performance.

Rankings by Turnover over GDP per Capita. TURNOVER/GDP PER CAPITA: TOP 10

Rank 2023	Organisation	Country	Economic Activity	Type	Turnover/GDP per capita 2023	Number of Employees 2023	FTE or Headcount
1	Gujarat Cooperative Milk Marketing Federation Ltd (AMUL)	India		Producer	2,899,260	1,600	Headcount
2	IFFCO	India		Producer	2,555,994	4,454	Headcount
3	Groupe Crédit Agricole	France		Consumer/ User	2,403,513	145,000	Headcount
4	Sistema Unimed	Brazil		Worker	1,898,376	146,761	Headcount
5	Groupe BPCE	France		Consumer/ User	1,853,431	97,835	FTE

About ICA World Cooperative Monitor 2025:

What it is?

- The **World Cooperative Monitor (WCM)** is an **annual research report** that analyses the **economic and social impact of the world's largest cooperatives and mutuals**, highlighting their contributions to inclusive and sustainable development across sectors.

Published by: Jointly published by the **International Cooperative Alliance (ICA)**, headquartered in **Brussels**, in partnership with the **European Research Institute on Cooperative and Social Enterprises (EURICSE)**.

First Edition: Launched in **2012**, the Monitor has been compiled annually since then, providing a decade-long comparative dataset on cooperative performance worldwide.

Aim:

- To measure the economic and social footprint of cooperatives globally.
- To demonstrate the cooperative model's contribution to the UN Sustainable Development Goals (SDGs).
- To promote transparency, data reliability, and international benchmarking in the cooperative sector.

Key Features:

- **Top 300 Cooperative Ranking:** Lists the world's 300 largest cooperatives based on turnover and GDP per capita ratios.
- **Sectoral Analysis:** Covers sectors such as **agriculture, insurance, retail, industry, and health**.
- **Global Reach:** Represents cooperatives from more than **50 countries**, showing their socioeconomic impact.
- **SDG Alignment:** Tracks cooperatives' contributions to **poverty reduction, gender equality, and sustainable communities**.
- **Research Integrity:** Recognized by the **UN General Assembly** as an authentic global reference for cooperative impact.

Top Ranking (2025):

1. **Gujarat Cooperative Milk Marketing Federation Ltd (Amul)** — Rank 1 globally.
2. **Indian Farmers Fertiliser Cooperative Ltd (IFFCO)** — Rank 2 globally.
→ Both Indian cooperatives reflect the **success of the "Sahkar Se Samriddhi"** (Prosperity through Cooperation) vision under **PM Modi's cooperative reforms**.

Biodiversity

SC PANEL SUGGESTS CREATION OF A GOA TIGER RESERVE

Source: TH

Context: A Supreme Court–appointed Central Empowered Committee (CEC) has recommended creating a tiger reserve in Goa, but in phases, to reduce impact on local communities.

About SC Panel Suggests Creation of a Goa Tiger Reserve:

What It Is?

- A proposal by the Supreme Court's Central Empowered Committee (CEC) to declare a Goa Tiger Reserve in a phased, community-sensitive manner, starting with areas that have very low human presence and strong ecological connectivity.

The Issue:

- The Bombay High Court (Goa bench) ordered the State in 2023 to notify a tiger reserve.
- The Goa government objected, arguing that tigers seen in Goa were only **"transient"**, not resident.
- The Supreme Court referred the matter to the CEC for an independent assessment.

Wildlife Sanctuaries & National Parks Involved:

- **To be included in Phase 1:**
  - Netravali Wildlife Sanctuary – Core Area
  - Cotigao Wildlife Sanctuary – Core Area
  - Bhagwan Mahavir National Park – Buffer Area
  - Northern part of Bhagwan Mahavir Wildlife Sanctuary – Buffer Area
- **Considered for Phase 2 (later):**
  - Mhadei Wildlife Sanctuary

Why a Tiger Reserve Is Needed in Goa?

- These Goa forests are **directly connected** to the **Kali Tiger Reserve (Karnataka)**, which has a strong, breeding tiger population.
- Connectivity allows **natural movement**, **genetic flow**, and recovery of tiger numbers in Goa.
- The region forms part of the **Western Ghats**, a global biodiversity hotspot.
- Tiger presence (though low) is **scientifically documented**, and protection is needed to maintain the landscape corridor

Significance of the Proposed Goa Tiger Reserve:

- **Landscape-level conservation:** Combined with Kali Tiger Reserve, it creates a 1,814 sq. km protected tiger landscape.
- **Minimal displacement:** Phase 1 focuses on areas with **very few households**, reducing conflict and community stress.
- **Tiger recovery:** Ensures safe corridors for tigers moving between Karnataka and Goa.

THE ROWMARI-DONDUWA WETLAND COMPLEX

Context: Experts, researchers, and forest officials have joined forces to seek Ramsar site status for the Rowmari–Donduwa wetland complex in Assam's Laokhowa Wildlife Sanctuary, after it recorded higher bird diversity than existing Ramsar sites in Northeast India.

About The Rowmari-Donduwa Wetland Complex:

What it is?

- The Rowmari–Donduwa wetland complex is an interconnected floodplain–marsh ecosystem located within the Laokhowa Wildlife Sanctuary (70.13 sq. km), which forms part of the Kaziranga Tiger Reserve in Nagaon district, central Assam.
- It serves as a crucial ecological and migratory corridor between the Kaziranga and Orang National Parks.

Location: Situated in the heart of Assam, the wetlands are embedded within the **Kaziranga–Orang landscape**, bordered by the **Laokhowa and Burhachapori Wildlife Sanctuaries**, both functioning as **buffer zones** of the Kaziranga Tiger Reserve.

Key Features:

1. **Area:** Covers around **2.5–3 sq. km** of interconnected floodplain–marsh terrain.
2. **Biodiversity Hotspot:** Hosts over **120 species of resident and migratory birds**, surpassing counts at Deepor Beel and Loktak Lake.
3. **Bird Census 2025:** Recorded **47,000+ birds**, including 20,653 at Rowmari Beel and 26,480 at Donduwa Beel.
4. **Ramsar Criteria:** Meets **8 of the 9 Ramsar criteria**, making it eligible for international wetland recognition.
5. **Ecological Role:** Acts as a **habitat, breeding, and feeding ground** for migratory and threatened avian species.

Flora:

- Dominated by **floodplain vegetation**, **aquatic grasses**, and **marshland reeds**, providing cover and nesting sites.
- Presence of **hydrophytes and sedges**, essential for wetland nutrient cycling and maintaining water quality.

Fauna:

- **Avian Diversity:** Includes globally threatened species such as the **Knob-billed Duck, Black-necked Stork, and Ferruginous Pochard**.
- **Other Wildlife:** Supports **fish, amphibians, otters, reptiles**, and serves as a feeding zone for animals migrating from Kaziranga and Orang.
- **Migratory Birds:** Hosts winter visitors from Central Asia and Siberia, forming part of the Central Asian Flyway.

Significance:

- **Biodiversity Conservation:** A critical site for waterbird and wetland ecosystem preservation in Assam's Brahmaputra floodplains.
- **Ecological Connectivity:** Strengthens wildlife corridors within the Kaziranga-Orang landscape.
- **Climate Resilience:** Acts as a natural flood buffer and carbon sink, supporting hydrological balance.

MARINE FISHERIES CENSUS 2025

Context: The Government of India has launched the Marine Fisheries Census (MFC) 2025, marking the country's first fully digital and geo-referenced fisheries census, powered by VYAS mobile applications developed by ICAR–CMFRI.

About Marine Fisheries Census 2025:

What it is?

- The **Marine Fisheries Census 2025** is a **nationwide digital enumeration** of India's marine fishing communities, designed to gather socio-economic and infrastructural data for informed policy planning.

Conducted by: The census is fully funded by the Department of Fisheries, Government of India, and implemented by the ICAR–Central Marine Fisheries Research Institute (CMFRI) with operational support from the Fishery Survey of India (FSI).

Aim: To establish a real-time, evidence-based database on marine fisher households, infrastructure, and socio-economic indicators to strengthen sustainable fisheries management and welfare delivery.

Key Features:

- **Fully Digital Process:** First-ever paperless, geo-referenced enumeration replacing traditional manual surveys.

- **Comprehensive Coverage:** Targets 1.2 million fisher households in 5,000 marine fishing villages across 13 coastal States and UTs.
- **Socio-Economic Insights:** Captures data on income, debt, insurance, and welfare scheme coverage including PMMSY and PM-MKSSY.
- **Drone-Based Support:** Incorporates aerial enumeration of fishing crafts using drones for accuracy and transparency.

About VYAS Apps Suite:

What it is?

- The **VYAS (Vessel and Yield Assessment System)** app ecosystem is a **set of digital tools** enabling end-to-end data collection, validation, and monitoring of the Marine Fisheries Census 2025.

Developed by: The apps were created by the **ICAR–CMFRI** as part of the digital modernisation of India's marine fisheries enumeration process.

Aim: To ensure **real-time, error-free, and transparent census operations**, improving data quality and coordination among field teams, supervisors, and policymakers.

Key Features:

- **Three Dedicated Apps:**
  - **VYAS–NAV:** For validation of **fishing villages and harbours**.
  - **VYAS–BHARAT:** For **household and infrastructure enumeration**.
  - **VYAS–SUTRA:** For **real-time supervision and monitoring** via dashboards.
- **Geo-Referenced Data:** Enables GPS-tagged entries for precise spatial mapping.
- **Multilingual Interface:** Supports multiple Indian languages for inclusive participation.
- **Real-Time Dashboards:** Provides live progress tracking and analytics for administrators.
- **Enhanced Transparency:** Ensures data accuracy and accountability through digital verification and cloud storage.

Species In News

AFRICAN GREY PARROT

Context:

RTI responses from 19 States/UTs revealed that no Forest Department has records of registered breeders or authorised pet shops dealing in African grey parrots despite their easy availability in Indian markets.

About African Grey Parrot:

- **What it is?**
  - The African grey parrot (*Psittacus erithacus*) is a **medium-sized, highly intelligent parrot** considered the best mimic among all bird species, often called the "Einstein of the bird world."
- **Habitat & Natural Range:** Native to West and Central Africa, it inhabits savannas, mangroves, woodland edges, and forest clearings, with two subspecies—Congo African Grey (CAG) and Timneh African Grey (TAG).
- **IUCN Status:** Classified as **Endangered** by the IUCN due to habitat loss and heavy capture for international pet trade.
- **Key Characteristics:**
  - Exceptional talking and comprehension ability; large vocabulary and contextual speech.
  - Distinctive grey plumage, intelligent orange eyes, and a bright red (CAG) or maroon tail (TAG).
  - Highly sensitive, social, and prone to stress-related behaviours (feather plucking, anxiety).
  - Require enriched environments, cognitive toys, high-nutrition diets (beta-carotene, vitamin D).
- **Significance:**
  - Among the world's most trafficked parrots due to high demand in the exotic pet trade.
  - Ecologically important seed dispersers in African ecosystems.
  - Serves as a flagship species for global wildlife protection under CITES

(Appendix I).

Status of African Grey Parrot in India:

- Although protected by CITES Appendix I (requiring strict import permits), **India's domestic market freely sells the species**, indicating widespread illegal and unreported trade.
- RTI findings show **no State has a proper registry**, breeder list, or authorised pet shops—indicating a complete data vacuum.
- Despite Tamil Nadu claiming zero authorised breeders, it is a **major hub for exotic bird trade**, along with Kerala and Karnataka.

DUGONG

Context: A new global report released at the IUCN Conservation Congress in Abu Dhabi has warned that India's dugong (sea cow) populations in the Gulf of Kutch, Gulf of Mannar–Palk Bay, and Andaman & Nicobar Islands.

About Dugong:

What it is?

- Dugong (Dugong dugon) is a **large herbivorous marine mammal**, closely related to manatees and more distantly to elephants.
- They are slow-moving, gentle sea-grazers that inspired ancient myths of mermaids due to their appearance and behaviour.

Habitat (Indian & Global):

- Found in **warm, shallow coastal waters** of the **Indian and Pacific Oceans**.
- **Major Indian habitats:** Gulf of Mannar–Palk Bay (TN), Andaman & Nicobar Islands, and Gulf of Kutch (Gujarat).
- Globally distributed from **East Africa to Australia**, with the largest stable population near **northwestern Australia**.

Conservation Status:

- **IUCN Red List:** Vulnerable (declining populations since 1982).
- **Wild Life (Protection) Act, 1972 (India): Schedule I** – highest level of legal protection.

Key Features of Dugongs:

- **Grow up to 3 m long and weigh 300–420 kg:** Dugongs are large, streamlined marine mammals whose considerable size supports slow movement and constant grazing in shallow coastal waters.
- **Have a whale-like tail fluke and paddle-shaped flippers:** Their tail fluke enables gentle, rhythmic swimming, while broad flippers help in manoeuvring through seagrass meadows where they forage.
- **Exclusively herbivorous, feeding mainly on seagrass meadows:** Dugongs rely entirely on seagrass for nutrition, making them one of the few strictly plant-eating marine mammals and tightly linking them to coastal ecosystems.
- **Consume 30–40 kg of seagrass daily, acting as "ecosystem engineers":** Their heavy grazing naturally trims seagrass beds, preventing overgrowth and encouraging healthy regrowth, which sustains diverse marine life.
- **Seagrass habitats maintained by dugongs are excellent blue carbon sinks:** By promoting seagrass productivity and turnover, dugongs indirectly support the storage of large amounts of carbon in sediments, aiding climate regulation.
- **Long lifespan (up to 70 years) but very low reproductive rate:** Female dugongs give birth only once every 3–7 years, making population recovery slow and increasing vulnerability to environmental and human pressures.

Major Threats to Dugongs:

- **Habitat Loss & Seagrass Degradation:** Coastal pollution, sedimentation, turbidity, dredging, and port development destroy seagrass meadows—the dugong's only food.
- **Fisheries Bycatch:** Accidental entanglement in fishing nets is the biggest killer across Tamil Nadu, A&N Islands, and Gujarat.
- **Marine Pollution & Heavy Metals:** A recent study detected arsenic, cadmium, chromium, mercury & lead in dugong tissues, entering through wastewater discharge and agricultural runoff.

BLACKBUCK

Context:

Thirty-one blackbucks died from a bacterial infection at Karnataka's Kittur Rani Chennamma Zoo in Belagavi, prompting a high-level probe ordered by the state Forest Minister.

About Blackbuck:

- **What it is?**
  - The blackbuck (*Antilope cervicapra*) is a diurnal, grassland antelope native to the Indian subcontinent, known for its distinct sexual dimorphism and spiralled horns.
- **Habitat:** Prefers open short grasslands, semi-desert areas, and agricultural margins; avoids dense forests.
- **IUCN Status:** Least Concern (global), but protected in India under Schedule I of the Wildlife (Protection) Act, 1972.
- **Key Characteristics of the Blackbuck:**
  - **Distinctive Horns:** Only mature males possess long (50-71 cm), spirally twisted, ringed horns that form a wide «V» shape.
  - **Pronounced Sexual Dimorphism:** Adult males have a striking dark brown-to-black coat with a white underside and eye rings, while females and young males are predominantly fawn or light brown.
  - **Speed and Agility:** Renowned as one of the fastest land animals in India, it can reach speeds of up to 80 km/h to evade predators.
  - **Social Structure:** Exhibits a flexible herd system, typically forming three group types: female herds with young, bachelor male herds, and territorial males who defend small, exclusive territories.
  - **Scent Marking:** Territorial males mark their domain using preorbital gland secretions (deposited on grass and twigs) and dung middens.
- **Cause of Death in This Case:** Bacterial infection (exact pathogen under investigation), leading to rapid mortality in a closed zoo environment.

About Kittur Rani Chennamma Zoo:

- **What it is?**
  - A mini zoo and natural retreat, also known as *Bhutaramanahatti Zoo*, dedicated to wildlife conservation and public education.
- **Location:** Situated in **Belagavi, Karnataka**, approximately 12 km from the city centre along National Highway-4.
- **Key Features:**
  - Established in **1989** and spans an area of **31.68 hectares**.
  - Houses a variety of animal species in naturalistic, well-maintained enclosures.
  - Focuses on **conservation of regional biodiversity** and promoting environmental awareness.
  - Serves as an educational and recreational destination for families, students, and nature enthusiasts.

THE GREAT INDIAN BUSTARD

Context: The Great Indian Bustard (GIB) returned to spotlight after Supreme Court Justice P.S. Narasimha observed that Western-origin environmental doctrines like "inter-generational equity" are inadequate to save critically endangered species.

About the Great Indian Bustard:

What it is?

- The Great Indian Bustard (GIB) is one of the heaviest flying birds in the world, endemic to the Indian subcontinent.
- Once widespread across India and Pakistan, it now survives in small pockets—mainly the Thar Desert (Rajasthan) and parts of Gujarat, Maharashtra, and Karnataka.

Habitat: Prefers **arid and semi-arid grasslands** with sparse vegetation, often sharing its habitat with blackbucks and chinkaras. It nests on **open, undisturbed plains**, making it highly vulnerable to human activities.

Conservation Status:

- **IUCN Red List:** Critically Endangered
- **Wildlife (Protection) Act, 1972:** Schedule I
- **CITES:** Appendix I
- **CMS Convention:** Appendix I
- Part of the **Integrated Development of Wildlife Habitats (IDWH)** species recovery programme

Physical Characteristics:

- Height: ~1 metre; Weight: 15–18 kg
- **Distinctive black crown**, white neck and underparts, and brown wings with grey and black markings
- **Males** have a prominent black breast band and a **gular pouch** that produces a booming mating call audible up to 500 m
- **Diet:** Omnivorous — feeds on grass seeds, insects, small reptiles, and rodents

About Intergenerational Equity:

- **What it is?**
  - The principle of intergenerational equity holds that each generation acts as a trustee of the Earth, enjoying its resources while ensuring they are passed on to future generations in no worse condition.
  - It forms the ethical and legal foundation of sustainable development.
- **Core Principles:**
  - **Trusteeship:** Every generation must protect and preserve the planet as a shared trust.
  - **Conservation of Options:** Maintain resource diversity so future generations have comparable choices.
  - **Conservation of Quality:** Preserve environmental quality—air, water, soil, biodiversity—for future resilience.
  - **Conservation of Access:** Use resources equitably today without denying fair access to tomorrow's users.

HIMALAYAN BLACK BEAR

Context: Himalayan black bears in Uttarakhand are turning unusually aggressive as erratic weather and delayed winter, linked to climate change, have disrupted their natural hibernation cycle—leading to a spike in human-wildlife conflict incidents.

About Himalayan Black Bear:

What it is?

- A subspecies of the Asiatic black bear, the **Himalayan black bear** is an omnivorous mammal found in the Himalayan ranges, known for the distinct **crescent- or V-shaped white patch** on its chest.
- It plays a vital role in forest ecology through **seed dispersal and soil turnover**.

Habitat:

- Inhabits **broadleaf and coniferous forests** between **1,200–3,300 m** across the Himalayas — from **Jammu & Kashmir to Arunachal Pradesh** — and occasionally descends to agricultural areas in search of food.
- The **Great Himalayan National Park (GHNP)** offers a key refuge.

IUCN and Legal Status:

- **IUCN Red List:** Vulnerable
- **Wildlife (Protection) Act, 1972:** Schedule I (Highest Protection)
- **CITES:** Appendix I

Distinctive Characteristics:

- Glossy black coat, tan-brown muzzle, and **powder-puff ears.**
- Males weigh up to **180–250 kg**, females **35–170 kg.**
- **Arboreal and nocturnal**, skilled climbers and swimmers.
- Enters **winter torpor/hibernation** in colder months — now disrupted due to climate change.

Ecological Significance:

- Acts as a **keystone species**, maintaining forest regeneration through **seed dispersal.**
- Controls pest populations and contributes to **nutrient cycling.**
- Indicator of **ecosystem health and climate balance** in Himalayan biomes.

Conservation Concern:

Climate variability, habitat loss, decline in fruit-bearing vegetation, and increased human encroachment are pushing the species toward greater conflict and vulnerability

Environmental Pollution

AIR QUALITY MONITORING

Context: The Supreme Court has sought details on the equipment used in Delhi's air-quality monitoring stations and whether these instruments are suitable for the city's extreme meteorological conditions.

About Air Quality Monitoring:

What it is?

- Air Quality Monitoring is the systematic measurement of pollutants in the atmosphere to assess compliance with national air standards, identify health risks, understand pollution sources, and support regulatory actions.
- In India, it is governed by the National Ambient Air Quality Standards (NAAQS), 2009.

Types of Air-Quality Monitoring Devices:

1. **Continuous Ambient Air Quality Monitoring Stations (CAAQMS):**
   - Automated, temperature-controlled stations used for real-time monitoring.
   - Track eight pollutants: **PM2.5, PM10, NO_2, SO_2, CO, O_3, NH_3, and Pb**.
   - Used extensively in Delhi (40 stations).
2. **Manual Monitoring Stations (e.g., Gravimetric Samplers):**
   - Measure pollutants using manual collection methods, especially for **PM, metals, benzene, and PAHs**.
   - Provide periodic data, not real-time information.
3. **Low-Cost Sensors (LCS):**
   - Compact devices useful for **trend analysis**, public awareness, and dense spatial mapping.
   - Less accurate; require calibration against reference-grade instruments.

How It Works?

- **Particulate Matter (PM2.5 & PM10):**
  - Measured primarily using **Beta Attenuation Monitors (BAM)**:
  - A beta radiation source passes through clean filter tape.
  - Air is drawn; particles accumulate; beta signal decreases.
  - Reduction in signal = pollutant mass concentration.
  - Used widely in Delhi under CPCB guidelines.
- **Sulphur Dioxide (SO_2):** Measured by **UV fluorescence**; SO_2 emits faint fluorescence under UV light.
- **Ozone (O_3):** Measured by **UV photometry**, tracking ozone's absorption of ultraviolet light.
- **Carbon Monoxide (CO):** Measured by **Non-Dispersive Infrared (NDIR) absorption**, based on CO's absorption of IR waves.
- **Nitrogen Oxides (NOx):** Measured by **chemiluminescence**, detecting light produced when NO reacts with ozone.
- **Ammonia (NH_3):** Measured using **optical**

spectroscopy based on its absorption spectrum.

Key Features of Continuous Monitoring Systems:

- **Automated Real-Time Measurement:** Provide minute-to-minute readings essential for AQI calculation and forecasting.
- **Temperature-Controlled, Dust-Proof Cabins:** Ensure instrument stability in diverse environmental conditions.
- **Standardised Protocols:** Operate under CPCB's 2012 guidelines ensuring uniform calibration, sampling, and quality-control procedures.
- **Remote Data Transmission:** Data is relayed to CPCB/SPCB servers and displayed publicly on AQI dashboards.
- **Multi-Pollutant Capability:** Each station tracks eight regulated pollutants simultaneously.

Limitations:

- **High Humidity Interference:** Beta-gauge monitors overestimate PM levels when **relative humidity >60%**, as particles absorb moisture and appear heavier.
- **Calibration & Instrument Drift:** Infrequent calibration leads to **instrument drift**, impacting accuracy of PM and gaseous pollutant readings.
- **Location Constraints:** Stations placed near buildings, trees, or vents face **distorted airflow**, causing skewed readings.
- **Data Availability Gaps:** CPCB requires **16 hours of valid data/day**; many Delhi stations fail due to power outages, equipment failure, and maintenance issues.

GRADED RESPONSE ACTION PLAN

Context: The Delhi government has implemented Stage III of the Graded Response Action Plan (GRAP-III) as the city's Air Quality Index (AQI) breached 400, entering the 'severe' category for the first time this season.

About Graded Response Action Plan:

What it is?

- The Graded Response Action Plan (GRAP) is a dynamic pollution control framework designed to combat deteriorating air quality in the National Capital Region (NCR) through stage-wise preventive and corrective actions based on AQI levels.

Organisation Involved: Implemented by the **Commission for Air Quality Management (CAQM)** in coordination with the Central Pollution Control Board (CPCB), Delhi Government, and state pollution control boards of NCR states.

Established in: 2017, following the directions of the **Supreme Court of India**, based on recommendations by the Environment Pollution (Prevention and Control) Authority (EPCA).

Aim:

- To reduce air pollution in Delhi-NCR through timely, coordinated, and graded interventions, thereby safeguarding public health and ensuring compliance with the National Clean Air Programme (NCAP) objectives.

Key Features:

- **Four-stage response system** linked to air quality levels:
  - **Stage I:** Poor (201–300)
  - **Stage II:** Very Poor (301–400)
  - **Stage III:** Severe (401–450)
  - **Stage IV:** Severe+ (>450)
- **Progressive and cumulative restrictions** — each stage includes measures from previous stages.
- **Actions include:** bans on **construction, demolition, and BS-III petrol/BS-IV diesel vehicles**, closure of **schools (up to Class 5)**, and promotion of work-from-home.
- **Essential services** like metro, railways, sanitation, defence, and healthcare are exempt but must adhere to dust and emission control norms.
- **Real-time monitoring** via CPCB and IMD/ IITM forecasts helps invoke stages in advance.

How it Works?

- The **CAQM Sub-Committee** reviews **daily AQI data and forecasts** to decide when to activate or relax stages.
- When higher AQI levels are expected to persist for **three or more days**, the next GRAP stage is invoked **proactively**.

- Enforcement is carried out jointly by **Delhi Pollution Control Committee (DPCC)**, **NCR state boards**, and **district administrations**, ensuring inter-agency coordination and public compliance.

Climate Change

COP30 DRAFT OUTCOME

Context: The COP30 climate summit in Belém, Brazil, has entered its final hours amid a major global split after the new draft outcome text removed all references to fossil fuels—including the roadmap for a transition away, demanded by over 80 countries.

About COP30 Draft Outcome:

What it is?

- The **COP30 draft outcome text** is the proposed final political declaration prepared by the Brazilian Presidency, summarising the agreed global commitments on climate mitigation, adaptation, finance and implementation under the Paris Agreement.
- It will become the summit's formal "cover decision" only if adopted by consensus.

Key Outcomes as feature:

- **No mention of "fossil fuels" or phase-out roadmap:** The revised draft removes all language on transitioning away from coal, oil and gas—a reversal from earlier drafts and from the COP28 Global Stocktake commitment to shift away from fossil fuels.
- **No timeline or milestones for fossil-fuel transition:** Despite support from 80+ countries, the draft avoids setting deadlines or mechanisms for an orderly fossil-fuel phase-down or phase-out.
- **Push for climate finance enhancement:** Calls for **tripling climate finance** **by 2030** relative to 2025 levels, but does not specify who must pay or how the target will be met.
- **References to adaptation and NCQG discussions:** Mentions progress on adaptation, including a high-level ministerial roundtable on the **New Collective Quantified Goal (NCQG)**—the new climate finance target to replace the old $100-billion goal.
- **Avoidance of politically sensitive commitments:** Draft avoids strong language on trade barriers, just transition measures, and emissions reduction pathways—reflecting pressure from major fossil-fuel producers and large developing economies.

Significance:

- **Triggers a major diplomatic standoff:** 29 nations formally threatened to block the draft, marking one of the sharpest divisions in COP history.
- **Seen as a rollback from COP28 Dubai:** COP28's historic agreement to "transition away from fossil fuels" risks being undermined if COP30 does not reaffirm or build on it.
- **Raises questions on credibility of global climate process:** Environmental groups warn that passing a weak, fossil-fuel-free text would signal a breakdown of climate multilateralism.

INTEGRATED FORUM ON CLIMATE CHANGE AND TRADE (IFCCT)

Context: The COP30 Presidency has formally launched the Integrated Forum on Climate Change and Trade (IFCCT), creating the first permanent global platform dedicated to navigating rising tensions between trade policies and climate action.

About Integrated Forum on Climate Change and Trade (IFCCT):

What it is?

- A politically supported, non-negotiating global platform designed to facilitate structured dialogue on the complex, rapidly evolving intersection of climate policies and international trade.

Launched In: Formally launched at **COP30**, Belém (Brazil), on **15 November 2025**.

Aim:

- To create a sustained, inclusive space where countries can debate, coordinate, and address frictions arising from climate-linked trade measures—such as carbon border adjustments, supply-chain disruptions, subsidies, and industrial policy—without the pressure of formal negotiations.

Key Features:

- **Non-negotiating dialogue platform:** Allows candid discussions without binding commitments.
- **Open-ended consultation process (2025–26):** Countries can shape agenda, jurisdiction, and priority themes.
- **Focus on climate–trade coherence:** Addresses unilateral climate trade measures, decarbonisation pathways, and developing-country concerns.
- **High-level, politically supported engagement:** Participation from ministers, WTO leadership, climate experts, and industry bodies.
- **Geneva-based consultation:** Integrates climate-trade debate within the global trade governance ecosystem.

Significance:

- **Bridges a major policy gap:** Trade measures like EU's CBAM, green subsidies, and industrial policies increasingly affect climate commitments.
- **Supports developing countries:** Helps them understand, adapt to, and influence fast-evolving climate-related trade rules.
- **Reduces global trade friction:** Creates "interoperability" and predictability amid proliferating unilateral measures.

ARISE PROGRAM

Context: At the COP30 Climate Summit in Belém, Brazil, the Climate Investment Funds (CIF) launched a new program — ARISE (Accelerating Resilience Investments and Innovations for Sustainable Economies) — with initial funding of $100 million from Germany and Spain

About ARISE Program:

- **What it is?**
  - ARISE is the next-generation resilience program launched under the Climate Investment Funds (CIF) to help developing countries strengthen their economic and institutional resilience against climate shocks and transform climate risks into opportunities for sustainable growth.
- **Launched by:** Climate Investment Funds (CIF) — a multilateral climate finance mechanism housed within the World Bank.
- **Aim:** To mainstream climate resilience into national economic planning, mobilize catalytic finance for adaptation, and empower communities and institutions to withstand and recover from compounding climate risks like floods, droughts, and storms.

About Climate Investment Fund (CIF):

- **What it is?**
  - A multilateral climate finance mechanism that provides concessional funding to developing countries to support low-carbon, climate-resilient development.
- **Established in:** 2008, as a collaborative initiative under the World Bank Group.
- **Managed by:** Hosted within the **World Bank**, implemented through six **Multilateral Development Banks (MDBs)** — including the **IFC**, **ADB**, **AfDB**, **EBRD**, and others — ensuring country-led and partnership-based climate action.
- **Aim:** To catalyse transformational climate investments by mobilising public and private finance for clean technology, energy access, resilience, and nature-based solutions in over 70 low and middle-income countries.
- **Key Features:**

- **Two Core Funds:**
  1. **Clean Technology Fund (CTF)** – finances renewable energy, clean transport, and energy efficiency projects.
  2. **Strategic Climate Fund (SCF)** – pilots and scales innovative programs such as the Pilot Program for Climate Resilience (PPCR), Forestry Investment Program, and Smart Cities Program.

Blended Finance Model: Combines concessional CIF funds with MDB and private investments to reduce risks and attract commercial capital

INTEGRITY MATTERS CHECKLIST

Context: The Global Reporting Initiative (GRI) has launched the UN-endorsed "Integrity Matters Checklist", a new tool designed to help companies align their climate disclosures with UN standards for credible net-zero commitment.

About Integrity Matters Checklist:

- **What it is?**
  - An UN-endorsed climate disclosure framework that helps companies and investors transparently report on net-zero targets, transition plans, and greenhouse gas reduction efforts.
- **Developed by:** GRI in partnership with the United Nations, aligning with recommendations of the UN High-Level Expert Group (HLEG) on Net Zero Commitments.
- **Aim:** To operationalise the Integrity Matters report of the HLEG by ensuring corporate climate action is credible, science-based, and transparent, supporting both the Paris Agreement and 2030 Agenda goals.
- **Key Features:**
  - **Alignment with UN guidance** on verifiable net-zero targets and just transition principles.
  - **Integrated with GRI 102: Climate Change 2025 Standard**, enabling consistent and comparable sustainability reporting.
  - Encourages companies to **phase out fossil fuel investments** and adopt **science-based transition pathways**.
  - Provides a **checklist-based reporting tool** to track progress from **pledges to delivery**, enhancing investor and policymaker trust.
  - Endorsed by UN officials as a bridge between **corporate ambition and climate accountability**.

About Global Reporting Initiative (GRI):

- **What it is?**
  - An international independent standards organisation that provides the world's most widely used sustainability reporting framework for businesses, governments, and NGOs.
- **Launched in:** 1997, by Ceres and the Tellus Institute, with support from the UN Environment Programme (UNEP).
- **Aim:** To promote transparency and accountability by helping organisations measure and communicate their environmental, social, and governance (ESG) impacts in a standardized and comparable way.

COP30 - UN CLIMATE SUMMIT 2025

Context: The 30th Conference of the Parties (COP30) to the UNFCCC began in Belém, Brazil, marking the decade since the Paris Agreement and focusing on translating global climate commitments into concrete implementation.

About COP30 - UN Climate Summit 2025:

What it is?

- COP30 is the **annual UN Climate Conference** under the UN Framework Convention on Climate Change (UNFCCC), where nations assess progress on the Paris Agreement, strengthen emission targets, and negotiate finance and adaptation frameworks.

Host: Hosted by Brazil in the Amazonian city of Belém.

Aim:

- To make COP30 an **"Implementation COP"** that turns pledges into measurable outcomes, ensuring fair, inclusive, and equitable climate transitions aligned with the principles of Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC).

Key Initiatives Expected:

1. **Global Stocktake (GST):** First major review since the Paris Agreement to assess global progress and identify gaps in mitigation and adaptation.
2. **New Collective Quantified Goal (NCQG):** To scale climate finance from **$100 billion to $300 billion annually by 2035**, with a roadmap to mobilise **$1.3 trillion per year** from all actors.
3. **Global Goal on Adaptation (GGA):** Establishing quantifiable, measurable targets and funding for climate resilience.
4. **Baku-to-Belém Climate Finance Roadmap:** Framework to operationalise predictable finance for developing nations.
5. **Tropical Forests Forever Facility (TFFF):** Brazil-led blended-finance fund to reward nations conserving tropical forests.
6. **Integration of Climate and Biodiversity Agendas:** Linking carbon reduction with forest, ocean, and soil restoration.

Significance:

- Marks 10 years since the Paris Agreement, focusing on implementation over intent.
- Reinforces equity and justice by spotlighting the Global South's priorities, especially finance, technology, and capacity building.
- Emphasises just transitions in energy, industry, and transport for developing economies.

Indian Laws/Schemes/Acts

NATIONAL GREEN TRIBUNAL (NGT)

Context: The NGT has directed the CPCB, Kerala SPCB and Plantation Corporation of Kerala to trace hundreds of missing barrels of banned pesticide Endosulfan.

National Green Tribunal

About National Green Tribunal (NGT):

What it is?

- A specialised judicial body for speedy disposal of environmental disputes, functioning with expertise in environmental science and law.

Established in: Set up on **18 October 2010** under the **National Green Tribunal Act, 2010** to provide dedicated and time-bound environmental justice.

Aim: To ensure effective environmental protection, conservation of natural resources, and provide relief and compensation for environmental damage.

Jurisdiction:

- Handles civil cases involving substantial environmental questions linked to laws listed in **Schedule I** (e.g., Water Act, Air Act, EPA, Forest Conservation Act, Biodiversity Act).
- The following important Acts are **NOT** within NGT's jurisdiction:
  - **Wildlife Protection Act, 1972**: Wildlife crimes, poaching, sanctuary matters fall outside NGT's powers and go to regular courts.
  - **Indian Forest Act, 1927**: Issues of forest offences, transit rules, and forest land rights are not heard by the NGT.
  - Forest Rights Act, 2006 **(FRA)**: Claims, titles, individual/community forest rights are outside NGT jurisdiction.
- Has **appellate jurisdiction** over decisions relating to environmental clearances, pollution control orders, and biodiversity benefit-sharing disputes.

Governance Structure:

- **Chairperson:** Head of the Tribunal - must be a retired Supreme Court Judge or Chief Justice of a High Court and appointed by the Central Government in consultation with the CJI.
- **Judicial Members:** Retired Judges of SC/HC and handle adjudication of environmental disputes based on legal principles.
- **Expert Members:** Specialists in environmental science, forestry, pollution control, or related fields; ensure interdisciplinary decision-making.

Powers & Functions:

- Can provide **relief, compensation, and restitution** for victims of pollution, environmental damage, and hazardous substance accidents.
- Applies the **polluter pays**, **precautionary**, and **no-fault liability** principles while awarding compensation.
- Not bound by the Civil Procedure Code; guided instead by **principles of natural justice** for faster adjudication.
- Aims to decide cases within **six months**, reducing burden on High Courts and the Supreme Court.
- Can enforce environmental rights, impose penalties, direct restoration work, and monitor compliance with its orders.

A POLICY FRAMEWORK FOR RELOCATION AND CO-EXISTENCE IN INDIA'S TIGER RESERVES

Context: The Ministry of Tribal Affairs has released "A Policy Framework for Relocation and Co-existence in India's Tiger Reserves" to safeguard forest-dwelling tribes' rights under the Forest Rights Act, 2006 during relocation and promote community-inclusive conservation.

About A Policy Framework for Relocation and Co-existence in India's Tiger Reserves:

What it is?

- A national-level policy framework developed by the **Ministry of Tribal Affairs (MoTA)** in 2025 to guide how forest-dwelling Scheduled Tribes and other traditional forest dwellers are to be treated during **relocation from tiger reserves**.
- It seeks to balance tiger conservation with constitutional and legal safeguards for tribal communities.

Organisations Involved:

- **Ministry of Tribal Affairs (MoTA)** – Nodal Ministry drafting the framework.
- **Ministry of Environment, Forests and Climate Change (MoEFCC)** – To collaborate in implementing the framework.
- **National Tiger Conservation Authority (NTCA)** – Existing regulatory authority for tiger reserves whose directives prompted the new framework.

Key Features:

1. **Last-resort Relocation Principle:** Relocation of forest-dwelling communities to be undertaken only as a last option, and strictly after settling rights under the Forest Rights Act (FRA), 2006.
2. **Consent-based Process:** Mandates free, prior, and informed consent from every Gram Sabha and household before declaring any area as part of a tiger reserve.
3. **Co-existence Option:** Recognises the right of communities to continue residing within tiger reserves, exercising FRA rights with State support for basic amenities and co-management roles.
4. **Collaborative Governance:** Proposes a National Framework for Community-Centred Conservation and Relocation, co-led by MoEFCC and MoTA, to set procedural standards, timelines, and accountability.
5. **Transparency and Monitoring:** Establishes a National Database on Conservation–Community Interface (NDCCI) to track relocations, compensation, and post-relocation outcomes.
6. **Independent Audits:** Annual third-party audits of relocation projects to ensure compliance with FRA, Wildlife Protection Act (WPA), 1972, and human rights norms.
7. **Affirmative State Duty:** Reiterates that the State has a constitutional duty to protect FRA rights, which may be curtailed only upon demonstrable ecological necessity.

8. **Joint Ministry Oversight:** Encourages inter-ministerial coordination to ensure relocation is voluntary, rights-compliant, and scientifically justified.

Significance:

- **Protects tribal rights:** Reinforces the constitutional and legal safeguards under FRA, ensuring communities are not displaced without consent or rehabilitation.
- **Balances conservation with justice:** Marks a shift from exclusionary conservation models to community-inclusive, co-management approaches in tiger reserves.
- **Prevents forced relocations:** Responds to protests following NTCA's 2024 directive prioritising village relocations, ensuring ethical and voluntary processes.

International Policies/Efforts

GLOBAL BIG CATS SUMMIT

Context: India announced that it will host the Global Big Cats Summit in New Delhi in 2026, reaffirming global leadership in wildlife conservation.

About Global Big Cats Summit:

- **What it is?**
  - A **high-level international summit** dedicated to strengthening global cooperation, policy coordination, and scientific collaboration for the conservation of big cat species across continents.
- **Host:** India, in New Delhi.
- **Key Features:**
  - Brings together big-cat range countries, global experts, scientists, conservation NGOs, and policy leaders.
  - Focus on tiger recovery models, lion conservation, snow leopard landscapes, cheetah translocation lessons, and global best practices.
  - Strengthens global partnerships to protect big-cat habitats that support carbon sequestration, watershed protection, climate resilience, and sustainable livelihoods.

About International Big Cat Alliance (IBCA):

- **What it is?**
  - A global, multi-country, multi-agency coalition dedicated exclusively to the conservation of the world's seven major big cats — Tiger, Lion, Leopard, Snow Leopard, Cheetah, Jaguar, and Puma.
- **Launched In:** 9 April 2023, during 50 years of Project Tiger celebrations at Mysuru, Karnataka.
- **Headquarters:** India (as approved by Union Cabinet on 12 March 2024).
- **Aim:**
  - To create a unified global platform to protect and recover big cat populations.
  - To pool scientific knowledge, technology, funding, and successful practices among 95 range & non-range countries.
  - To fill global gaps in capacity building, financing, technology, and scientific expertise for big cat conservation.
- **Key Features:**
  - **Global coalition** of 95 countries, conservation partners, scientific institutions & corporates.
  - Acts as a **central repository** of best practices, research data, and conservation models.
  - Focus on **capacity building, training, funding access, and technology transfer** for big cat range countries.
  - Addresses **poaching, illegal wildlife trade, habitat loss, prey depletion**, and ecological degradation.

BIHAR'S GOGABEEL LAKE – 94TH RAMSAR SITE OF INDIA

Context: Gogabeel Lake in Katihar district, Bihar, has

been officially added to the list of Ramsar Sites, becoming India's 94th Wetland of International Importance under the Ramsar Convention.

About Bihar's Gogabeel Lake – 94th Ramsar Site of India:

What it is?

- Gogabeel is a **natural oxbow lake**—a crescent-shaped waterbody formed by the meandering of rivers—located between the **Ganga and Mahananda rivers** in **Katihar district, Bihar**. It acts as a seasonal floodplain connecting both rivers during high water levels.

Location and formation:

- Formed from the flow of **Mahananda and Kankhar rivers** in the north and **Ganga** in the south and east.
- Spread over **57 hectares as a Community Reserve** and **30 hectares as a Conservation Reserve**.
- Declared Bihar's **first Community Reserve** in **2019** under the **Wildlife (Protection) Act, 1972**.

Historical background:

- Initially declared a **"Closed Area"** in **1990**, renewed till **2000**.
- Lost its legal protection after the 2002 amendment to the Wildlife Act removed the "Closed Area" provision.
- Regained recognition as an **Important Bird Area (IBA)** in **2004** and **2017** by the Indian Bird Conservation Network (IBCN) and BirdLife International.
- After community efforts led by NGOs like **Janlakshya** and **Goga Vikas Samiti**, it was notified as a **Community Reserve** in **2019**.
- Now recognized globally as a **Ramsar Site** (2025), acknowledging its ecological importance.

Ecological and biodiversity features:

- Supports over **90 bird species**, including **30 migratory** ones using the **Central Asian Flyway**.
- Habitat for **vulnerable species** such as **Common Pochard (Aythya ferina)** and **Lesser Adjutant Stork**; **Black-necked Stork**, **White Ibis**, and **White-eyed Pochard** are listed as **Near Threatened**.
- Also serves as a **breeding ground** for the **vulnerable catfish Wallago attu**.
- Identified as an **Important Bird and Biodiversity Area (IBA)** by BNHS and IUCN.
- Provides livelihood through fishing, cattle grazing, and irrigation, though excessive fertilizer use threatens its ecosystem.

SCIENCE AND TECHNOLOGY

Chemistry

AURAMINE O

Context: Auramine O, a banned industrial yellow dye, has again been detected in food products during State food safety inspections and academic studies.

About Auramine O:

- **What It Is?**
  - Auramine O is a synthetic diarylmethane-based yellow dye used in industrial and microbiological processes, not permitted as a food colour under Indian regulations.
- **Composition:** A bright yellow **diarylmethane compound**, appearing as yellow needle-like crystals; insoluble in water but soluble in ethanol and DMSO.
- **Applications:**
  - **Textile, leather & printing industries:** Used as an industrial colourant due to its bright hue and low cost.

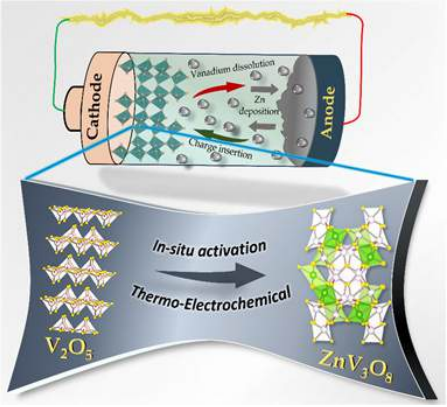
- **Microbiological staining:** Stains acid-fast bacteria like *Mycobacterium tuberculosis* (Auramine–Rhodamine method).
- **Laboratory reagent:** Used as a fluorescent alternative to Schiff reagent.
- **Paper & ink manufacturing:** Applied for colouring and fluorescence-based applications.

- **Issue Of Misuse In Food:**
  - **Enters food chain illegally** as vendors use cheap industrial-grade colour to imitate turmeric/saffron or enhance sweets.
  - Sold through **unregulated chemical markets**, making access easy for small manufacturers.
  - Many vendors are **unaware of restrictions**, while some knowingly bypass enforcement due to weak surveillance.
- **Implications:**
  - **Toxicity Risks:** Linked to liver/kidney damage, enlarged spleen, endocrine disruption, and mutagenic effects.
  - **Carcinogenic Potential:** Classified by IARC as **possibly carcinogenic to humans**.
  - **Chronic Exposure Threat:** Recurring ingestion can lead to long-term genetic and metabolic disorders.
  - **Regulatory Challenge:** Weak lab capacity and uneven enforcement make nationwide elimination difficult.

ZINC-ION BATTERIES (ZIBS)

Context:

A Bengaluru-based DST institute (CeNS) has developed a breakthrough cathode activation technique that dramatically improves the performance of zinc-ion batteries (ZIBs).



About Zinc-Ion Batteries (ZIBs):

- **What they are?**
  - Aqueous **zinc-ion batteries** are rechargeable batteries that use **zinc metal as the anode** and an aqueous electrolyte, offering a safer and more eco-friendly alternative to lithium-ion systems.
- **Developed By:** The new high-performance ZIB cathode was developed by researchers at the Centre for Nano and Soft Matter Sciences (CeNS), Bengaluru.
- **Aim:** To create a **stable, high-energy-density, eco-friendly battery** technology that overcomes limitations of lithium batteries (fire risk, resource scarcity, high cost).
- **How it works?**
  - Scientists applied a **thermo-electrochemical activation** process to modify the structure of **V_2O_5 (vanadium oxide)**.
  - This treatment introduces useful defects, converting it into **Zn-V_2O_5**, with **porous pathways** that allow zinc ions and hydrogen ions to move easily.
  - **Result:** faster ion transport, higher energy storage, and longer battery life.
- **Key Features:**
  - **Higher Energy Density:** Zn-V_2O_5 stores far more energy than untreated V_2O_5.
  - **Exceptional Longevity:** Can withstand **thousands of charge cycles** with minimal degradation.
  - **Hydrogen-ion Stabilisation:** The modified structure improves stability during ion insertion.
  - **Fully Aqueous Electrolyte:** Makes the system **non-flammable** and safer than lithium batteries.
  - **Low-Cost Materials:** Uses abundant zinc, avoiding expensive lithium and cobalt.
- **Significance:**
  - **Eco-friendly & safer** energy storage for grid-scale and consumer applications.
  - Reduces India's dependence on imported lithium and cobalt.
  - Supports clean-energy transitions, renewables integration, and electric mobility.

AMMONIUM NITRATE

Context: A massive explosion at the Nowgam police station in Srinagar occurred when seized explosives—primarily ammonium nitrate recovered from a terror-linked doctor in Faridabad—accidentally detonated, killing nine people.

About Ammonium Nitrate:

What it is?

- Ammonium nitrate is a **white crystalline chemical compound** widely used as a fertilizer and a key ingredient in industrial and improvised explosives.
- It is highly oxidising and becomes explosive when mixed with fuel or other sensitizing agents.

Chemical Formula: NH_4NO_3 – Ammonium Nitrate

Key Features:

- **Strong Oxidiser:** Does not burn alone but greatly accelerates combustion of other materials.
- **Highly Soluble & Hygroscopic:** Absorbs moisture easily, dissolves readily in water.
- **Thermally Unstable:** Can undergo decomposition at high temperatures (melting point 170°C), leading to violent explosions under confinement.
- **White Crystalline Solid:** Appears similar to common salts, making large quantities difficult to visually identify.

Regulations in India:

- Classified as an **explosive** under the **Explosives Act, 1884** (as per 2011 Gazette notification).
- Governed by the **Ammonium Nitrate Rules, 2012**, covering manufacture, conversion, bagging, transport, storage, import, and export.
- Any mixture containing **over 45% ammonium nitrate** is treated as an explosive.
- Requires licences under:
  - **IDR Act, 1951** (for industrial manufacture)
  - **Ammonium Nitrate Rules, 2012** (for handling, storage, transport, sale, or use)

Applications:

- **Agriculture:**
  - Used as a **high-nitrogen fertilizer** (NPK: 34-0-0).
  - Preferred for its stability and efficient nitrogen release compared to urea.
- **Industrial Explosives:**
  - Major ingredient in commercial explosives like **ANFO (Ammonium Nitrate Fuel Oil)**, which accounts for ~80% of explosives used in mining and quarrying.
  - Also used in mixtures like **Amatol, Ammonal, Minol, Nitrolite**, etc.
- **Terrorism:** Widely misused in **Improvised Explosive Devices (IEDs)** due to easy availability and high explosive potential when combined with fuel.
- **Niche Uses:**
  - **Instant cold packs:** Dissolution in water absorbs heat (endothermic).
  - Experimental use in **off-grid cooling systems** and as a refrigerant.
  - Previously used in some **airbag inflators** (now discontinued due to safety concerns).

Physics

ALTERMAGNETISM

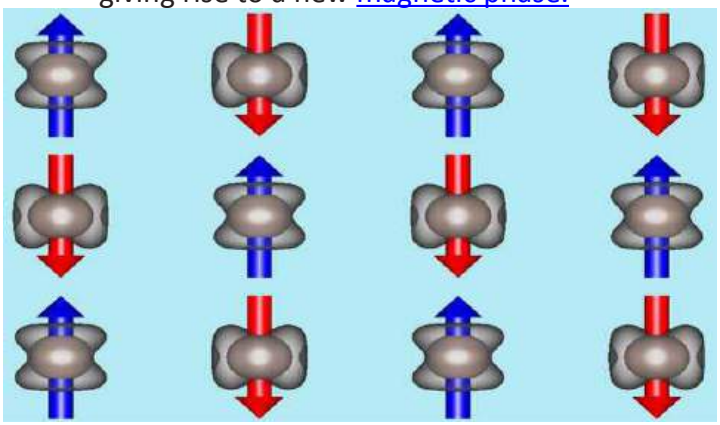
Context: Physicists have confirmed altermagnetism as a new class of magnetic order, distinct from ferromagnetism and antiferromagnetism, following recent experimental validations in 2024–25.

About Altermagnetism:

What it is?

- Altermagnetism is a third form of magnetism that combines features of ferromagnetism and antiferromagnetism.
- In altermagnetic materials, atomic spins alternate in direction, but are related by rotations or mirror reflections within the crystal

structure instead of simple shifts.
- This leads to no overall magnetic field while retaining a unique internal spin polarization, giving rise to a new magnetic phase.



Properties of Altermagnets:

1. **Physical Properties:**
   - **Zero net magnetisation:** Although spins alternate, their arrangement cancels external magnetic fields, similar to antiferromagnets.
   - **Spin-split electronic bands:** Inside the material, electrons with opposite spins occupy slightly different energy states, a feature typical of ferromagnets.
   - **Symmetry-based spin arrangement:** The opposite spins are related by mirror or rotational symmetry, not by simple spatial translation.
   - **High-speed spin dynamics:** Spin switching occurs on picosecond or sub-picosecond timescales, allowing operation in the terahertz range.
2. **Chemical and Material Properties:**
   - Found in compounds like **manganese telluride (MnTe)** and **ruthenium dioxide (RuO_2)**.
   - Exhibits strong **crystalline symmetry** that defines spin alternation and electronic structure.
   - Can exist in **metals, semiconductors, and insulators**, making it broadly applicable for material engineering.

Applications:

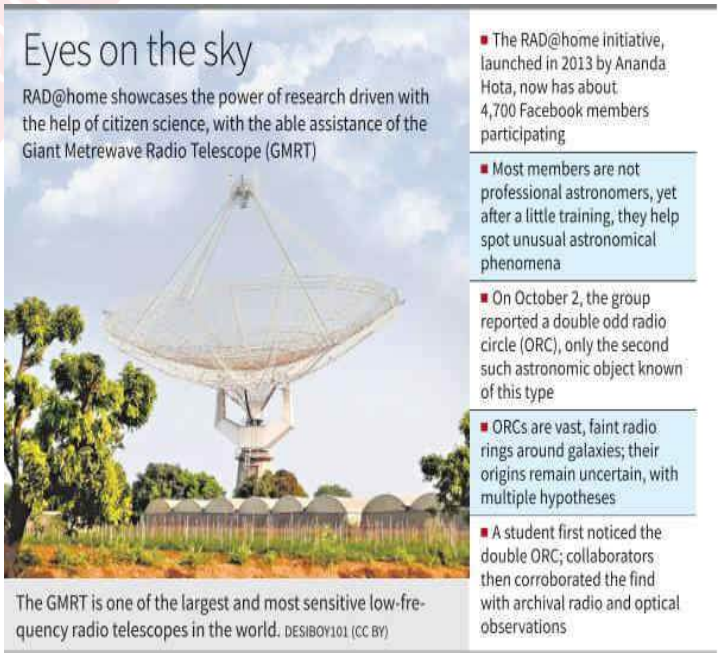
- **Spintronics:** Enables next-generation spin-based electronics that are faster, smaller, and more energy-efficient.
- **Quantum computing:** Reduces magnetic noise, enhancing qubit stability and coherence.
- **Data storage:** Facilitates high-density storage with minimal signal interference.
- **Ultrafast electronics:** Allows terahertz-level magnetic switching for advanced processors and logic gates.
- **Sensors and detectors:** The anomalous Hall effect in altermagnets enables precise electrical detection of magnetic states.

Limitations:

- **Complex synthesis:** Producing single-domain, defect-free altermagnetic crystals is still difficult.
- **Detection difficulty:** Conventional magnetometers cannot detect them due to the absence of external fields.
- **Scalability concerns:** Controlling spin domains and maintaining uniformity across large samples remains a challenge.

ODD RADIO CIRCLES (ORCS)

Context: Citizen scientists from India's RAD@home astronomy group, led by Prof. Ananda Hota of the University of Mumbai, have discovered a rare twin "Odd Radio Circle" (double ORC) using LOFAR telescope data — only the second such known instance globally.



About Odd Radio Circles (ORCs):

What it is?

- Odd Radio Circles (ORCs) are mysterious, circular astronomical structures visible only in radio wavelengths.
- They are vast rings of radio emission surrounding

distant galaxies, thought to arise from powerful shockwaves caused by extreme galactic events such as black hole mergers or massive energy outflows.

Discovered in:

- First identified in **2019** through data from the **Australian Square Kilometre Array Pathfinder (ASKAP)** telescope, and later studied using international facilities such as **LOFAR** and India's **Giant Metrewave Radio Telescope (GMRT)**.

Characteristics:

1. **Radio-only visibility:** Detected exclusively in radio frequencies—no visible, X-ray, or infrared emission observed.
2. **Circular morphology:** Appear as **faint, ring-like or bubble-like structures**, often bright along their edges.
3. **Immense scale:** Among the **largest cosmic structures**, extending millions of light-years across.
4. **Central galaxy presence:** Some ORCs surround a galaxy, while others exist in isolation, deepening their mystery.
5. **Twin ORCs:** The newly discovered "double ORC" shows **two giant plasma rings expanding in opposite directions**, possibly from a central galactic outburst or collision event.

Significance:

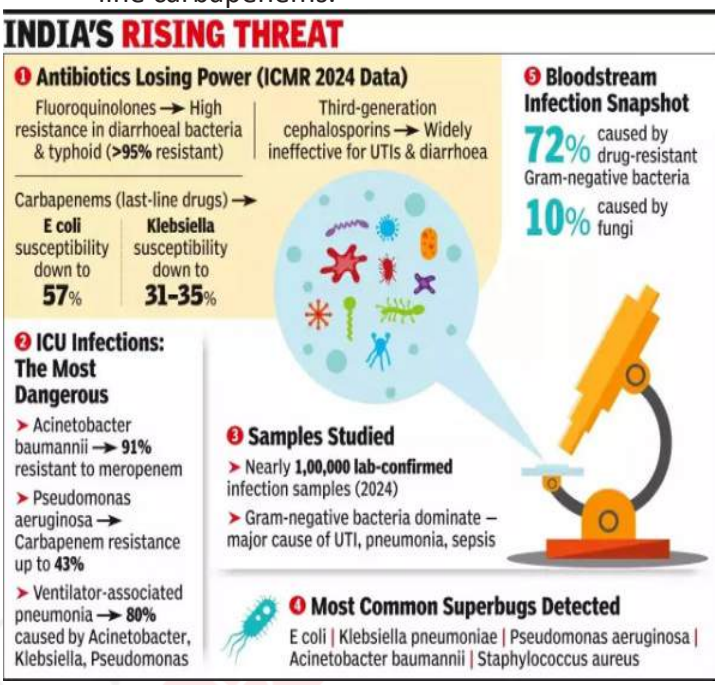
- **Scientific importance:** Offers rare insights into galactic evolution, black hole activity, and intergalactic shockwave dynamics.
- **Technological collaboration:** Demonstrates the synergy between citizen science and advanced observatories like LOFAR and GMRT.
- **Indian contribution:** Highlights India's growing role in radio astronomy and public-led scientific discovery through initiatives like RAD@home, bridging education and research.

Biotechnology

SUPERBUGS

Context: ICMR's AMRSN Report 2024 warns that common infections in India—UTIs, pneumonia, sepsis, diarrhoea—are becoming harder to treat as routine antibiotics fail.

- Superbugs like *E. coli*, *Klebsiella*, *Acinetobacter* and *Pseudomonas* now show high resistance to fluoroquinolones, cephalosporins and even last-line carbapenems.



About Superbugs:

What is a Superbug?

- A superbug is a bacteria or fungus that becomes resistant to multiple antibiotics or antifungals, making routine infections extremely difficult to treat.

How Superbugs Form?

- They evolve resistance due to misuse/overuse of antibiotics, incomplete dosing, hospital overexposure to high-end drugs, and gene transfer between microbes.

Types of Common Superbugs:

- **Bacterial:** *E. coli*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, MRSA, CRE.
- **Fungal:** *Candida auris*, *Aspergillus fumigatus* with rising antifungal resistance.

Symptoms of Superbug Infections:

- Symptoms vary by organ but include persistent fever, chills, septic shock, painful skin lesions, breathing difficulty, extreme fatigue, rapid heart rate or low blood pressure.

Implications:

- **Treatment Failure:** Even strong antibiotics stop working, forcing toxic or expensive drug combinations.
- **Higher Mortality:** ICU infections like ventilator-

associated pneumonia become life-threatening.

- **Longer Hospital Stays:** Patients require prolonged isolation, raising healthcare burden.
- **Economic Loss:** Increased cost of treatment, lost productivity, and higher burden on public hospitals.
- **Threat of Untreatable Infections:** Everyday illnesses could become fatal like in the pre-antibiotic era.

Significance:

- Highlights urgent need for India-wide antibiotic stewardship and infection-control protocols.
- Signals rising global AMR threat, jeopardising SDG targets on health and well-being.
- Calls for surveillance strengthening, new drug discovery, and regulated antibiotic sales.

BIRSA 101 GENE THERAPY

Context: India has launched its first indigenous CRISPR-based gene therapy for Sickle Cell Disease, named BIRSA 101, marking a major milestone in affordable genomic medicine.

About BIRSA 101 Gene Therapy:

What it is?

- BIRSA 101 is India's first indigenously developed CRISPR gene-editing therapy designed to cure Sickle Cell Disease (SCD)—a severe hereditary blood disorder disproportionately affecting India's tribal communities.

Developed by: CSIR–Institute of Genomics & Integrative Biology (IGIB)

- In partnership with the Serum Institute of India (SIIPL) for technology transfer, scale-up, and affordable national deployment.
- Named in honour of Birsa Munda, whose 150th birth anniversary was recently observed.

Objective:

- To support India's mission of becoming Sickle Cell–Free by 2047, as envisioned by the Prime Minister.
- To make cutting-edge gene therapy affordable, replacing global treatments costing ₹20–25 crore with indigenous, low-cost solutions.

How It Works?

- BIRSA 101 uses CRISPR technology like **"precise genetic surgery"** to edit defective genes inside the patient's cells.
- It corrects the mutation responsible for producing sickle-shaped red blood cells, thereby enabling normal haemoglobin production.
- Once edited, the corrected stem cells are infused back into the patient, offering a potential one-time, lifelong cure.

Key Features:

- **Fully indigenous CRISPR platform (enFnCas9)** engineered by IGIB.
- **Low-cost alternative** to global therapies costing crores.
- Developed under India's **Atmanirbhar Bharat** push for medical self-reliance.
- Backed by a **public–private partnership** ensuring scalability, safety, and regulatory readiness.
- Supported by a new advanced **translational research facility** at CSIR-IGIB.

Significance:

- Positions India among the global leaders in advanced gene-editing therapies.
- Major step toward eliminating a debilitating disease common in Gond, Munda, Bhil, Santal, and other tribal groups.
- Enhances India's capability to produce world-class therapies at a fraction of international prices.

LAB-GROWN MILK

Context: Israel-based startup Remilk has announced the commercial launch of its lab-grown "cow-free" milk from January 2026, marking one of the world's first large-scale rollouts of animal-free dairy.

About Lab-Grown Milk:

What it is?

Lab-grown milk, or **animal-free dairy**, is real milk made **without cows** using biotechnological methods.

Unlike plant-based milks (soy, almond, oat), it contains **actual dairy proteins—casein and whey—identical to cow's milk**, making it suitable for traditional dairy uses like cheese, curd, and yogurt.

Developed by:

- Pioneered by Israeli food-tech firms such as Remilk, Imagindairy, and Wilk.

Process:

- **Precision Fermentation:** Milk-producing genes are inserted into microbes like yeast.
- These microbes are grown in **bioreactors**, where they secrete milk proteins when fed sugar.
- Proteins are then blended with fats, minerals, and carbohydrates to replicate cow's milk—**lactose-free, cholesterol-free, and hormone-free**.

Features:

- **Nutritionally identical** to traditional milk—contains all **nine essential amino acids**, calcium, and similar fat/protein content.
- **Customizable:** Fat or lactose content can be altered; suitable for **lactose-intolerant consumers**.
- **Ethical and sustainable:** No animal use, antibiotics, or methane emissions.
- **Allergen label required** since proteins are identical to cow's milk.

Significance:

- Offers a climate-friendly alternative to conventional dairy—reducing land, water, and emissions.
- Addresses animal welfare and ethical concerns.
- For India, it opens new avenues for biotech innovation but faces cultural, cost, and regulatory challenges under FSSAI.

Health

SECOND REGIONAL OPEN DIGITAL HEALTH SUMMIT 2025

Context: India is hosting the second Regional Open Digital Health Summit (RODHS) 2025 in New Delhi, bringing together WHO-SEARO nations to advance interoperable digital health systems.

About Second Regional Open Digital Health Summit 2025:

What it is?

- The Regional Open Digital Health Summit 2025 is a three-day multilateral platform convened by India, WHO-SEARO, UNICEF, and partner governments to accelerate standards-based digital health transformation in South-East Asia.
- It serves as a capacity-building and policy harmonization forum for LMICs in the region.

Objectives:

- Build interoperable, people-centric digital health ecosystems aligned with UHC and SDGs.
- Promote adoption of global standards such as FHIR, open APIs, and open-source health tools.
- Integrate and modernise legacy health information systems, reducing fragmentation.

Key Features of the Summit:

- **Two focused tracks:** Standards and Digital Public Infrastructure (DPIs).
- **Technical sessions and hands-on learning** from India's ABDM, CoWIN, UPI, Aadhaar.
- Showcases on Generative AI in diagnostics, clinical documentation, and health data analytics.

- Focus on interoperability, full-stack digital health architecture, and ecosystem-wide collaboration.
- Demonstrations by innovators such as eClinicalWorks, Google, NiramAI, IIT Delhi, showcasing scalable AI health solutions.

Significance:

- Positions India as a regional leader in Digital Public Infrastructure and open-source digital health.
- Helps SEAR countries move from isolated digital pilots to scalable, interoperable national health systems.
- Strengthens regional preparedness for pandemics and public health emergencies through shared standards and data exchange models.

INDIA LAUNCHES NATIONAL ACTION PLAN ON ANTIMICROBIAL RESISTANCE 2.0 (NAP-AMR 2.0)

Context: India has launched the National Action Plan on Antimicrobial Resistance 2.0 (2025–29) at the start of WHO's World AMR Awareness Week.

About India Launches National Action Plan On Antimicrobial Resistance 2.0 (NAP-AMR 2.0):

What is it?

- NAP-AMR 2.0 is India's updated **five-year strategic framework (2025–29)** to combat rising antimicrobial resistance through a **One Health approach** covering human, animal, agriculture, and environmental sectors.
- It replaces and expands the earlier **NAP-AMR 2017–21**, incorporating gaps identified during its implementation.

Launched by: Union Ministry of Health & Family Welfare

Aim:

- To create a coordinated, multi-sectoral national response to AMR using a One Health framework.
- To reduce misuse/overuse of antimicrobials and strengthen laboratory surveillance, stewardship, and infection control.

Key Features of NAP-AMR 2.0:

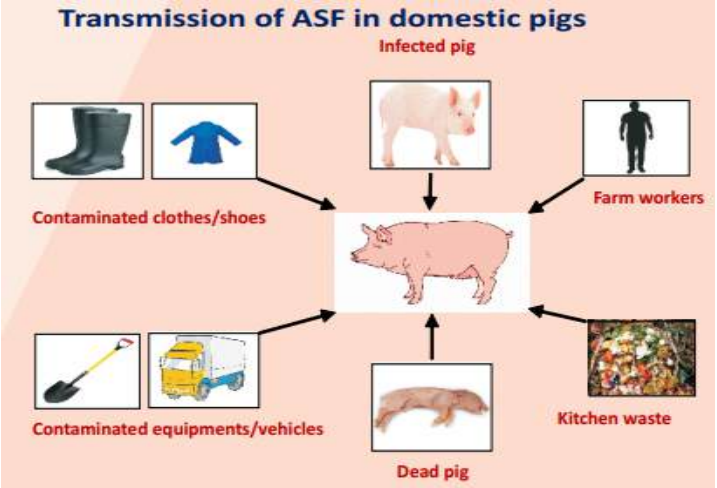
- **One Health Integration:** Brings together human health, animal husbandry, agriculture, food safety, environment, and research sectors under a unified national framework.
- **Ministry-Specific Action Plans:** Each of the 20+ ministries (Health, Agriculture, Animal Husbandry, MoEFCC, DST, Chemicals, Jal Shakti, etc.) has its **own action plan**, budget, goals, and timelines.
- **Strengthened Surveillance & Laboratory Capacity:** Focus on expanding diagnostic networks, AMR labs, pathogen tracking, and infection prevention and control (IPC) across hospitals.
- **Antibiotic Stewardship & Regulatory Measures:** Controls irrational antibiotic use; promotes prescription auditing; supports state actions like **Kerala & Gujarat banning OTC antibiotic sales**.
- **Public & Professional Awareness:** Nationwide awareness campaigns, medical curriculum integration, and training programs for healthcare providers, veterinarians & pharmacists.
- **Environment & Agriculture Measures:** Regulates antimicrobial/pesticide usage in crops; monitors pharmaceutical waste; promotes safe livestock practices.
- **Innovation & Research Push:** Strengthens the **India AMR Innovation Hub** to develop new diagnostics, technologies, and collaborative R&D models.

Significance:

- **Addresses India's Growing AMR Burden:** India has one of the highest global AMR rates, threatening surgeries, cancer care, organ transplants, and routine medical procedures.
- **Ensures Policy Continuity & Global Alignment:** Aligns with WHO's Global Action Plan on AMR and strengthens India's position as a global leader in AMR containment.
- **Whole-of-Government & Whole-of-Society Approach:** Engages ministries, private sector, NGOs, professional bodies, and international partners—boosting accountability and multisectoral coordination.

AFRICAN SWINE FEVER

Context: Assam has banned inter-district movement of live pigs and prohibited pork sales in seven districts after a sharp spike in African Swine Fever (ASF) cases.



About African Swine Fever:

What it is?

- A highly contagious **viral hemorrhagic disease** affecting domestic and wild pigs, caused by the **African Swine Fever Virus (ASFV)**—a large double-stranded DNA virus of the *Asfarviridae* family.
- It has no impact on humans but is devastating to pig populations with up to 100% mortality.

Vectors & Transmission:

- **Soft ticks (Ornithodoros spp.)** act as biological vectors, sustaining the virus in nature.
- Transmitted via **infected pigs**, contaminated clothes, shoes, vehicles, feed waste, bedding, slaughter waste, and unprocessed pork products.
- Virus survives long in the environment and in pork products (ham, sausages, bacon), making human movement and trade major spreaders.

Symptoms:

- **Peracute cases:** sudden death within 1–3 days, extremely high fever (106–108°F).
- **Acute cases:** lethargy, anorexia, respiratory distress, blue-purple discoloration of ears/abdomen/legs, bloody froth from nose/mouth, bloody diarrhoea, abortions.
- Mortality rate: **90–100%**.

Features of ASF:

- **Notifiable disease:** must be mandatorily reported.
- **Highly stable virus:** survives on surfaces, feed, soil, equipment, and meat products.
- **Endemic cycle:** maintained between wild pigs, warthogs, bushpigs, and ticks.
- **First detected in India** in Arunachal Pradesh & Assam in **2020**.

Treatment / Control:

- No vaccine or cure currently available globally.
- **Only method:** strict biosecurity, mass culling, movement bans.
- Measures include:
  - Quarantine of new pigs (30–45 days)
  - Restriction on pig/vehicle movement
  - Farm disinfection (2% sodium hypochlorite / potassium permanganate)
  - Segregation of healthy and sick animals

10 YEARS OF AMRIT PHARMACY

Context: AMRIT Pharmacy marked its 10th anniversary, with Union Health Minister announcing nationwide expansion and unveiling new digital upgrades.

About 10 years of AMRIT Pharmacy:

What it is?

- AMRIT (Affordable Medicines and Reliable Implants for Treatment) Pharmacy is a government initiative providing life-saving medicines, implants, and medical consumables at 50–90% discounted rates.

Launched in: 2015, under the Ministry of Health & Family Welfare to expand affordable access to critical medicines across India.

Organisation Involved: Implemented nationwide by **HLL Lifecare Limited**, a Central Public Sector Enterprise under MoHFW.

Aim: To ensure that quality branded and branded-generic medicines, surgical implants, and critical care products are accessible and affordable, especially for low-income and high-burden patients.

Key Features:

- **Pan-India Network:** Over 255 operational outlets, now expanding to 500—targeted for every medical college and district hospital.
- **Deep Discounts:** Offers **50–90%** reduction on essential medicines, oncology drugs, cardiac implants, and surgical consumables.
- **Massive Patient Savings:** Medicines worth ₹17,000 crore (MRP) dispensed at discounted rates, generating ₹8,400 crore in savings for patients.
- **High Reach:** Benefited **6.85 crore patients** in 10 years, cutting catastrophic health expenditure.
- **Digital Upgradation:** Launch of AMRIT ITes Eco-Green Version 2.0 to improve transparency, efficiency, and environmental sustainability.
- **Enhanced Services:**
  - Mobile Pharmacy Van for rural outreach
  - 24×7 National Contact Centre
  - My Stamp release & Coffee Table Book
  - Integration of Ayurvedic medicines in multi-disciplinary institute.
- **Skilled Workforce:** Employs certified pharmacy professionals (D.Pharm, B.Pharm).

Significance:

- **Affordable Healthcare Access:** Reduces out-of-pocket expenditure—critical for diseases like cancer and cardiovascular disorders.
- **Strengthens UHC Goal:** Supports India's mission of Accessible, Affordable, Equitable Healthcare under Ayushman Bharat.

Supports Tertiary Care: Ensures all essential drugs and implants are available in AIIMS and major medical colleges

COHORT CONNECT 2025

Context: The Union Minister of State for Science & Technology launched the Phenome National Conclave on Longitudinal Cohort Studies: Cohort Connect 2025 at CSIR–IMMT, Bhubaneswar.

About Cohort Connect 2025:

What it is?

- A nationwide scientific platform under the **Phenome India programme**, bringing together India's major longitudinal cohort studies to generate large-scale, India-specific health data for precision medicine, disease prediction, and public health planning.

Launched In: 2025, by the Ministry of Science & Technology at CSIR–IMMT, Bhubaneswar.

Aim:

- To examine how genes, lifestyle, behaviour, nutrition, pollution, and environment influence disease patterns in Indian populations.
- To create a massive longitudinal dataset for chronic and emerging diseases like diabetes, cancer, neurological disorders, and infectious disease interactions (e.g., diabetes–TB link).

Key Features:

- Integrates multiple Indian cohort studies under one national framework ("Cohort Connect").
- Focuses on rising **non-communicable diseases (NCDs)** including diabetes, metabolic disorders, cardiovascular diseases, and renal complications.
- Uses advanced tools such as **genome sequencing**, biomarkers, digital health monitoring, and lifestyle mapping.
- Builds upon India's existing genomic progress—**10,000 human genomes sequenced**, moving toward **one million genomes**.
- Encourages collaboration between **CSIR labs, DBT institutions, clinicians, epidemiologists, and industry partners**.
- Generates long-term datasets involving **diverse Indian populations**, addressing India's unique genetic and cultural diversity.

Significance:

- Provides **"Indian data for Indian solutions"**, reducing dependence on Western health models.
- Enables early detection, personalised treatment, and prevention strategies tailored to India's population.
- Strengthens India's preparedness against future health challenges, including emerging infections and lifestyle diseases.

HEPATITIS A

Context: Public health experts are urging that Hepatitis A vaccination be included in India's Universal Immunisation Programme (UIP) due to rising outbreaks and declining natural immunity among adolescents and young adults.

About Hepatitis A:

- **What it is?**
  - Hepatitis A is an **acute viral infection** caused by the Hepatitis A Virus (HAV), leading to inflammation of the liver.
  - It does **not cause chronic liver disease**, but can result in **severe hepatitis or acute liver failure**, especially in adults.
- **Geographical Distribution:**
  - Occurs **worldwide**, with **cyclic outbreaks** and both sporadic and epidemic patterns.
  - Highly prevalent in **low- and middle-income regions** with poor sanitation—most children get infected early in life.
  - Low prevalence in high-income countries, but outbreaks occur in specific risk groups (MSM, PWID, travellers, homeless communities).
- **Mode of Transmission (Vector/Route):**
  - (Hepatitis A has **no vector**; transmission is faeco-oral.)
  - Ingestion of **contaminated food or water**.
  - Direct contact with an infected person, including **poor hygiene**, dirty hands, or **oral-anal sexual contact**.
  - Household transmission common when infected individuals handle food.
  - Waterborne outbreaks linked to **sewage contamination**.
- **Symptoms:** Fever, malaise, loss of appetite, Nausea, diarrhoea, abdominal discomfort, Dark urine and jaundice.
- **Treatment:**
  - **No specific antiviral treatment** exists.
  - Hospitalisation only for **severe disease or acute liver failure**.
  - Most people recover fully and gain **lifelong immunity**.

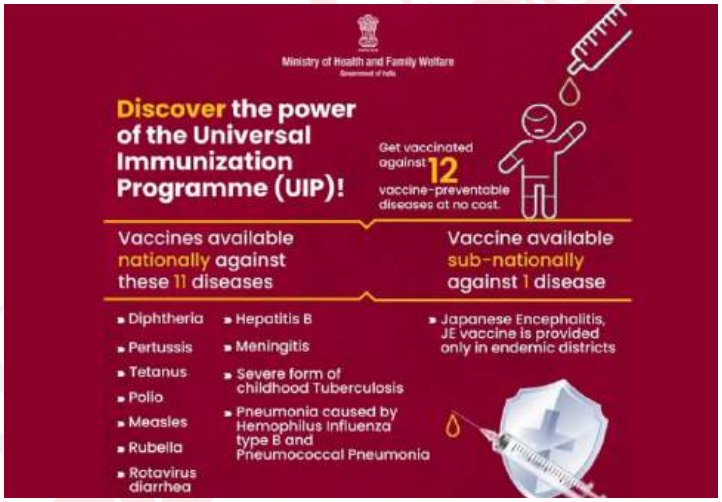
About Universal Immunisation Programme (UIP):

What it is?

- India's largest public-health vaccination programme providing **free immunisation** to all children and pregnant women against major **vaccine-preventable diseases**. It is one of the **largest immunisation programmes globally**.

Launched In:

- **1978** – as **Expanded Programme on Immunization (EPI)**
- **1985** – renamed & expanded as **Universal Immunization Programme (UIP)**
- Nationwide coverage achieved by **1989–90**

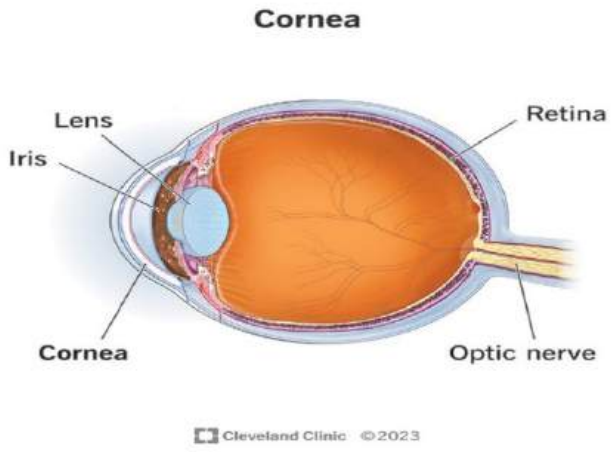


Key Components of UIP:

1. **Strategy & Policy:**
   - Guided by National Health Policy, National Vaccine Policy & NTAGI recommendations.
2. **Cold Chain, Vaccines & Logistics:**
   - ~30,000 Cold Chain Points; ILRs, Deep Freezers, WIC/WIFs, vaccine vans.
   - Uses **eVIN** for real-time stock & temperature monitoring.
3. **Injection Safety & Waste Disposal:** AD syringes, hub-cutters, CPCB-compliant biomedical waste disposal.
4. **AEFI Surveillance System:**
   - Structured multi-level reporting since 1988.
   - SAFEVAC portal for real-time AEFI reporting.
5. **Training:**
   - Standardised training for MOs, health workers, cold-chain technicians (NCCTC Pune, NCCVMRC Delhi).

TRANSPLANTATION OF HUMAN ORGANS AND TISSUES RULES, 2025

Context: The Union Health Ministry has amended the Transplantation of Human Organs and Tissues Rules, 2025, removing the mandatory requirement of clinical specular equipment for corneal transplantation centres.



About Transplantation of Human Organs and Tissues (Amendment) Rules, 2025:

- **What it is?**
  - The amendment to the Transplantation of Human Organs and Tissues Rules, 2014, issued under the Transplantation of Human Organs and Tissues Act, 1994, seeks to simplify norms for corneal transplantation and strengthen the National Organ Transplant Programme (NOTP).
- **Aim:**
  - To boost cornea donation and transplantation services, streamline the approval process, and remove infrastructural bottlenecks, ensuring equitable access to eye-care facilities across India.
- **Key Features:**
  - **Removal of mandatory clinical specular microscope requirement:** previously used to assess corneal endothelial cell health, easing compliance for smaller eye centres.
  - **Promotes equitable access** to transplant services in rural and semi-urban regions by reducing cost and equipment barriers.
  - **Strengthens NOTP** by improving coordination among hospitals, tissue banks, and regulatory authorities.
  - **Based on expert and stakeholder consultations**, aligning with the government's Vision for Equitable Healthcare Access.
  - **Long-term objective:** Strengthen India's **cornea donation ecosystem** and reduce the burden of **corneal blindness** — the **second-leading cause of blindness** among Indians over 50 years of age.

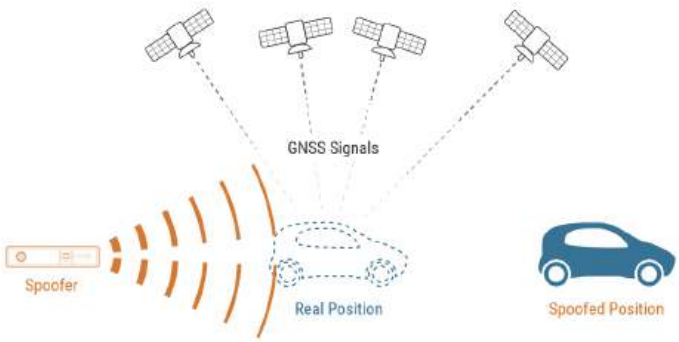
About the Cornea:

- **What it is?**
  - The cornea is the transparent, dome-shaped outer layer at the front of the eye that functions like a window, allowing light to enter and focus on the retina for clear vision.
- **Characteristics:**
  - Acts as a **protective barrier** against dust, microbes, and injury.
  - **Comprises six layers:** Epithelium, Bowman's Layer, Stroma, Pre-Descemet's (Dua's) Layer, Descemet's Layer, and Endothelium.
  - **Highly sensitive:** has **300–600 times more pain receptors** than skin, ensuring quick reflex protection.
  - Maintains **eye structure and fluid balance**, essential for vision clarity.
  - **Self-healing:** minor injuries repair rapidly, but deeper damage (scarring or clouding) often requires **corneal transplant surgery** to restore vision.

Emerging Technologies

GNSS SPOOFING

Context: Aircraft flying near Delhi reported multiple cases of GNSS spoofing in early November 2025, triggering false cockpit alerts and misleading terrain warnings.



About GNSS Spoofing:

What is GNSS Spoofing?

- GNSS spoofing is the intentional transmission of fake satellite navigation signals to mislead receivers such as aircraft, drones, ships or vehicles into calculating an incorrect position, time or velocity.

Types of GNSS Interference:

1. **GNSS Spoofing (Deception):** Fake signals are injected to mislead the aircraft about its location, altitude or direction. This is the most dangerous form.
2. **GNSS Jamming (Blocking):** High-power noise disrupts genuine satellite signals, making the receiver unable to compute a location.
3. **Meaconing (Signal Re-broadcasting):** Original signals are captured and rebroadcast with a delay, tricking receivers subtly without generating obvious alarms.

How GNSS Spoofing Works?

- A transmitter near the target emits counterfeit GNSS signals with slightly stronger power than genuine satellite signals.
- The aircraft receiver unintentionally locks onto the fake signal believing it to be legitimate.
- Gradually, the spoofer drifts the false signals to pull the computed aircraft position away from reality, creating false navigation, terrain, or proximity alerts.
- Weapon systems and drones can be misdirected, diverted or disabled using the same technique.

Characteristics of GNSS Spoofing:

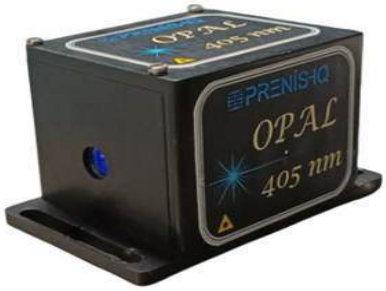
- **Covert and Hard to Detect:** Signals mimic genuine GNSS codes, making cockpit warnings ambiguous.
- **Localized in Range:** Typically affects aircraft within a radius of a few kilometres from the source.
- **Gradual Drift:** Spoofing attempts often shift position slowly to avoid abrupt discrepancies.
- **Can Trigger False Cockpit Alerts:** E.g., fake terrain warnings, incorrect runway alignment, wrong altitude/position calculation.
- **Bypasses Basic Anti-Jamming Measures:** Because the receiver sees it as a "valid" signal—not just noise.

Threats from GNSS Spoofing:

- **Loss of Navigation Accuracy:** Aircraft may display incorrect position, wrong flight path, or misleading headings—forcing pilots to rely on manual navigation.
- **False Terrain & Collision Warnings:** Spoofed signals can trigger false terrain warnings, runway misalignment alerts or obstacle proximity alerts, distracting pilots during critical phases like takeoff/landing.
- **Pilot Workload Spike & Situational Confusion:** Crew workload increases sharply as they cross-check instruments, verify backup systems, and coordinate with ATC.
- **Dependence on Backup Systems:** Aircraft must switch to Inertial Reference Systems—safe for several hours—but not ideal for long stretches or high-traffic zones.

INDIA UNVEILS FIRST INDIGENOUS HIGH-PRECISION DIODE LASER

Context: India launched its first indigenous high-precision diode laser engineered for quantum communication and computing. It marks a major step in India's capability to build quantum-grade hardware.



About India Unveils First Indigenous High-Precision Diode Laser:

What it is?

- A **compact, high-precision diode laser system** engineered for quantum technologies, scientific research, higher-education laboratories, and cutting-edge industrial applications.
- It provides ultra-stable, tunable and long-duration laser output required for quantum experiments and secure communication systems.

Developed by: Prenishq Pvt. Ltd., a deep-tech startup and spin-off from IIT Delhi

- Supported by the National Quantum Mission (NQM)

Aim:

- To create an indigenous quantum-grade diode laser for secure communication, quantum computing, and high-precision scientific research.
- To strengthen India's quantum ecosystem and enable quantum-safe digital infrastructure.

Key Features:

- **Ultra-Narrow Linewidth & High Beam Quality:** Ensures sharp, stable beams ideal for high-resolution quantum sensing and communication tasks.
- **Long-Term Frequency & Power Stability:** Maintains precise performance over long durations, reducing recalibration needs in labs and field setups.
- **Wide Wavelength Range (UV to Near-IR):** Supports multiple quantum systems and scientific instruments requiring different operational wavelengths.
- **Rugged & Temperature-Controlled:** Designed to operate reliably in Indian climatic conditions, ensuring stable quantum output.
- **Compact, Lightweight & Low-Power:** Portable, energy-efficient architecture makes deployment easy in both labs and mobile platforms.
- **Plug-and-Play Integration:** Simple setup with minimal configuration enables fast adoption by researchers and educational institutions.
- **Free-Space & Fiber-Coupled Output:** Flexible delivery options allow use in both optical table experiments and long-distance communication links.

Applications:

- **Quantum Communication:**
  - **QKD Backbone:** Provides stable, coherent light required for generating quantum keys used in ultra-secure communication.
  - **Quantum-Safe Transactions:** Enables banks, defence and telecom systems to protect data against attacks from future quantum computers.
- **Photonic Quantum Computing:**
  - **Photon Qubit Control:** Generates precise laser pulses to encode, manipulate, and read photonic qubits in quantum processors.
  - **Error-Resilient Operations:** Low noise and stable frequency improve gate fidelity, reducing errors in optical quantum computation.
- **Scientific & Industrial Research:**
  - **Precision Spectroscopy:** Offers narrow, stable beams for analysing atomic and molecular structures at extremely high resolution.
  - **Atomic Clocks & Metrology:** Supports next-gen optical clocks and ultra-precise timekeeping, improving navigation and communication systems.

AI-BASED LOCKING MONITORING SYSTEM CALLED 'DRISHTI'

Context: Indian Railways is set to install an AI-based Locking Monitoring System called 'DRISHTI' to enhance freight train security by detecting tampered or unlocked wagon doors in real time.

About AI-based Locking Monitoring System called 'DRISHTI':

What it is?

- 'DRISHTI' is an **Artificial Intelligence–powered real-time surveillance and locking monitoring system** designed to track the door-locking condition of freight wagons during transit.

Developed By: A joint innovation initiative between:

- Northeast Frontier Railway (NFR)
- IIT Guwahati – Technology Innovation and Development Foundation (IITG TIDF)

Aim:

- To automate the detection of unlocked, open, or tampered wagon doors.
- To reduce manual inspections, which are slow, labour-intensive, and impractical for long-haul freight operations.
- To enhance the security, reliability, and

transparency of freight movement across the Indian Railways network.

Key Features:

- **AI-powered cameras & sensors** mounted on freight wagons for continuous door monitoring.
- **Computer vision + machine learning algorithms** to analyse door positions and locking conditions.
- **Real-time alerts** for abnormalities such as tampering, partial locking, or unexpected door movement.
- **Automated anomaly detection** without disrupting normal train operations.
- **Advanced analytics & imaging** for accurate monitoring under dynamic transit conditions.
- Encouraging accuracy levels seen during **10-month trial phase** on selected wagons.
- Scalable design for future deployment across the NFR and wider Indian Railways network.

Significance:

- Strengthens **cargo security** by preventing theft, pilferage, and tampering.
- Reduces dependence on manual checks, improving **operational efficiency**.
- Enhances **rolling stock integrity**, ensuring wagons remain sealed throughout transit.

PROJECT SUNCATCHER

Context: Google has announced Project Suncatcher, a pioneering plan to build AI-powered data centres in space to harness continuous solar energy and reduce Earth's carbon footprint.

About Project Suncatcher:

What it is?

- Project Suncatcher is Google's research initiative to create solar-powered AI data centres in space by deploying high-performance **TPUs (Tensor Processing Units)** aboard orbiting satellites that communicate through optical data links.

Launched by: Developed and launched by **Google**, under its AI and Advanced Infrastructure Division, as part of a long-term sustainability and innovation roadmap.

Aim:

- To reduce energy, water, and carbon costs of terrestrial data centres.
- To harness uninterrupted solar power available in space for round-the-clock AI computation.
- To develop a scalable space-based computing network with interlinked, high-speed satellites.

Key features:

- **Solar-Powered Satellite Constellation:** Uses solar panels up to **8 times more efficient** in orbit than on Earth.
- **Orbiting TPUs:** AI accelerators (Trillium v6e) tested under radiation for space durability.
- **High-Speed Optical Links:** Free-space optical communication capable of **tens of terabits per second**, connecting satellite nodes.
- **Prototype Launch:** Two test satellites planned for **early 2027** to validate hardware and communication systems.
- **Scalability:** Analytical models suggest satellites can operate just **hundreds of meters apart**, allowing clustered space-based data hubs.
- **Future Cost Efficiency:** By **mid-2030s**, falling launch costs (as low as $200/kg) could make orbital data centres economically viable.

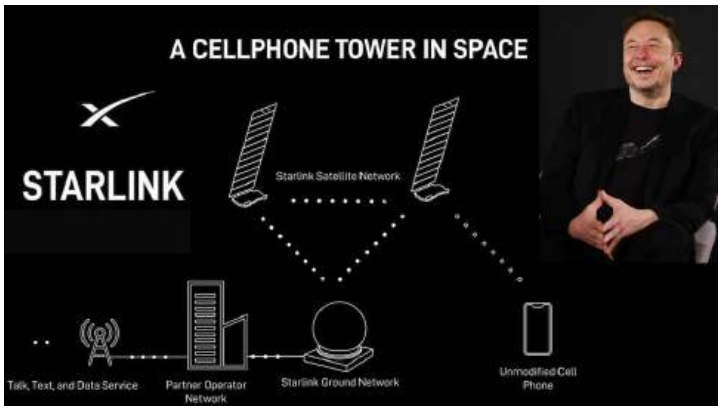
Significance:

- **Sustainability Breakthrough:** Eliminates dependency on Earth's power and water resources.
- **Technological Innovation:** Opens avenues for distributed, radiation-resistant AI computing beyond Earth.
- **Climate Impact Reduction:** Helps offset the rising carbon emissions of expanding AI infrastructure.

MAHARASHTRA BECOMES FIRST STATE TO PARTNER WITH STARLINK

Context: Maharashtra has become the first Indian

state to sign an agreement with Starlink Satellite Communications Pvt. Ltd. to deliver satellite-based internet services across government institutions and remote rural areas of state.



About Maharashtra Becomes First State to Partner with Starlink:

What is Starlink?

- Starlink is a satellite-based broadband service operated by SpaceX, the aerospace company founded by Elon Musk, providing high-speed, low-latency internet access globally through a network of low-Earth orbit (LEO) satellites.

Company involved: Starlink Satellite Communications Pvt. Ltd., a subsidiary of SpaceX (USA)

Aim:

- To connect remote schools, health centres, and rural institutions with reliable high-speed internet and promote digital inclusion, enabling online education, telemedicine, and e-governance in far-flung areas.

How it works?

- Unlike traditional geostationary satellites orbiting at **35,786 km**, Starlink's satellites orbit at **~550 km**, drastically reducing data transmission delay.
- These satellites form a **constellation** that communicates with each other via **optical inter-satellite links (ISLs)**, transmitting data without relying solely on local ground stations.
- This design achieves **latency as low as 25 milliseconds**, making real-time streaming, gaming, and video conferencing feasible even in rural zones.

Features:

- **True global coverage:** Network of thousands of LEO satellites ensuring uninterrupted internet access worldwide.
- **Low latency & high speed:** Enables seamless access to high-data applications.
- **Autonomous collision avoidance:** Satellites use AI-driven systems to maneuver and avoid orbital debris, enhancing reliability and safety.
- **Compact flat-panel design:** Allows dense launch stacking on **SpaceX's Falcon 9 rockets**, optimizing deployment efficiency.
- **Rural connectivity focus:** Tailored to serve hard-to-reach regions where fiber or mobile networks are impractical.

INDIA'S FIRST 500 KM QUANTUM KEY DISTRIBUTION (QKD) NETWORK

Context: A startup supported under the National Quantum Mission (NQM) — QNu Labs Pvt. Ltd. — has successfully demonstrated India's first 500 km Quantum Key Distribution (QKD) network.

About India's first 500 km Quantum Key Distribution (QKD) network:

What it is QKD?

- Quantum Key Distribution (QKD) is a **secure communication technology** that uses the laws of **quantum physics** to generate and exchange encryption keys between two parties. Unlike traditional encryption, it ensures that any attempt to intercept or observe the key instantly alters the system, making eavesdropping detectable.

Developed by: The Bengaluru-based quantum startup QNu Labs Pvt. Ltd., supported by the Department of Science and Technology (DST) under the National Quantum Mission (NQM).

How it works?

- QKD transmits streams of **light particles (photons)** carrying random quantum states through **optical fiber**.
- Each photon encodes information as **qubits (quantum bits)**.
- If an eavesdropper tries to measure or clone the photons, quantum properties change—alerting the communicating parties.
- After error correction and privacy amplification, both parties obtain a **shared secret key** used for encrypting data securely.

Types of QKD:

1. **Prepare-and-Measure Protocols:**
   - Use random photon polarization to generate keys and detect eavesdropping.
   - **Example: BB84 protocol** (most widely used).
2. **Entanglement-Based Protocols:**
   - Use **entangled photon pairs** — measuring one instantly determines the state of the other.
   - Intrusions become instantly noticeable.
3. **DV-QKD (Discrete Variable QKD):**
   - Uses photon detectors to read discrete quantum states.
4. **CV-QKD (Continuous Variable QKD):**
   - Encodes quantum data in amplitude and phase of laser light.

Features of the Demonstrated QKD Network:

- **500 km quantum-secure link** deployed over existing optical fiber infrastructure.
- Enabled **end-to-end encryption** using multiple trusted nodes for enhanced reliability.
- Supported by **Quantum Suraksha Kavach** hardware for high-grade data protection.
- Demonstrated integration of **Quantum Random Number Generator (QSIP)** technology for superior cryptographic strength.
- Showcases **civil–military synergy (STRIDE model)** — linking research, industry, and defence sectors.
- Positions India among leading nations in **quantum-safe communication** and cybersecurity readiness.

Space

IAU APPROVES NEW NAMES FOR MARTIAN LANDFORMS

Context: A 3.5-billion-year-old crater on Mars has been officially named after Indian geologist M.S. Krishnan, following approval by the International Astronomical Union (IAU).

- The IAU has also approved five Kerala-based names—***Valiamala, Thumba, Bekal, Varkala and Periyar***—for nearby craters and a Martian valley.

About IAU Approves New Names for Martian Landforms:

What this is?

- The **International Astronomical Union (IAU)**—the global authority that names planetary features—has approved a proposal by two Kerala researchers to name Martian craters and a valley (vallis) after **M.S. Krishnan** and Kerala localities.

MARS-KERALA CONNECT

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

Key Features of the Naming Decision:

- The crater is **3.5 billion years old** and lies in **Xanthe Terra**, a region where researchers identified evidence of **ancient glacial and river activity**.
- Names follow **IAU rules**:
  - Large craters → named after **deceased scientists** with major contributions.
  - Small craters → named after **towns/ villages** with cultural or historical relevance.
- The proposal was submitted by **Kerala-based scientists** from IIST and Government College Kasaragod.

Significance:

- This is the first time Kerala place-names have been adopted for features on Mars.
- Highlights India's growing role in planetary

science and space research.

- Immortalises M.S. Krishnan, the first Indian Director of the Geological Society of India.

KODAIKANAL SOLAR OBSERVATORY (KOSO)

Context: Scientists from ARIES, IIA and global collaborators have reconstructed over 100 years of the Sun's polar magnetic history using archival data from the Kodaikanal Solar Observatory (KoSO).

About Kodaikanal Solar Observatory (KoSO):

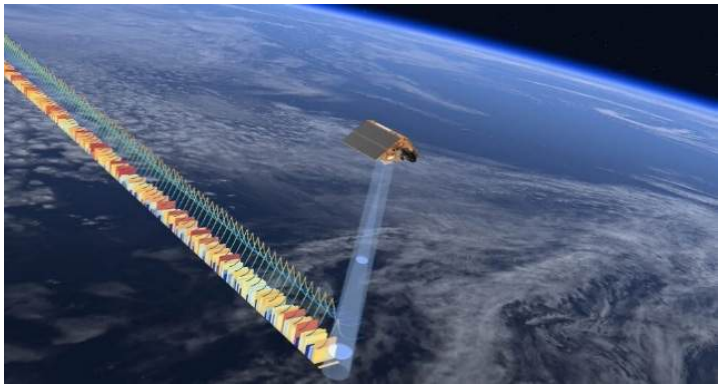
- **What it is?**
  - KoSO is one of India's oldest and globally renowned solar observatories, conducting continuous solar observations for more than 120 years.
- **Location:** Situated in the Palani Hills, Tamil Nadu, KoSO functions as a field station of the Indian Institute of Astrophysics (IIA), Bengaluru.
- **History:**
  - Established in **1899**.
  - Systematic solar imaging in the **Ca II K wavelength** began in **1904**, creating one of the world's longest solar data archives.
- **Key Features:**
  - Continuous solar observations for over a century — among the longest consistent solar records globally.
  - Multi-wavelength imaging of the chromosphere capturing plages, sunspot groups, magnetic networks.
  - A digitised database now publicly available, enabling global scientific access.

About Sun's Magnetic Future:

- **What it is?**
  - The Sun's magnetic future refers to the predicted behaviour of its polar magnetic fields—key drivers of the 11-year solar cycle, sunspots, flares, and geomagnetic storms.
- **Breakthrough:**
  - ARIES-led researchers reconstructed the Sun's polar magnetic fields from **1904 to 2022** by analysing KoSO's Ca II K images.
  - They used **Rome-PSPT data, AI-based feature recognition, and Polar Network Index (PNI)** to identify faint bright structures near the poles.
  - These structures act as **proxies** for magnetic field strength before direct polar field measurements began in 1976.
- **Significance:**
  - Offers the first reliable, century-long reconstruction of solar magnetism.
  - Helps predict the strength of ongoing **Solar Cycle 25** and future solar activity.
  - Crucial for forecasting **solar storms** that can disrupt GPS, communications, satellites, aviation, and power grids.

SENTINEL-6B SATELLITE

Context: Sentinel-6B, a new ocean-monitoring satellite, has been successfully launched from Vandenberg Space Force Base to enhance global sea-level monitoring.



About Sentinel-6B Satellite:

What it is?

- Sentinel-6B is an advanced ocean-altimetry satellite designed to measure global sea-surface height, waves, winds and climate-driven changes in ocean dynamics with high precision.

Launched By: A joint mission of NASA, NOAA,

European Space Agency (ESA), Eumetsat, the European Commission, with support from CNES.

- Lunched aboard a SpaceX Falcon-9 rocket.

Aim:

- To provide continuous, high-accuracy measurements of sea-level rise, ocean temperature patterns, and sea-state data to improve climate modelling, storm forecasting, and coastal resilience planning.

Key Features:

- **Radar Altimeter:** Measures sea-surface height by timing radar pulses to millimetre accuracy.
- **Advanced Microwave Radiometer:** Corrects atmospheric water-vapour errors for more precise altimetry.
- **6 science instruments** enabling sea-level measurement accuracy to ~1 inch across 90% of global oceans.
- Orbits Earth at **7.2 km/s**, completing one revolution every **112 minutes**.
- Continuation of the Topex-Poseidon → Jason-1/2/3 → Sentinel-6 Michael Freilich legacy record since early 1990s.

Significance:

- Provides the world's gold-standard reference dataset for sea-surface height—critical for tracking sea-level rise.
- Enhances weather and storm forecasting, especially cyclones, floods and wave prediction.
- Supports maritime safety, submarine cable/ pipeline protection, and climate adaptation planning.

MOON'S SPHERE OF INFLUENCE (MSI)

Context: ISRO confirmed that the Chandrayaan-3 Propulsion Module (PM) re-entered the Moon's Sphere of Influence (MSI) during its high-altitude Earth-bound orbit, undergoing two lunar flybys.

About Moon's Sphere of Influence (MSI):

What it is?

- The Moon's Sphere of Influence (MSI) is the region around the Moon where its gravitational influence dominates over Earth's for orbital calculations.
- Inside this region, it is mathematically more accurate to treat a spacecraft as orbiting the Moon, with Earth acting as a perturbing body.

Located in:

- The MSI is an **imaginary, approximately spherical (or oblate spheroid) region** surrounding the Moon.
- For the Earth–Moon system, the MSI radius is roughly **~66,000 km** from the Moon's center (approximate, varies with models).

How to Calculate It (SOI Radius)?

Using the classical patched-conic approximation:

$$r_{SOI} \approx a\left(\frac{m}{M}\right)^{2/5}$$

- **a** = Moon's semi-major axis around Earth (~384,400 km)
- **m** = Mass of Moon
- **M** = Mass of Earth
- Gives a practical estimate used for mission planning.

(**Note:** For precise mission design, ISRO uses numerical N-body simulations, not this crude formula.)

Features of the Sphere of Influence:

- **Dominant gravitational region**: Moon's gravity governs trajectory integration more strongly than Earth's.
- **Not a physical boundary**: It is a mathematical convenience, not a sharp gravitational cutoff.
- **Both Earth & Moon still influence motion**: Earth still perturbs the orbit inside MSI; Moon still perturbs outside it.
- **Useful for "patched conic" method**: Helps switch from one two-body solution (Earth–craft) to another (Moon–craft).
- **Shape is not perfectly spherical**: It is closer to an **oblate spheroid**, influenced by orbital eccentricity and the Sun.

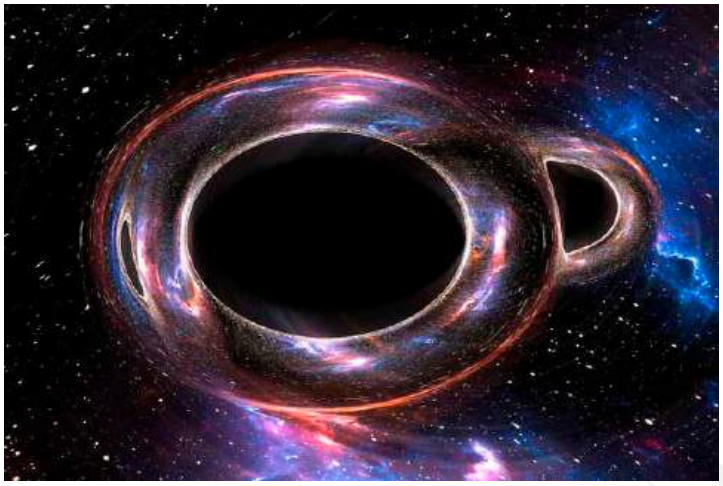
Significance:

- **Trajectory Planning**: Determines when spacecraft navigation should shift from Earth-centric to Moon-centric calculations.
- **Critical for Lunar Flybys & Insertions**: Ensures optimal timing for orbit circularisation, braking, or slingshot manoeuvres.

- **Avoids Orbital Uncertainty**: Helps predict perturbations from Earth, Sun, and other lunar orbiters.

GW250114 DISCOVERY

Context: Scientists have detected GW250114, the clearest gravitational wave signal ever recorded, from a black hole merger about 1.3 billion light-years away.



About GW250114 Discovery:

- **What it is?**
  - GW250114 is a gravitational wave event produced by the merger of two black holes roughly 30 times the mass of the Sun each, orbiting in near-circular paths before coalescing into a single, rotating black hole.
- **Found by:** Detected jointly by the **LIGO (U.S.)**, **Virgo (Italy)**, and **KAGRA (Japan)** observatories using laser interferometry — the same technology that confirmed gravitational waves in 2015.
- **Features:**
  - **Most precise signal yet:** Clearer and stronger than earlier detections, thanks to improved detector sensitivity (reduced laser noise, better mirrors).
  - **Observed 1.3 billion light-years away**, providing an exceptionally clean waveform for analysis.
  - **Verified Hawking's area theorem:** Researchers measured the event horizon areas before and after the merger, confirming that the total surface area increased, as predicted.

About Stephen Hawking's Black Hole Area Theorem:

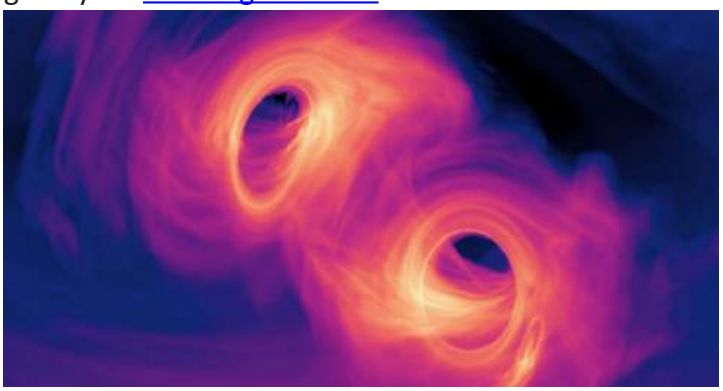
- **Proposed in:** 1971 by **Stephen Hawking**, as part of black hole thermodynamics.
- **Core Idea:** The total surface area of all black holes (event horizons) in an isolated system can never decrease over time — it can only increase or remain constant.
- **Physical Meaning:**
  - The event horizon area represents a black hole's entropy (disorder).
  - Hence, the theorem mirrors the Second Law of Thermodynamics, where total entropy never decreases.
  - During a black hole merger, the combined event horizon area after merger is greater than the sum of the individual black holes' areas.

Significance of GW250114 Discovery:

- Marks a milestone in gravitational-wave astronomy, ten years after LIGO's first detection.
- Offers direct empirical evidence for fundamental laws of black-hole physics.
- Enhances understanding of black hole formation, spin, and merger dynamics.
- Strengthens global collaboration among LIGO–Virgo–KAGRA networks, setting the stage for next-generation detectors and deeper cosmic exploration.

BLACK HOLE MORSELS

Context: A new theoretical study proposes that tiny "black hole morsels"—micro-black holes formed in violent cosmic collisions—could produce detectable gamma-ray bursts and offer a rare test of quantum gravity via Hawking radiation.



About Black Hole Morsels:

What they are?

- These are extremely **tiny black holes**, much smaller than the usual ones we hear about — imagine something **as massive as an asteroid,** but squeezed into a point. Because they're so small, they get **very hot** and shine faintly by giving off energy known as **Hawking radiation**.

Proposed by: Scientists **Giacomo Cacciapaglia** and **Francesco Sannino** came up with this idea in a recent study accepted in Nuclear Physics B.

How they form?

- When two huge black holes crash into each other, the collision might "**pinch off**" tiny blobs of space so dense that they become mini–black holes, or "morsels." These morsels don't last long — they slowly **evaporate**, disappearing in anything from a **split second to a few years**, depending on their size.

What makes them special?

- Because they're small, they're **much hotter** and give off stronger radiation than normal black holes.
- As they vanish, they release **powerful flashes of energy**—bursts of gamma rays that could be seen from Earth.
- These bursts would spread out **in all directions**, unlike normal gamma-ray bursts, which are usually narrow beams.

Why it matters?

- Detecting one would give scientists a real-world glimpse of quantum gravity — the link between gravity and quantum physics that's never been observed directly.
- The team has already looked at telescope data to check for signs of these events — their first step toward testing the theory.
- These tiny black holes could act as "natural cosmic labs," helping us study the universe at energy levels far beyond what any human-made experiment can reach.

LVM3-M5 LAUNCH VEHICLE

Context: The Indian Space Research Organisation (ISRO) successfully launched India's heaviest communication satellite, CMS-03 (GSAT-7R), aboard the LVM3-M5 rocket from Sriharikota.

About CMS-03 (GSAT-7R) Communication Satellite:

What it is?

- CMS-03, also known as **GSAT-7R**, is a **next-generation multi-band communication satellite** designed to enhance India's secure and high-throughput communication capabilities over land and sea.

Developed by: Developed and launched by **ISRO**, with all stages and subsystems built using **indigenous technology**, under the Department of Space.

Aim: To provide reliable, high-capacity communication links for government, defence, maritime, and disaster management operations while expanding India's digital and strategic communication footprint.

Key Features:

1. **Heaviest Indian-built satellite** launched from Indian soil, weighing **4,410 kg**.
2. **Multi-band payloads** covering **C, Ku, and Ka bands** for versatile communication applications.
3. Offers coverage across **the Indian mainland and wide oceanic regions**, supporting maritime connectivity.
4. Equipped with **15-year mission life** and high-throughput transponders for broadband and satellite internet services.
5. Replaces the ageing **GSAT-7 series**, integrating advanced transponders for **secure defence communications** and **future 5G applications**.

About LVM3-M5 Launch Vehicle:

What it is?

- The **Launch Vehicle Mark-III (LVM3)**—nicknamed **"Baahubali"** for its heavy-lift capability—is **India's most powerful three-stage rocket**, capable of placing 4-tonne class satellites into **Geosynchronous Transfer Orbit (GTO)**.

Aim: To ensure **complete self-reliance** in launching heavy communication and deep-space satellites from

Indian soil, eliminating dependence on foreign launch providers.

Key Features:

1. **Three-stage configuration:** Two **S200 solid boosters**, one **L110 liquid stage**, and a **C25 cryogenic upper stage**.
2. **Heaviest launch vehicle** (641 tonnes; 43.5 metres tall) capable of carrying **4,000 kg to GTO and 8,000 kg to LEO**.
3. **Cryogenic re-ignition experiment** successfully tested for future **multi-satellite deployments**.
4. **Indigenous cryogenic engine (C25)** developed by **Vikram Sarabhai Space Centre**, enhancing payload efficiency by 10%.
5. Proven reliability — **eight consecutive successful missions**, including **Chandrayaan-3 (2023)** and now **CMS-03 (2025)**, solidifying its role as **India's heavy-lift workhorse** and **future Gaganyaan crew launcher**.

Defence and Security

S-500 AIR DEFENCE SYSTEM

Context: PM of India and President of Russia are set to meet during the India–Russia Summit, where both defence ministers are expected to discuss India's potential interest in Russia's next-generation S-500 air defence system.

About S-500 Air Defence System:

What it is?

- The S-500 Prometey is Russia's most advanced long-range surface-to-air and anti-space defence system, capable of intercepting aircraft, ballistic missiles, hypersonic weapons, and even low-orbit satellites.

Developed By: Developed by Almaz-Antey, Russia's premier air-defence manufacturer.

Key Features:

- **Ultra-long range:** Can intercept targets up to **600 km** away.
- **Near-space interception:** Works at altitudes up to **200 km**, including low-Earth-orbit objects.
- **Hypersonic interceptors:** Missiles like **77N6-N / 77N6-N1** fly at **Mach 5–7**, using "hit-to-kill" accuracy.
- **Multi-target engagement:** Tracks and destroys stealth jets, ballistic missiles, hypersonic glide vehicles, and drones.
- **Advanced radar suite:** 91N6A(M) & 96L6-TsP radars can detect threats up to **800 km** away, including stealth aircraft.
- **Rapid response:** Reaction time of **3–4 seconds**, nearly twice as fast as S-400.
- **Highly mobile:** Mounted on all-terrain transporters for quick deployment.

Advancements Over S-400:

Feature	S-400	S-500
Max Range	380 km	600 km
Target Altitude	~30–40 km	Up to 200 km (near-space)
Hypersonic Interception	Limited	Full capability (Mach 5–7)
Satellite Kill Capability	No	Yes – Low Earth Orbit
Response Time	9–10 sec	3–4 sec
Stealth Tracking	High	Superior multi-band radar

Significance:

- Massive strategic upgrade to India's layered air-defence shield.
- Enhances India's capability against China's hypersonic missiles and Pakistan's ballistic arsenal.
- Gives India anti-space defence—a rare capability globally.

LCA TEJAS

Context: The LCA Tejas crashed during an aerial display at the **Dubai Air Show**, leading to the death of IAF pilot Wing Commander Namansh Syal.

About LCA Tejas:

What it is?

- LCA Tejas is India's indigenous 4.5-generation, all-weather, multi-role light combat aircraft, forming a key element of the IAF's fighter fleet modernisation.

Developed by: Designed by Aeronautical Development Agency (ADA) and produced by Hindustan Aeronautics Limited (HAL) under the Light Combat Aircraft (LCA) programme.

Evolution:

- Conceived in the 1980s as a replacement for the MiG-21 fleet, the LCA Tejas made its first flight in 2001 and was formally inducted into the Indian Air Force in 2016.
- Over time, it has evolved into improved variants such as Tejas Mk-1 and Mk-1A, with the more advanced Tejas Mk-2 currently under development.

Key Features:

- **Lightest & smallest in its class:** Composite airframe for high maneuverability and reduced weight.
- **4.5-gen avionics:** AESA radar, advanced EW suite, digital flight controls, SMFDs, and open architecture mission computer.
- **Quadruplex fly-by-wire:** Ensures high agility with enhanced pilot control and safety.
- **Multi-role capability:** Air-to-air, air-to-ground, BVR missiles, precision bombs, and maritime strike roles.
- **IFR capability:** In-flight refuelling for extended range.
- **Variants:** Single-seat fighter (IAF/Navy), twin-seat trainer, and advanced Mk-1A with superior sensors and survivability features.

Significance:

- **Strengthens Atmanirbhar Defence:** A major milestone in India's indigenous aerospace capabilities.
- **MiG-21 replacement:** Provides a modern, agile and cost-effective fighter for IAF.
- **Export potential:** Several countries, including in Asia–Africa, have expressed interest.

INS MAHE

Context: INS Mahe, India's first Mahe-class Anti-Submarine Warfare Shallow Water Craft (ASW-SWC), was commissioned into the Indian Navy at Mumbai.

About INS Mahe:

What it is?

- INS Mahe is the lead ship of the indigenously designed Mahe-class ASW Shallow Water Craft, built to conduct anti-submarine warfare in coastal and shallow waters.
- It serves as the first line of coastal defence, supporting larger ships, submarines and naval aviation assets.

Developed By:

- Designed and built by Cochin Shipyard Limited (CSL), Kochi.
- Over 80% indigenous content, making it a major milestone in Aatmanirbhar Bharat and indigenous naval capability.

Aim:

- To detect, track and neutralise submarine threats in India's littoral zones.
- To enhance India's coastal security architecture and provide persistent maritime surveillance.

Key Features of INS Mahe:

- **ASW Shallow Water Craft**: Optimised for

operations in coastal, low-depth waters where larger platforms cannot manoeuvre effectively.

- **Stealth and readiness**: Embodied in its motto **"Silent Hunters"**.
- **Advanced combat suite**: A compact yet powerful network of
  - modern weapons
  - high-precision sensors
  - advanced communication systems
- **Superior ASW capability**: Can detect, track, and neutralise sub-surface threats with high accuracy.
- **Modern systems**: Equipped with technologically advanced machinery and integrated control systems.
- **Design inspiration**:
  - Named after the historic coastal town **Mahe** on the Malabar Coast
  - Crest features the **Urumi** (flexible sword of Kalaripayattu)
  - **Mascot:** Cheetah symbolising speed and focus

Significance:

- **Boosts India's ASW capabilities**: Enhances surveillance and submarine-tracking capacity in crucial littoral waters.
- **Strengthens coastal defence**: Forms the forward layer of India's multi-layered maritime security grid.
- **Major stride in indigenisation**: Reinforces India's ability to design and build complex naval combatants.

EXERCISE SURYAKIRAN

Context: India and Nepal will launch the 19th edition of Exercise Suryakiran from November 25 to December 8 in Pithoragarh, Uttarakhand.

About Exercise Suryakiran:

- **What it is?**
  - Exercise Suryakiran is a bilateral, annual, battalion-level military exercise conducted alternately by India and Nepal to enhance defence cooperation, coordination, and military preparedness.
- **Nations Involved:** Indian Army and Nepal Army.
- **Aim:** To improve operational synergy in jungle warfare, counter-terrorism operations, mountain warfare, and integrate modern technologies for improved interoperability and tactical coordination.
- **Features of Exercise Suryakiran:**
  - **Joint High-Altitude & Jungle Warfare Drills:** The exercise focuses on coordinated operations in **forested and mountainous terrain**, reflecting the shared geography and operational challenges of both nations.
  - **Counter-Terrorism Operations:** Includes training in **cordon-and-search**, room intervention, surveillance, and small-team tactics against insurgent and terrorist threats.
  - **Integration of Niche Technologies:** Emphasises the use of modern systems for **surveillance, communication, drones, medical evacuation**, and battlefield support tools.
  - **Exchange of Best Practices:** Soldiers share **combat experiences, tactical knowledge, survival skills**, and operational procedures from real-world missions.
  - **Battalion-Level Participation:** Typically involves a full battalion (around **300+ troops**) from both sides, including specialists in aviation, medical, engineering, and high-altitude warfare.
  - **Annual Alternating Format:** Exercise is held every year, alternating between India and Nepal; the **18th edition** took place in **Saljhandi, Nepal (2024–25)**.
- **Significance:**
  - Reinforces long-standing military ties rooted in mutual trust, respect, and historical kinship between the two armies.
  - Helps standardise operational procedures, communication methods, and tactical responses during joint

missions.
- Contributes to counter-terror preparedness, border security cooperation, and shared responses to emerging threats in the Himalayas.

HAMMER PRECISION WEAPON SYSTEM

Context: Bharat Electronics Limited (BEL) and France's Safran Electronics & Defence have signed a Joint Venture Cooperation Agreement to manufacture the HAMMER precision-guided air-to-ground weapon system in India.

About HAMMER Precision Weapon System:

What it is?

- The **HAMMER (Highly Agile Modular Munition Extended Range)** is a smart, precision-guided, air-to-ground weapon designed to strike hardened targets with high accuracy from stand-off ranges.

Developed by: Originally developed by **Safran (Sagem), France**, and now set for joint manufacturing with **BEL** in India.

Aim: To provide the IAF and Navy with a **combat-proven, modular, precision weapon** suitable for mountainous warfare, quick deployment, and integration with aircraft like **Rafale** and **Tejas**.

Key Features of HAMMER:

- **Modular Architecture:** Features a guidance kit + range-extension kit that can be fitted onto multiple types of general-purpose bombs, enhancing flexibility across missions.
- **High Accuracy Precision Strike:** Uses **GPS/INS, infrared, and laser-guided** options, enabling accurate strikes on bunkers, hardened shelters, airstrips, and enemy infrastructure.
- **Extended Stand-Off Range:** Can hit targets up to **70 km**, enabling aircraft to strike without entering high-risk airspace—crucial for operations in contested zones.
- **High Agility & Manoeuvrability:** Optimised for mountain warfare (e.g., Ladakh), allowing precision strikes even in **complex topography and high-altitude environments**.
- **Platform Compatibility:** Integrated with **Rafale**, and to be integrated with **LCA Tejas**, providing flexibility across Air Force and Navy combat platforms.
- **Joint Manufacturing & Indigenous Capability:** The BEL–Safran JV will achieve **60% localisation**, with BEL leading final assembly, testing, and quality assurance, reducing foreign dependence.

Significance:

- **Boost to 'Make in India' Defence Manufacturing:** Local production strengthens India's self-reliance in advanced, high-precision weapon systems and supports export potential.
- **Enhances Air Force Strike Capability:** Provides India with a versatile, precision strike weapon capable of neutralising hardened targets — essential for operational readiness against adversaries.
- **Faster, Cost-Effective Availability:** Indigenous manufacturing avoids delays associated with emergency imports and reduces long-term procurement costs.

CENTRE DESIGNATES CISF AS NEW SAFETY REGULATOR FOR INDIAN SEAPORTS

Context: The Union Government has designated the CISF as the new safety regulator for over 250 major and minor seaports across India.

About Centre Designates CISF as New Safety Regulator

for Indian Seaports:

- **What This Decision Means?**
  - The Government has officially recognised the **Central Industrial Security Force (CISF)** as the Recognised Security Organisation (RSO) for all major and minor seaports, empowering it to regulate, oversee, and enforce security standards across India's maritime facilities.
  - Port-security responsibility was earlier managed in a fragmented manner under the **Directorate General of Shipping (DG Shipping)**, without a dedicated professional security regulator for maritime zones.
- **Need for the Change:**
  - **Rising cargo movement and Blue Economy expansion** demanded a uniform, professional security architecture.
  - **250+ seaports lacked standardised assessments**, modern screening systems, and integrated security plans.
  - Increasing threats—smuggling, sabotage, infiltration—required a **specialised paramilitary force** with nationwide presence, expertise, and training.
  - CISF already protects **airports, nuclear plants, metros**, making it the most capable agency to modernise seaport security.

About Central Industrial Security Force (CISF):

- **What It Is?**
  - A **Central Armed Police Force** dedicated to securing India's critical infrastructure, industrial assets, and transport systems.
- **Established In: 1969**, through an Act of Parliament, later expanded into a full-fledged armed force under the CISF Act, 1983.
- **Aim:** To provide **specialised, technology-driven security** to critical national infrastructure and ensure safe, secure, and uninterrupted industrial, aviation, and strategic operations.
- **Major Functions:**
  - **Industrial & Infrastructure Security:** Protects PSUs, refineries, steel plants, atomic energy units, ISRO facilities, currency presses.
  - **Airport Security:** Secures **70+ airports**, handling passenger and cargo screening.
  - **Transport Security:** Guards Delhi Metro and other urban transit systems; now regulates seaport security.
  - **VIP & Government Premises Security:** Protects sensitive government buildings and select individuals.
  - **Fire Services:** Operates a specialised fire wing for industrial units.
  - **Disaster Response:** Supports national disaster management and emergency response operations.

COASTAL SECURITY EXERCISE 'SAGAR KAVACH'

Context: The biannual coastal security exercise 'Sagar Kavach' has commenced in Tamil Nadu's Cuddalore and Villupuram districts, involving multi-agency coastal preparedness drills.

About Coastal Security Exercise 'Sagar Kavach':

What it is?

- 'Sagar Kavach' is a **biannual multi-agency coastal security exercise** conducted along India's coastline to assess real-time preparedness against seaborne threats, intrusions, and infiltration attempts.
- It simulates realistic attacks to gauge vulnerabilities and response efficiency.

Host: Indian Coast Guard.

Aim:

- To validate Standard Operating Procedures (SOPs) for coastal security.
- To assess preparedness against threats such as intrusions, sabotage, smuggling, and terrorist infiltration.

Key Features of 'Sagar Kavach':

- Conducted **twice a year** across coastal states and island territories.
- Uses **realistic threat simulations** such as dummy intruders (Red Force teams), infiltration attempts, and sabotage scenarios.
- Involves **sea patrolling, boat inspections, harbour checks, coastline surveillance**, and securing high-value targets.
- Trains coastal police in **intelligence gathering, interrogation, interception, and patrolling procedures**.
- Enhances coordination between military, paramilitary, and civil agencies to build a **robust and resilient coastal security architecture**.
- Covers **coastal villages, harbours, vital installations, rail/bus stations**, and sensitive public infrastructure.
- Integrates **surface assets, air surveillance, and communication networks** across agencies.

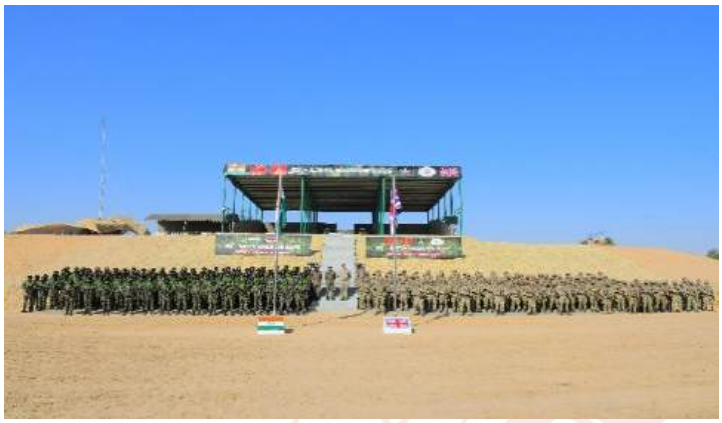
MILITARY EXERCISES IN NEWS

Context: Two major military exercises hit headlines: Garuda-2025, a bilateral air exercise between India and France in France, and Ajeya Warrior-25, a key India–UK joint military training exercise that began in Rajasthan under a UN mandate.

About Military Exercises in News:

About Exercise Garuda-2025:

- **What it is?**
  - A bilateral air combat exercise between the Indian Air Force (IAF) and the French Air & Space Force.
- **Nations involved:** India and France.
- **Host:** Mont-de-Marsan Air Base, France.
- **Aim:** To enhance air-combat interoperability, exchange best practices, and strengthen strategic air cooperation.
- **Features:**
  - IAF *Su-30 MKI* flying alongside French *Rafale* fighters in simulated combat.
  - Focus on complex air operations, tactical manoeuvres, and operational synergy.
  - Showcases long-standing Indo-French defence partnership.



About Exercise Ajeya Warrior-2025:

- **What it is?**
  - A biennial India–UK military exercise focusing on counter-terrorism operations.
- **Nations involved:** India and the United Kingdom.
- **Host:** Mahajan Field Firing Ranges, Rajasthan (Foreign Training Node).
- **Aim:** To enhance tactical proficiency, joint mission planning, and coordinated responses in semi-urban counter-terror settings.
- **Features:**
  - 240 personnel (equal representation from both armies).
  - Indian Army represented by troops of the *Sikh Regiment*.
  - Brigade-level mission planning, simulation drills, and field training exercises.
  - Conducted under a **UN mandate**, strengthening global peace and stability efforts.
  - Focus on semi-urban warfare, integrated drills, and interoperability.

RUDRA BRIGADE

Context: The Army successfully validated a newly raised Rudra all-arms integrated brigade during the major tri-service Trishul exercise, prompting discussions on upgrading India's Cold Start doctrine to a "Cold Strike" doctrine.

About Rudra Brigade:

What is the Rudra Brigade?

- A **Rudra Brigade** is a newly conceptualised all-arms, permanently integrated combat formation combining infantry, mechanised units, armour, artillery, air defence, engineers, signals, drones, logistics and support elements under a single operational framework.

Aim:

- To create self-contained, rapidly deployable integrated battle formations that can execute swift, multi-axis offensive strikes.
- To operationalise India's move from Cold Start → Cold Strike, enabling faster mobilisation and decisive limited-war operations under a nuclear overhang.

Operated By:

- Operated by the **Indian Army**, under different regional Corps (e.g., Konark Corps on western front).
- Two Rudra brigades already deployed on the **northern borders (Eastern Ladakh & Sikkim)**.

Key Features of Rudra Brigades:

- **Fully Integrated All-Arms Formation:** Combines infantry, mechanised infantry, armour, artillery, AD, engineers, signals, UAV units and logistics into one cohesive brigade during peace and war.
- **Tailor-Made for Terrain:** Composition changes depending on the operational theatre—deserts, plains, mountains, or LoC.
- **Faster Mobilisation & Higher Readiness:** Permanent integration reduces mobilisation time drastically, enabling immediate offensive action.
- **Capable of Multi-Domain Operations:** Equipped for operations involving land, air support, drones, sensors, precision weapons and electronic warfare.
- **Built-In Force Multipliers:** Includes drones, ISR systems, area-saturation artillery, attack helicopter support and rapid logistics nodes.
- **Modular & Flexible Structure:** Units can be added or detached based on mission requirements, enabling high adaptability.

Significance:

- **Enables "Cold Strike" Doctrine:** Moves beyond Cold Start by combining speed + technology + integrated logistics for deep, rapid offensives.
- **Strengthens Western & Northern Borders:** Enhances India's ability to respond swiftly to Pakistan-based provocations and Chinese mobilisation.
- **Reduces Response Time in Crisis:** Permanent integration ensures forces are pre-aligned, trained together, and mission-ready.

INTEGRATED DRONE DETECTION AND INTERDICTION SYSTEM (MARK-2)

Context: India is set to boost its counter-drone warfare capabilities as the Army and IAF prepare to procure 16 indigenous Integrated Drone Detection and Interdiction System (Mark-2) units.

About Integrated Drone Detection and Interdiction System (Mark-2):

What it is?

- An advanced indigenous counter-drone warfare platform designed to detect, track and neutralise hostile unmanned aerial systems using a combination of sensors, jammers and high-energy laser weapons.

Developed by: Defence Research and Development Organisation (DRDO), led by its lab **CHESS – Centre for High Energy Systems & Sciences**, in collaboration with the Armed Forces.

Aim: To provide India with a rapid-response, precise and high-energy counter-drone system capable of neutralising surveillance drones, weaponised UAVs and swarm attacks across sensitive borders, military bases and critical infrastructure.

Key Features:

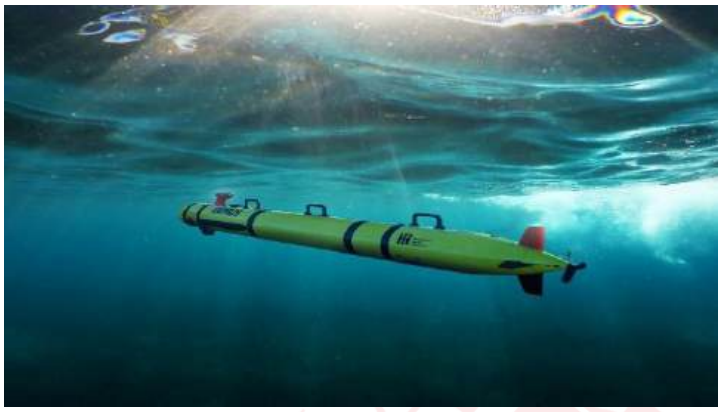
- **10 kW Laser Neutralisation:** Engages and destroys enemy drones at **up to 2 km**, doubling the range of the earlier Mark-1 system.
- **Multi-Sensor Detection Suite:** Radar, EO/IR sensors, RF detectors and AI-enabled algorithms for real-time drone detection and classification.
- **Hard-Kill + Soft-Kill Capability:** Disables drones using both laser beams (hard kill) and RF jamming/GNSS spoofing (soft kill).
- **Vehicle-Mounted & Rapidly Deployable:** Mobile platform suited for border areas, forward bases, airports and urban protection zones.
- **Next-Gen Integration:** Built to integrate with future **30 kW high-energy laser systems** capable of strikes up to 5 km.

Significance:

- **Strengthens Drone Warfare Preparedness:** Meets urgent national security needs amid rising drone threats from Pakistan and in global conflicts (Ukraine, Middle East).
- **Indigenous Laser Weapon Capability:** Positions India among a select group of nations (US, China, Russia) with demonstrated directed-energy weapons.
- **Protects Critical Infrastructure:** Enhances defence of borders, ammunition depots, nuclear sites, VVIP events and airports against both single drones and swarm attacks.

DRDO DEVELOPS NEW GENERATION MAN-PORTABLE AUTONOMOUS UNDERWATER VEHICLES

Context: DRDO has successfully developed a new generation of Man-portable Autonomous Underwater Vehicles (MP-AUVs) for naval mine countermeasure missions.



About DRDO Develops New Generation Man-Portable Autonomous Underwater Vehicles:

What it is?

- A compact, lightweight **autonomous underwater vehicle system** that can be carried by personnel and deployed quickly for detecting, classifying, and analysing underwater mines in real time.

Developed by: Naval Science & Technological Laboratory (NSTL), Visakhapatnam — a premier naval systems lab of Defence Research and Development Organisation **(DRDO).**

Aim:

- To strengthen India's **indigenous mine countermeasure (MCM) capability**,
- Reduce risk to naval divers and manned vessels,
- Enable fast, autonomous, and networked underwater mine detection.

Key Features:

- **Multi-AUV System:** Uses multiple portable AUVs working collaboratively during missions.
- **Side Scan Sonar + Underwater Cameras:** Enables high-resolution imaging and real-time detection of mine-like objects.
- **AI-Driven Target Recognition:** Deep-learning algorithms autonomously classify threats, reducing operator load and speeding up missions.
- **Underwater Acoustic Communication:** Allows AUVs to exchange data underwater, enhancing situational awareness and coordination.
- **Man-Portable & Rapid Deployment:** Lightweight design suitable for quick launch from ships or shore.
- **Validated Through Field Trials:** Successfully tested in NSTL harbour trials for accuracy, coordination, and mission reliability.

Significance:

- **Enhances Naval Mine Warfare Capability:** Provides an intelligent, networked, and safer system for mine detection and neutralisation.
- **Reduces Risk to Personnel:** Minimises the need for divers or manned vessels in high-risk minefields.
- **Boosts Indigenous Defence Tech:** Strengthens India's self-reliance under Aatmanirbhar Bharat in critical underwater warfare systems.

OPERATION SOUTHERN SPEAR

Context: The United States has launched Operation Southern Spear, a major new military and surveillance campaign targeting Latin American drug-trafficking cartels.

About Operation Southern Spear:

What it is?

- A large-scale U.S. military and intelligence operation deploying unmanned air and sea systems to detect, monitor, and disrupt drug-trafficking networks across the Caribbean and eastern Pacific.

Nation Involved: Led by the United States, under the Department of Defence.

Aim:

- To neutralize narco-terrorist networks operating in the Western Hemisphere.
- To secure U.S. borders against drug smuggling routes.
- To test and operationalize a hybrid fleet of robotic and manned naval forces as part of Navy modernization.

Key Features of Operation Southern Spear:

- **Robotic & Autonomous Systems (RAS):** Long-endurance robotic surface vessels, interceptor boats, and VTOL robotic aircraft for round-the-clock surveillance.
- **Hybrid Fleet Integration:** Combines unmanned systems with traditional warships under the U.S. Navy's Project 33 for accelerated robotic fleet deployment.
- **Expanded Naval Presence:** Over a dozen U.S. vessels in the region, including **USS Gerald R. Ford**, amphibious ships, and a nuclear submarine.
- **High-Speed Interdiction:** Robotic boats capable of rapid interception of narco-vessels in high-traffic maritime chokepoints.

Significance:

- **Major Military Escalation:** Largest U.S. naval buildup in the Caribbean in decades, heightening geopolitical tensions.
- **Counter-Narcotics Capability Boost:** Enhances the U.S.'s ability to monitor and intercept drug shipments across vast oceanic routes.
- **Regional Impact:** Raises concerns among Latin American nations—especially Venezuela—about potential U.S. interventionism.

NYOMA AIR BASE

Context: The Indian Air Force (IAF) has operationalised the Nyoma Air Base in Eastern Ladakh, with Air Chief Marshal A.P. Singh making the inaugural landing on a C-130J aircraft.

About Nyoma Air Base:

- **What it is?**
  - A newly operationalised IAF airbase at Mudh-Nyoma in Eastern Ladakh, designed to handle fighter jets, heavy transport aircraft, and helicopters, making it one of the highest operational airfields in the world at an altitude of 13,700 feet.
- **Located in:** Nyoma subdivision, Leh district, Ladakh, near the southern bank of Pangong Tso

and about 30 km from the LAC, on the northern bank of the Indus River.

- **History:**
  - Originally built as a **mud-paved landing ground in 1962**, it remained inactive for decades.
  - **Reactivated in 2009** when an **AN-32 aircraft** landed successfully.
  - Following the **2020 India–China border standoff**, Nyoma ALG supported operations of **C-130J, AN-32, Apache, and Chinook** aircraft.
  - In **2023**, the **BRO** began upgrading it into a full-fledged airbase under **Project Himank**, completing the 2.7-km paved runway by 2024 at a cost of ₹218 crore.
  - **Operationalised in November 2025** after completion of hangars, ATC, and support facilities.
- **Geological Features:**
  - Situated in a **high-altitude cold desert terrain**, surrounded by rugged mountains and the **Changthang plateau**.
  - The region experiences **temperatures up to –30°C**, limiting construction windows to just a few months each year.
  - Lies near **strategic valleys** like Hanle, Chumar, and Demchok, with proximity to the **Kailash Range and Skakjung plains**.
- **Importance of Nyoma Air Base:**
  - **Strategic Edge:** Enhances India's air mobility and quick response capability along the sensitive LAC with China.
  - **Infrastructure Milestone:** Symbolises India's growing border infrastructure strength alongside airfields at Leh, Thoise, Kargil, Daulet Beg-Oldie, and Fukche.
  - **Geo-political Significance:** Strengthens deterrence posture, ensuring sustained dominance and surveillance across the Indus–Pangong–Hanle corridor.

EXERCISE MITRA SHAKTI XI – 2025

Context: The 11th edition of India–Sri Lanka Joint Military Exercise "Mitra Shakti XI–2025" began at Belagavi, Karnataka, bringing together troops from both nations to enhance operational coordination under UN peacekeeping mandates.

About Exercise Mitra Shakti XI – 2025:

- **What it is?**
  - A bilateral joint military exercise between the Indian Army and the Sri Lankan Army, conducted annually to strengthen defence cooperation and interoperability in sub-conventional operations.
- **Host:** The Foreign Training Node, Belagavi (Karnataka) is hosting the 2025 edition.
- **Nations involved:**
  - The Indian contingent (170 personnel) is led by the Rajput Regiment, while the Sri Lankan contingent (135 personnel) is represented by the Gajaba Regiment.
- **Aim:**
  - To jointly rehearse sub-conventional operations under Chapter VII of the UN Charter, focusing on counter-terrorism, peacekeeping, and humanitarian operations through joint tactical drills.
- **Key features:**
  - Joint raid, search and destroy missions, heliborne operations, and counter-terrorist drills.
  - Use of **drones, counter-UAV systems, and helicopters** for real-time operational training.
  - Inclusion of **Army Martial Arts Routine (AMAR), combat reflex shooting**, and **Yoga sessions** to build physical and mental synergy.
  - Focus on **casualty evacuation, securing helipads, and integrated command operations** to simulate UN peacekeeping conditions.

- Exchange of **best practices and tactical experiences** to enhance mutual learning and strengthen bilateral defence ties.

EXERCISE MALABAR 2025

Context: INS Sahyadri has reached Guam in the Northern Pacific to participate in Exercise Malabar 2025, reaffirming India's commitment to maritime cooperation, regional stability, and interoperability among the Quad nations.

About Exercise Malabar 2025:

What it is?

- Exercise Malabar is a multilateral naval exercise involving the navies of India, the United States, Japan, and Australia.
- It serves as a premier platform for enhancing maritime security coordination, interoperability, and joint operational capabilities among the participating nations.

Origin:

- Initiated in **1992** as a **bilateral naval exercise between India and the United States**.
- **Japan** became a permanent member in **2015**, followed by **Australia** in **2020**, making it a **Quad-level exercise**.

History:

- Over three decades, the exercise has evolved from basic maritime coordination drills to advanced joint operations, reflecting growing strategic cooperation in the **Indo-Pacific region.**
- It has been hosted rotationally by member countries, symbolising shared responsibility for regional security.

Nations Involved: India, United States, Japan, and Australia — collectively representing the **Quad (Quadrilateral Security Dialogue)** nations committed to a free, open, and rules-based Indo-Pacific.

2025 Host: Guam, a U.S. Island territory in the **Western Pacific**, is hosting **Malabar 2025**, featuring both harbour and sea phases of the exercise.

Features of Malabar 2025:

1. **Harbour Phase:** Operational planning meetings, communication alignment, cross-deck visits, and cultural exchanges to enhance mutual understanding.
2. **Sea Phase:** Advanced maritime operations including joint fleet manoeuvres, anti-submarine warfare, surface gunnery drills, air defence operations, and cross-deck helicopter flights.
3. **Focus Areas:** Strengthening maritime domain awareness, joint logistics, and coordinated response to emerging security challenges in the Indo-Pacific.
4. **Symbol of Aatmanirbhar Bharat:** India's participation with **INS Sahyadri**, an indigenously designed and built stealth frigate, underscores indigenous naval capability.

POORVI PRACHAND PRAHAR

Context: The Eastern Command of the Indian Armed Forces is set to conduct a major tri-service exercise, 'Poorvi Prachand Prahar', at Mechuka, Arunachal Pradesh, near the LAC.

About Poorvi Prachand Prahar:

What it is?

- A large-scale **tri-service joint exercise** by the Indian Army, Navy, and Air Force under the **Eastern Command**, designed to validate multi-domain operations in high-altitude terrain near the Line of Actual Control (LAC).

Organisations involved: Conducted by the Eastern Command, with participation from the Indian Army's Bhairav Battalions, Ashni Platoons, Divyastra Artillery.

Aim:

- To refine interoperability and command integration across land, air, and maritime domains, test revised tactics and joint doctrines, and enhance combat agility and responsiveness in high-altitude conditions.

Features:

- **First-ever deployment** of new light combat formations under the "**Save and Raise**" model, ensuring zero additional fiscal burden.
- Integration of **Special Forces, UAVs, precision-strike weapons, and AI-enabled ISR systems**.
- Validation of **networked operations centres** for real-time decision-making.
- High-altitude **live simulation** of multi-domain warfare close to the LAC.
- Continuation of past tri-service drills — **'Bhala Prahar' (2023)** and **'Poorvi Prahar' (2024)**.

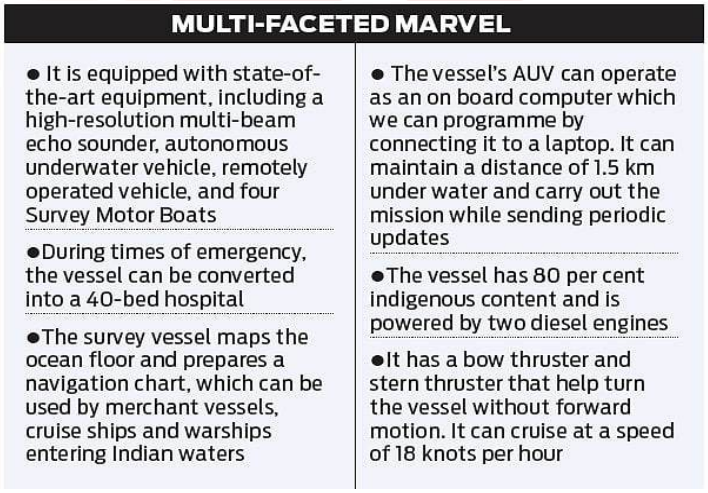
Significance:

- Strengthens India's tri-service synergy and operational readiness in the Eastern theatre.
- Enhances technology-driven warfighting capacity through drones, loitering munitions, and precision-guided systems.
- Demonstrates deterrence posture against Chinese aggression in Arunachal Pradesh, particularly across disputed zones like Yangtse and Tulung-la.

SURVEY VESSEL – IKSHAK

Context: The Indian Navy is set to commission 'Ikshak', the third vessel of the Survey Vessel (Large) class, built by Garden Reach Shipbuilders and Engineers (GRSE).

- It will be the first SVL-class ship based at the Southern Naval Command.



About Survey Vessel – Ikshak:

What it is?

- INS Ikshak is an indigenously built hydrographic survey vessel, designed to conduct coastal and deep-water mapping of ports, harbours, and navigational channels, ensuring safe maritime navigation and supporting India's blue economy operations.

Developed by: Constructed by Garden Reach Shipbuilders and Engineers (GRSE) Ltd., Kolkata, with over 80% indigenous content, in collaboration with Indian MSMEs under the Aatmanirbhar Bharat initiative.

Aim:

- To enhance the Indian Navy's hydrographic and oceanographic survey capacity, generate accurate nautical charts, and support navigation safety, resource mapping, and defence infrastructure planning across India's vast maritime domain.

Key Features of INS Ikshak:

- **Indigenous Build:** Third Sandhayak-class survey vessel built by GRSE Kolkata with 80% indigenous content under Aatmanirbhar Bharat.
- **Specifications:** 110 m long, 16 m beam, 3,300 t displacement; accommodates **231 crew** and **20 officers**.
- **Advanced Equipment:** Fitted with multi-beam echo sounder, side-scan sonar, AUV (1,000 m depth, 24-hr mission), ROV, and 4 survey motor boats.
- **Medical Role:** Convertible into a **40-bed hospital ship** with OT, lab, blood bank, and isolation ward for HADR missions.
- **Navigation & Power:** Two diesel engines with Integrated Platform Management System, bow and stern thrusters; speed 18 knots.
- **Operational Reach:** Equipped with a **helicopter deck** for surveillance and logistics.
- **Hydrographic Function:** Produces nautical charts for National Hydrographic Office; supports surveys for Mauritius, Sri Lanka, Bangladesh, Myanmar.

Significance:

- **Boosts hydrographic excellence:** Strengthens India's maritime charting, seabed mapping, and naval navigation safety network.
- **Strategic autonomy:** Reflects India's self-reliance in naval engineering and defence manufacturing.

- **Supports Blue Economy:** Enables port development, undersea cable planning, and marine resource management.

EXERCISE MILAN 2026

Context: India will host a historic maritime convergence in February 2026 at Visakhapatnam, featuring the International Fleet Review (IFR), Exercise MILAN 2026, and the IONS Conclave of Chiefs, under the MAHASAGAR vision.

About Exercise MILAN 2026:

- **What it is?**
  - Exercise MILAN is a biennial multilateral naval exercise hosted by the Indian Navy since 1995, aimed at fostering naval diplomacy, interoperability, and regional maritime cooperation.
- **Nations Involved:** It began with **four navies at Port Blair** and has grown into a premier global event, with participation from **over 40 friendly foreign navies** including those from the **Indo-Pacific, Africa, Europe, and ASEAN regions**.
- **Aim:** The exercise aims to enhance maritime domain awareness, anti-submarine warfare capabilities, air defence coordination, and search-and-rescue preparedness, reinforcing a rules-based maritime order.
- **Key Features of MILAN 2026:**
  - **Dual-Phase Structure:** The exercise will comprise Harbour and Sea phases, focusing on both operational drills and strategic-level exchanges.
  - **Advanced Naval Drills:** Includes anti-submarine warfare, air defence, maritime domain awareness, and search-and-rescue operations, enhancing multi-navy interoperability.
  - **International City Parade:** A grand parade at RK Beach, Visakhapatnam, featuring contingents from participating navies, the Indian Army, and Indian Air Force, showcasing maritime diplomacy to the public.
  - **Showcase of Indigenous Capability:** India will display INS Vikrant, Visakhapatnam-class destroyers, and Nilgiri-class frigates, reflecting its evolution into a Builder's Navy.
- **Significance of MILAN 2026:**
  - **Strengthening Maritime Diplomacy:** Positions India as a regional convenor for maritime cooperation, advancing the MAHASAGAR vision of collective security and growth.
  - **Enhancing Naval Interoperability:** Builds trust, communication, and tactical synergy among participating navies for coordinated multilateral operations.
  - **Supporting the Indo-Pacific Vision:** Reinforces India's role in ensuring a free, open, and inclusive Indo-Pacific, aligned with Act East and IPOI initiatives.

Sports

1ST BLIND WOMEN'S T20 WORLD CUP 2025

Context: Prime Minister of India met and felicitated the Indian Women's Blind Cricket Team after they created history by winning the inaugural Blind Women's T20 World Cup 2025, defeating Nepal in the final.

About 1st Blind Women's T20 World Cup 2025:

What it is?

- The Blind Women's T20 World Cup 2025 is the first-ever global cricket championship exclusively for women cricketers with visual impairment.
- It marks a historic step toward inclusivity, representation and international recognition for blind women athletes.

Organised By: World Blind Cricket Ltd. (WBC)

- Hosted jointly with the Cricket Association for the Blind in India (CABI) and the Cricket Association for the Blind in Sri Lanka.

Hosts & Venues:

- The World Cup was **co-hosted by India and Sri Lanka**.
- **Tournament venues included:**
  - Delhi (India)
  - Bengaluru (India)
  - Colombo (Sri Lanka) — venue for the final at **P. Sara Oval Stadium**

Features of the Tournament:

- **Six participating nations:** India, Nepal, Pakistan, Sri Lanka, Australia, USA.
- **Format:** Round-robin league → semifinals → final
- **Team composition:**
  - Players grouped as **B1 (fully blind)**, **B2**, **B3.**
  - Every team must field a mix of all categories.
- **Specialised equipment:**
  - White **plastic ball with metal bearings** (rattling sound helps tracking).
  - **Underarm bowling** along the ground.
  - B1 batters use **runners**, and each B1 run counts **double.**

Results:

- **Champion:** India (Unbeaten campaign)
  - India won the first-ever Blind Women's T20 World Cup, defeating Nepal by 7 wickets in the final.
- **Player of the Final:** Phula Saren.
- **Captain:** Deepika TC (Deepika Gaonkar)

COMMONWEALTH GAMES 2030

Context: India has been formally ratified as the host of the 2030 Commonwealth Games, with Ahmedabad (Amdavad), Gujarat as venue.

- This will be the **centenary edition** of the Games, marking 100 years since the first British Empire Games were held in **Hamilton, Canada, in 1930**.

About Commonwealth Games 2030:

What it is?

The Commonwealth Games are a **quadrennial multi-sport event** featuring athletes from member nations of the Commonwealth of Nations, blending Olympic-core sports with Games-specific disciplines like netball, lawn bowls and squash.

Brief History:

- **Origin:** Proposed in the late 19th–early 20th century as a "Pan-Britannic" sporting contest and first realised as the **Inter-Empire Championships (1911)**.
- **Formal start:** The first **British Empire Games** were held in **Hamilton, Canada, in 1930**, with 11 countries and 400 athletes.
- **Name evolution:**
  - British Empire Games (up to 1950)
  - British Empire and Commonwealth Games (1954–1966)
  - British Commonwealth Games (1970–1974)
  - Commonwealth Games (from 1978 onwards), reflecting decolonisation and equality among members.

2030 Host: Ahmedabad (Amdavad)

- The **Commonwealth Sport General Assembly in Glasgow (Nov 2025)** ratified **Amdavad/ Ahmedabad, Gujarat** as host of the **2030 Centenary Commonwealth Games**, after a vote of 74 member nations and territories.
- Ahmedabad's bid builds around the **Sardar Vallabhbhai Patel Sports Enclave and Narendra Modi Stadium** sports infrastructure, aligning also with India's long-term ambition to bid for the **2036 Olympics**.
- India has been a regular participant since **1934**, and first hosted the Games in **Delhi 2010**, which remain India's best-ever multi-sport performance, finishing second on the medals

tally.

About The Commonwealth:

What the Commonwealth is?

- The **Commonwealth of Nations** is a **voluntary association of independent and equal countries**, many of which were formerly part of the British Empire, cooperating on the basis of shared values rather than formal political control.

Historical Evolution:

- **Early Commonwealth**
  - At the 1926 Imperial Conference, Britain and the Dominions agreed they were equal in status, forming what was then called the British Commonwealth of Nations—linked by allegiance to the British monarch but not ruled by the UK.
- **Birth of the Modern Commonwealth**
  - After World War II, many territories became **fully independent**.
  - **India's independence in 1947** created a new situation: India wanted to be a **republic**, yet remain in the association.
  - The **London Declaration (1949)** allowed republics and countries not owing allegiance to the British Crown to remain members, effectively creating the **modern Commonwealth of Nations**.
  - Membership later expanded to countries with **no direct colonial link** to Britain

ICC WOMEN'S CRICKET WORLD CUP 2025

Context: India created history by winning its maiden ICC Women's Cricket World Cup 2025, defeating South Africa by 52 runs in the final held at Dr. DY Patil Stadium, Navi Mumbai.

About ICC Women's Cricket World Cup 2025:

What it is?

- The ICC Women's Cricket World Cup is the premier One Day International (ODI) championship for women, organized by the International Cricket Council (ICC) every four years. Each team plays 50 overs, and qualification is determined through the ICC Women's Championship and World Cup Qualifier tournaments.

Origin and History:

- **First held:** 1973 in England — two years before the first men's World Cup.
- **Initially organized by:** International Women's Cricket Council (till 2005).
- **Format:** Round-robin and knockout stages, featuring top women's cricketing nations.
- **Dominant teams:** Australia (7 titles), England (4), New Zealand (1), India (1 – 2025).
- **India's hosting years:** 1978, 1997, 2013, and 2025(along with Sri Lanka).

ICC Women's Cricket World Cup 2025 Highlights:

Category	Details
Host Nation	India and Sri Lanka
Venue (Final)	Dr. DY Patil Stadium, Navi Mumbai
Winner	India (First-ever title)
Runner-up	South Africa
Margin of Victory	India won by 52 runs
Player of the Match	**Shafali Verma**
Player of the Series	**Deepti Sharma**
Captain (India)	Harmanpreet Kaur
Captain (South Africa)	Laura Wolvaardt

Significance:

- **Historic Achievement:** India lifted its **first-ever Women's World Cup**, cementing its place among top global cricketing nations.
- **Women's Cricket Empowerment:** A major milestone for women's sports in India, inspiring greater participation and investment.
- **Sporting Diplomacy:** Enhanced India's image as a leading global host of major sports events.

ASIAN YOUTH GAMES 2025

Context: Prime Minister of India congratulated India's young athletes for their historic performance at the Asian Youth Games 2025, where India achieved its best-ever medal tally of 48 medals.

3rd Asian Youth Games
Bahrain 2025

About Asian Youth Games 2025:

What it is?

- The Asian Youth Games (AYG) is a continental multi-sport event organised by the Olympic Council of Asia (OCA) for athletes aged between 14–17 years, aimed at nurturing young sporting talent across Asia.

Origin: First held in **Singapore in 2009**, the Games were designed as a feeder event for the **Asian Games**, helping young athletes gain international exposure early in their careers.

History:

- **1st Edition (2009):** Singapore
- **2nd Edition (2013):** Nanjing, China
- The 2017 and 2021 editions were cancelled due to logistical and pandemic-related issues, marking **Bahrain 2025** as the **third edition** of the Games after a 12-year gap.

2025 Event (Bahrain):

- Held in **Manama, Bahrain**, from **22–31 October 2025**.
- Featured participants from across Asia in multiple disciplines.
- India delivered a **record-breaking performance**, winning **48 medals** — its **highest-ever tally**, surpassing previous bests from **2009 and 2013** editions.
    - 13 gold, 18 silver, 17 bronze which is total of 48 medals.
- The achievement reflected India's growing youth sports infrastructure and training programs under initiatives like **Khelo India**.

Next Event: The **4th Asian Youth Games** will be held in **Tashkent, Uzbekistan, in 2029**, which was originally planned for 2025 but postponed due to construction delays.

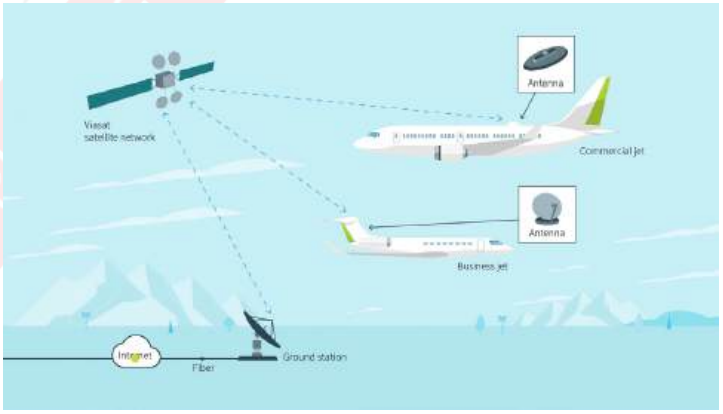
Significance:

- Reinforces India's rise as a youth sports powerhouse in Asia.
- Strengthens the nation's Olympic talent pipeline for future global competitions.
- Encourages investment in grassroots sports development and youth training programs.

Miscellaneous

IN-FLIGHT INTERNET

Context: With rising global air travel, in-flight Internet has become a standard service on commercial flights, prompting renewed public interest in how aircraft stay connected mid-air.



About In-flight Internet:

What It Is?

- In-flight Internet refers to **wireless Internet access provided to passengers on aircraft**, using onboard Wi-Fi networks that relay data to the ground through specialised aviation communication systems.

Types of In-flight Internet Systems:

1. **Air-to-Ground (ATG) Systems:** Aircraft connect to **ground-based towers** with upward-facing antennas, similar to cellular networks, making

coverage effective over land.

2. **Satellite-based Systems:** Aircraft use **dome-mounted antennas** to link with **geostationary (GEO)** or **low-earth orbit (LEO)** satellites, enabling connectivity over oceans, deserts, and polar regions.

How it works?

- Your device joins a local wireless network inside the aircraft, which is distributed through multiple ceiling-mounted access points to ensure stable connectivity across the cabin.
- All passenger data flows to a core onboard server that processes requests and directs them either to the air-to-ground antenna or satellite terminal, depending on the system in use.
- The aircraft's antenna maintains a continuous radio link with ground towers or satellites, transmitting packets outward while receiving return traffic for onboard users.
- In satellite-based systems, orbiting GEO or LEO satellites act as intermediaries, bouncing data between the aircraft and ground teleport stations linked to fibre Internet networks.
- Once connected, passengers are routed through a browser login page where the system verifies identity, enforces usage policies, and prioritises limited bandwidth across the aircraft.

Key Features:

- **Continuous connectivity** even at 30,000+ feet using certified aviation hardware.
- **GEO satellites** provide wide coverage; **LEO constellations** offer lower latency and higher speeds.
- **Dynamic bandwidth allocation** across multiple aircraft.
- **Onboard traffic shaping**—blocking VoIP calls, compressing images, limiting streaming.
- **Multiple Wi-Fi access points** ensure cabin-wide signal distribution.

Limitations:

- **Bandwidth constraints:** Total data is shared by all passengers; speeds drop when many users are active.
- **Latency issues:** GEO satellites (~36,000 km above Earth) cause delays of 500–700 ms.
- **Network variability:** Routes, weather, satellite load, and provider quality affect performance.
- **High cost:** Aircraft antennas, modems, and bandwidth leases are expensive for airlines.

MAPPING

TANZANIA

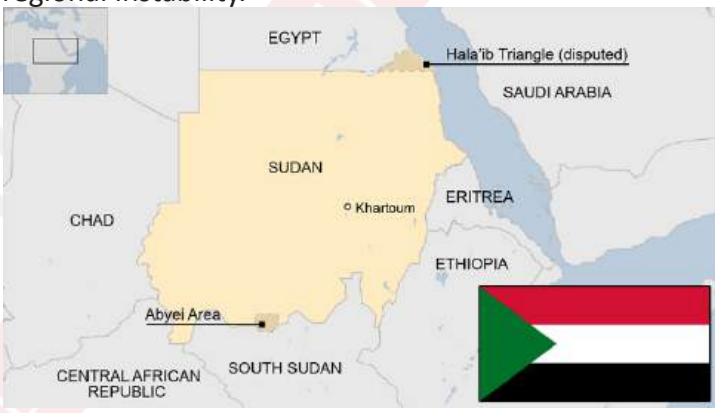
Context: Tanzania has seen post-election protests after opposition leaders were barred from the 2025 polls, prompting curfews, internet cuts, and government assurances of restoring order under **President Samia Suluhu Hassan**.

About Tanzania:

- **What it is?**
  - Tanzania is an East African nation formed in 1964 through the union of Tanganyika and Zanzibar, operating as a unitary multiparty republic with a single legislative house (National Assembly).
- **Location:** Situated **just south of the Equator**, Tanzania lies in East Africa, bordered by the Indian Ocean to the east and several major lakes including Victoria, Tanganyika, and Nyasa.
- **Capital:** The official capital is **Dodoma** (since 1974), located centrally on the mainland, while **Dar es Salaam** remains the **largest city, port, and economic hub**.
- **Neighbouring Nations:**
  - Tanzania shares borders with Uganda, Kenya, Mozambique, Malawi, Zambia, Rwanda, and Burundi, and includes offshore territories such as Zanzibar, Pemba, and Mafia Islands.
- **Key Physical Features:**
  - Dominated by **plateaus and highlands**, most land lies above 600 feet (200 metres).
  - Contains **Mount Kilimanjaro (5,895 m)**, Africa's highest peak, and **Lake Tanganyika**, one of the world's deepest lakes.
  - The **East African Rift System** divides the country into Western and Eastern Rift Valleys, forming scenic depressions and lakes.
  - Rich in **hydroelectric potential**, fertile volcanic soils, and unique ecosystems such as the **Ngorongoro Crater** and **Serengeti Plains**, home to iconic wildlife.

SUDAN

Context: Sudan's civil war, now in its third year, has escalated after the Rapid Support Forces (RSF) captured El Fasher, the last major city in Darfur under army control — deepening fears of genocide, partition, and regional instability.



About Sudan:

What it is?

- Sudan, officially the Republic of the Sudan, is a Northeast African nation currently engulfed in a civil war between the Sudanese Armed Forces (SAF) led by Gen. Abdel Fattah al-Burhan and the Rapid Support Forces (RSF) led by Gen. Mohamed Hamdan Dagalo (Hemedti).

Capital: The national capital is **Khartoum**.

Neighbouring Nations:

- Sudan shares borders with **Egypt (north)**, **Libya (northwest)**, **Chad (west)**, **Central African Republic (southwest)**, **South Sudan (south)**, **Ethiopia and Eritrea (southeast)**, and has a coastline along the **Red Sea (east)**.

Key Features:

- **Third-largest country in Africa** (1.88 million sq. km) with a **population of around 50 million**.
- Rich in **gold and agricultural resources**, yet among the **poorest globally**, ranking **170th on the Human Development Index (2024)**.

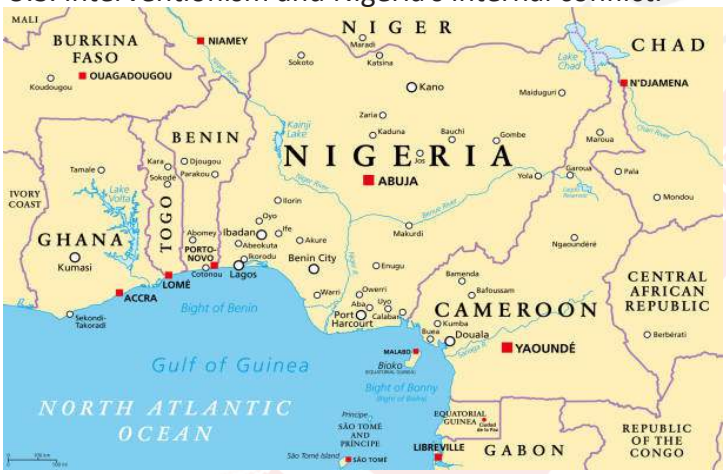
- Experienced decades of **civil wars, coups, and authoritarian rule** — from British-Egyptian colonisation to Omar al-Bashir's dictatorship (1989–2019).
- Climate vulnerability, desertification, and famine compound its humanitarian crises.

Current Issues:

- **Civil War (since April 2023):** A power struggle between the **army (SAF)** and **RSF** over political control and military integration.
- **Humanitarian Catastrophe:** Over **24 million people** face acute food insecurity; famine declared in several Darfur regions.
- **Ethnic Violence:** Widespread killings and sexual violence against non-Arab communities, with genocide allegations in Darfur.

NIGERIA

Context: U.S. President Donald Trump's threat to launch military action against Nigeria to "wipe out Islamic terrorists" has reignited global concerns over U.S. interventionism and Nigeria's internal conflict.



About Nigeria:

What it is?

- Nigeria, officially the Federal Republic of Nigeria, is Africa's most populous nation and a federal republic located in West Africa.
- It is known for its vast ethnic, linguistic, and religious diversity, as well as being the continent's largest oil producer.

Capital: Abuja (relocated from Lagos in 1991 for administrative centrality).

Neighbouring Nations: Niger, Chad and Cameroon, Benin and Gulf of Guinea (Atlantic Ocean).

Geographical Features:

- Nigeria has a **tropical climate** ranging from humid equatorial in the south to arid in the north.
- Its landscape includes the **Sokoto and Borno plains**, **Jos Plateau**, and **Niger-Benue River basin**, which forms the **country's main drainage system**.
- The **Niger Delta** is one of the world's largest wetlands, rich in petroleum and natural gas reserves.
- The **Cameroon Highlands** along the southeast host **Chappal Waddi (2,419 m)**, Nigeria's highest peak.
- The **soils vary from sandy arid types in the north to lateritic and alluvial soils in the south**, supporting agriculture and oil palm cultivation.

Issues Between the U.S. and Nigeria:

- **Religious Freedom Dispute:** Trump reclassified Nigeria as a "Country of Particular Concern" under the International Religious Freedom Act (1998), citing severe violations and opening scope for sanctions.
- **Accusations of Christian Persecution:** The U.S. accused Nigeria of failing to protect Christians from Islamist attacks, prompting Trump's threat of possible military intervention.
- **Terrorism and Internal Conflict:** Nigeria faces ongoing violence from **Boko Haram** and **ISWAP**, alongside **farmer–herder clashes** worsened by climate change and resource scarcity.

UMNGOT RIVER

Context:

The Umngot River in Meghalaya — famous for its crystal-clear waters that attract thousands of tourists to Dawki and Shnongpdeng — has turned murky and brown this year, raising concerns over pollution from highway construction activities.

About Umngot River:

What it is?

- The **Umngot River**, also known as the **Dawki River**, is one of India's **cleanest and most scenic rivers**, known for its transparent, emerald-green water that makes boats appear to float in air. It is a vital **tourism and ecological asset** for Meghalaya.

Origin: It originates from the Eastern Shillong Peak in the Khasi Hills of Meghalaya.

Flow through:

- The river flows through the **West Jaintia Hills district**, passing through **Mawlynnong village**, **Dawki**, and **Shnongpdeng**, before reaching the **India–Bangladesh border**, where it continues as the **Shari Goyain River** in Bangladesh.

Key Features:

- Acts as a natural boundary between India and Bangladesh.
- Famous for boat rides and underwater visibility, often up to several metres during winter.
- Supports local livelihoods through tourism, fishing, and eco-camping.
- Surrounded by lush forests and limestone formations, contributing to its unique turquoise hue.

Issues:

- The river has turned turbid and muddy due to construction debris, soil dumping, and hill-cutting linked to the NHIDCL Shillong–Dawki highway project.
- The Meghalaya State Pollution Control Board has flagged violations, citing dumped excavated soil sliding into the river and lack of containment measures.

KUNAR RIVER

Context:

India has announced support for Afghanistan's plan to build a dam on the Kunar River, marking a major geopolitical shift that could intensify Pakistan's water scarcity.

About Kunar River:

What it is?

- The **Kunar River**, known as the **Chitral River** in Pakistan, is a transboundary river flowing through the Hindu Kush mountains, crucial for irrigation, drinking water, and hydropower.

Origin: It rises from the **Chiantar Glacier** near the Pakistan–Afghanistan border in Gilgit-Baltistan.

Countries Flow Through:

- The river flows **east to west**, originating in **Pakistan's Chitral region**, entering **Afghanistan's Kunar and Nangarhar provinces**, and re-entering **Pakistan** to merge with the Kabul River.

Tributaries: Major tributaries include the **Pech River** and **Lotkoh River**.

Mouth: It merges with the Kabul River near Jalalabad (Afghanistan), and this combined flow joins the Indus River near Attock (Pakistan).

Key Features of the Kunar River:

- **Transboundary Nature:** The river flows across **Pakistan and Afghanistan**, forming a critical part of the **Indus Basin system** shared by both nations.
- **Glacial Origin:** It originates from the **Chiantar Glacier** in the **Hindu Kush Mountains**, ensuring a perennial flow fed by snowmelt and glacial runoff.
- **Course and Length:** The river runs for about **480 km**, beginning as the **Chitral River** in Pakistan, entering Afghanistan's **Kunar and Nangarhar provinces**, and later merging with the **Kabul**

River near Jalalabad.

Significance:

- **Hydrological importance:** Forms a key part of the Indus basin, sustaining agriculture and energy in northwestern Pakistan.
- **Geopolitical hotspot:** Emerging as a new axis of Indo-Afghan cooperation and a hydro-diplomatic flashpoint for Pakistan

TYPHOON KALMAEGI

Context:

Typhoon Kalmaegi struck Vietnam's central coast, forcing flight cancellations and mass evacuations after killing over 114 people in the Philippines, where it caused widespread flooding, destruction, and displacement.

About Typhoon Kalmaegi:

- **What it is?**
  - Typhoon Kalmaegi is a tropical cyclone that developed over the western Pacific Ocean, characterized by strong winds, torrential rains, and high tidal waves.
  - It intensified rapidly before making landfall in the Philippines and Vietnam.
- **Origin:**
  - Kalmaegi formed over the **Philippine Sea**, moving westward toward **Luzon (Philippines)** before crossing the South China Sea and hitting central Vietnam.
  - It is named after the Korean word for "seagull."

About the Philippines:

- **What it is?**
  - The Philippines is an archipelagic country in Southeast Asia, located in the western Pacific Ocean. It consists of over 7,000 islands, divided mainly into three groups — Luzon, Visayas, and Mindanao.
- **Capital:** Manila
- **Neighbouring nations:** It lies **500 miles (800 km) off the coast of Vietnam**, bordered by the Philippine Sea (east), South China Sea (west), Celebes Sea (south), and near Taiwan (north) and Indonesia (south).
- **Geological features:**
  - The archipelago is **mountainous and volcanic**, part of the **Pacific Ring of Fire**.
  - Notable volcanoes include **Mayon**, **Mount Apo**, and **Mount Pinatubo**.
  - **Major rivers:** Cagayan, Pampanga, Agusan, Mindanao River.
  - The islands experience frequent **typhoons, earthquakes, and volcanic activity**.
  - **Climate:** Tropical monsoon with a wet season (May–Oct) and dry season (Nov–Apr).

KHANGCHENDZONGA NATIONAL PARK RATED "GOOD" BY IUCN

Context: The International Union for Conservation of Nature (IUCN) has rated Khangchendzonga National Park as "Good" in its 2025 global review of natural World Heritage Sites — making it India's only site with a positive conservation status.

About Khangchendzonga National Park Rated "Good" by IUCN:

- **What it is?**
  - A global **IUCN World Heritage Outlook**

2025 assessment that evaluates the conservation effectiveness of all natural World Heritage Sites based on biodiversity health, management quality, and climate resilience.

- **Initiative by IUCN:**
  - Conducted under the **World Heritage Outlook programme** to track the condition of 252 natural sites globally.
  - Sites are ranked as **"Good," "Good with Some Concerns," "Significant Concern," or "Critical."**
  - Khangchendzonga National Park emerged as **the only Indian site rated "Good,"** indicating effective ecological management and cultural conservation.

About Khangchendzonga National Park:

What it is?

- A **UNESCO World Heritage Site (2016)** and India's **first "mixed" heritage site**, recognized for both its **natural beauty and cultural significance.**

Location:

- Situated in **North and West Sikkim**, covering **1,784 sq km**—nearly **40% of Sikkim's total area**—along the India–Nepal border.

History:

- Declared a **National Park in 1977** and later incorporated into the **Khangchendzonga Biosphere Reserve.**
- Named after **Mount Khangchendzonga (8,586 m)**, the world's **third-highest peak** and India's highest.
- Inscribed as a **UNESCO site in 2016** for its integration of **Lepcha spiritual traditions** and Himalayan biodiversity.

Geographical Features:

- Encompasses **280 glaciers** and **70+ glacial lakes**, including **Zemu Glacier** and **Tso Lhamo Lake.**
- Spans diverse biomes — from **subtropical forests (1,300 m)** to **permanent snowfields (8,598 m).**
- Habitats include **Himalayan moist forests, alpine meadows, and temperate broadleaf forests.**

Uniqueness:

- Houses rare species like snow leopard, red panda, clouded leopard, blue sheep, Himalayan tahr, and over 550 bird species including Impeyan pheasant and Satyr tragopan.
- Represents a sacred landscape — the Lepcha's Mayel Lyang and Tibetan beyul (hidden paradise).
- Known for its intact ecological gradients, pristine biodiversity, and fusion of spiritual ecology with scientific conservation.

ANGOLA

Context: President of India is on a State Visit to Angola, marking the first-ever visit by an Indian President, to strengthen bilateral cooperation in energy, trade, and technology under the India–Africa Forum Summit framework.

About Angola:

What it is?

- Angola is a **resource-rich nation in southwestern Africa**, known for its vast oil reserves, diamonds, and diverse landscapes ranging from tropical coasts to rugged highlands.
- It gained independence from Portugal in 1975 after a long anti-colonial struggle.

Capital: Luanda.

Neighbouring Nations: Republic of the Congo, Democratic Republic of the Congo, Zambia, Namibia, and Atlantic Ocean.

Geological & Physical Features:

1. **Topography:** Angola is roughly square-shaped, rising from a narrow coastal plain to a **central plateau** averaging 1,000–2,000 metres in elevation.
2. **Highest Point:** **Mount Moco** (2,620 m), near Huambo.
3. **Major Rivers:** The **Cuanza**, **Cunene**, and **Cuango** rivers form key drainage basins; some southeastern rivers flow into the **Zambezi** and

Okavango systems.

4. **Soils & Minerals:** Rich in **oil-bearing formations**, **diamonds**, and **metal ores**; features **lateritic soils** and eroded escarpments.
5. **Ecosystems:** Hosts semi-desert coasts, rainforests, highlands, and savannahs, making it one of Africa's most **biodiverse** regions.

ETHIOPIA

Context:

Ethiopia is set to be officially confirmed as the host of COP32 in 2027, making it the first East African nation to organize a UN Climate Change Conference.

About Ethiopia:

- **What it is?**
  - Ethiopia is a federal republic and one of the oldest independent countries in the world, known for its rich cultural heritage and role in African unity.
  - It is the largest and most populous nation in the Horn of Africa and headquarters of the African Union and UN Economic Commission for Africa.
- **Located in:** Horn of Africa, in the eastern part of the African continent.
- **Capital:** Addis Ababa.
- **Neighbouring Nations:** Eritrea, Djibouti, Somalia, Kenya, South Sudan and Sudan
- **Geological and Physical Features:**
  - **Topography:** One of Africa's most rugged terrains, dominated by highlands, plateaus, and deep valleys.
  - **Major Highlands:** Western and Eastern Highlands separated by the **Great Rift Valley**, which runs north to south through the country.
  - **Highest Point:** **Mount Ras Dejen (Dashen)** at 4,533 metres, the tallest peak in Ethiopia.
  - **Key Rivers:** Blue Nile (Abay), Tekeze, Baro, Awash, Omo, Shebele, and Genale, forming three main drainage systems.
  - **Lakes and Basins:** **Lake Tana**—the source of the Blue Nile—and numerous Rift Valley lakes like Abaya, Shala, and Ziway.
  - **Geological Composition:** Built mainly of Precambrian crystalline rocks, overlaid by volcanic basalt and sedimentary layers from the Mesozoic and Cenozoic eras.
- **COP upcoming summits:**
  - **COP 30 Host:** Belém, Brazil
  - **COP 31 Host:** Australia (in partnership with Pacific Island nations) or Turkey not finalised.
  - **COP32 Host:** Ethiopia

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BOTSWANA

Context:

During President of India state visit to Botswana, the country announced the donation of eight cheetahs to India under Project Cheetah.

About Botswana:

- **What it is?**
    - Botswana is a **landlocked country in Southern Africa**, renowned for its democratic stability, wildlife diversity, and conservation-led development model. It gained independence from Britain in **1966** and has since become one of Africa's most peaceful and prosperous nations.
- **Located in:** The centre of Southern Africa, roughly triangular in shape, covering about 600 miles north–south and east–west.
- **Neighbouring Border Nations:** Namibia (Caprivi Strip), Zambia, Zimbabwe and South Africa.
- **Geological & Physical Features:**
    - Lies on a **high inland plateau (~1,000 m elevation)** dominated by the **Kalahari Desert sands**.
    - Divided into three main regions:
        1. **Hardveld** (rocky hills and shallow soils in the east)
        2. **Sandveld** (deep Kalahari sands covering most of the country)
        3. **Ancient lakebeds and wetlands** in the north (Okavango Delta, Makgadikgadi Pans).
    - Major rivers include the **Okavango**, **Chobe**, and **Limpopo**; rainfall is sparse and seasonal.
    - **Climate:** Semi-arid, with hot summers (up to 34°C) and dry winters; cyclic droughts are frequent.

About Cheetah Distribution Worldwide:

- **Global Range:** Once widespread across Africa, the Middle East, and India, cheetahs now occupy only ~9–10% of their historical range.
- **Current Population:** Around 7,100 adult and adolescent cheetahs remain globally.
- **African Distribution:**
    - **Southern Africa** (Namibia, Botswana, Angola, South Africa, Mozambique, Zambia) holds the largest population, retaining about **22% of the species' former range**.
    - **Eastern Africa** (Kenya, Tanzania) retains about **6%**.

NEW MANGALORE PORT

Context:

The Government of India has launched ₹1,500 crore worth of modernisation projects at the New Mangalore Port as part of its Golden Jubilee (50 years) celebrations in 2025.

About New Mangalore Port (NMP):

What it is?

- New Mangalore Port is an **all-weather, deep inner-harbour major port** on India's west coast, and the **only major port in Karnataka**. It is among India's **top 10 major ports** and a key gateway for petroleum, coal, container, and agricultural cargo.

Location:

- Situated at **Panambur, Mangaluru**, on the **Arabian Sea** coast.
- Lies north of the **Gurupur (Phalguni) River** estuary.
- 170 nautical miles south of Mormugao Port (Goa) and 191 nautical miles north of Kochi Port.

Established In:

- **1962** – Mangalore Harbour Project initiated
- **1968** – Maritime works commenced
- **4 May 1974** – Declared **India's 9th Major Port**
- **11 January 1975** – Formally inaugurated by PM **Indira Gandhi**
- **1 April 1980** – Came under Major Port Trust Act, 1963
- **3 November 2021** – Renamed as **New Mangalore Port Authority (NMPA)** under the Major Port Authorities Act, 2021

History:

- Ancient port city referenced in **Roman, Greek, and Ptolemaic** records; known as **Mangala** in classical geography.
- Arab traders used the port for spice and silk trade during the **Vijayanagara Empire**.
- Old Mangalore Port (Bunder) became inadequate for rising trade needs, leading to the creation of a new deep-water port at Panambur.
- Grew from handling **<1 lakh tonnes** to **46 million tonnes (2024–25)**.

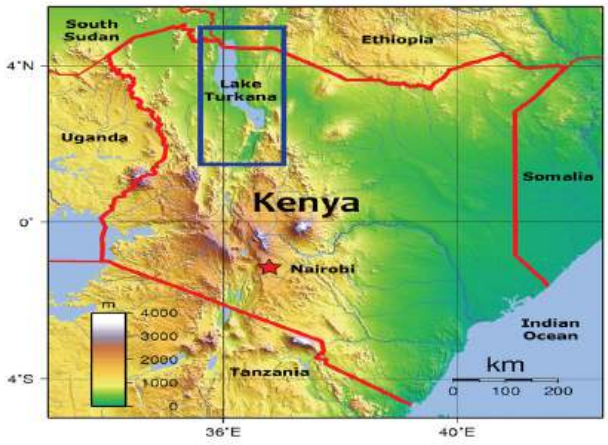
Key Features:

- Deepest inner harbour on India's west coast.
- **Total area:** ~480 hectares (1,200 acres).
- **Handles major export cargo**: POL products, iron ore pellets, container cargo.
- **Handles major import cargo:** crude oil (for MRPL), coal, fertilizer, edible oil, liquid chemicals, containers.
- Excellent connectivity via **NH-66**, **Konkan Railway (Surathkal station)** and **Mangaluru International Airport**.
- Plays a vital role in **export-led growth**, reducing logistics costs, and supporting Karnataka's industrial hinterland.

LAKE TURKANA

Context:

A new Nature Scientific Reports study found that falling water levels in East Africa's Lake Turkana over the past 6,000 years accelerated earthquake activity.



About Lake Turkana:

- **What it is?**
  - Lake Turkana is the world's largest permanent desert lake and the fourth-largest of Africa's Great Rift Valley lakes, known for its unique jade-green waters and active tectonic setting.
- **Located in:** Located mainly in northern Kenya, with its northern tip extending into southern

Ethiopia, situated in the eastern arm of the East African Rift System.

- **Geological Features:**
  - Formed due to **rift-related tectonic activity,** with volcanic outcrops shaping much of its eastern and southern shores.
  - Stretches **248 km long**, **16–32 km wide**, with a depth of up to **73 m**.
  - A **closed-basin brackish lake** fed primarily by the **Omo River**; levels fluctuate widely with climate changes.
  - Hosts three volcanic islands—**North, Central, and South Islands**—rich in geological and biological diversity.
  - Known for sudden, intense storms due to basin topography and desert winds.
- **Significance:**
  - **Seismic & Volcanic Research:** Located at a key rifting zone providing valuable insights into continental breakup and magma generation.
  - **Biodiversity Hotspot:** Large populations of Nile perch, tilapia, crocodiles, hippos, and numerous bird species.
  - **Cradle of Humankind:** Shores contain prehistoric sites like **Koobi Fora**, with fossils of 200+ early hominins discovered by the Leakeys.

SILIGURI CORRIDOR

Context:

The Indian Army has established three new garrisons near the Siliguri Corridor—at Dhubri (Assam), Kishanganj (Bihar) and Chopra (West Bengal)—to strengthen surveillance and operational readiness.

About Siliguri Corridor:

What is the Siliguri Corridor?

- The Siliguri Corridor—popularly called the "Chicken's Neck"—is a narrow land strip in northern West Bengal that connects mainland India to the eight Northeastern States.

Location:

- Situated near **Siliguri city** in northern West Bengal.
- Flanked by Nepal (west), Bangladesh (south), Bhutan (north), and close to the Chumbi Valley (China–Bhutan–India tri-junction).
- **Narrowest width: 20–22 km**, making it one of the world's most sensitive strategic bottlenecks.

Historical Background:

- Formed after the **Partition of India (1947–48)**, when East Bengal became East Pakistan (now Bangladesh).
- Strategic relevance increased after **Sikkim's merger with India in 1975**, giving India greater hold over the northern Himalayan approaches.
- Vulnerability became evident during the **1962 Sino-Indian War** and again during the **2017 Doklam standoff**.

Key Features:

- Major **railway, road, and air links** to the Northeast pass through this strip.
- Houses military facilities, supply lines, and critical civilian infrastructure.
- Includes **Bagdogra Airport**, a key IAF base and civilian aviation hub.
- Forms a transit point connecting **Bhutan, Nepal, Bangladesh, Sikkim, and Northeast India**.
- Defended by the **Tri-Shakti Corps**, BrahMos regiments, and Rafale squadrons at Hasimara.

Strategic Importance:

- A potential target in geopolitical crises—any blockade could isolate the entire region.
- Close to the **Doklam Plateau**, where China has rapidly built border infrastructure.
- Increasing influence of China in Bangladesh and Nepal has heightened security sensitivities.
- Acts as India's eastern **military buffer**, enabling rapid troop movement towards LAC in Sikkim and Arunachal Pradesh.

SAUDI ARABIA

Context: A tragic bus fire near Medina, Saudi Arabia, killed 45 Umrah pilgrims from Telangana, leaving only one survivor.

About Saudi Arabia:

- **What it is?**
  - Saudi Arabia is a West Asian kingdom, the largest country on the Arabian Peninsula, ruled by the Al Saud royal family.
- **Location:** Situated in the **Middle East**, it occupies most of the Arabian Peninsula.
- **Capital:** Riyadh
- **Neighbouring Nations:** Borders Jordan, Iraq, Kuwait, UAE, Qatar, Oman, Yemen, Red Sea & Gulf of Aqaba.
- **Geological Features:**
  - Dominated by vast **deserts** including the *Rub' al-Khāli (Empty Quarter)*, the largest sand desert in the world.
  - Western highlands (Hejaz) house **Mecca & Medina**, Islam's holiest cities.
  - Central plateau region of **Najd** and eastern **oil-rich** coastal belt along the Persian Gulf.

About Umrah Pilgrimage:

- **What it is?**
  - Umrah is the "lesser pilgrimage" to **Mecca**, performed anytime during the year (unlike Hajj), consisting of a set of prescribed rituals.
- **Features:**
  - A deeply spiritual journey for Muslims seeking purification, forgiveness, and closeness to God.
  - Involves rituals such as **Ihram**, **Tawaf (circumambulating Kaaba)**, and **Sa'i (walking between Safa and Marwah)**.

Not obligatory like Hajj but **highly recommended (Sunnah)** and Prophet Muhammad performed Umrah four times

BRAZIL CREATES NEW INDIGENOUS TERRITORIES

Context:

Brazil, during COP30 at Belém, officially created 10 new Indigenous Territories, expanding protected areas amid ongoing protests demanding land demarcation.

About Brazil creates new Indigenous territories:

- **What is this decision?**
  - Brazil designated 10 new Indigenous Territories through a presidential decree, granting them legal protection for culture, land rights, forests, and biodiversity. Indigenous territories together now cover 117.4 million hectares (~13.8% of Brazil's land area), roughly the size of Colombia.
- **Why was it done?**
  - **Climate Action at COP30:** Indigenous lands protect **82% of global biodiversity**; demarcation reduces deforestation by up to **20%** and carbon emissions by **26% by 2030**.
  - **Violence & Land Invasion:** Sharp increase in attacks by illegal miners, loggers, cattle ranchers.

Tribes/Peoples Associated with the New Territories:
Mura, Tupinambá de Olivença, Pataxó, Guarani-Kaiowá, Munduruku, Pankará, and Guarani-Mbya

About Brazil:

- **What is Brazil?**

- Brazil is the largest country in South America, the 5th largest in the world, occupying nearly half of the South American continent.

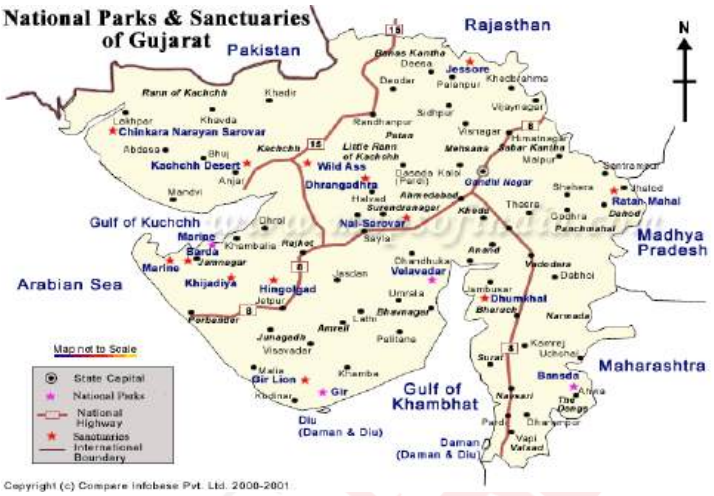
- **Neighbouring Nations:**
  - Brazil borders **every South American country except Chile and Ecuador**.
  - **Bordering countries:** Uruguay, Argentina, Paraguay, Bolivia, Peru, Colombia, Venezuela, Guyana, Suriname, and French Guiana.
- **Capital:** Brasília
- **Major Physiographic Features:**
  - **Amazon Lowlands:**
    - World's largest **river system** & most extensive **virgin rainforest**.
    - Dominated by **terra firme** forests, várzeas (floodplains), wetlands, and oxbow lakes.
  - **Brazilian Highlands (Panalto Central):**
    - Covers **half the country**; rich in **minerals**.
    - Includes **Serra do Mar**, **Serra da Mantiqueira**, **Serra do Espinhaço**.
    - Elevations up to **~2,900 m** (Agulhas Negras, Bandeira Peak).
  - **Guiana Highlands:**
    - Shared with Venezuela, Guyana, Suriname.
    - Highest peak: **Pico da Neblina (3,014 m)**.
  - **Pantanal Wetlands:**
    - **World's largest freshwater wetland**, ~140,000 sq km.
    - Seasonal flooding from upper Paraguay River.

RATANMAHAL WILDLIFE SANCTUARY

Context:

A wild tiger has permanently settled in Gujarat's Ratanmahal Wildlife Sanctuary for the first time in decades, staying for nine continuous months—an unprecedented wildlife milestone for the state.

- This marks Gujarat as the **only state in India hosting all three big cats**—Asiatic lion, Indian leopard, and now the tiger—within a shared natural landscape.



About Ratanmahal Wildlife Sanctuary:

What it is?

- A protected wildlife sanctuary known for its rich biodiversity and Gujarat's **stronghold of the sloth bear**, now gaining attention as the state's newest tiger habitat.

Location: Situated in **Dahod district**, Central Gujarat, along the **Gujarat–Madhya Pradesh border**; the sloth bear habitat extends deep into MP's Jhabua district.

History:

- Declared a **Wildlife Sanctuary in March 1982**, covering forests that once belonged to the former Devgadh Baria princely state.
- Encompasses **55.65 sq km** of reserve forests spread across 11 villages, with an interaction zone of 41 surrounding villages.

Key Ecological Features:

- **Diverse forest types:** dry teak forest, mixed deciduous forest, Sadad & Timru patches, and extensive dry bamboo brakes.
- High density of **mahuda trees**, providing crucial food to sloth bears.
- Habitat for leopard, palm civet, four-horned antelope, langurs, sunbirds, green barbets, junglefowl, pit viper and more.
- Dense sloth bear population—**highest in Gujarat**—making it a prime area for behaviour studies.
- Rugged topography giving a hill-station-like environment attractive to wildlife and visitors.

Ecological Significance:

- Forms the catchment of the Panam River, a major lifeline for Dahod and Panchmahals districts.
- Critical for water conservation, with an irrigation dam and reservoir downstream near Godhra.
- The sanctuary's improving prey base, water sources, and vegetation created conditions

stable enough for a tiger to establish territory—a powerful indicator of ecosystem recovery.

INDIA HOSTS COLOMBO SECURITY CONCLAVE (CSC) NSA MEET

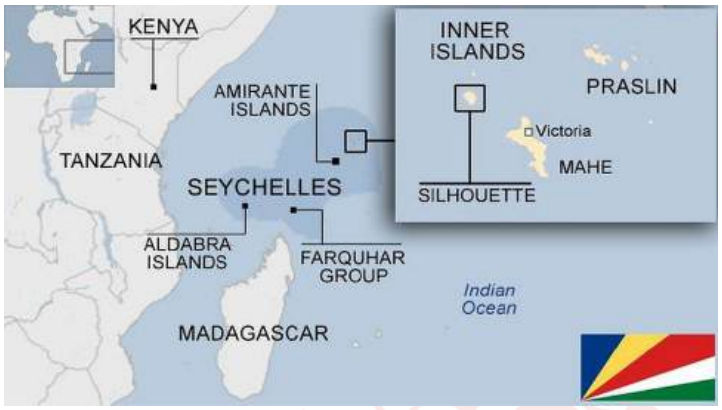
Context:

India hosted the 7th Colombo Security Conclave (CSC) NSA-level meeting in New Delhi, reaffirming commitment to regional maritime security amid a rapidly evolving Indo-Pacific environment.

- Seychelles also announced its decision to **join CSC as a full member**, marking an important expansion of the grouping.

About India Hosts Colombo Security Conclave (CSC) NSA Meet:

- **What it is?**
  - A regional security grouping of Indian Ocean nations focused on cooperative responses to common maritime and transnational security challenges.
- **History:**
  - Originated in **2011** as the India–Sri Lanka–Maldives Trilateral Maritime Dialogue.
  - Expanded to include **Mauritius (2022), Bangladesh (2024)** and Seychelles became a full member in **2025**.
  - Founding documents & CSC Secretariat were formalised in **Colombo, August 2024**.
- **Members:** India, Bangladesh, Sri Lanka, Maldives, Seychelles and Mauritius.
- **Key Features of the 7th NSA Meet:**
  - Hosted by India (New Delhi).
  - Attended by NSAs of India, Maldives, Mauritius, Sri Lanka, Bangladesh. Seychelles was an observer and Malaysia as guest.
- **Focus on 5 security pillars:**
  - Maritime Safety & Security
  - Counter-Terrorism & Radicalisation
  - Transnational Organised Crime
  - Cybersecurity & Critical Infrastructure Protection
  - HADR (Humanitarian Assistance & Disaster Relief)



About Seychelles:

- **What it is?**
  - A sovereign **island nation and archipelagic state** in the western Indian Ocean; Africa's smallest and least populated country.
- **Located in:** Western Indian Ocean, ~1500 km east of mainland East Africa.
- **Capital:** Victoria (on Mahé Island).
- **Geographical Features:**
  - Comprises **115 granite and coral islands**.
  - No indigenous population; settled by French (18th century) and later controlled by British until 1976.
  - Volcanic & coral islands, rich marine biodiversity, extensive EEZ critical for India's SAGAR vision.

MOUNT SEMERU

Context:

Mount Semeru, Indonesia's tallest and most active volcano on Java Island, erupted violently, spewing ash up to 13 km into the sky and triggering dangerous pyroclastic flows.

About Mount Semeru:

- **What it is?**
  - Mount Semeru is an active *stratovolcano* and the **third-tallest volcano in Indonesia**, known for continuous low-level eruptions since 1967.
- **Located in:** Eastern Java, Indonesia—at the southern end of the Tengger Volcanic Complex in a major subduction zone where the Indo-Australian Plate sinks beneath the Eurasian Plate.
- **Key Features:**
  - Elevation **3,676 metres**, steep cone, andesitic lava.
  - Frequently produces pyroclastic flows, ash plumes, and crater explosions (over **61 eruptive periods since 1818**).
  - Known as **Mahameru ("Great Mountain")**, derived from the sacred Hindu Mountain *Meru/Sumeru*.
  - Surrounded by calderas, crater lakes, and volatile volcanic belts forming one of the most hazardous zones in Java.

About Indonesia:

- **What it is?**
  - Indonesia is a Southeast Asian archipelago nation, the world's largest island country with >17,500 islands and the 4th most populous nation globally.
- **Location:** Between the **Indian Ocean and Pacific Ocean**, straddling the Equator and sitting on the geologically active **Pacific Ring of Fire**.
- **Capital:** Jakarta.
- **Neighbouring Nations:** Borders Malaysia (Borneo), Papua New Guinea (New Guinea), Timor-Leste, India's Andaman Sea region.
- **Geological Features:**
  - One of the most tectonically active zones on Earth, with nearly **130 active volcanoes**.
  - Hosts deep ocean trenches like the **Java Trench (7,450 m)**.
  - Features massive volcanic arcs, plate collision zones, coral islands, and biodiverse rainforests shaped by complex crustal interactions.

GEORGIA

Context: India has strengthened its textile and sericulture cooperation with Georgia during a high-level visit by the Central Silk Board delegation, including India's participation at the 11th BACSA International Conference – CULTUSERI 2025.

About Georgia:

What it is?

- Georgia is a Transcaucasian country located at the intersection of Eastern Europe and Western Asia, known for its ancient cultural heritage, diverse landscapes, and strategic geopolitical position between the Black Sea and the Caucasus mountains.

Location:

- Located in the **South Caucasus** region at the eastern end of the **Black Sea**.
- Lies between **Europe and Asia**, making it a crucial geopolitical bridge.

Capital: Tbilisi (Tiflis)

Neighbouring Nations: Russia, Azerbaijan, Armenia, Turkey, and Black Sea.

Geological Features:

- Dominated by **mountainous terrain**, especially the **Greater Caucasus** in the north and **Lesser Caucasus** in the south.
- Home to **Mount Shkhara** (5,068 m) — the country's highest peak.
- **Kolkhida Lowland** (ancient Colchis) — fertile plains near the Black Sea.
- **Rivers:** Rioni, Inguri, Kodori, flowing westward.
- Climate varies from **humid subtropical** in the west to **dry subtropical** and alpine climates in central and eastern regions.
- Over **one-third forest cover**, rich in biodiversity with oak, beech, fir, and alpine vegetation.

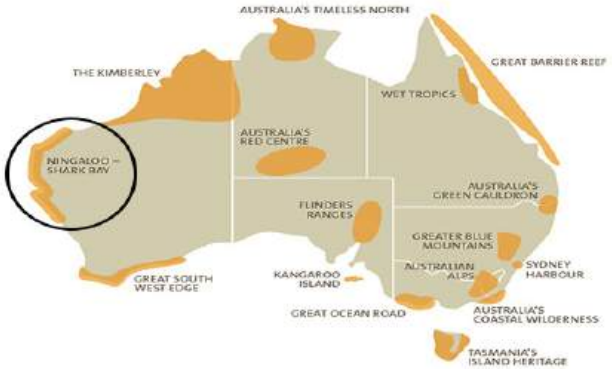
Significance:

- **Strategic Location:** Serves as a gateway between Europe, Russia, Central Asia, and the Middle East.
- **Geopolitical Importance:** Historically contested zone between Russia, Turkey, and Persia; key transit route for pipelines (energy corridor).

- **Cultural-Historical Value:** Ancient Christian heritage; powerful medieval kingdom (10th–13th centuries).

NINGALOO REEF

Context: Nearly 70% of corals at UNESCO-listed Ningaloo Reef have died due to Australia's most intense and prolonged marine heatwave ever recorded.



About Ningaloo Reef:

What it is?

- Ningaloo Reef is **Australia's largest fringing coral reef** and a UNESCO World Heritage Site known for its exceptional marine biodiversity, whale-shark aggregations, and intact coral ecosystems close to land.
- It is one of the world's most significant long, near-shore reef systems.

Located In: Situated along the **north-west coast of Western Australia**, about **1,200 km north of Perth**, the reef stretches across the **East Indian Ocean** and forms part of the Ningaloo Coast World Heritage Area.

Formation:

- The reef formed through **millennia of coral growth** along the shallow continental shelf where warm, clear, low-nutrient waters enabled extensive accretion of coral limestone.
- Tectonic uplift of the Cape Range and stable sea levels supported its continuous development.

Key Features:

- **260 km long fringing reef**—rare due to its close proximity to the coast.
- UNESCO World Heritage Site (2011), incorporating marine parks, coastal reserves, and the Muiron Islands.
- Home to **whale sharks**, manta rays, humpback whales, turtles, and diverse coral species.
- Supports **~200,000 tourists annually**, significant eco-tourism economy.
- Deep historical connection with **Baiyungu and Jinigudira Indigenous peoples**, with archaeological evidence dating back 32,000+ years.

Issues:

- **Severe marine heatwaves (2024–25):** Up to **70% coral mortality**, widespread bleaching of dominant species like staghorn corals.
- **Rising global sea temperatures:** 2023 marine heatwaves lasted 4× longer than average, affecting 96% of world oceans.
- **Ecological degradation:** Sponges, algae, and invasive organisms now infesting dead coral skeletons, reducing structural stability.
- **Previous stress events:** Low oxygen levels in 2022 reduced coral cover from 70% to 1% in some sites.

ARUNACHAL PRADESH

Context: India has reaffirmed that Arunachal Pradesh is an integral and inalienable part of India, after China again questioned its status and denied recognising it.

About Arunachal Pradesh:

What it is?

- Arunachal Pradesh is a border state in north-eastern India, popularly called the "Land of the Rising Sun" because it is the first to receive the sun's rays in India.
- It is the largest state in the North-East Region (NER) by area and is constitutionally a full-fledged State of the Indian Union since 20 February 1987.

Location: Located in the extreme north-east of India.

- **International borders:** Bhutan, China and Myanmar.
- **Indian neighbours:** Assam and Nagaland.

Historical Background:

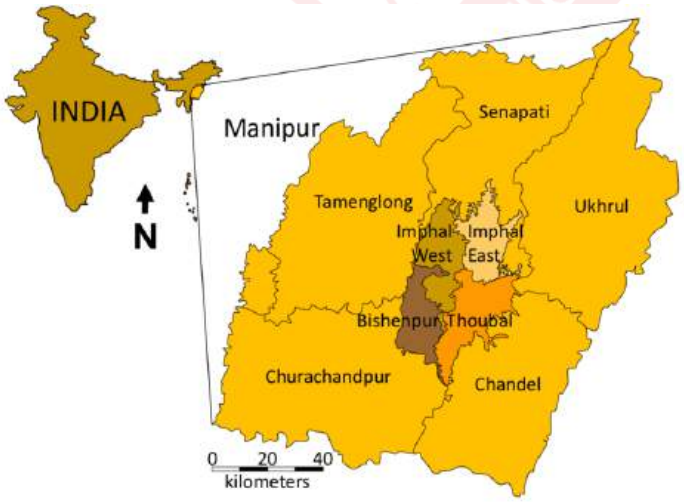
- **Colonial & NEFA Phase:**
  - Modern political history begins after the **Treaty of Yandaboo (1826)**, when **Assam came under British rule** and the British gradually extended control into the frontier hills.
  - The area was administered as part of the **North-East Frontier Tracts**, later organised as the **North-East Frontier Agency (NEFA)**.
  - **Shimla Convention (1914)** between British India, Tibet, and China delineated the **McMahon Line**, under which the boundary between Tibet and NEFA was recognised by the Tibetan and British side.
- **Post-Independence Administrative Evolution:**
  - After 1947, NEFA was administered under the **Governor of Assam** on behalf of the President of India, initially under arrangements linked to the **Government of India Act, 1935**, later via constitutional provisions.
  - NEFA was reorganised into **five frontier divisions/districts** – Kameng, Subansiri, Siang, Lohit, Tirap – each headed by a Political Officer (later Deputy Commissioner).
  - On **21 January 1972**, NEFA became the **Union Territory of Arunachal Pradesh** under the North Eastern Areas (Reorganisation) Act, 197. An Agency Council and later a Pradesh Council / Provisional Legislative Assembly were created and a Lt. Governor appointed.
  - On **20 February 1987**, Arunachal Pradesh was granted **statehood** under the **Arunachal Pradesh Act, 1986**, becoming a full-fledged state with its own elected Legislative Assembly and Council of Ministers.

Geographical Features:

- Forms part of the **Eastern Himalaya**, with predominantly **mountainous and sub-montane terrain** sloping down towards the plains of Assam.
- **Altitudinal range:** from low-lying foothills and river valleys to **high Himalayan peaks**, giving rise to sharp climatic variation—from **hot and humid** in lower valleys with dense forests to **cold and even alpine conditions** in higher reaches.

37,000-YEAR-OLD BAMBOO FROM MANIPUR

Context: Scientists from BSIP (DST) discovered a 37,000-year-old thorny bamboo fossil in the silt-rich deposits of the Chirang River, Manipur, revealing the earliest evidence of thorniness in Asian bamboo.



About 37,000-year-old Bamboo from Manipur:

- **What it is?**
  - A remarkably preserved Ice Age–era bamboo fossil belonging to the genus *Chimonobambusa*, found with clear thorn scars, nodes and buds — features that almost never fossilise due to bamboo's hollow, fragile structure.
- **Discovery:**
  - Microscopic analysis confirmed it as **Chimonobambusa manipurensis**, showing traits similar to modern thorny bamboos like *Bambusa bambos*.
- **Significance:**
  - Earliest fossil evidence of thorny bamboo in Asia, proving that herbivore-defence traits evolved before or during the Ice Age.
  - Shows that Northeast India acted as a climatic refugium while harsh Ice Age conditions wiped bamboo out from regions like Europe.
  - Offers rare insight into palaeoclimate, plant evolution, and biodiversity resilience in the Indo-Burma hotspot.
  - Preservation of delicate structures

(thorn scars, buds) marks a major palaeobotanical milestone, helping reconstruct ancient ecosystems.

About Manipur:

- **Location:**
  - Manipur lies on India's eastern frontier, positioned between 23.83°N–25.68°N latitudes and 93.03°E–94.78°E longitudes.
  - It covers an area of 22,327 sq. km, comprising a central valley surrounded by highlands.
- **Neighbouring States & Nations:** Myanmar (Burma), Nagaland, Assam, Mizoram and Myanmar.
- **Geographical Features:**
- Manipur consists of **two major physical regions**:
- **Hills (≈ 90% of total area)**
  - Surround the valley on **all sides**, forming a protective mountain ring.
  - Higher elevations in the **northern ranges**, gradually decreasing toward the south.
- **Valley (≈ 10% of the area)**
  - The central **Manipur Valley** sits at about **790 metres above sea level**.
  - The valley slopes gently **southward**, forming a natural drainage pathway.
- **Chirang River:**
  - The Chirang River in Manipur's Imphal Valley hosts silt-rich sediment deposits that preserve plant remains, including the newly discovered 37,000-year-old bamboo fossil.

PARADIP PORT

Context: Paradip Port Authority (PPA) has achieved the fastest-ever 100 MMT cargo throughput in its history, and for the 9th consecutive year, crossing the 100 MMT mark—this time 12 days earlier than last fiscal.

About Paradip Port:

What is Paradip Port?

- Paradip Port is one of India's Major Ports, operated by the Paradip Port Authority under the Ministry of Ports, Shipping & Waterways.
- It is a key deep-water port on the eastern coast of India, handling large volumes of coal, POL, iron ore, steel, containerised cargo and coastal shipments.

Location: Located in Jagatsinghpur district, Odisha.

- Situated near the **confluence of the Mahanadi River** and the Bay of Bengal.

History:

- Foundation stone laid by **Prime Minister Jawaharlal Nehru** on **3 January 1962.**
- Government of India took over management from the Odisha government on 1 June 1965.
- Declared the **8th Major Port of India** on **18 April 1966**—the **first Major Port on the East Coast** to be commissioned after Independence.
- Operates as an **autonomous body** under the **Major Port Trusts Act, 1963**, governed by a Board of Trustees.

Key Features:

- **Handles a diverse cargo profile:** coal (45% share), containers, steel, gypsum & flux, POL, and coastal cargo
- Consistent year-on-year cargo growth; achieved **100 MMT for 9 consecutive years**
- Advanced **mechanised cargo handling** systems and improved operational efficiency
- Strong support from Indian Railways and coastal shipping networks

Significance:

- One of India's top-performing Major Ports in cargo handling.
- Acts as a critical gateway for coal-based power plants, steel industries and mineral exports.
- Strengthens India's coastal shipping ecosystem, reducing logistics costs.
- Enhances connectivity to the eastern industrial corridors.

ARAVALLI HILLS

Context:

A Forest Survey of India (FSI) assessment has revealed that the government's new 100-metre height definition for Aravalli Hills—accepted by the Supreme Court—removes over 90% of the Aravalli landscape from protection.

About Aravalli Hills:

What It Is?

- The Aravalli Hills are one of the **oldest fold**

mountain ranges in the world, forming a major ecological barrier, wildlife corridor, and mineral-rich region of northern and western India.

Located In: Extends from **near Delhi** through **southern Haryana** and **Rajasthan** to **Gujarat**, running roughly **670 km**.

Formation:

- Formed during the **Proterozoic era** through ancient **tectonic collisions**, part of the Aravalli–Delhi orogenic belt.
- Once very high mountains, they have been **heavily eroded** over millions of years.

Geological & Physical Features:

- Typically, **300–900 m** high, with the highest peak **Guru Shikhar (1,722 m)** in Mount Abu.
- Composed of **quartzite, marble, granite, copper- and zinc-bearing rocks**.
- Generate rivers such as **Banas, Luni, Sabarmati, and Sahibi**.
- Act as a **major barrier** preventing sand, dust, and desertification from advancing eastward.

About Aravalli definition issue:

What is the "100-metre definition" of Aravalli Hills?

- The Supreme Court has accepted a recommendation from the Environment Ministry that o**nly those landforms that rise 100 metres or more above** their immediate surroundings (local ground level) will be counted as "Aravalli Hills."
    - If a hill is **less than 100 m tall** (from base to peak), it is **not considered Aravalli** under the new rule.
    - Only tall hill sections remain protected and **smaller hills lose protection.**
- **Issues Highlighted by FSI Survey:**
    - **New 100-metre definition excludes 90% of hills**, leaving them unprotected.
    - Earlier scientific criteria (slope + 30m height) would have covered around **40%**, far more than the new definition.
    - Lower hills (10–30 m) are **critical windbreaks** that stop sand and dust from the Thar desert.