IAS GOOGLE JANUARY 2026

INDEX

ECONOMIC DEVELOPMENTS

- India–ADB $2.2 billion loan agreements
- Kenduadih Gas Leak Crisis
- National Bioenergy Programme
- Parliamentary Select Committee Report on the IBC (Amendment) Bill, 2025
- Nuclear Energy Mission
- National Pension System Reforms 2025
- Securities Markets Code Bill, 2025
- Freight Diversification in Indian Railways
- India's Rapid AI Adoption Boom
- The Rapid Financing Instrument (RFI)
- Report on 'Self-Reliance in Minerals and Metals'
- Reviving Shipbuilding in India
- Bureau of Port Security
- Reversal of Net FDI Flows in India
- Expansion in Rabi Crops Cultivation
- Export Concentration in Few States
- Electronics Sector in India
- China files WTO complaint against India
- Industrial Parks emerging as a key pillar of India's Innovation and Industrial Growth
- India's First PPP-Model Medical Colleges
- Subansiri Lower Hydroelectric Project
- Quality Council of India
- 25th Anniversary of Pradhan Mantri Gram Sadak Yojana (PMGSY)
- Initial Public Offering (IPO) market has touched record highs
- Central Consumer Protection Authority imposed penalty on UPSC coaching institute
- Enforcement Directorate Moves to Fast-Track Investigations
- Institutional Deliveries Reduced India's Maternal Mortality Rate
- State of Marginal Farmers in India 2025
- Plasser's Quick Relaying System (PQRS)
- Passenger Assistance Control Room (PACR)

- Industrial hemp
- India's Two Major Shipbuilding Initiatives
- Revamped Distribution Sector Scheme (RDSS)
- Dulhasti Stage-II Hydropower Project
- RBI initiates review of scale-based regulation (SBR) for NBFCs
- MoJS releases Dynamic Groundwater Resource Assessment Report 2025
- Export Promotion Mission
- Copper prices touched a record high

CONSTITUTION, POLITY AND GOVERNANCE

- Need to Modernize Policing Practices with the vision of Viksit Bharat: PM
- DoT Mandated SIM Binding
- ST Status for Six Communities in Assam
- Renaming Raj Bhavans
- CEC Chairmanship of International IDEA
- Assam Prohibition of Polygamy Bill, 2025
- National Commission for Backward Classes (NCBC)
- Flight Duty Time Limitations Rules
- Parliamentary panel seeks full operationalisation of Lokpal's inquiry wings
- 2nd WHO Global Summit on Traditional Medicine
- SC Directives for PwDs in Prisons
- Fire Safety in India
- Karnataka Hate Speech Bill, 2025
- Contempt of Court
- Supreme Court's Ruling on Narco Tests
- Sustainable Harnessing of Advancement of Nuclear Energy for Transforming India Bill
- Fourth National Lok Adalat of 2025 successfully resolved 2.59 crore disputes
- National Blood Transfusion Bill, 2025

- NCBC has advised the Union Government to exclude 35 communities from West Bengal
- Dowry eradication urgent constitutional, social necessity: Supreme Court
- Viksit Bharat Shiksha Adhishthan Bill, 2025 introduced in Lok Sabha
- National Disaster Mitigation Fund
- Viksit Bharat–Guarantee for Rozgar and Ajeevika Mission (Gramin) Act, 2025
- Marital Rape Law Reform
- India's First National Counter-Terrorism Policy
- PESA Mahotsav 2025
- Comprehensive Guidelines on Building Road Tunnels
- Digital Residue Reshaping Policing in India
- Unrest in Assam's Karbi Anglong
- Government Links NATGRID to National Population Register
- Governance Foundations for the Agentic AI Age
- Indian Pharmacopoeia Commission (IPC)
- White Paper on Democratising AI Infrastructure
- National Technology Readiness Assessment Framework (NTRAF)
- Annual Groundwater Quality Report 2025 released by CGWB

INTERNATIONAL RELATIONS AND SECURITY

- Hansa-3 (NG) Trainer Aircraft
- 50th anniversary of the Biological Weapons Convention
- India Re-Elected to UNESCO Executive Board for 2025–29
- DRDO Rocket-Sled Test
- Exercise EKUVERIN
- A new naval detachment on Bitra Island
- INS Aridaman
- Thailand has formally expressed its intention to join BRICS
- Operation Sagar Bandhu
- Indian Navy Day 2025

- Exercise Garuda & Garuda Shakti 2025
- 23rd India-Russia Annual Summit
- National Intelligence Grid (NATGRID)
- C-130J Super Hercules Aircraft
- Washington Accords
- India-UK Defence Partnership
- Thailand–Cambodia Border Tension
- Diving Support Craft (DSC) A20
- India-Israel Joint Working Group Meeting
- India-Italy Relations
- Mexico to Raise Import Tariffs on Non-FTA Countries
- Yellow Line
- Gold Card Visa Programme
- Pax Silica Initiative
- Bondi Beach attack
- HAMMER precision-guided weapon (AASM)
- Vijay Diwas Marks India's Victory in 1971 War
- India–Jordan Joint Statement
- The Tianjin Declaration
- PM Modi's Visit to Ethiopia
- Exercise Ekatha
- Rising Security Concerns in Bangladesh
- India's BRICS presidency 2026
- Exercise DESERT CYCLONE–II 2025
- India & Argentina Signed Work Plan 2025–27
- India Assumes BRICS Presidency for 2026
- PM Modi's Visit to Oman
- Implications of U.S. National Security Strategy for India
- India–New Zealand Free Trade Agreement
- Pollution Control Vessel 'Samudra Pratap'
- The Blue Line

- Village Defence Guards (VDGs)
- Somaliland
- Anti-Terrorism Conference 2025
- INS Vaghsheer
- INSV Kaundinya
- Pinaka Long Range Guided Rocket (LRGR-120)
- Defence Acquisition Council
- 3 Years of India-Australia Economic Cooperation & Trade Agreement (ECTA)
- Justice Mission 2025
- UAE–Saudi Rift in Yemen
- United States–Venezuela Tensions over Oil Sanctions and Maritime Interdictions

SOCIETY AND SOCIAL JUSTICE

- WHO Issues First Global Guideline on Infertility
- Child Marriage Hotspot
- Kondapalli Transformation
- Bharat Ranbhoomi Darshan
- Operation Hinterland Brew
- Research Ecosystem Beyond STEM Priorities
- Convention against Discrimination in Education
- Dandami Maria Tribe
- United Nations Alliance of Civilizations (UNAOC)
- UNESCO Makes A Strong Case for Mother-Tongue Instruction
- Pa Pa Pagli Project
- Panchayat bans smartphone use by married women
- SHAKTI Scholars – NCW Young Research Fellowship

GEOGRAPHY, ENVIRONMENT, BIODIVERSITY AND DISASTER MANAGEMENT

- Africa is gradually splitting into two plates

- Anopheles stephensi
- Gandikota Canyon
- Kanger Valley National Park
- Glacier Disappearance
- India's Clean Energy Achievements in 2025
- The World Weather Attribution Annual Report 2025
- Kaimur Wildlife Sanctuary

SCIENCE AND TECHNOLOGY

- India's Shift from GM to Genome-Edited Crops
- The World AIDS Day
- Burtele Foot
- WHO issues Global Guideline on the use of GLP-1 Medicines in treating Obesity
- Software Defined Radios
- Alaknanda Galaxy Discovered in Early Universe
- Tensor Processing Unit (TPU)
- AstroSat
- India International Science Festival (IISF) 2025
- Brain–Computer Interface (BCI)
- Cosmic Filaments
- Bharat 6G Mission
- Planetary-Defense Exercise on 3I/ATLAS
- Q-day
- India's First Indigenous Hydrogen Fuel Cell Passenger Vessel
- ISRO To Launch Its Heaviest Us Commercial Satellite: Bluebird-6
- National Hub for Quantum Communication
- GlowCas9
- Geminid Meteor Shower
- Supernova

- FSSAI launches egg safety drive after 'nitrofurans presence'
- AFMS launches India's first AI-driven community screening programme for Diabetic Retinopathy
- The RESPOND Basket 2025
- DHRUV64 Microprocessor
- Mars Atmosphere and Volatile Evolution (MAVEN) Spacecraft
- CRISPR Gene-Editing Technology
- Advancing Breast Cancer Care
- BRAIN Initiative Cell Atlas Network (BICAN)
- ISRO Launches Heaviest Satellite BlueBird Block-2
- AILA (Artificially Intelligent Lab Assistant)
- Nanobots
- Optical Frequency Comb
- Neodymium
- Nimesulide Ban
- Maglev Technology
- India's First 3D Flex Aqueous Angiography for Glaucoma
- PathGennie Software for Fast-Tracking Drug Discovery
- The drug-resistant fungal species Candida auris

HISTORY, HERITAGE AND CULTURE

- Ellora Caves
- Bhagavad Gita serves as a Universal Guide offering Moral Clarity: Vice President
- Kashi Tamil Sangamam 4.0
- Swargadeo Chaolung Sukapha
- The 26th Hornbill Festival
- Mahad Satyagraha
- 200th anniversary of Dadabhai Naoroji
- 150 Years of Vande Mataram
- Saudi UNESCO Global Network of Learning Cities (GNLC)

- UNESCO Recognises Deepavali as Intangible Cultural Heritage
- Boreendo
- First Country to Win UNESCO Recognition for Its National Cuisine
- Adichanallur Historical Site
- 115 Years of Savarkar's Poem 'Sagara Pran Talamalala'
- Charaichung Festival
- Preah Vihear Temple
- Emperor Perumbidugu Mutharaiyar II
- Petra & Ellora Caves
- National Maritime Heritage Complex (NMHC) at Lothal
- 2,000-year-old labyrinth revealing India's role in ancient global trade
- Thanjavur Paintings
- Scientific Study on Keezhadi
- 100 Years of The Communist Party of India (CPI)
- 140th Foundation Day of Indian National Congress (INC)
- Narsapuram Lace Craft
- The Santhali Language
- Srimanta Shankar Dev
- Port Blair Tricolour Hoisting
- Piprahwa Relics

FACTS FOR PRELIMS

- UN Champions of the Earth award
- MahaCrimeOS AI
- Param Vir Chakra
- China Wireless Freight Trains
- Chillai Kalan
- National Farmers' Day
- National Mathematics Day
- Flower Lady of Manipur - Chokhone Krichena
- UN Chief Issues New Year Message in Hindi

ECONOMIC DEVELOPMENTS

Shipping Corporation of India

- The Government of India has announced a major **revival plan for the Shipping Corporation of India (SCI)**, including the purchase of over 200 merchant ships through joint ventures with other PSUs.

Evolution of the Shipping Corporation of India

- For decades, the SCI stood as one of the world's leading national carriers, operating over 120 ships across categories such as oil tankers, gas carriers, chemical tankers, passenger vessels, liners and offshore vessels. SCI symbolised India's maritime pride, combining national service with commercial capability. SCI also led technological upgrades, introducing the latest German marine engines, operating India's first LNG carrier, and building vessels in Indian shipyards despite delays and cost overruns.
- Its diverse fleet and national obligations made it central to India's maritime economy.

Role in National Interest and Strategic Missions

- **Energy Security:** Historically, SCI had first rights on transporting India's oil, making tankers the backbone of its fleet.
- **National Service:** It transported civilian workers at concessional rates to the Andaman Islands and supported defence logistics during crises.
- **Risk Operations:** During the Iran-Iraq war, SCI tankers bore the word INDIA in large white letters to signal non-hostility and ensure safe passage.
- **Skill Development:** SCI's Mumbai-based training institute in Powai trained thousands of marine professionals who went on to earn significant foreign exchange for India.

Decline During Liberalisation

- Under WTO rules, India had to **dilute preferential treatment** for its national carrier in EXIM cargo.

Key consequences included:

- Loss of **"right of refusal"** over oil cargo, a major revenue source for SCI.
- Neglect in fleet modernisation, only two ships were ordered in 10 years before the recent purchases.
- Shrinking tanker capacity and rising average fleet age (18 years, nearing scrapping levels).
- Collapse of Indian presence in container shipping after **cabotage relaxation**.

- India's share of EXIM cargo carried by Indian vessels fell from 27% earlier to just 7%, illustrating a precipitous decline.

COVID-19 and the Reassessment of Strategic Shipping Capacity

- The pandemic became a turning point. Global freight rates skyrocketed, up to 10 times pre-pandemic levels, as port delays and geopolitical bottlenecks grew.
- Many global carriers skipped developing country ports, disrupting India's key exports such as rice and shrimp and affecting essential imports such as rubber.

India's lack of national container capacity left it vulnerable to:

1. Supply chain disruptions
2. High freight costs
3. Loss of export competitiveness

This renewed recognition of maritime self-reliance prompted the shift away from privatisation and toward rebuilding SCI.

Global Trends Supporting Public Ownership

- The revival of SCI is not an isolated move. Across the world, governments have increased intervention in strategic sectors:
- **United States:** The Biden administration invested billions in semiconductors, while the Trump administration acquired stakes in companies including Intel and U.S. Steel, abandoning earlier reluctance toward industrial ownership.
- **Rare Earth Sector:** U.S. government investment has grown due to supply chain vulnerabilities.
- This global shift toward strategic state-driven industrial capacity strengthens the logic behind reviving SCI.

Government's New Revival Plan for SCI

- Large-Scale Ship Acquisition Through PSU Joint Ventures
- The government plans to purchase 200+ merchant vessels for SCI through joint ventures with other PSUs using funds from the Maritime Development Fund.
- PSU partners, such as oil companies, the **Container Corporation of India (CONCOR)** and others, will provide long-term assured cargo contracts, enabling SCI to finance new ships sustainably.

Rebuilding Container Shipping Capacity

- One major initiative includes the creation **of Bharat Shipping Line**, a joint venture of SCI and CONCOR, to buy 20 new container ships, reviving India's long-neglected container fleet.

Balancing Newbuilds and Market Realities

- While the revival is ambitious, experts note that global ship prices are currently extremely high due to a prolonged post-pandemic shipping boom.
- Therefore, expansion will be gradual, balancing strategic needs with market conditions.

Need to Support Private Indian Shipping

- Industry experts emphasise that revival efforts should not remain limited to SCI.
- India's broader merchant shipping capacity can grow only if private operators also receive:

1. Long-term cargo contracts
2. Support for capital investment
3. A competitive taxation and regulatory environment
4. A holistic approach would build India's overall flag tonnage, enhancing supply chain resilience and global trade competitiveness

National Beekeeping and Honey Mission

- India has increased honey production from 76,000 MT to over 1.5 lakh MT in the last decade and has tripled its exports recently.
- The achievement is attributed to the government's **"Sweet Revolution" initiative, carried** out through the **National Beekeeping and Honey Mission (NBHM).**

National Beekeeping and Honey Mission - NBHM

- The NBHM is a Central Sector Scheme under the Ministry of Agriculture & Farmers' Welfare to promote and develop quality honey and beehive products.
- Launched under Atmanirbhar Bharat for FY 2020–21 to 2022–23; it has been extended to FY 2025–26.
- **Objective:** Enhance honey production, increase crop yields through scientific beekeeping and pollination, and raise beekeepers' incomes.
- **Implementing Body:** The National Bee Board (NBB) implements the mission.
- **Mission Structure:** NBHM operates through three sub-missions covering production, post-harvest management, and research.

1. **Mini Mission-I:** Increases honey and hive-product yield by encouraging scientific beekeeping and the adoption of modern equipment.
2. **Mini Mission-II:** Develops infrastructure for honey testing, processing, storage, value addition,

and organised market access.

3. **Mini Mission-III:** Supports region-specific research and development to address diverse agro-climatic and socio-economic conditions across states.

Key initiatives under the NBHM

- **Digital Support:** The **Madhukranti Portal** facilitates honey registration and traceability to prevent adulteration and promote transparency for consumers.
- **Institutional Support:** Beekeeper collectives through Farmer-Producer Organisations (FPOs), Self-Help Groups (SHGs), and cooperatives promote women-focused capacity building.
- **Skill Development:** Training programs, exposure visits, and technology dissemination to promote high-value hive products such as royal jelly and beeswax.
- **Research Facility:** The National Centre of Excellence in Beekeeping at IIT, Roorkee, was established for scientific innovation and advanced sectoral training.

Other Initiatives for Honey Production

- **KVIC's Honey Mission: The Khadi and Village Industries Commission (KVIC)** offers training, bee boxes, and toolkits to rural youth and farmers to promote sustainable livelihoods.
- **Export Support:** The APEDA strengthens export readiness through quality certification, laboratory testing, and enforcement of a Minimum Export Price mechanism.
- **GI Tags Support:** Geographical Indication tags for unique regional honeys, such as Ramban Sulai Honey (J&K) and Sundarban Mouban Honey (WB), boost branding and market access.

Global Indices for Reforms and Growth (GIRG)

- The Government of India has undertaken the Global Indices for Reforms and Growth (GIRG) initiative for driving reforms and growth in the country.
- Global Indices for Reforms and Growth (GIRG) Framework

- **Purpose:** It monitors India's performance on selected global indices to identify gaps and guide evidence-based reforms.
- **Coverage:** Tracks 26 indices across four broad themes: economy, governance, development, and industry, released by 16 international agencies.

- Implementation: 17 nodal ministries are assigned specific indices.
- The **Development Monitoring and Evaluation Office (DMEO),** NITI Aayog coordinates data quality checks, methodology review, and reform implementation.
- **Significance:** Enhances transparency, strengthens policymaking, boosts India's global competitiveness, and supports cooperative and competitive federalism.

Low Acceptance Rate of the PM Internship Scheme

- The Ministry of Corporate Affairs (MCA) told the Lok Sabha that only 20% of the 1.65 lakh internship offers under the **Prime Minister's Internship Scheme** were accepted by candidates.
- Of the accepted offers, 20% of candidates quit their internships prematurely.

Factors Behind Lower Acceptance Rate

- **Geographical Mismatch:** Opportunities are concentrated in major industrial or urban centres located far from candidates' hometowns.
- **Longer Duration:** The compulsory 12-month duration exceeds typical 3–6-month skill-building programmes that align with academic breaks or short transition periods.
- **Role Mismatch:** A mismatch between candidates' aspirations and tasks assigned resulted in limited interest in the offered roles.
- **Low Stipend:** The ₹5,000 monthly stipend is insufficient to meet living costs, especially for candidates who need to relocate.
- **Job Prospects:** The scheme does not guarantee post-internship employment. Very few participants received full-time job offers during the pilot.

About PM Internship Scheme

- The Prime Minister's Internship Scheme is a **central-sector scheme** that offers a 12-month paid internship to Indian youth in the top 500 Indian companies.
- **Core Objective:** The scheme aims to bridge the gap between academic learning and industry requirements through hands-on workplace exposure.
- **Target:** It plans to deliver one crore internships over a five-year implementation period (2024-29).
- **Implementing Body:** The Ministry of Corporate Affairs (MCA) administers the scheme through a dedicated Prime Minister's Internship Scheme **(PMIS) Cell.**

- **Company Selection:** The initial list of top 500 companies was chosen based on their average Corporate Social Responsibility (CSR) expenditure.
- **Duration:** The internship spans 12 months, with at least six months spent in a real job environment.
- **Financial Support:** Interns receive a ₹5,000 monthly stipend, a ₹6,000 one-time joining grant, and insurance coverage under relevant government schemes.

Eligibility Conditions

- **Eligibility Criteria:** Applicants must be Indian citizens aged 21 to 24 with Class 10/12, ITI, polytechnic diploma, or bachelor's degree qualifications.
- **Work-Income Condition:** Candidates must not be in full-time employment or formal education, and annual family income must be below ₹8 lakh.
- **Ineligibility:** Graduates from premier institutions (IITs, IIMs), higher qualifications (CA, MBBS, MBA), or with immediate family in government service, are not eligible.

National Strategy for Financial Inclusion 2025-2030

- The Governor of the Reserve Bank of India (RBI) released the new **National Strategy for Financial Inclusion (NSFI)** 2025-2030.

About NSFI

- It is a comprehensive plan to expand financial access and usage across India over the next five years.
- The NSFI is based on five strategic objectives, collectively known as **'Panch-Jyoti' (Five Lights).**
- It has been developed under the Technical Group on Financial Inclusion and Financial Literacy **(TGFIFL),** in consultation with various stakeholders.
- **Panch-Jyoti:** A five-pillar strategy focusing on equitable financial services, women-led inclusion, finance–livelihood integration, financial education, and stronger customer protection.

Key Focus Areas

- **Last-Mile Delivery:** Ensure every revenue centre has at least one banking outlet (branch, Digital Banking Unit, or fixed-point Business Correspondent).
- **Business Correspondents:** Provide fair pay for BCs and utilise their networks to distribute

insurance, pensions, and mutual funds; a medium-term goal is achieving 30% women BCs.

- **Digital Innovation:** Explore programmable **Central Bank Digital Currency (CBDC)** for targeted credit flows and pilot its offline functionality in low-connectivity areas.
- **Social Security:** Integrate all banks and insurers onto the Jansuraksha portal for seamless enrolment and claims processing under PMJJBY and PMSBY.
- **Product Development:** Design bundled financial products, including combined life, health, accident, and property insurance for underserved users.

PM-WANI Scheme

- The government has updated Parliament on the rapid expansion of the PM-WANI network, with over 3.9 lakh Wi-Fi hotspots deployed across India as of November 2025.

About PM-WANI Scheme:

- PM-WANI (Prime Minister's Wi-Fi Access Network Interface) is a national public Wi-Fi framework enabling affordable, widespread broadband access through decentralized Wi-Fi hotspots operated by small entrepreneurs.
- **Ministry:** Implemented by the Department of Telecommunications (DoT) under the Ministry of Communications.
- **Launched in:** Approved by the Union Cabinet on 9 December 2020.
- **Aim:** To democratize internet access, promote digital inclusion, and create a nationwide network of public Wi-Fi hotspots—supporting the goals of the **National Digital Communications Policy (NDCP) 2018.**

Key Features of PM-WANI

- **No License Required:** PM-WANI allows small shops and local businesses to operate Wi-Fi hotspots without needing any licence, fee, or formal registration, making broadband delivery easy and low-cost.
- **Four-tier Architecture:** The system works through four components—PDOs providing Wi-Fi, PDOAs handling authentication and accounting, App Providers enabling user access, and a **Central Registry (C-DoT)** that records all entities.
- **FTTH Support:** PDOs are now permitted to use regular fibre-to-the-home broadband connections, reducing their operational costs and making hotspot deployment more viable.

- **Roaming Between PDOAs:** Users can seamlessly switch between hotspots operated by different PDO Aggregators, ensuring continuous connectivity similar to mobile network roaming.
- **Mobile Data Offload:** PDOs can partner with telecom operators to divert mobile data traffic onto Wi-Fi networks, improving network quality and reducing mobile congestion.
- **User-Based Promotions:** App Providers and PDOAs may send promotional messages or content to users, but only after obtaining explicit user consent to ensure privacy protection.
- **Affordable Bandwidth (TRAI Rule):** TRAI requires that all retail fibre broadband plans up to 200 Mbps be sold to PDOs at no more than twice the consumer tariff, ensuring that public Wi-Fi remains affordable.

Significance:

- Bridges the digital divide by providing low-cost internet in rural and underserved regions.
- Generates local entrepreneurship, creating lakhs of micro-Wi-Fi operators.
- Enhances digital payments, e-learning, telemedicine, and e-governance reach.

Transforming India into a leading Quantum-Powered Economy

- The roadmap "Transforming India into a leading Quantum-Powered Economy" will help to build a home grown quantum computing ecosystem and capture a major share of the global quantum market.
- It aims to incubate at least 10 globally competitive quantum startups, each surpassing USD 100 million in revenue and capturing over 50% of the value in the global quantum software and services market by 2035.

Status in India of Quantum Technology

- **Talent Pool:** India ranks 2nd globally in the number of graduates in quantum-relevant fields (approximately 91,000), behind only the EU.
- **State-Level Competition:** Different states are actively building their own ecosystems. For example, Karnataka has established the Quantum Research Park (QuRP), and Andhra Pradesh recently launched the **Amaravati Quantum Valley (AQV).**

Recommendations of Roadmap

- **Expand the Quantum Workforce:** Grow the scientific, deep engineering and professional deployment-ready workforce in 2-3 years.
- **Prioritization of Top 3-5 Quantum Opportunity Areas:** Such as secure communication and Health and Pharma, Cryogenics, Financial services, logistics etc.
- **Accelerate Lab-to-Market Transition:** Significantly improve ease of doing research, of technology validation and of taking technology from lab-to-market, within 2 years.
- **Lead in Global Standard Setting:** Engage actively with global standards bodies and take leadership in international standard setting related to quantum technologies to ensure that Indian products have access to global markets.
- Make Indian domicile attractive for startups: So that >90% deep tech Indian startups choose to stay domiciled in India.

About Quantum Technology

- **Definition:** Quantum technology is a class of technology that works by using the principles of quantum mechanics (the physics of sub-atomic particles), including quantum entanglement and quantum superposition.
- **Classified into four major vectors:** Quantum Computing, Quantum Communication (Utilizing concepts like quantum key distribution (QKD)), Quantum Sensing and Metrology, Quantum Materials.

Hindu Rate of Growth

- Prime minister criticised the phrase **"Hindu rate of growth"** as a colonial and communalising label that unfairly tied India's past economic stagnation to Hindu culture and identity.

What is meant by **'Hindu rate of growth'?**

- The "Hindu rate of growth" is an economic term for India's persistently low GDP growth (about 3.5–4% per year) from the 1950s to the 1980s, before the 1991 reforms.
- It refers specifically to long-run real GDP growth, not to religion-based economic behaviour in any technical macro model.
- **Coined by:**
- The term was coined by economist Raj Krishna (Delhi School of Economics) in the late 1970s

(commonly dated to 1978).

- **Features:**
- **Low and Persistent GDP Growth:** India's GDP stayed stuck around 3.5–4% annually from the 1950s to 1980s, and per capita income rose even slower due to high population growth, reflecting long-term structural stagnation.
- **Stability Across Shocks and Regimes:** The growth rate barely changed despite wars, droughts, famines, political shifts, and policy variations, making economists view it as a deeply entrenched, system-wide equilibrium.
- **Licence-Permit-Quota Raj:** A heavily controlled economy with industrial licensing, import substitution, high tariffs, and a dominant public sector restricted private enterprise and kept productivity low.
- **Mixed but State-Led Economic System:** India pursued a mixed economy with the state controlling core industries, credit, trade, and planning, limiting market competition and foreign participation in growth sectors.
- Contrast with **East Asian "Miracle" Economies:** While India grew at ~3.5%, East Asian economies like South Korea and Taiwan achieved 7–10%, underscoring India's relative underperformance among post-colonial peers.
- **Turnaround Before 1991:** Studies show growth accelerated to ~5.6–5.8% in the 1980s, indicating India had already moved beyond the old growth trap due to gradual deregulation and internal reforms pre-1991.

SEBI Action Highlights Finfluencer Issue

- Securities and Exchange Board of India (SEBI) barred trader Avadhut Sathe for allegedly offering unregistered investment advice, placing finfluencer regulation under sharper scrutiny.

Finfluencers

- Finfluencers are individuals offering financial opinions or investment-related content on social media without necessarily being registered or qualified.
- Regulation: SEBI treats real-time stock cues or return-linked claims as investment advisory activity that requires registration under SEBI (Investment Advisers) Regulations.
- Risk: Unregistered finfluencer activity raises concerns of inducement, misleading claims,

undisclosed paid partnerships and weakened investor protection.

- Action: SEBI now restricts regulated

India's Tax Collection from Cryptocurrency Transactions

- The Ministry of Finance shared the tax collection data on cryptocurrency transactions for 2024-25 in response to a question in the Rajya Sabha.
- **Transaction Value:** Crypto transactions reached ₹51,000 crore in 2024-25, marking a 41% rise.
- **Tax Collection:** Authorities collected ₹511.8 crore as Tax Deducted at Source (TDS).
- **Undisclosed Income:** The Income Tax Department detected ₹888.82 crore in undisclosed income linked to virtual digital assets (VDA).
- **ED Action:** The Enforcement Directorate (ED) attached over ₹4,000 crore as proceeds of crime under the Prevention of Money Laundering Act (PMLA), 2002.
- **Virtual Digital Asset:** The Income Tax Act, 1961, uses this term to classify cryptocurrencies, Non-Fungible Tokens (NFTs), and similar digital assets.

India's Tax Provisions for Cryptocurrency:-

Tax Rates

- **Flat Tax:** A flat 30% tax applies on VDA transfer income, excluding surcharge and 4% cess.
- **Uniform:** This 30% rate applies to all taxpayers irrespective of the income tax slab.
- **Cost Deduction:** Only the acquisition cost may be deducted when calculating taxable crypto profit.
- **GST Rule:** No GST applies to the crypto asset, but 18% GST is levied on platform service fees.

Loss and TDS

- **Loss Restriction:** Losses from one crypto asset cannot offset gains from another crypto asset.
- **Carry-Forward:** Crypto-related losses cannot be carried forward to later financial years.
- **TDS:** A 1% TDS applies on crypto transfers above ₹50,000 for specified persons or ₹10,000 for all others.

Gift and Reporting

- **Gift Tax:** Crypto received as a gift becomes taxable at slab rates when the value exceeds ₹50,000.
- **Exemption:** Gifts from defined relatives such as spouse, siblings, and lineal family are exempt.
- **ITR Reporting:** Crypto gains must be reported in Schedule VDA of the Income Tax Return.

IMF Lists UPI as World's Largest Real-Time Payment System

- The IMF has officially recognised India's **Unified Payments Interface (UPI)** as the world's largest real-time retail payment system by transaction volume.
- UPI accounts for **49% of all global real-time digital payments**, far ahead of Brazil, Thailand and China.

What is UPI ?

- UPI (Unified Payments Interface) is India's instant, real-time, interoperable payments system that enables bank-to-bank transfers using a mobile phone.
- It is operated by **NPCI** (National Payments Corporation of India) **and regulated by the Reserve Bank of India (RBI).**

Origin of UPI:

- Conceptualised by NPCI to unify fragmented payment systems under one interoperable platform.
- Launched as a pilot in April 2016 by then RBI Governor **Raghuram Rajan.**
- **Key Features of UPI**
- **Real-time payments:** Money transfers in under 5 seconds, 24×7.
- **Interoperability:** Works across banks, apps, QR codes and merchants.
- **Low-cost / Zero MDR:** Ensures mass adoption among small businesses and consumers.
- **Scalable architecture:** Handles billions of transactions per month.
- **Versatility:** Supports P2P, P2M, autopay, credit line on UPI, RuPay linkage, and international acceptance.

Global Share & IMF Recognition

- IMF's **report "Growing Retail Digital Payments – The Value of Interoperability"** lists UPI as the world's largest retail fast-payment system.
- **As per ACI Worldwide (Prime Time for Real-Time 2024):**
- UPI share: 49% of global real-time transactions
- Volume: 129.3 billion transactions

UPI outperforms:

- Brazil (14%) – Pix

- Thailand (8%) – PromptPay
- China (6%) – UnionPay/WeChat/Alipay
- This makes India the undisputed global leader in fast payments.

Dumping

- The U.S. is considering new tariffs on Indian rice after American farmers accused India of dumping subsidised rice into the U.S. market, lowering domestic prices.

What is Dumping?

- Dumping occurs when a firm **sells a product in a foreign market at a price lower than its domestic price** or below its average cost of production, often to capture market share.
- It is a form of international price discrimination, enabled when goods cannot freely move back from low-price to high-price markets due to tariffs or transport costs.

Criteria to Determine Dumping

- A product is considered dumped if:
- Export price < domestic market price of the exporting country; or Domestic price unavailable, then compare export price with:
- Price in a third-country market, or Exporter's average production cost.
- If any of these tests confirm under-pricing, the importing country can initiate anti-dumping action.

Implications of Dumping:

- Hurts domestic producers by undercutting prices and eroding market share, leading to losses and job reductions.
- Short-term benefit to consumers through cheaper imports but long-term harm when domestic industry becomes uncompetitive.
- Market distortion occurs when firms rely on subsidies to artificially lower prices, creating trade tensions.

WTO and Dumping Rules:

- The WTO does not ban dumping, but allows countries to act only if they prove:

- Dumping has occurred,
- Domestic industry suffered material injury, and
- Dumping caused this injury.
- Countries may impose anti-dumping duties equal to the margin of dumping (difference between dumped price and normal price).

Measures to Counter Dumping:

- **Anti-dumping duties:** Additional tariffs matching the price difference (as the U.S. is considering against Indian rice).
- **Countervailing duties:** Tariffs to offset foreign government subsidies.
- **Import quotas:** Limits to prevent market flooding.
- **Price undertakings:** Exporter voluntarily raises prices to avoid penalties.
- **Strengthening domestic industry:** Support for productivity, tech upgrades, and diversification to withstand imported competition.

Pilot Gold-Backed Digital Trade Currency

- A digital, **blockchain-based settlement currency** designed for cross-border trade within BRICS, backed by physical gold and BRICS national currencies.

Launched by:

- Developed as a pilot by the International Research Institute for Advanced Systems (IRIAS), supported informally by BRICS members.

Aim:

- Reduce reliance on the US dollar for international trade.
- Provide a stable, neutral settlement instrument anchored in gold.
- Build an alternative financial architecture for the Global South.

How It Works?

- **40% gold + 60% BRICS currency basket:** The Unit's value is anchored in physical gold while balancing currency exposure, ensuring stability and diversified risk across the five BRICS economies.
- **Daily value recalibration:** Its price updates every day based on gold rates and currency fluctuations, keeping the Unit aligned with real-world macroeconomic movements.

- **Blockchain-based settlement (Cardano):** Transactions run on a permissioned **Cardano blockchain**, enabling secure, traceable, tamper-proof settlement across countries.
- **Not a national currency replacement:** The Unit serves only as a cross-border settlement tool, reducing dollar dependence while leaving domestic monetary policy untouched.

Key Features

- **Gold-anchored stability:** Pegging to physical gold protects the Unit from extreme volatility and fiat currency shocks, making it a reliable trade-settlement medium.
- **Transparency through blockchain:** Blockchain ensures all transactions are auditable and immutable, reducing manipulation risks and increasing trust among BRICS members.
- **AI-led governance:** The AI-governed Unit Foundation minimizes political bias in decision-making, providing consistent oversight and automated, rules-based management.
- **Reserve sovereignty:** Member countries keep gold reserves domestically while still backing the Unit, avoiding the geopolitical risks of pooling gold offshore.
- **Improves gold liquidity:** By using gold in active trade settlement rather than storage, the Unit increases gold's transactional role and deepens global gold-market liquidity.

Significance

- Major step toward de-dollarisation by offering a non-Western settlement option.
- Strengthens BRICS' role in global monetary reform and south-south cooperation.
- Potential to become the first large-scale gold-backed digital settlement system if scaled.

World Inequality Report 2026

- This is the 3rd edition of the report after 2018 and 2022, prepared by the **World Inequality Lab**.

Key Findings of the Report:

- **Global Wealth Concentration:** Top 1% control 37% and **top 10% share 75% of all global wealth**.
- **India:** Top 1% holds about 40% and top 10% hold around 65% of total wealth.
- **Global Income Concentration:** Top 10% share 53% of global income.
- **India:** Top 1% earns around 23% and top 10% capture 58% of national income.
- **Wealth Growth:** Since the 1990s, the wealth of billionaires has grown (at 8%) nearly twice the

rate of bottom half of the population.

- **Climate Inequality:** Top 10% account for 77% of carbon emissions, while the poorest half accounts for only 3%.
- **Structural Imbalance:** Each year Global South **transfer more than 1% of world GDP** to Global North through debt service, profit repatriation, and financial flows (3 times more than development aid).

Policy Recommendations in the Report

- **Progressive Taxation and Tax Justice:** Global minimum tax on billionaires and internationalanti-evasion coordination to fund public goods and cut inequality.
- **Public Investment:** Fund free high-quality education, healthcare, childcare, and nutrition to reduce early disparities and boost opportunities.
- **Redistributive Programs:** Use cash transfers, pensions, and unemployment benefits to shift resources downward.
- **Gender Equality Measures:** Provide affordable childcare and parental leave, enforce equal pay, and protect against discrimination to redistribute unpaid care work.
- **Climate Policy Focused on Ownership:** Climate subsidies with progressive taxes and green investments by public sector (instead of private) to reach net-zero without wealth concentration.
- **International Financial Reform:** Introduce global currency, centralized credit systems, and surplus taxes to aid social investment in developing countries.

India's Nuclear Power Generation reaches Record High in FY 2024-25

- As per **Department of Atomic Energy (DAE),** Nuclear Power Corporation of India Limited (NPCIL) crossed **50 billion Units (BUs) generation** in financial year 2024-25, first time in its operation history.
- This helped avoid nearly 49 million tonnes of carbon dioxide emissions.

Nuclear Power in India

- India adopted a **three-stage nuclear power programme**.

Three Stage Nuclear Programme

- **Status:** It contributes about 3% to total electricity generated. (July 2025).
- **Target:** 100 GW of Nuclear Power Capacity by 2047.

Key Initiatives to advance Nuclear Power in India

- **Nuclear Energy Mission:** Launched in Union Budget 2025-26 focussing on Research and Development (R&D) of **Small Modular Reactors (SMRs)**
- SMRs are advanced nuclear reactors with power capacity of **up to 300 MW(e) per unit**, about one-third of generating capacity of traditional nuclear power reactors.
- **Developing Bharat Small Reactors:** BSRs are **220 MW Pressurized Heavy Water Reactors (PHWRs)** with a proven safety and performance record.
- PHWR is a **heavy water cooled and heavy water moderated** natural uranium based fuel reactor.

Key Achievements towards Enhancing Capacity:

- First two units of indigenous 700 MWe PHWR at **Kakrapar, Gujarat (KAPS - 3 & 4)** began commercial operation in FY 2023-24.
- Launch of **Mahi Banswara Rajasthan Atomic Power Project (MBRAPP),** a 4 x 700 MWe PHWR.
- **Rawatbhata Atomic Power Project (RAPP)** Unit 7 –3rd indigenous 700 MWe PHWR, started commercial operation in 2025.

Sustainability of India's Growth Rate

- India recorded **8.2% GDP growth**, supported by the manufacturing and services sectors.
- However, the IMF rated India's national income accounting **"Grade C",** citing methodological gaps.
- **Evidence for the Sustainable Growth Rate of India**
- **Sectoral Momentum:** Manufacturing grew 9.1% and Services 9.2%, with financial services at 10.2%.
- **Consumption Demand:** Private Final Consumption Expenditure **(PFCE) up 7.9%,** signalling rising household spending and urban demand resilience.
- **Real GVA Growth:** Real GVA increased from ₹82.88 lakh crore → ₹89.41 lakh crore, confirming genuine increase in value addition, not inflation-led growth.
- **Inflation Contained:** Nominal GDP grew 8.8%, very close to real GDP 8.2%, meaning.
- **Exports & Investment:** Exports from SEZs rose from ₹7.59 lakh crore (FY21) → ₹14.63 lakh crore (FY25); investments up ₹6.17 lakh crore → ₹7.82 lakh crore.

Evidence for the Unsustainable Growth Rate of India

- **National Accounting Quality:** IMF flagged **outdated base year (2011–12),** absence of **Producer Price Index**, and weak state-level data question the reliability of growth numbers.
- **Uneven Sectoral Recovery:** Mining grew only 0.04%, electricity 4.4%, showing weak backbone sectors.
- **Employment-Output Mismatch:** Agriculture employs ~45% of workforce but contributes ~14% to GVA.
- **Weak Goods Export:** In 2023–24, India's merchandise exports were approx. $437 billion, while Vietnam exported approx. $404 billion despite being far smaller, and China exported approx. $3.4 trillion.
- **Structural Weaknesses:** No consolidated state/local body fiscal data after 2019.

Way Forward

- **Data Reform:** Update base year; adopt Producer Price Index (PPI). E.g. Shift from 2011–12 → 2023–24 base, matching global statistical norms.
- **Export Diversification:** Broaden goods export base via FTAs and cluster development. E.g. India–UAE CEPA boosting gems/jewellery & electronics exports.
- **Labour Formalisation:** Improve productivity via skilling and MSME digitisation. E.g. Apprenticeship incentives under Skill India promote an industry-ready workforce.
- **Manufacturing Deepening:** Push labour-intensive and high-tech sectors through PLI schemes.
- **Climate Resilience:** Build climate-proof infrastructure and diversify energy mix. E.g. Renewable-powered industrial corridors in Gujarat & Tamil Nadu.

Shilp Didi Programme

- **The Union Textiles Secretary** announced that the **Shilp Didi Programme** has significantly boosted women artisans' income, with some earning over ₹5 lakh.

Shilp Didi Programme:

- A government initiative to economically empower women artisans ("Shilp Didis") by providing training, digital skills, and market access, including e-commerce platforms and physical exhibitions.
- Launched In: **2024 (100-day pilot phase began in June 2024).**
- Implemented By: Ministry of Textiles, through the Office of the Development Commissioner

(Handicrafts).

- Aim: To make women artisans financially independent, improve design and business skills, and help them leverage modern marketing and entrepreneurship tools.

Key Features:

- E-training modules (entrepreneurship, regulatory compliance, social media, e-commerce onboarding).
- Marketing opportunities via **Dilli Haat**, craft fairs, and curated events.
- E-commerce integration for nationwide and global visibility.
- Baseline inclusion of 100 women artisans from 72 districts across 23 states.
- Covers 30 diverse handicrafts (textiles, pottery, metal crafts, embroidery, etc.).
- Capacity-building through National Handicrafts Development Programme (NHDP) clusters.

Significance:

- Provides sustainable livelihoods and boosts rural/non-farm incomes.
- Strengthens micro-entrepreneurship among women in the handicrafts sector.
- Enhances digital inclusion—artisans use social media & e-commerce to expand markets.

Policy for Auction of Coal Linkage for Seamless, Efficient & Transparent Utilisation (CoalSETU)

- The Union Cabinet has approved creation of a new CoalSETU window under the NRS Linkage Policy, enabling long-term coal linkages for any industrial use and exports.

About CoalSETU :

- Policy for Auction of Coal Linkage for Seamless, Efficient & Transparent Utilisation (CoalSETU) is a new auction-based coal linkage window under the **Non-Regulated Sector (NRS) Linkage Policy**, allowing any domestic industrial buyer to secure long-term coal linkages for own use or export (up to 50%), except resale within India.
- Ministry: **Ministry of Coal**, Government of India

Aim of the Policy

- To ensure transparent, seamless and efficient utilisation of domestic coal resources.
- To promote ease of doing business and reduce dependence on coal imports.

- To boost availability of washed coal and support export opportunities.

Key Features-

New CoalSETU Window in NRS Policy (2016):

- Allows any industrial consumer to participate in coal linkage auctions.
- Existing NRS auctions for cement, sponge iron, steel, aluminium, CPPs will continue.
- These users may also bid in the CoalSETU window.

No End-Use Restrictions:

- Coal can be used for own consumption, washing, or export (up to 50%).
- Coking coal excluded from this window.
- Traders barred from bidding to prevent speculative hoarding.

Export Flexibility:

- Companies may export up to 50% of allotted coal.
- Washed coal allowed for export.
- Coal can be shared across group companies as per operational needs.

Boost to Washery Operators:

- Encourages growth of private washeries.
- Improves domestic supply of washed, cleaner coal.
- May reduce import dependence and improve export viability.

Alignment with Coal Sector Reforms:

- Complements the 2020 reform allowing commercial mining without end-use restrictions.
- Strengthens fair, market-driven allocation of mineral resources.

Significance of the Policy:

- **Promotes Transparent & Competitive Allocation:** Auction-based linkages ensure fair market access and remove closed-door allocations.
- **Reduces Import Dependence:** By expanding domestic access and improving washed coal availability, industries can reduce reliance on costly imports.
- **Supports Industrial Growth:** Provides long-term assured coal supply to small, medium and new industries previously excluded.

PMGKY Package: Insurance Scheme for Health Workers

- Supreme Court Extends ₹50 Lakh Insurance to All Doctors Who Died on COVID Duty under

"Pradhan Mantri Garib Kalyan Package: Insurance Scheme for Health Workers Fighting COVID-19".

About Pradhan Mantri Garib Kalyan Package: Insurance Scheme for Health Workers Fighting COVID-19

- **Objective:** To provide financial protection to health workers engaged in COVID-19 duties.
- **Implementing Ministry:** Ministry of Health and Family Welfare, Government of India
- **Insurance Coverage:** ₹50 lakh accident insurance cover per beneficiary.

Coverage Provided

- Death due to COVID-19 infection during duty.
- Accidental death while performing COVID-19–related duties.
- **Beneficiaries:** Healthcare workers including doctors, nurses, paramedics and support staff directly involved in COVID-19 duties.

Underlying Challenges in India's Civil Aviation Sector

- A wave of mass flight cancellations by IndiGo exposed structural weaknesses and longstanding regulatory gaps in India's civil aviation sector.

Challenges Faced by India's Civil Aviation Sector

- **Regulatory Capture:** The **DGCA remains under the Ministry** despite the 2006 ICAO audit recommending independent oversight.
- **Market Duopoly:** Dominance of **IndiGo (60%)** and the Tata Group (20%) makes nationwide operations vulnerable to disruptions.
- **Fuel Cost:** High taxes and **GST exclusions make Aviation Turbine Fuel form 40-50%** of total airline operating expenses.
- **Currency Risk:** Dollar-denominated costs raise operating expenses and reduce profits when the Rupee weakens.
- **Route Mortality:** Over 100 UDAN routes closed after government subsidies ended due to a lack of commercial viability.
- **Pilot Shortage:** Insufficient trained pilots make compliance with Flight Duty Time Limitations difficult.
- **ATCO Shortage:** Inadequate **Air Traffic Controller** (ATCO) strength reduces safe-handling capacity during peak traffic.

- **MRO Gap:** Limited domestic MRO (Maintenance, Repair and Overhaul) capacity makes airlines rely on foreign servicing for major maintenance.

Way Forward

- **Implement Convention:** Strictly implement the 2025 Protection of Interests in Aircraft Objects Act to secure lessor rights during defaults.
- **Reform ATF:** Bring Aviation Turbine Fuel under GST to allow airlines to claim Input Tax Credit for reducing operating costs.
- **Expand MRO:** Reduce GST on MRO services to 5% and attract OEMs (Original Equipment Manufacturer) like Safran to strengthen domestic maintenance capacity.
- **Optimise FDTL:** Introduce stricter Flight Duty Time Limitations (FDTL) norms in phases to manage pilot fatigue without causing capacity shocks.
- **Build Hubs:** Develop coordinated flight banks and a "Hub and Spoke" model at Delhi and Jewar to capture international transit traffic.
- **Sustain UDAN:** Use targeted Viability Gap Funding and smaller aircraft to keep regional routes commercially viable.

India's Civil Aviation Sector

- **Market Scale:** India is the third-largest domestic aviation market with 376 million passengers in FY24.
- **Target:** Metro airports are targeting an annual handling capacity of 468 million passengers.
- **Women Pilots:** Women constitute 15% of India's pilot workforce, three times the global average.
- **Airport Expansion:** Operational airports increased from 74 in 2014 to ~160 in 2025.
- **Freight Volume:** Airports handled 3.36 MMT of cargo in FY24, reflecting a 7% year-on-year increase.
- **Green Airports:** 93 airports have transitioned to 100% green energy.

National Makhana Board

- ₹476-crore **Central Sector Scheme** has been rolled out for holistic development of makhana sector in first meeting of National Makhana Board.
- Roadmap has been approved for research, quality seed production, value addition, and export

promotion. The first board meeting of the **National Makhana Board** was chaired by Devesh Chaturvedi, Secretary, Department of Agriculture and Farmers Welfare, and held at Krishi Bhawan, New Delhi.

- Initiated the implementation process for the Board and the **Central Sector Scheme.**
- Reviewed Annual Action Plans submitted by States and research institutions.
- Allocated budgets for various components targeting holistic sectoral development.

State and Research Collaboration

- The board emphasized consolidating states' seed requirements with supply from SAU Sabour and CAU Samastipur, Bihar, for the upcoming years.
- Training for trainers from various states by State Agriculture University, Central Agriculture University, Bihar, and NRC Makhana Dharbhanga.

Research and Development

The importance of R&D in cultivation and processing technologies was highlighted, along with infrastructure needs for:

- Grading, drying, popping, and packaging
- Promotion of modern cultivation practices
- Value addition and market linkages
- Export readiness
- This foundational meeting set a roadmap for coordinated, scientific, and market-oriented growth of the makhana sector across India.

Launch of the National Makhana Board

- The Union Government established the National Makhana Board as announced in the Union Budget 2025-26. It was officially launched by Prime Minister Narendra Modi in Bihar on September 15, 2025, marking a significant step toward modernizing India's Makhana sector.

National Makhana Board (Ministry of Agriculture and Farmers' Welfare)

- Established to boost value addition, branding, and global positioning of makhana.
- *Location: Bihar*
- **Objectives:** Improve farmers' income and promote scientific cultivation, post-harvest processing and value addition.

International Fund for Agricultural Development (IFAD)

- Recently, the Government of India highlighted the country's pioneering achievements in rural transformation and development leadership at the International Fund for Agricultural Development – **India Day event held in Rome.**

International Fund for Agricultural Development

- It is an international financial institution and a specialized agency of the United Nations.
- It was established as an international financial institution in **1977** through **United Nations General Assembly Resolution.**
- **Objective:** It is dedicated to eradicating poverty and hunger in rural areas of developing countries.
- IFAD seeks to empower rural people to increase their food security, improve the nutrition of their families.
- Its projects and programmes are carried out in remote and environmentally fragile locations, including least-developed countries and **Small Island developing States**.
- It is a member of the United Nations Development Group (UNDP).
- IFAD grants support research, innovation, institutional change, and pro-poor technologies.
- IFAD extends two types of grants, depending on the nature of the innovation and the scope of intervention: global or regional grants and country-specific grants.
- **Membership:** Currently, IFAD has 180 Member States, including India. (India is a founding member of IFAD).
- **Governance:** Its Governing Council is the highest decision-making body which meets every three years.
- **Headquarter: Rome, Italy**

About IFAD (HQ: Rome, Italy)

- **UN Specialised Agency:** IFAD is an international financial institution and a United Nations specialised agency dedicated to eradicating rural poverty and hunger.
- **Focus on Smallholders:** It supports smallholder farmers, pastoralists and rural entrepreneurs through finance, training and technology.
- **Rural Development Financing:** Provides loans and grants for agriculture, climate resilience, value-chain development and livelihood diversification.

NCAER Report on Employment

- **The National Council of Applied Economic Research (NCAER) released a report titled "India's Employment Prospects: Pathways to Jobs."**
- It highlights skilling and small enterprises as key drivers of job creation to sustain the 8% GDP growth.
- The report underlines the role of skilling and small enterprises as key drivers of job creation in the country.
- The NCAER is India's oldest and largest independent, non-profit think tank. Established in New Delhi in 1956, it conducts evidence-based economic research to guide public policy.

Key Findings of the Report

- **Employment Pattern:** India's recent employment growth is driven mainly by necessity-based self-employment in low-technology, subsistence household enterprises.
- **Income Level:** Despite economic growth, India's per capita GDP is relatively low, ranking 128th globally.
- **Skill Deficit:** Transition to skilled labour has been slow; only 4.1% workers had vocational training in 2024, much less than in countries like Germany, Singapore, and Canada.
- **Job Potential:** A 9% rise in skilled workers could generate about 9.3 million jobs by 2030.
- **Multiplier Effects:** Moderate growth of labour-intensive sub-sectors could increase employment in manufacturing by 53% and in services by 79%.

Policy Recommendations for Job Creation

- **PLI Reorientation:** Redirect Production-Linked Incentives toward labour-intensive sectors like textiles, garments, footwear, and food processing.
- **Service Sectors:** Increase support for tourism, education, and healthcare to generate large-scale, employment-intensive job opportunities.
- **Digital Adoption:** Improve access to digital technologies and credit, as enterprises using digital technologies hire 78% more workers than non-digital firms.

Empanel Heritage Conservation Architects

- The Ministry of Culture has initiated a process to empanel heritage conservation architects for the upkeep, conservation, and **restoration of ASI-protected monuments**.
- **About Empanel Heritage Conservation Architects:**
- A heritage (conservation) architect is a specialised professional trained in the restoration,

conservation, and management of historic structures, ensuring preservation of architectural integrity, materials, and cultural value in line with established conservation norms.

The Initiative

- The Ministry of Culture has begun empanelling qualified conservation architects to form a national pool approved by the Archaeological Survey of India (ASI).
- This allows donors, corporates, and private entities to directly engage ASI-approved professionals for conservation works funded through the **National Cultural Fund (NCF).**

Key Features of the Initiative

- **Donor flexibility:** Donors can choose architects from the ASI-approved panel for monuments of their choice.
- **ASI oversight mandatory:** ASI will continue to monitor all projects to ensure compliance with scientific conservation standards.
- **Defined responsibilities:** Empanelled architects will prepare Detailed Project Reports (DPRs), design conservation methods, provide project management support, and supervise execution.
- **Execution mechanism**: Actual restoration work will be carried out by agencies selected by donors, subject to ASI approval.
- **Eligibility criteria:** Architects must have prior experience in conserving or restoring heritage structures over 100 years old.
- **Tenure:** Empanelment valid for three years, with annual performance review.

New Insurance Bill, 2025

- **The Sabka Bima Sabki Raksha (Amendment of Insurance Laws) Bill, 2025,** aims to modernise India's insurance framework in line with Insurance for All by 2047.
- It has amended the **Insurance Act 1938**, the **LIC Act 1956**, and the **IRDAI Act 1999** to expand the insurance coverage.

Status of Insurance Sector in India

- **Insurance Market (Global):** India's overall insurance market is ranked the 10th largest in the world in terms of total premium volume.
- **Life Insurance Sector:** India also ranks 10th globally in the life insurance business.

- **LIC Global Ranking**: The Life Insurance Corporation of India (LIC) is ranked among the **3rd strongest insurance brands globally** according to Brand Finance's 2025 report.
- **Market Size:** The Indian insurance market was valued at **approximately USD 303.3 billion** (₹25 lakh crore) in 2024 and is expected to grow substantially in the coming decade.
- **Penetration:** Insurance penetration in India stood at around **3.7% of GDP** (latest for FY24), with life insurance accounting for ~2.8% and non-life for ~0.9%.

Need for the New Insurance Bill

- **Low Insurance Penetration:** Insurance penetration in India is only ~4% of GDP, compared to the global average of ~7%, leaving large populations uninsured.
- **Capital & Investment Deficit:** Long-term insurance requires deep capital, but restricted inflows limited expansion. E.g. Raising FDI to 100% can attract global insurers into a market with a 1.4 billion population.
- **Reinsurance Concentration Risk:** India's reinsurance market is dominated by GIC Re (General Insurance Corporation of India Reinsurance), limiting risk diversification.
- **Weak Consumer Protection:** Earlier regulatory tools had limited deterrence against unfair practices.

Key Provisions of the Bill

- **FDI Liberalisation:** Raises **insurance FDI cap from 74% to 100%,** enabling global capital inflows.
- **Reinsurance Entry:** Cuts Net Owned Funds for foreign reinsurers from ₹5,000 crore to ₹1,000 crore.
- **Equity Flexibility:** Raises IRDAI approval threshold for share transfer from 1% to 5%.
- **Autonomy:** Allows LIC to open zonal offices and restructure overseas operations without prior approvals.
- **IRDAI Empowerment:** Grants powers for disgorgement, penalties and one-time registration.
- **Disgorgement**: A regulatory enforcement tool that requires entities to return unlawfully gained profits, preventing unjust enrichment and deterring violations.

Key Issues Within the Bill

- **Composite Licensing:** No provision allowing insurers to operate across life and non-life segments.
- **Entry Barriers:** ₹100 crore minimum paid-up capital for insurance companies (life and general insurers) and ₹200 crore for reinsurance companies, remaining unchanged under the Bill

- **Limited Inclusion:** Missed opportunity for niche, regional, health-only, or micro-insurers.
- **Product Silos:** No permission for bundled insurance or cross-financial product distribution.
- **Risk Innovation:** Absence of a framework for captive insurance for large corporations.
- **Captive Insurance:** A risk-management arrangement where a company creates its own subsidiary insurer to cover internal risks and reduce dependence on external insurance markets.

Way Forward

- **Composite Licensing:** Allow single insurers to operate across life, health and general insurance; E.g. global markets like the UK and Australia permit composite insurers.
- **Capital Rationalisation:** Reduce minimum paid-up capital to enable niche and regional players; E.g. micro-insurance models in ASEAN markets expanded coverage among low-income households.
- **Inclusive Insurance:** Promote health-only, micro and rural insurers to reach underserved groups; E.g. PMFBY and Ayushman Bharat show targeted schemes improve last-mile coverage.
- **Regulatory Safeguards:** Strengthen IRDAI's supervision alongside liberalisation to protect policyholders; E.g. SEBI-style disgorgement powers ensure market discipline.

Sahyog Portal

- Disclosures show a rising number of unlawful content removal orders issued through the Sahyog Portal.

Recent Trends in Sahyog Portal

- 2,312 blocking orders were issued between October 2024 and October 2025, averaging about 6 daily.
- Each blocking order typically contained multiple links or user accounts.
- Meta platforms accounted for over 78% of all blocking orders, with WhatsApp receiving the highest.
- More than 118 online intermediaries have been onboarded to the Sahyog Portal.

About Sahyog Portal

- Sahyog is a centralised portal designed to streamline the **removal of unlawful content from the internet**.
- **Objective:** It creates a single window for government agencies to report unlawful online content.

- **Nodal Ministry:** The portal functions under the Ministry of Home Affairs.
- ***Indian Cyber Crime Coordination Centre (I4C) manages the Sahyog portal.***
- Mechanism: Authorised officials flag unlawful URLs on the portal instead of emailing grievance officers.
- The system automatically forwards takedown requests to intermediaries as formal notices.
- **Legal Basis:** The portal operates under Section 79(3)(b) of the Information Technology Act, 2000, and Rule 3(1)(b) of the 2021 IT Rules.
- **Section 79(3)(b):** Creates a legal obligation for intermediaries to remove unlawful content.
- **Rule 3(1)(b):** Defines categories of content that users are prohibited from hosting.
- Intermediaries lose **safe harbour immunity** if unlawful content is not removed after 'actual knowledge'.

Global Value Chain (GVC) Development Report 2025

- The report titled **'Rewiring GVCs in a Changing Global Economy'** is a joint publication of Asian Development Bank (ADB), WTO, World Economic Forum etc.
- GVCs refers to a production sequence for a final consumer good, with each stage adding value and at least 2 stages taking place in different countries.

Key Highlights of the Report

- **Globalization Rewiring, Not Reversal:** Due to factors like technological change, green transition and shifting geopolitical conditions, showing resilience of GVCs.
- Global Share of **GVC in trade is 46.3%,** declining marginally from 2022 peak of 48%.
- **Rise of services and Digital trade:** Services surpassed goods in GVC participation, accounting for more than one-third of the value added in manufacturing exports.
- India strengthened its integration in GVCs due to its robust growth in digital services exports.
- **Dominance of Regional Hubs:** Asia, Europe, and North America account for majority of GVC trade while, Latin America and Africa lag in GVC and trade integration.

Emerging trends:

- Reshoring in China, US, EU reduced their dependence on foreign value addition.
- Diversification of manufacturing despite China's dominance. E.g. China accounts for 76.9% of global EV production.

- India: Among top 10 value adding economies and accounts for 2.8% of global domestic value added in exports (2024).

Significance of GVCs

- **Reduced Poverty:** 1% increase in GVC participation is estimated to boost per capita income levels by twice as much as conventional trade. (World Bank)
- **Employment Creation:** Especially Labour intensive and female-driven jobs. E.g. GVC-oriented export apparel sector in Bangladesh.
- Others: Economic growth, increased productivity and specialization, promotes trade competitiveness and market access.

India–ADB $2.2 billion loan agreements

- India and the Asian Development Bank (ADB) have signed loan agreements worth over $2.2 billion to finance five major development projects.
- A multi-sector financing package from ADB to India aimed at accelerating human capital development, clean energy transition, urban mobility, healthcare capacity and sustainable livelihoods across several states.

Key features:

- **Skilling & employability ($846 million):** Modernisation of 650 ITIs in 12 states and upgradation of 5 National Skill Training Institutes; targets employability of 1.3 million youth in high-growth sectors like renewable energy and electric mobility.
- **Rooftop solar expansion ($650 million):** Supports PM Surya Ghar: Muft Bijli Yojana to scale rooftop solar for 10 million households by 2027, focusing on sectoral reforms and affordable, collateral-free loans.
- **Healthcare augmentation ($398.8 million):** Strengthens tertiary healthcare by upgrading medical colleges in Guwahati, Dibrugarh and Silchar as centres of excellence.
- **Urban transport ($240 million):** Chennai Metro Rail Project: Tranche 2 for new corridors and stations with climate-resilient and universal access features.
- **Sustainable livelihoods ($77 million):** Meghalaya ecotourism and climate-smart agriculture project to improve incomes and conservation outcomes for local and indigenous communities.

Asian Development Bank (ADB):

- ADB is a multilateral development bank that supports inclusive, resilient and sustainable growth in Asia and the Pacific through finance, policy support and partnerships.
- Established: 19 December 1966
- **Headquarters: Manila, Philippines**
- Members: 69 countries (50 regional, 19 non-regional); India is a founding member (1966)
- ***India's position: Largest recipient, accounting for about 14% of ADB's financial commitments***
- **Aims:** Eradicate extreme poverty and promote prosperous, inclusive, resilient and sustainable development aligned with the SDG

Functions:

- Provides loans, grants, technical assistance and equity investments to governments, private sector and PPPs.
- Supports policy reforms, capacity building and co-financing with official and private sources.
- Focuses on education, health, transport, energy, finance and climate action.

Kenduadih Gas Leak Crisis

- A carbon monoxide (CO) gas leak in Kenduadih, Jharkhand's Jharia coalfields, causing deaths and mass displacement, has exposed chronic vulnerabilities arising from legacy mining.
- **Legacy Mining:** Decades of unregulated, pre-nationalisation coal mining left behind underground fires, gas pockets, and unstable seams, creating long-term safety hazards for present-day settlements.

Vulnerability Of Kenduadih

- **Toxic Gas Exposure:** CO levels reportedly reached ~2,000 ppm, capable of causing asphyxiation during sleep, leading to at least two confirmed deaths.
- **Habitation:** Around 1,200 families continue to live above fire-affected seams, amplifying human risk.
- **Invisible Risk:** Carbon monoxide is colourless and odourless, making detection.
- **Emergency Preparedness:** Allegations of ambulances without oxygen and delayed medical response.

Jharia Master Plan (JMP)

- **Objective:** To extinguish underground fires and relocate residents from unsafe zones.
- **Timeline:** Original plan notified in 2009, ended in 2021; Revised JMP approved in June 2025.
- **Rehabilitation Strategy:** Construction of ~16,000 housing units at sites like Belgarhia township.
- **Current Status:** ~3,700 flats occupied; remaining construction ongoing with a 2028 target.

Concerns Regarding Jharia Master Plan

- **Forced Displacement:** Residents allege that evacuation is driven more by land clearance than safety.
- **Livelihood Disruption:** Belgarhia lies 15–20 km away, disconnecting families from social networks.
- **Quality of Rehabilitation:** Earlier phases faced criticism for small housing units and poor amenities.
- **Delayed Fire Control:** Underground fires continue despite decades of planning, undermining credibility.
- **Way Forward**
- **Scientific Audit:** Independent gas-mapping studies, like third-party CO monitoring, before evacuation.
- **Transparent Data:** Disclosure of gas readings through real-time dashboards accessible to residents.
- **Polluter-Pays Norms:** Enforce norms, with compensation funded by BCCL (Bharat Coking Coal Limited).
- **Community Consent:** Participatory planning through local committees in rehabilitation decisions.

Legal Safeguards Against Unsustainable Mining and Gas Leakages

- **Environmental Clearance (EC):** Mandatory prior approval under the Environment (Protection) Act, 1986 and EIA Notification, 2006 to assess ecological and social.
- **Mine Safety Regulation:** Directorate General of Mines Safety (DGMS) enforces safety standards under the Mines Act, 1952, to prevent hazards like gas leakage, fires, and subsidence.
- **Extraction Norms**: Mineral Conservation and Development Rules (MCDR), 2017 mandate scientific mining, progressive mine closure plans, and land reclamation.
- **Rehabilitation & Resettlement:** Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013, ensures humane relocation.

- **Corporate Accountability: Public Liability Insurance Act, 1991** mandates compensation for victims of industrial accidents involving hazardous substances, including mining-related gas leaks.

National Bioenergy Programme

- **India added 2,362 MW** of biomass and **228 MW** of **waste-to-energy** capacity in Last **10 years**
- Apart from this **2.88 lakh biogas plants** were also installed at various locations in the country.
- **Ministry of New and Renewable Energy** supports installation of **Bioenergy Projects** in the country under **National Bioenergy Programme (NBP),** Phase-I (Notified in 2022).

National Bioenergy Programme

- **Period:** Phase 1 - (2021-22 to 2025-26)
- **Objective:** Utilize surplus biomass (primarily from rural areas) for power generation, while providing additional income for rural households.

Program comprise of the following sub-schemes:

- **Waste to Energy Programme** (Programme on Energy from Urban, Industrial and Agricultural Wastes /Residues)
- **Biomass Programme** (Scheme to Support Manufacturing of **Briquettes & Pellets** and Promotion of Biomass (non-bagasse) based cogeneration in Industries)
- **Biogas Programme:** Biogas is primarily CH_4 and CO_2 with traces of N_2, H_2, H_2S, and O_2.

Bioenergy and its status in India

- Bioenergy is a source of energy from the **organic material** that makes up plants, known as biomass (e.g. wood, dung or charcoal).
- Modern bioenergy involves processed biomass and advanced technologies to produce cleaner and more efficient energy. e.g. liquid biofuels, biogas, etc.
- **Total Installed capacity: 11.6GW (Nov. 2025)**
- Modern bioenergy **today accounts for 13%** of India''s total final energy consumption and is expected to grow by up to 45% between 2023 and 2030.

Other Initiatives taken for Bioenergy promotion

- **National Policy on Biofuels (2018, Revised 2022):** Sets various targets e.g. 5% biodiesel blending by 2030, 20% ethanol blending in **petrol (E20) by 2025/26**
- **Pradhan Mantri JI-VAN Yojana:** financial support for advanced biofuels projects.
- **SATAT (Sustainable Alternative Towards Affordable Transportation) Initiative**
- **GOBAR-Dhan Scheme (Galvanizing Organic Bio-Agro Resources)**

Parliamentary Select Committee Report on the Insolvency and Bankruptcy Code (Amendment) Bill, 2025

- IBC (Amendment) Bill 2025 was introduced as the implementation of IBC faces critical challenges.
- These include **protracted delays at insolvency admission stage**, delays impacting the finality of resolution plans, **erosion of asset values** and absence of clear frameworks to manage complex modern corporate structures like **cross-border insolvency issues**.

Key Features of Amendment Bill

- Introduction of a **"Creditor Initiated Insolvency Resolution Process (CIIRP)"** featuring an out-of-court initiation mechanism specifically targeted at resolving cases of genuine business failures.

Introduces two crucial frameworks –

- Group Insolvency Framework to resolve insolvencies involving complex corporate group structures.
- Cross-Border Insolvency Framework to for addressing situations where debtors or assets are located in multiple jurisdictions.

Key Recommendations of the Committee

- **Clean Slate Principle:** Codify clean slate (extinguishment of all prior claims) providing protection to successful resolution applicant against past claims.
- **Avoid conflict of interest:** Resolution Professional (RP) who conducted insolvency resolution process for corporate debtor shall be ineligible to be appointed as the Liquidator if process fails.
- **Timeline:** A specific statutory timeline of 3 months to be prescribed for National Company Law Appellate Tribunal (NCLAT).
- **Corporate Debtor:** Clarify the term **corporate debtor** to include any person incorporated with limited liability outside India to ensure cross-border provisions legally apply to foreign company

with assets, creditors, or operations connected to India.

Nuclear Energy Mission

- Government informed Parliament that India will operationalise at least 5 indigenously designed **Small Modular Reactors (SMRs) by 2033** under the Nuclear Energy Mission, backed by ₹20,000 crore.

Nuclear Energy Mission:

- A national mission framework to scale up nuclear power through advanced and indigenous technologies, with a strong thrust on SMR R&D and deployment alongside large reactors.
- **Announced in: Union Budget 2025–26** as a dedicated push for R&D and deployment of SMRs, with a clear 2033 milestone.
- **Scale-up target:** Reach about **100 GW nuclear power capacity by 2047** to support India's long-term energy transition.
- **SMR target:** At least 5 indigenous SMRs by 2033 for clean, reliable, decentralised nuclear power.
- Key features
- **Big R&D push:** ₹20,000 crore for research, design, development and deployment of SMRs (FY 2025–26).
- **Indigenous SMR pipeline:** BARC has initiated design work on BSMR-200 (200 MWe), SMR-55 (55 MWe), and a high-temperature gas-cooled reactor (~5 MW) for hydrogen generation.
- **Industrial decarbonisation focus:** SMRs are positioned for captive power, repowering retiring fossil units, and remote/off-grid applications.
- **Capacity roadmap with roles:** Public sector expected to contribute ~58–60 GW, with the remainder envisaged via public/private participation under the evolving policy framework.
- **NPCIL-led rollout + partnerships:** NPCIL's roadmap includes indigenous PHWRs and foreign cooperation; and the NTPC–NPCIL JV is part of enabling nuclear expansion.

Significance

- **Clean baseload power:** Nuclear provides 24×7 firm electricity, supporting grid stability as renewables scale up.
- **Net Zero pathway:** Helps India progress toward Net Zero 2070 by cutting lifecycle emissions compared to fossil generation.

National Pension System Reforms 2025

- The **Pension Fund Regulatory and Development Authority** has revised National Pension System norms in 2025 to enhance flexibility for non-government subscribers.

About National Pension System (NPS)

- **Launch:** Introduced in 2004 for government employees; opened to all citizens in 2009.
- **Objective:** Ensure long-term retirement income security and reduce old-age dependency.
- **Nature:** Voluntary, defined-contribution pension scheme with market-linked returns.
- **Coverage:** Government employees, corporate sector employees and all citizens of India.
- **Structure:** Contributions invested through professional Pension Fund Managers (PFMs) across equity, corporate debt and government securities.

Key Changes Made in NPS 2025

- **Enhanced Lump-sum Withdrawal: Up** to 80% withdrawal allowed at exit for non-government subscribers. The earlier limit was 60% lump sum + 40% annuity.
- **Government Subscribers:** 60% lump-sum withdrawal continues without any change.

Corpus-Based Withdrawal Rules

- Corpus ≤ ₹5 lakh: 100% lump-sum withdrawal permitted.
- Corpus ≤ ₹8 lakh: Full withdrawal (100%) allowed at superannuation.
- Corpus ₹8–12 lakh: ₹6 lakh lump sum, remaining amount used for annuity / structured withdrawal.
- Corpus > ₹12 lakh: For Non-government Subscribers Up to 80% lump sum + 20% annuity, and for Government Subscribers Up to 60% lump sum + 40% annuity

Exit & Deferment Provisions

- **Normal Exit:** Allowed after 15 years of subscription or on attaining 60 years, whichever is earlier.
- **Deferment Option:** Subscribers may defer lump-sum withdrawal or annuity purchase up to age 85.
- **Premature Exit:** At least 80% of corpus must be annuitised. If corpus ≤ ₹5 lakh, full withdrawal allowed.

Special Situations

- Death of Subscriber: Entire accumulated corpus paid to nominee / legal heir.

- Missing Subscriber: 20% interim relief to nominees. The remaining amount paid after the legal presumption of death under Bharatiya Sakshya Adhiniyam, 2023.
- Renunciation of Citizenship: Full lump-sum withdrawal permitted after closing the NPS account.
- Disability: For ≥75% disability, exit is allowed with medical certification from a government doctor.
- Pension Fund Regulatory and Development Authority (PFRDA)
- Establishment: **Statutory body under the PFRDA Act, 2013.**
- **Headquarters: New Delhi.**
- Mandate: Regulate, promote and ensure orderly growth of the pension sector in India.

Securities Markets Code Bill, 2025

- The Union Government has introduced the **Securities Markets Code Bill, 2025**, in the Lok Sabha to consolidate multiple legacy laws into a single, principle-based code.
- India's securities regulation is currently governed by three separate laws: **the SEBI Act, 1992**, the **Depositories Act, 1996**, and the **Securities Contracts (Regulation) Act, 1956**.

Key Objectives of the Bill

- **Legal Consolidation:** Replace three separate Acts with a single unified statutory framework.
- **Investor Protection:** Strengthen safeguards, grievance redressal and investor confidence.
- **Capital Mobilisation:** Facilitate broader participation & efficient fundraising for a growing economy.
- **Regulatory Efficiency:** Reduce compliance burden through simplified, principle-based regulation.

Key Provisions of Securities Markets Code

- **Stronger SEBI Governance:** SEBI Board strength expanded from 9 to up to 15 (Chairperson, 2 Central Government nominees, 1 RBI nominee (ex officio), and 11 members (minimum five whole-time members).
- **Conflict of Interest Disclosure:** Mandatory disclosure of direct or indirect interests by board members.
- **Consultative Rule-Making:** Introduces a transparent process for the issuance of subordinate legislation.
- **Streamlined Enforcement:** Single adjudication process for quasi-judicial actions with clear

timelines for investigation and interim orders, ensuring regulatory certainty.

- **Grievance Redressal:** Creation of an Ombudsperson to address investor complaints.
- **Regulatory Sandbox:** Empowers SEBI to promote innovation in financial products and services.
- **Inter-Regulatory Coordination:** Enables seamless listing and regulation of instruments overseen by multiple financial regulators.

Decriminalisation of Minor Offences

- **Category I:** Only civil penalties for fraudulent or unfair trade practices.
- **Category II:** Civil and criminal penalties for market abuse and serious violations harming market integrity and public interest.

Potential Concerns of the Securities Markets Code

- **Over-Centralisation:** Consolidation of three Acts increases SEBI's powers; globally, excessive regulator concentration has raised accountability concerns. E.g., UK FCA faced criticism post-2012 reforms.
- **Transition Uncertainty:** Migration from three legacy laws to a single Code may cause short-term compliance ambiguity; past reforms like GST rollout saw initial litigation spikes of over 30%.
- **Investor Protection Risks:** Decriminalisation of minor offences could weaken deterrence.
- **Enforcement Capacity Strain:** Number of cases pending before the Securities Appellate Tribunal (SAT) jumped to 1,121 in 2024 from 736 in 2023, with 1,105 of those being appeals against SEBI orders.

Way Forward

- **Phased Rollout:** Implement the Code in stages with transition guidelines; similar phased adoption helped Australia's Corporations Act reforms stabilise markets.
- **Clear Rulemaking:** Issue detailed subordinate regulations early; India's Insolvency and Bankruptcy Code gained predictability through timely regulations and circulars.
- **Capacity Strengthening:** Enhance SEBI staffing and tech tools; Singapore's Monetary Authority of Singapore (MAS) invests heavily in reg-tech for faster enforcement.
- **Investor Safeguards:** Balance decriminalisation with strict civil penalties.
- **Judicial Alignment:** Strengthen coordination with appellate tribunals; fast-track securities cases like specialised commercial courts under India's Commercial Courts Act.

Freight Diversification in Indian Railways

- A Parliamentary Standing Committee on Railways has urged Indian Railways to diversify its freight basket beyond bulk commodities to ensure sustainable freight growth.

Necessity of Freight Diversification

- **Coal Dependence Risk**: Coal alone accounts for Approx. 50% of freight loading (823 MT of 1,617 MT in 2024–25), but revenue growth from coal is slowing, exposing Railways to demand shocks.
- **Low Modal Share:** Railways carry only approx. 27% of India's total freight, despite being cheaper and greener.
- **Sustainability Imperative:** Freight shift from road to rail can cut logistics costs (currently ~14% of GDP).
- **Efficiency:** Average freight speed on DFCs is 37 km/h, compared to 23.8 km/h on conventional tracks.

Challenges in Freight Diversification

- **Tariff Inflexibility:** Freight tariffs remain relatively rigid; road transport captures time-sensitive cargo.
- **Weak Private Participation:** High capital costs deter PPPs; the Sonnagar–Dankuni DFC PPP failed due to uncertain returns, slowing terminal and service innovation needed for diversification.
- **Last-Mile Connectivity Gaps:** Many industrial clusters lack rail sidings; as a result, road dominates first- and last-mile movement, discouraging firms from shifting to rail.
- **Market Awareness Deficit:** Railways historically focused on bulk freight; despite freight demand projected at 6,017 MT (National Rail Plan 2025), diversified cargo strategies remain underdeveloped.

Way Forward

- **Freight Diversification:** Target automobiles, FMCG and e-commerce through specialised wagons and scheduled freight services; E.g., Automobile Freight Train Operators scheme.
- **Crew Augmentation:** Fast-track recruitment, training and redeployment of loco pilots and guards.
- **Terminal Integration:** Develop multi-modal logistics parks and private freight terminals to solve last-mile gaps; e.g. **PM Gati Shakti**-linked logistics hubs.
- **PPP Recalibration:** De-risk private participation via viability gap funding and assured traffic commitments, learning from Japan's freight corridor models.
- **Technology Upgrade:** Use digital freight management, real-time tracking and AI-based scheduling to improve reliability and customer confidence.

India's Rapid AI Adoption Boom

- Bank of America (BofA) has identified India as the world's largest and most active market for **Large Language Model (LLM) adoption.**
- India is leading globally in monthly and daily active users of AI applications like ChatGPT, Gemini, etc.

Why India Has Emerged as the Largest AI Adoption Market?

- **Digital Scale:** India has 700–750 million mobile internet users, making it the second-largest online population globally, providing unmatched scale for AI diffusion.
- **Affordable Data Access:** Ultra-low data costs allow 20–30 GB/month for about $2, sharply reducing entry barriers for compute- and data-intensive AI applications.
- **Demographic Advantage:** Over 60% of Indian internet users are below 35 years, ***a tech-curious cohort*** that rapidly experiments with and integrates new digital tools.
- **Multilingual Edge:** A large English-speaking base, combined with AI models now available in Indian languages, accelerates both global AI use and local inclusion.
- **Telecom-Led Push:** Telcos like Reliance Jio and Bharti Airtel are bundling premium AI subscriptions with data plans, expanding adoption beyond early adopters.

Strategic Significance for India

- **AI Power Shift:** India's role is evolving from a back-end IT services hub to a frontline AI consumption and experimentation market.
- **Policy Opportunity:** High adoption creates scope for responsible AI governance, indigenous model development and AI-skilled workforce expansion.
- **Next-Gen AI Applications:** BofA highlights India's suitability for agentic AI systems that can reason, plan and execute tasks autonomously.
- **Innovation Testbed:** India's diversity makes it an ideal real-world stress-testing ground for new AI models before global deployment.
- **Democratisation of AI:** Low-cost access enables students, gig workers and MSMEs to use advanced AI tools, narrowing digital and productivity gaps.

The Rapid Financing Instrument (RFI)

- The International Monetary Fund (IMF) has approved USD 206 million in emergency funding for Sri Lanka under the Rapid Financing Instrument (RFI) following the devastation caused by Cyclone Ditwah.

Rapid Financing Instrument (RFI):

- The Rapid Financing Instrument (RFI) is an **IMF emergency lending facility** that provides quick, low-access financial assistance to member countries facing **urgent balance-of-payments (BoP) needs**, especially during crises such as **natural disasters, external shocks**, or domestic instability.
- **Organisation: International Monetary Fund (IMF)**
- **Aim:**
- Provide immediate liquidity to countries facing sudden BoP pressures.
- Prevent severe economic disruption when full-fledged IMF programmes are unnecessary or not feasible.
- Support macroeconomic stability during short-term crises.

Key features

Nature of assistance:

- Single, rapid disbursement of funds.
- Designed for urgent and temporary BoP needs.
- No requirement for a comprehensive economic reform
- Windows under RFI

Regular window:

- For BoP stress due to domestic instability, exogenous shocks, or fragility
- Access up to 50% of IMF quota per year and 100% cumulatively

Large Natural Disaster window:

- Applicable when disaster damage equals or exceeds 20% of GDP
- Higher access: up to 80% of quota per year and 133.33% cumulatively

Conditionality framework:

- No ex-post conditionality or programme reviews
- Limited prior actions may be required
- Borrowing country expected to pursue policies addressing underlying BoP problems

Terms of lending:

- Repayment period: 3¼ to 5 years
- Interest rate: Same as IMF's standard non-concessional facilities (FCL, PLL, SBA)
- Access: Generally one-off, with scope for repeated use in exceptional circumstances

Review and monitoring:

- No formal programme reviews
- IMF monitoring remains light and focused on macroeconomic stability

Report on 'Self-Reliance in Minerals and Metals'

- **Standing Committee on Coal, Mines and Steel Presents Report on 'Self-Reliance in Minerals and Metals'**
- The report outlines a roadmap for India to reduce import dependency and achieve the vision of Atmanirbhar Bharat and Viksit Bharat.

Self-Sufficiency Levels in Minerals and Metals:

- India is largely self-sufficient in key industrial minerals like **bauxite, chromite, iron ore, kyanite, limestone and sillimanite.**
- However, certain minerals, such as **magnesite, manganese ore, and rock phosphate, are deficient** and must be imported to meet domestic demand.
- India is 100% dependent on imports for vital minerals such as **lithium, Cobalt, and Nickel**.

Key challenges in achieving Self-Sufficiency

- **Operational Delays:** Out of 486 mineral blocks auctioned since 2015, only 63 are operational. Mining projects face long gestation periods of about 5 to 14.5 years.
- **Technology Gap:** India lags global standards in automation, AI and IoT use in mining, which raises costs and limits exploration intensity.
- **Exploration Constraints:** Only about 15% of India's area has been covered by detailed exploration, mostly focusing on surface deposits rather than deep-seated ones.

Key Recommendations

- **Urban Mining & Circular Economy:** The committee recommends a focus on recovering minerals from e-waste, industrial scrap, and EV batteries.

- **Inter-Ministerial Coordination:** Suggests setting up an Inter-Ministerial Group to fast-track post-auction progress and statutory clearances for critical mineral projects.
- **Public-Private Collaboration:** Encourages leveraging the strengths of Public Sector Undertakings (PSUs) and private sector expertise for faster exploration and processing development.
- **Upskilling:** Recommends that mining companies allocate a percentage of CSR funds for upskilling the workforce to handle advanced technologies like AI and automation.

Policy Framework for Self-Reliance

- **Mines and Minerals (Development and Regulation) (MMDR) Act Amendments (2015-2023**): Key reforms include the introduction of transparent e-auctions, uniform 50-year lease periods, and a new Exploration Licence (EL) category for 29 deep-seated and critical minerals.
- **National Critical Mineral Mission (NCMM):** Launched in 2025, this mission aims to secure the supply chain for 30 identified critical minerals.
- **Overseas Acquisitions:** Through KABIL (a joint venture of NALCO, HCL, and MECL), India is actively pursuing mineral assets in resource-rich nations like Argentina, Chile, and Australia.
- **Offshore Mining:** In 2024, the government launched the first tranche of 13 offshore mineral blocks for auction, targeting construction sand and polymetallic nodules.

Reviving Shipbuilding in India

- Shipbuilding is known as mother of heavy engineering as it enhances national security, strategic independence, and the resilience of trade and energy supply chains.

Current Status of Shipbuilding in India

- Shipbuilding industry accounts for less than 1% of the global shipping market.
- China has the biggest shipbuilding capacity in the world, followed by South Korea and Japan.
- Foreign ships carry 92% of India's total trade and are paid $75 billion annually for it.
- Cochin Shipyard has India's highest capacity in shipbuilding and repairing.

Challenges faced by Sector

- **High capital costs:** Due to expensive financing options available, making large investments risky and limiting shipyards' ability to scale.
- **Import dependence:** Lack of indigenous availability of many advanced materials and

components.

- **Lower productivity:** Compared with China, Indian shipyards are less productive, often due to outdated technology, longer build times, Supply chain limitations, etc.
- Strengthening India's shipbuilding sector is vital to transforming India into a global maritime and shipbuilding hub by 2047

Key Initiatives taken to promote Shipbuilding in India

- **Financial Assistance:** Shipbuilding Financial Assistance Scheme, Maritime Development Fund.
- **Public Procurement Preference**: Ships under ₹200 crore must be procured from Indian shipyards as per the Make in India Order, 2017.
- **Infrastructure Status:** Ships have been reclassified as 'infrastructure', making them eligible for favorable financing.
- **Haritha Nauka Guideline, Green Tug Transition Programme (GTTP**): Promotes green shipbuilding and domestic manufacturing.
- **Shipbuilding Development Scheme (SbDS):** Drives greenfield clusters, yard expansions, and risk coverage.
- Other: Maritme Amritkal Vision 2047 for Shipping Sector

Bureau of Port Security

- Centre decided to constitute a dedicated Bureau of Port Security (BoPS) to oversee the security of vessels and port facilities.

About the Bureau of Port Security

- **Legal Basis:** Statutory body under **Section 13 of the Merchant Shipping Act 2025**, for ship security.
- **Institutional Set-up:** Headed by a Director General under the Ministry of Ports, Shipping and Waterways; modelled on the Bureau of Civil Aviation Security (BCAS).
- **Core Functions:** Timely analysis, collection and exchange of security information, dedicated focus on cybersecurity to protect port Information Technology (IT) systems.
- **Risk-Based Security:** Implementation to be graded and risk-based instead of one-size-fits-all.
- **Role of CISF:** Central Industrial Security Force (CISF), earlier designated as **Recognised Security Organisation (RSO)** for seaport facilities, is also tasked to train private security agencies.

- **Transition:** For one year, the shipping safety regulator's head will function as Director General of the Bureau of Civil Aviation Security to ensure continuity.

Significance of BoPS

- **Trade Backbone:** Maritime routes carry ~95% of India's trade by volume and ~70% by value.
- **Scale Exposure:** India has 12 major ports and 200+ notified non-major ports.
- **Throughput Risk:** Major ports handled ~855 million tonnes in FY 2024–25; E.g., even a brief shutdown can create cascading congestion and demurrage.
- **Energy Security:** Petroleum-related cargo was ~254.5 million tonnes (~29.8% share) in FY 2024–25; any disruption can affect fuel availability and price stability.
- **Efficiency Protection:** Average turnaround time at major ports improved to ~49.5 hours in FY 2024–25, and stronger security helps protect these productivity gains from sabotage/cyber outages.

Central Industrial Security Force (CISF)

- The CISF, a **Central Armed Police Force** under the **Union Home Ministry**, was established in **1969** with three battalions to secure sensitive public sector undertakings.
- CISF protects critical infrastructure, including ***nuclear installations, space establishments, airports, seaports, power plants, government buildings, heritage monuments***, etc.
- The force is divided into seven sectors (Airport, North, North-East, East, West, South, and Training), and also has a Fire Service Wing.

Reversal of Net FDI Flows in India

- India recorded a net Foreign Direct Investment (FDI) outflow in **October 2025 (-$1.55 billion)**, following a similar outflow in September, due to high foreign repatriations.

Foreign Direct Investment (FDI)

- FDI is a **non-debt monetary source** (it involves the transfer of a part of the ownership to the investor rather than the creation of debt).
- In FDI, a foreign company or a foreign investor not only invests in a company (in another country) but is also directly involved with the day-to-day operations, thus bringing knowledge and

technology.

- Net FDI is basically gross FDI, which is the total money coming in, minus the money being repatriated out by foreign companies doing business in India and the outward FDI by Indian companies.

Drivers Behind FDI Net Outflow

- **Foreign Repatriation:** Foreign investors repatriated just under $5 billion in October, reflecting profit-booking and risk rebalancing amid global uncertainty, which outweighed fresh equity inflows into India.
- **Outward FDI Surge:** Indian companies invested $3.09 billion abroad during the month, indicating a strategic shift towards overseas presence to access markets and supply chains.
- **Sustained High Outflows:** Combined repatriations and outward FDI reached $8.08 billion for the second consecutive month, marking an unprecedented scale of capital moving out on a net basis.
- **Services Concentration:** Nearly 90% of outward FDI was directed towards financial, insurance and business services, limiting reinvestment into domestic manufacturing and infrastructure.
- **Global Rate Cycle:** Persistently higher interest rates in advanced economies have reduced India's relative return attractiveness, encouraging capital relocation to developed markets.

Implications for the Indian Economy

- **Rupee Stress:** Net FDI outflows reduced stable dollar inflows, contributing to the rupee weakening beyond 90 per US dollar, before stabilising due to central bank intervention.
- **Investor Confidence Signal:** While gross inflows remain positive, repeated net outflows signal weaker investor confidence in reinvestment and long-term commitment.
- **Domestic Growth Impact:** Higher outward FDI supports global expansion of Indian firms, but may temporarily slow domestic capital formation and job creation.
- **Corporate Strategy Shift:** Outward FDI concentrating in services and key hubs like Singapore, USA and UAE suggests firms are investing to access markets and supply chains, not just exporting from India.
- **BoP Sensitivity:** A net outflow despite $6.54 billion gross inflow shows repatriation/outward flows can dominate, raising dependence on more volatile portfolio flows in stress periods.
- Balance of Payments (BoP) is a comprehensive ledger that records a country's financial transactions with the rest of the world, showing inflows and outflows of money. It shows the flow of money coming in (positive) and going out (negative) of the country.

Expansion in Rabi Crops Cultivation

- Ministry of Agriculture and Farmers Welfare highlighted that the total area under rabi crops cultivation has increased this year.

Key Details

- The total area sown under rabi crops in the ongoing winter season went up by 8.11 lakh hectares to 580.70 lakh hectares compared to last year.
- Wheat, pulses (Urad, Masur and Moong), millets (jowar, bajra, ragi) and oilseeds such as rapeseed and mustard all saw an increase in total cultivated area this year.
- Good monsoon rains and **Cabinet Committee on Economic Affairs (CCEA)'s** decision to raise Minimum Support Price (MSP) for all mandated rabi crops for 2026-27 have facilitated this expansion.

About Rabi Crops

- Rabi crops are winter crops sown after the southwest monsoon (Oct-Dec) and harvested in spring (Mar-Apr), mainly dependent on irrigation and western disturbances.
- Compared to kharif crops, rabi crops face lower pest pressure, require assured irrigation rather than rainfall, and are less vulnerable to monsoon failure, making output more predictable.
- They account for the bulk of India's wheat and mustard production and play a key role in maintaining buffer stocks and price stability in the food economy.

Export Concentration in Few States

- **RBI Handbook of Statistics on Indian States** 2024-25 showcases export performance masked by a growing regional imbalance, raising concerns about inclusive growth.

Pattern of Export Concentration

- **Top-Heavy Share:** The top five States, Maharashtra, Gujarat, Tamil Nadu, Karnataka and Uttar Pradesh account for ~70% of India's exports, up from ~65% five years ago.
- **Core-Periphery Divide:** Coastal western and southern States are integrating into global value chains, while large northern and eastern regions remain weakly linked.
- **Rising Concentration:** The **Herfindahl–Hirschman Index (HHI)** of India's export geography has

increased, indicating growing spatial concentration rather than dispersion.

- HHI: A standard indicator used to measure concentration, where a higher value shows dominance by a region and a lower value indicates a more even distribution.

Structural Reasons Behind Export Concentration

- **Value Over Volume:** Global merchandise trade growth has slowed to 0.5–3%, pushing capital towards high-complexity, high-value clusters rather than low-skill regions.
- **High Global Concentration:** Since the top 10 global exporters control ~55% of world merchandise trade, India's smaller exporting base faces tougher entry barriers and higher competitive pressure.
- **Capital Deepening:** Fixed capital investment rose ~10.6% (ASI 2022–23) while factory employment grew only 7.4%, raising capital per worker to ₹23.6 lakh.
- **Employment Stagnation:** Manufacturing's share in total employment remains stuck at ~11.6–12%.
- **Financial Asymmetry:** High-export States show credit–deposit ratios above 90%, while States like Bihar and eastern Uttar Pradesh remain below 50%, indicating capital flight.
- **Credit-Deposit Ratio:** A measure showing how much of a bank's deposits are lent out as credit, with higher ratios indicating greater local use of savings for investment.

Implications for the Indian Economy

- **Urban Congestion Costs:** Export clustering in coastal metros has raised stress; E.g., industrial land prices in major export corridors have risen 2–3 times in a decade, discouraging decentralisation.
- **Regional Income Divergence:** Export-heavy States report per-capita incomes 2–3 times higher than low-export States, reinforcing long-term regional inequality.
- **External Dependence Risk:** India's exports to the US and EU form ~40% of total exports, so a demand slowdown there can quickly transmit stress to export-linked States and sectors.
- **Policy Measurement Gap:** Using export growth alone as a success metric can mislead, because national aggregates may rise even when many States see limited export dynamism and spillovers.
- **Forex Vulnerability:** Merchandise exports are dominated by a few States, while India still ran a current account deficit of ~1.1% of GDP (FY24), making forex stability sensitive to regional export shocks.

Way Forward

- **Financial Rebalancing:** Improve local credit flow in hinterland States; E.g., targeted lending mandates and regional development finance institutions.
- **Place-Based Policy:** Tailor industrial strategy to State-specific strengths; E.g., agro-processing in eastern India and logistics-linked manufacturing in the north.
- **Employment Focus:** Complement export policy with labour-absorbing sectors; E.g., Vietnam's export strategy combined electronics exports with large-scale textiles, footwear and food-processing clusters.
- **Capability Building:** Invest in skills, logistics and supplier ecosystems in lagging States; E.g., district-level industrial capability hubs rather than isolated parks.

Electronics Sector in India

- The Union Minister for Electronics and Information Technology recently said that India's electronics sector is creating large-scale blue-collar jobs, especially for women.

About Blue-Collar Jobs

- Blue-collar workers are individuals who perform **manual labour or skilled trades** in sectors like manufacturing, construction, and logistics.
- They constitute about 80% of India's non-agricultural workforce, with nearly 300 million workers.
- Blue-collar wages are rising by about 5–6% annually in 2025, supplemented by performance-linked incentives to manage high attrition.

India's Electronics Sector

- **Production:** Domestic electronics output reached ₹11.32 lakh crore in FY2024–25, a six-fold increase over the last decade (2014–15).
- **Export:** Electronics became India's third-largest export category in FY2024–25 and FY2025–26, with exports exceeding $40 billion.
- **Mobile Manufacturing:** India is the world's second-largest mobile phone manufacturer, with exports touching ₹2 lakh crore after a rapid decade-long growth.
- **Employment Base:** The electronics sector employs about 25 lakh people nationwide and is India's largest employer of women in organised manufacturing.
- **National Target:** The government aims to build a $500 billion electronics manufacturing ecosystem by FY 2030–31, with $120 billion in exports by FY 2025-26.

Key Government Initiatives

- **PLI Scheme 2.0:** The Production-Linked Incentive scheme offers around 5% incentives on incremental sales of IT hardware such as laptops, tablets, and servers manufactured in India.
- **ECMS 2025:** The Electronics Components Manufacturing Scheme promotes 'passive components' and sub-assemblies to reduce import dependence.
- **SPECS:** The Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors offers 25% capex incentives for component manufacturing.
- **DLI Scheme:** The Design Linked Incentive scheme supports domestic chip design through financial and infrastructure assistance.
- **EMC 2.0:** Modified Electronics Manufacturing Clusters create world-class electronics infrastructure, including semiconductor parks.
- **Skilling Push:** The 'Chip-in' programme aims to train industry-ready engineers to meet demand for one million skilled workers by 2030.

China files WTO complaint against India

- China has filed a fresh complaint against India at the World Trade Organization (WTO) challenging India's solar subsidies and tariff measures.

What is the issue?

- China has sought formal consultations with India under the WTO framework regarding subsidies for India's photovoltaic (solar) sector.

It claims that India's policies:

- Violate bound tariff commitments and national treatment obligations.
- Constitute prohibited import-substitution subsidies, favouring domestic producers over foreign firms.
- This follows an earlier Chinese complaint (October 2025) against India's EV and battery subsidies, signalling rising trade frictions over green industrial policies.

WTO Dispute Settlement System:

- The WTO Dispute Settlement System (DSS) is a rules-based, compulsory and multilateral

mechanism to resolve trade disputes between WTO Members.

- It operates under the Dispute Settlement Understanding (DSU), which is an integral part of the WTO Agreement.

Aim:

- Ensure security, predictability and stability in international trade.
- Uphold WTO rights and obligations while preventing unilateral trade retaliation.

Key stages of WTO dispute settlement

- **Consultations:** The disputing members first hold formal consultations to resolve the issue amicably without litigation, reflecting the WTO's preference for negotiated and mutually agreed solutions.
- **Panel stage:** If consultations fail, an independent panel of experts examines factual evidence and legal arguments to determine whether WTO rules have been violated.
- **Appellate review:** Parties may appeal panel findings on points of law before the Appellate Body, though this stage is currently stalled due to non-functioning of the body.
- **Adoption of reports:** Panel or Appellate Body reports are adopted by the Dispute Settlement Body (DSB), making the rulings legally binding on the parties.
- **Implementation:** The losing member must bring its measures into compliance within a "reasonable period of time," monitored by the DSB.
- **Retaliation (if needed):** If compliance is not achieved, the complainant may seek DSB authorisation to impose proportionate trade countermeasures.

Key features

- Compulsory jurisdiction: All WTO Members are bound once they join the WTO.
- Time-bound process: Normally ~12 months (or ~16 months with appeal).
- Ban on unilateral action: Members cannot impose trade sanctions without WTO authorisation.
- Exclusive forum: WTO disputes cannot be taken to parallel international bodies.

Industrial Parks (IP) emerging as a key pillar of India's Innovation and Industrial Growth

- India's industrial parks, developed with government and private sector support, boost economic growth, attract FDI, promote sustainability, and enhance ease of doing business through various initiatives and infrastructure development.

- Developed in partnership with state governments and private sector, they offer shared infrastructure, streamlined approvals and a predictable regulatory environment.

Status of IP in India

- Currently, India has more than **4,500 industrial parks** as per India **Industrial Land Bank (IILB).**
- 306 plug-and-play industrial parks and 20 parks and smart cities are being developed under **National Industrial Corridor Development Corporation (NICDC).**

Key Benefits offered by Industrial Parks

- **Economic Growth:** Integrate scarce factors of production, generate higher productivity and operational efficiency, attract FDI (India among the top 5 global destinations for greenfield projects as per UNCTAD), creating jobs, and improved wages, etc.
- **Environmental and Social Responsibility:** Promote eco-friendly practices, support resource efficiency, etc., along with offering gender sensitive facilities, health and security systems to employees.

Initiatives taken to promote them

- **Plug-And-Play Industrial Parks:** Union Budget 2025-26 allocated Rs. 2,500 crores for their development.
- **India Industrial Land Bank (IILB):** Developed by Department for Promotion of Industry and Internal Trade (DPIIT) as a centralized Geographic Information System (GIS)-enabled platform offering spatial and non-spatial information on industrial land.
- **Industrial Park Rating System (IPRS):** Comprehensive framework for assessing performance and quality.
- IPRS 3.0 was launched in September 2025 with enhanced parameters on sustainability, skill linkages, digitalization, etc.
- **Ease of Doing Business Reforms:** Through National Business Reforms Action Plan (BRAP), 2014; Goods and Services Tax (GST), reducing compliance burden, etc.

India's First PPP-Model Medical Colleges

- India has announced its **first-ever PPP-model** medical colleges in the tribal districts of **Dhar and Betul (Madhya Pradesh).**

India's first PPP-model medical colleges:

- India's first medical colleges under the Public–Private Partnership (PPP) model are being set up in tribal-dominated districts of Madhya Pradesh.
- Four such colleges are planned (Dhar, Betul, Katni, Panna), linked with existing district hospitals to strengthen both medical education and public healthcare delivery.

What is the PPP model?

- **Public–Private Partnership (PPP)** is an arrangement where the government and private sector jointly provide public infrastructure or services.
- The private partner invests in construction, management or operations, while risks and responsibilities are clearly shared, and payments are linked to performance standards.

Types of PPP models

- **BOT / DBFOT (Build–Operate–Transfer / Design–Build–Finance–Operate–Transfer):** Private entity designs, builds, finances and operates the asset for a fixed period before transferring it to the government.
- **Operations & Maintenance (O&M):** Private player manages and maintains public assets for a shorter contractual duration.
- **Lease–Develop–Operate–Maintain:** Existing public assets are leased to private entities for development and operation during the concession period.

Government incentives for PPP

- **Viability Gap Funding (VGF):** Capital grant of up to 40% of project cost to improve financial viability.
- India Infrastructure Project Development Fund (IIPDF): Financial support for feasibility studies and project structuring.
- **IIFCL financing:** Long-term debt support for infrastructure projects with long gestation periods.
- **FDI support:** Up to 100% FDI permitted in most PPP sectors through the automatic route.

Subansiri Lower Hydroelectric Project

- India's largest hydropower project, the 2,000 MW Subansiri Lower Hydroelectric Project, has become operational after nearly 20 years, with the commissioning of its first 250 MW unit.

Subansiri Lower Hydroelectric Project (SLHEP)

- The Subansiri Lower Hydroelectric Project is a **run-of-the-river hydropower project** with an installed capacity of 2,000 MW, making it India's largest hydropower project once fully commissioned.
- Located in: **Gerukamukh**, on the Assam–Arunachal Pradesh border
- Implemented by NHPC Limited (National Hydroelectric Power Corporation)
- River flow through: Built on the **Subansiri River (a.k.a Gold river), the largest tributary of the Brahmaputra River**

Project History

- Approved: 2003
- **Challenges (2011–2019):** Progress was delayed by environmental impact studies, seismic safety reviews, and public protests in downstream Assam.
- **Operational Launch:** The first 250 MW unit began operation in December 2025.
- **Completion Schedule:** The remaining seven units (250 MW each) are scheduled for commissioning between 2026 and 2027.

Key Specifications

- **Type: Concrete Gravity Dam**
- **Height:** 116 m (from riverbed) / 210 m (from deepest foundation)
- **Length:** 284 m
- **Engineering Highlights:** The dam features several landmark achievements for India's hydroelectric sector, including:
- The country's heaviest hydro generator rotors.
- Its largest stators and inlet valves.
- The first use of the **Rotec Tower Belt system** for dam concreting.
- **Strategic Benefits**: Beyond power generation, the project will provide:
- **Flood Control:** Moderation of downstream flooding in Assam.
- **Grid Stability:** Enhanced resilience and reliability of the national power grid.
- **Clean Energy Goals:** Direct support for national Net Zero and renewable energy targets.

Quality Council of India

- The Quality Council of India (QCI) announced next-generation quality reforms on the eve of Sushasan Divas 2025 to strengthen India's quality ecosystem.

About Quality Council of India (QCI):

- The Quality Council of India (QCI) is **an autonomous, non-profit national accreditation body** that promotes, adopts, and institutionalises quality standards across sectors in India.
- It operates as a public–private partnership (PPP) model, independent of direct government control, while supporting national quality objectives.

Established in:

- 1996, following Cabinet approval, under **the Societies Registration Act, 1860.**
- Set up on the recommendations of a multi-stakeholder committee coordinated by the then Department of Industrial Policy and Promotion (now DPIIT).

Aim:

- To build a robust national quality infrastructure aligned with international standards.
- To enhance global competitiveness of Indian goods and services, protect consumer interests, and improve quality of life.

Key functions

- **National accreditation programmes:** Accredits laboratories, certification bodies, inspection

agencies, medical labs, and testing facilities as per global norms.

- **Service-sector quality assurance:** Develops accreditation frameworks for education, healthcare, governance, environment, infrastructure, and vocational training.
- **Trade facilitation:** Helps overcome TBT/SPS barriers under WTO by ensuring internationally acceptable conformity assessment.
- **Capacity building:** Strengthens quality systems in governments, institutions, MSMEs, and enterprises through training and benchmarking.
- **International engagement:** Maintains linkages with ILAC, IAF, OECD, ISQua, APLAC, PAC, enabling mutual recognition and global acceptance.
- **Quality awareness:** Leads the National Quality Campaign to empower citizens to demand quality goods and services.

Significance

- Recent initiatives like **Q Mark – Desh ka Haq** and **Quality Setu** shift the system from inspection-heavy regulation to trust-based governance.
- Improves export credibility, especially for MSMEs, by aligning Indian standards with global benchmarks.

25th Anniversary of Pradhan Mantri Gram Sadak Yojana (PMGSY)

- Pradhan Mantri Gram Sadak Yojana (PMGSY) completed 25 years in December 2025, marking a major milestone in India's rural infrastructure journey.

Pradhan Mantri Gram Sadak Yojana (PMGSY):

- Pradhan Mantri Gram Sadak Yojana (PMGSY) is a **centrally sponsored scheme** aimed at providing all-weather road connectivity to eligible, previously unconnected rural habitations, thereby integrating villages with markets, schools, and healthcare facilities.

Launched in

- **Year: 25 December 2000**
- **Occasion:** Birth anniversary of former Prime Minister Atal Bihari Vajpayee
- **Implementing ministry:** Ministry of Rural Development (MoRD), Government of India

Key features

1. Phased implementation:

- PMGSY-I: Universal rural connectivity to unconnected habitations.
- PMGSY-II: Upgradation and consolidation of existing rural road networks.
- PMGSY-III: Strengthening through routes and major rural links connecting markets, schools, and health facilities.
- PMGSY-IV (2024–29): Connectivity to 25,000 habitations via 62,500 km of roads.

2. Large-scale coverage: Over 8.25 lakh km of roads sanctioned, with nearly 95% completed by December 2025.

3. Technology-driven monitoring: Use of OMMAS, e-MARG, GPS-based tracking, and geo-tagged inspections for real-time monitoring and transparency.

4. Quality assurance: Institutionalised three-tier quality monitoring system involving executing agencies, State Quality Monitors, and National Quality Monitors.

5. Sustainability focus: Adoption of eco-friendly materials like waste plastic, fly ash, bio-bitumen, and climate-resilient construction techniques.

Significance

- Improves market access, farm-to-market linkages, and price realisation for farmers.
- Enhances access to education, healthcare, and welfare services in remote areas.

Initial Public Offering (IPO) market has touched record highs

- India's IPO market has touched record highs, raising about ₹3.8 lakh crore through 701 IPOs in the last two years (2024–25), surpassing the previous four-year total.

Initial Public Offering (IPO):

- An Initial Public Offering (IPO) is the process through which a private company offers its shares to the public for the first time to raise equity capital, thereby becoming a publicly listed company on stock exchanges like NSE and BSE.

Types of IPO

- **Fixed price issue:** The company sets a single, pre-determined price for its shares in consultation

with merchant bankers, giving investors certainty about the issue price.

- **Book building issue:** Shares are offered within a price band (floor price to cap price), and the final price is discovered based on investor demand during bidding. This is the most common method in India.

Stages of IPO allotment

- **Preparation and due diligence:** Company appoints investment banks; financial, legal, and regulatory checks are conducted.
- **DRHP filing:** Draft Red Herring Prospectus is filed with SEBI, disclosing business, risks, and financials.
- **Pricing and bidding:** Price or price band is announced; investors place bids during the subscription period.
- **Basis of allotment:** Registrar finalises allocation based on demand and SEBI norms.
- **Listing:** Shares are listed on stock exchanges and trading begins in the secondary market.

How IPO allotment works?

- IPO shares are allotted category-wise to Qualified Institutional Buyers (QIBs), Non-Institutional Investors (NIIs), and Retail Individual Investors (RIIs) as per SEBI regulations.
- If the issue is undersubscribed, all valid applicants receive shares.
- If oversubscribed, allotment is done proportionately or through a lottery system (especially for retail investors).
- Allotted shares are credited to Demat accounts, while unallotted funds are refunded.

Central Consumer Protection Authority imposed penalty on UPSC coaching institute

- The Central Consumer Protection Authority (CCPA) has imposed an ₹11 lakh penalty on coaching institute for publishing misleading advertisements related to UPSC CSE results.
- The action was taken under the Consumer Protection Act, 2019, highlighting strict enforcement against deceptive coaching claims.

About Consumer Protection Act, 2019:

- The Consumer Protection Act, 2019 is a comprehensive law enacted to protect consumer rights, curb unfair trade practices, and provide speedy grievance redressal in an increasingly digital and

service-driven economy. It replaced the Consumer Protection Act, 1986.

Aim:

- To safeguard consumers from misleading advertisements, unfair trade practices, and defective goods/services.
- To establish strong enforcement mechanisms and ensure accountability of manufacturers, service providers, and advertisers.

Key features

- **Central Consumer Protection Authority (CCPA):** Empowers the government to investigate, penalise, and order discontinuation of misleading advertisements and unfair trade practices.
- **Definition of misleading advertisement (Section 2(28)):** Covers false claims, concealment of material facts, and exaggerated promises likely to mislead consumers.
- **Product liability provisions:** Fixes liability on manufacturers, service providers, and sellers for harm caused by defective goods or deficient services.
- **Enhanced consumer rights:** Explicitly recognises six consumer rights including the right to information, choice, redressal, and consumer awareness.
- **E-commerce regulation:** Brings online platforms and digital advertisements under the consumer protection framework.
- **Simplified dispute redressal:** Introduces e-filing of complaints, mediation cells, and clearer jurisdiction of consumer commissions.

Significance

- Protects aspirants and parents from exploitative practices in high-stakes sectors like education and coaching.
- Promotes truthful advertising and transparency, especially in the digital space.

Enforcement Directorate Moves to Fast-Track Investigations

- Enforcement Directorate (ED) has initiated steps to fast-track its backlog of money laundering investigations.
- The actual conviction rates under the **Prevention of Money Laundering Act (PMLA)** remain much below the 94% figure cited by ED.

Enforcement Directorate (ED)

- ED is a multi-disciplinary agency responsible for investigating financial crimes and enforcing economic laws.
- It was established in **1956 as an 'Enforcement Unit'** under the **Department of Economic Affairs**.
- It was **renamed in 1957** and placed under the **Department of Revenue**, Ministry of Finance in 1960.
- The agency is headed by a Director of Enforcement and is headquartered in New Delhi.
- ED functions through five regional offices and multiple zonal and sub-zonal offices nationwide.

About Prevention of Money Laundering Act (PMLA) 2002

- The PMLA, 2002, is a comprehensive law to combat money laundering, and provides for the confiscation of property derived from illicit means.
- It was enacted primarily to honour India's international obligations under the **Vienna and Palermo Conventions** and to comply with **Financial Action Task Force (FATF)** recommendations.

Key Provision

- **Offence Definition:** Section 3 defines money laundering as involvement with proceeds of crime and projecting it as untainted property.
- **Penal Provision:** Section 4 prescribes imprisonment and fines, with stricter punishment for offences linked to the Narcotic Drugs and Psychotropic Substances Act.
- **Proof Burden:** Section 24 places the burden of proof on the accused once a case is established.
- **Reporting Obligations:** Section 12 mandates banks and financial institutions to verify client identity, maintain records, and report suspicious transactions.
- **Special Courts:** Section 43 provides for the establishment of Special Courts to handle PMLA cases.

Institutional Deliveries Reduced India's Maternal Mortality Rate

- The Union Health Minister recently stated that increasing institutional deliveries has significantly reduced India's **Maternal Mortality Rate (MMR).**

About Institutional Deliveries

- Institutional delivery refers to **childbirth in a medical institution** under trained health personnel, with facilities to manage complications.

- India's institutional delivery rate has risen to 89%, with public health facilities handling 62% of cases.
- **Regional Disparities**: Kerala and Tamil Nadu have achieved nearly 100% institutional delivery, while Nagaland (46%) and **Bihar (76%)** still lag.

Key Government Initiatives for Institutional Delivery

- **JSY: Janani Suraksha Yojana**, a centrally sponsored scheme, provides conditional cash transfers to promote institutional deliveries, especially in low-performing states.
- **JSSK: Janani Shishu Suraksha Karyakram** guarantees free and cashless deliveries, including caesarean sections, covering drugs, diagnostics, diet, and transport.
- **PMMVY: Pradhan Mantri Matru Vandana Yojana**, a **Direct Benefit Transfer scheme**, provides ₹5,000 for the first child and ₹6,000 for a second girl child.
- **PMSMA: Pradhan Mantri Surakshit Matritva Abhiyan** ensures fixed-day, free, specialist-led antenatal care every month to detect high-risk pregnancies.
- **LaQshya: Labour Room Quality Improvement Initiative** improves labour room and maternity operation theatre quality through standardised protocols and certification.

Maternal Mortality Rate (MMR)

- MMR is the number of **maternal deaths per 100,000 live births** during a given time period.
- Sustainable Development Goal (SDG) **Target 3.1** aims to reduce global MMR below 70 per 100,000 live births by 2030.

Current Trends of MMR in India

- As per the Sample Registration System (SRS), MMR fell from 130 in 2014–16 to 88 in 2020–22.
- **Rate of Reduction:** India's annual rate of reduction in MMR averages about 6.36%, nearly three times higher than the global rate.
- **State Variation:** Kerala (19), Maharashtra (33), and Telangana (43) have surpassed SDG targets, while Assam, Madhya Pradesh, and Uttar Pradesh record high MMRs.

State of Marginal Farmers in India 2025

- A new report titled State of Marginal Farmers in India 2025, released on **Kisan Diwas (December 23)** by the Forum of Enterprises for Equitable Development (FEED), reveals that less than 25% of

India's marginal farmers are linked to agricultural cooperatives.

State of Marginal Farmers in India 2025

- The State of Marginal Farmers in India 2025 is an empirical assessment by FEED examining how agricultural cooperatives, especially **Primary Agricultural Credit Societies (PACS),** serve marginal farmers (landholding < 1 hectare).

Key trends

- **Low cooperative inclusion:** Less than 25% of marginal farmers are active cooperative members, despite marginal farmers constituting nearly 60–70% of India's agricultural households, indicating deep structural exclusion.
- **Regional disparities:** Participation is particularly weak in Bihar, Tripura and Himachal Pradesh, reflecting uneven institutional reach and state capacity.
- **Structural barriers:** Complex membership rules, long distances to PACS, inadequate capitalisation and caste- and gender-based exclusion restrict marginal farmers' access, pushing them towards informal credit markets.
- **Digital divide:** Digitisation remains limited — 77.8% of cooperatives in Tripura and 25% in Bihar reported no digital tool usage — with women and elderly farmers facing the greatest skill gaps.
- **Gender leadership gap:** While over 21 lakh women are cooperative members, only about 3,355 women serve as directors nationwide, highlighting symbolic inclusion without decision-making power.
- **Positive outcomes where access exists:** Among cooperative-linked marginal farmers, 45% reported income gains and nearly 49% improved livelihood security, underscoring the transformative potential of inclusive cooperatives.

Plasser's Quick Relaying System (PQRS)

- The Northeast Frontier Railway (NFR) has set a record single-day mechanised track renewal of 1,033 track metres using Plasser's Quick Relaying System (PQRS).

Plasser's Quick Relaying System (PQRS):

- Plasser's Quick Relaying System (PQRS) is a semi-mechanised track renewal technology used by Indian Railways to remove old track panels and replace them with new prefabricated rail panels

efficiently within short traffic blocks.

- **Developed by:** Plasser & Theurer, an Austria-based global leader in railway track maintenance and construction machinery

Aim:

- To speed up track renewal while minimising traffic disruption.
- To enhance track safety, reliability, and maintenance efficiency.
- To reduce manual labour and lifecycle maintenance costs.

How it works?

- PQRS uses self-propelled portal cranes that move on an auxiliary track (3,400 mm gauge) aligned with the existing track.
- Old rail panels (rails + sleepers) are lifted and removed, and new prefabricated panels are placed using Track Laying Equipment (TLE).
- Retrieved old panels are directly transferred to **BFRs (Bogie Flat Wagons),** eliminating extra freight handling.

Key features

- **Portal cranes:** Self-loading, self-unloading cranes capable of lifting complete rail panels.
- **High lifting capacity:**
- Older models: ~5 tonnes (9 m panels)
- Newer models (PQRS-201): up to 9 tonnes, lifting 13 m PRC sleeper panels
- **Integrated gripping system:** Sleeper grippers and rail clamps securely hold panels during lifting and placement.
- **Turntable mechanism:** Enables cranes to be turned and placed on/off BFRs even in mid-sections.
- **Compact and modular design:** Reduces maintenance cost and improves operational flexibility.

Significance

- **Faster renewals:** Allows renewal of longer track lengths in shorter traffic blocks.
- **Improved safety:** Ensures uniform track geometry and reduces human error.

Passenger Assistance Control Room (PACR)

- The **Ministry of Civil Aviation (MoCA)** has established a 24×7 **Passenger Assistance Control**

Room (PACR) to fast-track aviation-related passenger grievance redressal.

Passenger Assistance Control Room (PACR):

- The Passenger Assistance Control Room (PACR) is a permanent, round-the-clock integrated control centre set up to monitor aviation operations and ensure real-time resolution of passenger grievances related to flights, airports and airlines.

Ministry: Ministry of Civil Aviation (MoCA)

Aim:

- To place passengers at the centre of India's civil aviation ecosystem.
- To ensure fast, transparent and accountable grievance redressal.
- To institutionalise a coordinated crisis-response mechanism during operational disruptions.

Key features

- **24×7 real-time operations:** Continuous monitoring of aviation operations, passenger calls and disruptions to enable immediate intervention.
- **Integrated stakeholder hub:** Officials from MoCA, DGCA, AAI and airlines work under one roof, enabling on-the-spot coordination and resolution.
- **AirSewa integration:** Complete integration with the AirSewa grievance platform for seamless handling of online complaints.
- **Omni-channel grievance intake:** Passenger inputs via calls, digital platforms and AirSewa are converted into actionable cases.
- **Data-driven dashboards:** Live dashboards track grievance type, response time and stakeholder action for transparency and accountability.
- **Passenger Charter compliance:** Grievances on delays, cancellations, refunds and baggage are handled strictly as per the Passenger Charter.

Significance:

- Over 13,000 grievances resolved and 500+ call-based interventions since December 2025.
- Enhances confidence in India's rapidly expanding aviation sector.

Industrial hemp

- Himachal Pradesh has legalised and initiated regulated cultivation of industrial hemp under the

'Green to Gold' initiative to promote a bio-economy-led growth model.

Industrial hemp:

- Industrial hemp is a non-intoxicating variety of **Cannabis sativa** cultivated for fibre, seed, and biomass, with tetrahydrocannabinol (THC) content below 0.3%, making it unsuitable for drug use.

Origin:

- Native to Central and South Asia, with millennia-old use in textiles, ropes, paper, and medicine
- Now legally cultivated across parts of Europe, North America, and Asia under regulated THC thresholds

Key characteristics

- Low THC (<0.3%) and high fibre/seed yield
- **Climate-resilient:** Requires ~50% less water than cotton and grows in marginal soils
- **Fast-growing:** Harvest cycle of 70–140 days
- **Soil-friendly:** Suppresses weeds and improves soil structure via deep roots
- **High biomass yield:** Suitable for fibre, oilseed, and dual-purpose use

Applications

- **Construction:** Hempcrete is a lightweight, insulating material that absorbs more carbon than it emits, offering a carbon-negative alternative for sustainable building.
- **Paper & packaging:** Hemp provides a low-impact pulp source, requiring fewer chemicals and enabling recyclable, biodegradable packaging solutions.
- **Pharmaceuticals & wellness:** Hemp-derived oils and extracts are used in nutraceuticals and medicines for pain relief and anti-inflammatory applications without psychoactive effects.
- **Cosmetics & personal care:** Hemp seed oil is rich in essential fatty acids, making it valuable for skin-friendly creams, lotions, and hair products.
- **Bio-energy & bioplastics:** Hemp biomass can be converted into renewable fuels and biodegradable plastics, supporting a circular and low-carbon economy.

India's Two Major Shipbuilding Initiatives

- Context (PIB): The Ministry of Ports, Shipping, and Waterways (MoPSW) notified operational guidelines for two major shipbuilding initiatives.

- The schemes—**Shipbuilding Financial Assistance Scheme (SBFAS)** and **Shipbuilding Development Scheme (SbDS)—**seek to strengthen India's domestic shipbuilding capacity.
- **Objective:** to position India among the top five global shipbuilding nations by 2047, aligning with the **Maritime Amrit Kaal Vision 2047.**

Shipbuilding Financial Assistance Scheme (SBFAS)

- The scheme provides graded support for small, large, and specialised vessels, with stage-wise disbursement tied to defined milestones and backed by security instruments.
- The government will provide 15–25% financial assistance per vessel, depending on vessel category.
- The scheme establishes a **National Shipbuilding Mission** to ensure coordinated planning and execution of all shipbuilding initiatives.
- **Key Feature:** It introduces Shipbreaking Credit Notes, giving shipowners 40% of scrap value as credit for scrapping vessels at Indian yards; this credit can be used for new vessel construction in India.

Shipbuilding Development Scheme (SbDS)

- The scheme supports greenfield shipbuilding clusters, brownfield yard modernisation, and an India Ship Technology Centre under the Indian Maritime University.
- **Greenfield Support:** Greenfield shipbuilding clusters will receive 100% capital support through a 50:50 Centre–State special purpose vehicle.
- **Brownfield Expansion:** Existing shipyards are eligible for 25% capital assistance for dry docks, shiplifts, fabrication, and automation upgrades.
- **Mechanism:** Disbursements will be milestone-based and monitored by independent agencies.
- **Key Feature:** It includes a Credit Risk Coverage Framework that provides government-backed insurance against various risks, enhancing financial resilience.

Revamped Distribution Sector Scheme (RDSS)

- Rajasthan is accelerating rooftop solar installations under the Revamped Distribution Sector Scheme (RDSS) to modernise power distribution infrastructure.

About Revamped Distribution Sector Scheme (RDSS)

- It is a major flagship initiative launched in 2021 by the **Ministry of Power** to improve the quality and reliability of power supply in India.

- **Objective:** to improve operational efficiency and financial sustainability of **state-owned DISCOMs**, ensuring reliable 24×7 affordable power.
- **Key Targets:** to reduce Aggregate Technical and Commercial (AT&C) losses to 12–15% and eliminate the Average Cost of Supply (ACS) and Average Revenue Realized (ARR) gap by 2024–25.
- **Key Feature:** RDSS follows a reform-based, results-linked model in which funding depends on meeting pre-qualification criteria and performance benchmarks.
- **Nodal agencies:** Rural Electrification Corporation (REC) and Power Finance Corporation (PFC) coordinate the implementation.

Key Components

- **Infrastructure & Metering:** The scheme prioritises prepaid smart meters, system metering, and upgrades to distribution infrastructure.
- Smart metering is implemented through the TOTEX (Total Expenditure) model under Public–Private Partnership.
- **Capacity Building:** it supports training, process reforms, consumer awareness, and third-party evaluation to strengthen DISCOM capabilities.
- **Feeder Segregation:** Agricultural feeders are separated and later solarised under PM-KUSUM to provide reliable daytime power to farmers.

Dulhasti Stage-II Hydropower Project

- The Centre has approved the **260-MW Dulhasti Stage-II hydropower project** on the **Chenab River** in Kishtwar district, Jammu and Kashmir.

Dulhasti Stage-II Project

- **Type: Run-of-the-river hydropower project** on the Chenab basin developed by National Hydroelectric Power Corporation Ltd (NHPC) under a BOOT framework.
- **Capacity:** 260 MW (2 × 130 MW), designed for large-scale grid supply with an annual Generation of approximately 803 million units.
- **Extension Project:** Builds upon the existing 390-MW Dulhasti Stage-I, operational since 2007.
- **BOOT Model:** A project framework where a private developer Builds, Owns, Operates, and later transfers the infrastructure to the host government after a fixed concession period.

About Chenab River

- **Etymology:** Name derives from Persian words Chan (Moon) and Aab (Water).
- **Origin Point:** Formed by the confluence of the Chandra & Bhaga rivers at Tandi, Himachal Pradesh; both rivers originate from opposite sides of Baralacha Pass.
- **Tributaries:** Includes Miyar Nalla, Sohal, Thirot, Bhut Nalla, Marusudar and Lidrar.
- **Key Dams:** Salal (rockfill dam), Aalal (concrete dam), Baglihar, Dul.

RBI initiates review of scale-based regulation (SBR) for NBFCs

- The review comes as Non-Banking Financial Companies (NBFCs) play a growing role in lending **(~15% of GDP),** amid concerns over their interconnectedness with banks, rising unsecured loans, and potential systemic risks.
- **SBR Framework for NBFCs:** Implemented by RBI from 2022, it categorizes NBFCs into four distinct layers based on their systemic importance, size and perceived level of risk.
- **Base Layer (NBFC-BL):** Consists of non-deposit taking NBFCs with assets below ₹1,000 crore. Includes specific entities like Peer-to-Peer (P2P) lending platforms, **Account Aggregators (AA)**, Non-Operative Financial Holding Company. It has a share of 5.2% of total NBFC assets.
- **Middle Layer (NBFC-ML):** Includes all deposit-taking **NBFCs (NBFC-D)** regardless of asset size and non-deposit-taking NBFCs with assets of ₹1,000 crore and above. It accounted for the largest share of 64.6% of total NBFC assets.
- **Upper Layer (NBFC-UL):** Comprises NBFCs specifically identified by the RBI as warranting enhanced regulatory oversight based on a set of parameters and scoring methodology. It has a share of 30.2% in total NBFC assets.
- **Top Layer:** NBFCs judged to be **extreme in supervisory risk** perception would be pushed to the Top. There will be enhanced and more intensive supervisory engagement with these NBFCs. Ideally it remains empty.

NBFCs

- A NBFC is a company registered under **the Companies Act, 1956** or **Companies Act, 2013**.
- NBFCs are engaged primarily in lending, investment in securities, and leasing or hire-purchase activities.

Difference between functions of NBFC and Banks:

- NBFCs cannot accept demand deposits.
- NBFCs do not form part of the payment and settlement system and cannot issue cheques drawn

on itself;

- Deposit insurance facility of Deposit Insurance and Credit Guarantee Corporation (DICGC) is not available to depositors of deposit taking NBFCs.

Ministry of Jal Shakti releases Dynamic Groundwater Resource Assessment Report 2025

The assessment was carried out jointly by the Central Ground Water Board (CGWB) and States/UTs.

Key Highlights of the report:

- **Annual GW Recharge:** Total Annual Ground Water Recharge has increased marginally to 448.52 Billion Cubic Meter (BCM) from 446.9 BCM (2024).
- **GW Extraction:** Annual Extractable Ground Water Resources has also increased marginally to 407.75 BCM from 406.19 BCM (2024).
- Further, total Annual Ground Water Extraction of the entire country for the year 2025 has been assessed as 247.22 BCM.
- **Stage of Ground Water Extraction (SoE):** Measure of Annual Ground Water Extraction for all uses over Annual Extractable Ground Water Resource is worked out to be 60.63%.

Categories: Out of the total 6746 assessment units (Blocks/ Mandals/ Talukas) in the country.

1. 73.4 % assessment units are categorized as 'Safe'.
2. 10.5 % assessment units are categorized "Semi-critical",
3. 3.05 % assessment units, have been categorized as 'Critical' and
4. 11.1% assessment units have been categorized as 'Over-exploited'.

- **Concentration of Over-exploited units**: North West (Punjab, Haryana, Delhi, Western UP); West (Rajasthan, Gujarat); South (Karnataka, TN, Telangana, Andhra Pradesh).
- 1.8% assessment units have been categorized as 'Saline'

Categorization of Assessment Units in the report:

- **Overexploited:** Groundwater extraction exceeding annually replenishable ground water recharge.
- **Semi-critical:** Groundwater extraction is between 70-90 % of annual extractable resources available.
- **Critical:** Groundwater extraction is between 90-100 % of annual extractable resources

available.

- **Safe:** Groundwater extraction is less than 70%.

Export Promotion Mission

Small-Value Digital Payment Surge

- In the rising digital payments ecosystem in India, the share of small value payments is seen growing faster, according to a report by the Reserve Bank of India (RBI).

Key Highlights from the RBI Report

Trends in Digital Payments

- Digital payments **grew 17.9% in** value and now form **97.6%** of total costs, while cheques fell to 2.4%.
- Digital payment volumes expanded by 35%, far outpacing value growth due to small-ticket transactions.
- Average retail digital transaction value declined to ₹3,830 from ₹4,382, signalling daily-use adoption.
- UPI accounts for the largest share of transaction volume, while **RTGS** dominates high-value payments.
- Debit card usage declined, while credit card transactions continued to rise in recent periods.

ATM Usage and Infrastructure Trends

- Digital payments reduced cash withdrawals; E.g., total ATMs declined moderately in 2024–25.
- Reduction driven mainly by a fall in off-site ATMs, despite growth in on-site ATMs.
- Public sector banks hold the largest share of ATMs with a more even population-wise distribution.

Types of ATMs

- On-Site ATMs: Located within bank branches, mainly in urban and semi-urban centres.
- Off-Site ATMs: Standalone machines outside branches.
- White-Label ATMs: Owned by non-bank entities, with nearly 80% located in rural & semi-urban areas.
- Brown-Label ATMs: Infrastructure owned by service providers but operations managed by

banks.

Risks Posed by AI Adoption in the Financial Sector

- Model Explainability: Black-box AI models risk flawed credit decisions at scale.
- Data Drift: Changing borrower behaviour can reduce model accuracy over time.
- Ethical Risks: Data privacy breaches and algorithmic bias pose systemic concerns.

Microfinance Stress Signals

- Credit Contraction: Microfinance lending contracted across most lender categories by end-March 2025.
- Portfolio Stress: Rising stress observed across regulated entities, excluding NBFC-MFIs.

Reasons for the Rise in Small-Value Digital Payments

- **UPI Convenience:** UPI handles a major share of digital payment transactions, with UPI processing ~85% of all digital volumes in 2025, reflecting strong user preference for instant digital micro-payments.
- **Merchant Acceptance:** UPI's ubiquity extends to point-of-sale and QR payments, with digital payments comprising 99.8% of total payment transactions by volume, indicating wide merchant adoption.
- **Smartphone Access:** In India, ~ 85 % of households possessed at least one smartphone. Approximately 86.3% of households in India have internet access. (Telecom Survey, 2025).

Copper prices touched a record high

- Copper prices touched a record high of over USD 12,000 per tonne in 2025, driven by US tariff uncertainty, global supply disruptions and surging demand from AI, clean energy and EVs.

About Copper:

- Copper (Cu) is a naturally occurring metallic element (Atomic number: 29) known for its excellent electrical and thermal conductivity.
- It is among the oldest metals used by humans and is central to modern industrial, digital and green

economies.

Characteristics of Copper

1. Chemical characteristics:

- **Symbol:** Cu and Atomic weight: 63.546 amu
- High resistance to corrosion and oxidation
- Forms important alloys such as brass (Cu+Zn) and bronze (Cu+Sn)

2. Physical characteristics:

- Excellent electrical and thermal conductivity (second only to silver)
- Ductile and malleable, enabling easy wiring and shaping
- Naturally reddish-brown; one of the few coloured metals

3. Unique properties:

- 100% recyclable without loss of quality
- Antimicrobial in nature, useful in healthcare settings
- Enhances energy efficiency, reducing CO_2 emissions over product life cycles

Applications of Copper

- **Energy and power sector:** Used extensively in power grids, transformers, renewable energy systems, and battery storage.
- **Electric vehicles (EVs):** EVs use over twice the copper of conventional vehicles due to motors, batteries and wiring.
- **Digital and AI infrastructure:** Data centres, especially hyperscale AI facilities, require massive copper volumes for cooling and power transmission.
- **Construction and manufacturing:** Plumbing, roofing, industrial machinery and electronics rely heavily on copper.
- **Defence and healthcare:** Used in defence electronics, ammunition and antimicrobial medical surfaces.

India and Copper: Current Status

- India is recognised copper as a critical mineral under its resource strategy.
- Over 90% dependence on imported copper concentrate
- Major producers across globe: Chile, Peru, DR Congo, China, USA

CONSTITUTION, POLITY AND GOVERNANCE

Need to Modernize Policing Practices with the vision of Viksit Bharat: Prime Minister

Key Challenges Concerning the Police in India

- **New forms of crime:** Including the white-collar crimes like bribery and corruption, evasion of taxes, violation of fiscal laws etc., along with modern technological use like Artificial Intelligence.
- **Inadequate infrastructural facilities:** Absence of adequate transport and communication network, modern weaponry, and need based training, etc.
- **Shortage of Workforce:** Ratio of police personnel per lakh persons is 152.80 as against the sanctioned strength of 196.23 (as on January 2022 based on Bureau of Police Research & Development (BPR&D) data).

Measures Needed for Modernizing Police

- **Innovative Strategies:** Effective use of databases integrated under NATGRID through Artificial Intelligence to generate actionable intelligence.
- Research Encouraging universities and academic institutions to undertake case studies on the use of forensics in police investigations, etc.
- **Whole of the Government Approach**: Bringing enforcement, rehabilitation, and community-level intervention.
- **Administrative Reforms:** As suggested by Supreme Court in Prakash Singh case (2006) including fixing the tenure and selection of the DGP, absence of political interference, etc., to be observed in full spirit.

Measures taken Reforming Police in India

- **Scheme:** Assistance to States & UTs for Modernization of Police (ASUMP) scheme aiming to equip Police Forces adequately with the required modern technology.
- **Legislative Reforms:** New criminal laws like Bharatiya Nyay Sanhita 2023 (BNS), Bharatiya Nagarik Suraksha Sanhita 2023 (BNSS) and Bharatiya Sakshya Adhiniyam 2023 (BSA).

- **SMART Policing Initiatives:** Like Crime and Criminal Tracking Network and Systems (CCTNS), etc.

DoT Mandated SIM Binding

- The Department of Telecommunications has mandated SIM-binding for all app-based communication platforms under the **Telecommunication Cybersecurity Amendment Rules, 2025.**
- Platforms must ensure compliance within 90 days and submit reports to DoT within 4 months.
- SIM binding means the messaging service can function **only if the registered mobile number's SIM card is physically present in the device**. If the SIM is removed, replaced, or inactive, access must be blocked.

Need for SIM Binding

- **Rising Cyber-Frauds:** SIM binding is needed to curb cyber-frauds executed using Indian numbers from abroad. E.g. India reported over 1.1 lakh cyber-fraud cases in 2024, with 70% linked to messaging apps.
- **Fake KYC SIM Cards:** Large volumes of SIMs activated with forged/mule IDs make account misuse easier. E.g. more than 6.3 lakh fraudulent SIMs were detected by DoT's Sanchar Saathi portal in 2023–24.
- **Functioning After SIM Removal:** Current app systems allow running even if the SIM is removed. E.g. DoT audit found over 45% of scam-linked accounts operated without the original SIM in the device.
- **Cross-Border Fraud Networks:** Karnataka cyber police traced ₹850+ crore frauds (2023–25) to handlers operating outside India via unbound messaging accounts.
- **Growing Telecom Identifier User Entity (TIUE):** Apps using mobile numbers as identifiers are vulnerable without SIM-device pairing. E.g. TIUE audit shows 12+ major messaging apps lacked SIM verification.

Impacts of Mandatory Sim Binding

1. Impact on Users

- Users travelling abroad who change SIMs cannot continue using apps linked to their Indian SIM unless the original SIM remains active in the device.
- 6-hour logout for WhatsApp Web disrupts office workflows relying on computer-based

messaging.

- Users will face more frequent re-verification and tighter account-SIM synchronisation requirements.

2. Impact on Platforms

- Need to redesign backend systems to ensure continuous SIM presence checks.
- Platforms must now continuously verify SIM–account linkage, maintain logs, and send compliance reports, significantly increasing their operational workload under TIUE rules.
- Messaging apps using end-to-end encryption cannot access user content and rely only on minimal metadata, making real-time SIM verification and fraud detection technically more difficult.

ST Status for Six Communities in Assam

- A Group of Ministers in Assam has submitted an interim report recommending Scheduled Tribe (ST) status for six communities.
- **Six Communities:** The proposed beneficiary communities *are **(1) Ahom, (2) Chutia, (3) Moran, (4) Matak, (5) Koch-Rajbongshi, and (6) the Tea Tribes.***
- **New Classification:** The report also recommends a three-tier ST framework to safeguard the existing rights of recognised tribal communities.

Key Recommendations by the Interim Report

1. Structural & Reservation Framework

- **New Structure:** The report proposes a three-tier Scheduled Tribe framework for Assam comprising ST (Plains), ST (Hills), and a newly created ST (Valley).
- **Valley Inclusion:** The ST (Valley) category will include **Tai Ahom**, Chutia, Tea Tribes, and Koch-Rajbongshi (excluding those in undivided Goalpara).
- **Quota Protection:** Existing reservation quotas for ST (Plains) and ST (Hills) must remain fully protected under the new system.
- **Separate Roster:** The **new ST (Valley) category** must have an independent reservation roster, quota, and vacancy register for state-level recruitment and admissions.
- **Central Pool:** All notified ST communities should compete within a single, common ST pool for

central government reservation benefits.

2. Cultural and Political Safeguards

- **Interim Privileges:** All land-related protections currently enjoyed by existing STs must be immediately extended to the six communities until their statutory inclusion is completed.
- **Cultural Oversight:** The cultural practices, languages, and customs of the six communities should come under the **Department of Indigenous and Tribal Faith and Culture**.
- **LS Reservation:** The two Lok Sabha constituencies covering the **Sixth Schedule** areas should be permanently reserved for existing STs through a constitutional amendment.

Procedure for Inclusion in the Scheduled Tribe (ST) List

- **State Proposal:** The process begins when a State or UT government submits a formal proposal to the Ministry of Tribal Affairs (MoTA) to add, remove, or modify a community in the ST list.
- **MoTA Review:** The Ministry of Tribal Affairs reviews the proposal and verifies all supporting evidence and documentation.
- **RGI Examination:** MoTA forwards the proposal to the Office of the **Registrar General of India (RGI)** for **ethnographic assessment** and formal approval.
- **NCST Scrutiny:** After RGI clearance, the proposal is referred to the National Commission for Scheduled Tribes (NCST) for its recommendations.
- **Cabinet Approval:** Once the NCST recommends the proposal, MoTA prepares a Cabinet note and seeks approval from the Union Cabinet.
- **Parliament & Notification:** After Cabinet approval, the proposal is introduced in Parliament and must be passed by a simple majority.
- **Presidential Notification:** Once Parliament enacts the amendment, the President issues a notification updating the ST list.

Renaming Raj Bhavans

- The Union Home Ministry has written to all States & Union Territories proposing renaming **Raj Bhavans as Lok Bhavans** and **Raj Niwas as Lok Niwas** to remove colonial connotation.
- West Bengal and Ladakh accepted the proposal and changed names accordingly.

Raj Bhavan :-

- **Role:** Official residence & office of the Governor, the constitutional head of the State under **Article 153.**
- Raj Niwas is the Raj Bhavan equivalent at the Union Territory level, serving the Lieutenant Governors and Administrators of Union Territories.
- **Protocol:** Comparable to Rashtrapati Bhavan at the Union level; hosts swearing-in ceremonies, official meetings and visiting dignitaries.
- **Constitutional Basis: Article 158** entitles the Governor to a rent-free official residence; if one Governor is appointed to more than one State, one Raj Bhavan is designated as the principal official residence.
- **Colonial Origin:** Most Raj Bhavans trace their origin to British-era government houses used by Governors or Lieutenant-Governors in provinces.
- Kolkata Raj Bhavan was built in 1803 as the Governor-General's house.
- **Symbolism:** The transition from 'Raj' to 'Lok' seeks to replace colonial ways of authority and hierarchy with people-centric governance.

CEC Chairmanship of International IDEA

- India's Chief Election Commissioner Gyanesh Kumar will assume the Chair ship of the International Institute for Democracy and Electoral Assistance (International IDEA) on December 3, 2025, in Stockholm.

The **International Institute for Democracy and Electoral Assistance (International IDEA):**

- An intergovernmental organisation dedicated exclusively to supporting and strengthening democratic institutions, processes and norms worldwide.
- **Establishment:** Founded in 1995 as a global platform for democracy support, with its headquarters in Stockholm, Sweden.

Membership:

- Started with 14 founding members including India, Norway, Spain, Australia and South Africa.
- Today has 35 member countries, with the US and Japan as observers.
- Holds UN General Assembly Observer Status since 2003.
- **Aim:** To advance and safeguard sustainable democracy by generating comparative knowledge, strengthening electoral institutions, supporting reforms, and promoting rule of law, participation,

and inclusion.

Core Functions

- **Knowledge Production:** Research on elections, political parties, constitutions, governance and democratic innovations.
- **Capacity Building:** Training Election Management Bodies (EMBs), political parties and democratic institutions.
- **Advocacy:** Promoting global democratic standards and electoral integrity.
- **Dialogue Convening:** Facilitating international exchanges among policymakers, civil society and regional bodies.
- **Technical Assistance:** Advising countries on electoral reforms, institutional design and democratic resilience.

Significance

- Only global intergovernmental organisation with a sole mandate to support democracy.
- Provides a "virtuous cycle" of research → capacity building → advocacy → policy reform.
- India's chair ship enhances its global leadership in election management, sharing expertise from administering elections to 90+ crore voters.

Assam Prohibition of Polygamy Bill, 2025

- Assam has passed the **Assam Prohibition of Polygamy Bill, 2025**, becoming the second state after Uttarakhand to ban polygamy.

Polygamy in India:

- Polygamy refers to a marital system where one person has more than one spouse at the same time. In India, it is regulated differently across religions, states, and tribal customs.

Historical Context:

- Traditionally practiced in several communities, polygamy was restricted over time through religion-specific reforms — e.g., **the Hindu Marriage Act (1955)** outlawed bigamy for Hindus.
- Muslim personal law historically permitted up to four wives; tribal groups followed customary practices recognized by the Constitution.

Laws Governing:

- Hindus, Buddhists, Jains, Sikhs – Bigamy prohibited under the Hindu Marriage Act, 1955; second marriages deemed void.
- Parsis - Prohibited under **Parsi Marriage & Divorce Act, 1936.**
- Christians - Prohibited under the **Indian Christian Marriage Act, 1872**.
- Muslims - **Muslim Personal Law (Shariat) Act, 1937** allows Muslim men to have **up to four wives**; hence **not criminal under BNS Section 82.**
- Goa - Under the Portuguese Civil Code, monogamy is the rule for all; a unique historical clause allows a Hindu man a second marriage under rare conditions (unused since 1910).
- **Tribal Groups - Exempt under the Constitution (Fifth & Sixth Schedule);** customary laws prevail.

Recent State-Level Bans

- **Uttarakhand UCC (2024):** Outlaws bigamy for all residents except Scheduled Tribes.
- **Assam Bill (2025):** Makes polygamy a cognisable, non-bailable offence; penalties up to 7–10 years; bars convicts from government jobs and elections; tribal areas exempt.

Significance:

- Reflects push toward gender justice and uniform legal standards in marriage.
- Tests the legal boundary between personal law autonomy and legislative reform.
- Raises questions on minority rights, state powers, and the future trajectory of UCC in India.

National Commission for Backward Classes (NCBC)

- The NCBC has recommended excluding 35 communities, mostly Muslim from West Bengal's Central OBC list, following its scrutiny of OBC inclusions made in 2014.

National Commission for Backward Classes (NCBC):

- A constitutional body under **Article 338B**, mandated to safeguard the rights and ensure the welfare of **Socially and Educationally Backward Classes (SEBCs).**

Established in:

- Originally created under the NCBC Act, 1993, it gained constitutional status in 2018 through the

102nd Constitutional Amendment, which inserted Articles 338B and 342A.

- **Aim:** To advise, monitor, investigate, and recommend matters related to SEBC inclusion/exclusion, welfare safeguards, socio-economic advancement, and violations of rights.

Composition:

- **5 members:** Chairperson, Vice-Chairperson, and three Members.
- Appointed by the President of India by warrant under his hand and seal.
- Members hold rank and pay equivalent to Secretary, Government of India.

Functions:

- Investigate and monitor implementation of Constitutional safeguards for SEBCs.
- Inquire into complaints of rights violations or misuse of reservation benefits.
- Evaluate socio-economic development programs for backward classes and advise governments.
- Ensure mandatory consultation by Union & States on policy matters affecting SEBCs.
- Submit annual and special reports to the President, which are tabled in Parliament and State Legislatures.

Powers:

- Has civil court powers: summoning witnesses, examining on oath, demanding documents, receiving evidence.
- Advises Union Government on inclusion/exclusion in the Central OBC List and final amendments must be enacted by Parliament under **Article 342A.**

Flight Duty Time Limitations Rules

- India's aviation sector is facing major disruptions as the newly implemented Flight Duty Time Limitations (FDTL) rules have triggered large-scale flight cancellations and delays, especially at IndiGo, due to crew shortages and tighter fatigue norms.

Flight Duty Time Limitations Rules: What it is?

- FDTL refers to regulatory limits on how long pilots can be on duty, how many hours they may fly, the number of night operations they can perform, and the minimum rest required to prevent fatigue.

- **Published by:** Issued and enforced by the Directorate General of Civil Aviation (DGCA) under a revised framework notified in January 2024.
- **Aim:** To reduce fatigue-related safety risks, align Indian aviation with global norms, and ensure safer flight operations by regulating duty hours, night operations, and rest requirements.

Features:

- 48 hours of continuous weekly rest ensures pilots get sufficient uninterrupted recovery time, reducing cumulative fatigue that builds up over busy rosters and frequent night operations.
- Night period extended to 00:00–06:00 increases protected rest hours for early-morning and late-night flights, which are biologically high-fatigue windows, strengthening safety margins.
- Limit of two-night landings and two consecutive night duties reduce exposure to the most fatiguing tasks, preventing performance degradation during critical phases of flight.
- Mandatory roster adjustments and **fatigue reporting** require airlines to redesign schedules and allow pilots to formally flag fatigue risks, making crew management more transparent and safety-driven.
- Phased implementation by November 1, 2025 pushed airlines to overhaul long-standing scheduling practices and expand crew capacity to comply with the stricter fatigue-control framework.

Significance:

- Enhances flight safety by scientifically addressing circadian fatigue.
- Aligns India with ICAO and international best practices.
- Improves pilot well-being and operational discipline.

Parliamentary panel seeks full operationalisation of Lokpal's inquiry and prosecution wings

- The Committee notes that despite statutory requirements under the Lokpal and Lokayuktas Act, 2013, the inquiry and prosecution wings of Lokpal remain inadequately operationalised.

About Lokpal and Lokayuktas Act, 2013

- The act mandates establishment of the Lokpal at the union level and Lokayukta at the state level to deal with complaints relating to corruption against certain public functionaries.

It also contains provisions for establishment of :-

- **Inquiry Wing (Section 11) headed by the Director of Inquiry:** for the purpose of conducting preliminary inquiry into any offence alleged to have been committed by a public servant punishable under the Prevention of Corruption Act, 1988.
- **Prosecution Wing (Section 12) headed by the Director of Prosecution:** for the purpose of prosecution of public servants in relation to any complaint by the Lokpal under this Act.

Parliamentary Committee Report Findings

- **Inquiry Wing:** Using officers on deputation temporarily, but full operationalisation incomplete.
- **Prosecution Wing:** only a small number of cases have reached the prosecution stage so far, and thus a full-fledged separate wing has not yet been set up.
- **Recommendations :** The Committee reiterates that both wings must be fully constituted within six months and urges urgent steps to operationalise both the Inquiry and Prosecution Wings.

Lokpal

- **Composition of Lokpal:** Consists of a Chairperson and **up to 8 Members**, with 50% being Judicial Members.
- Chairperson is a person who is or has been a **Chief Justice of India** or is or has been a Judge of the Supreme Court.
- Judicial Member is a person who is or has been a **Judge of the Supreme Court** or is or has been a Chief Justice of a High Court
- **Composition:** At least 50% of total Members must be from SC, ST, OBC, Minorities, and women.
- **Term for members**:5 years or till the age of 70 years.
- **Expenses of Lokpal:** Administrative expenses of the Lokpal, including all salaries, allowances and pensions shall be charged upon the Consolidated Fund of India
- Complaint against Public Servant can be filed by : Individual, Society, Association of Persons, Trust , Company , Limited Liability Partnership, Statutory Board , Corporation , Statutory Authority

2nd WHO Global Summit on Traditional Medicine

- India has officially begun the countdown to the **2nd WHO Global Summit on Traditional Medicine**, to be held from 17–19 December 2025 at Bharat Mandapam, New Delhi.

- A high-level global health summit convened by the WHO to advance traditional, complementary, and integrative medicine through scientific validation and policy collaboration.

Host:

- Co-hosted by WHO and the **Ministry of Ayush**, Government of India.
- Supported by the WHO **Global Traditional Medicine Centre (GTMC), Jamnagar**, established in partnership with India.
- **Theme (2025): "Restoring balance: The science and practice of health and well-being."**

Key Features of the 2025 Summit

- **Evidence-Based Integration:** Pushes scientific validation of traditional medicine through research, clinical trials, regulatory frameworks, and quality benchmarks.
- **Global Participation:** Delegations from 100+ countries, including Ministers, policymakers, industry leaders, scientists, and Indigenous medicine practitioners.
- **Digital Health & Innovation: Showcases** digital repositories, AI-driven pharmacopeias, and biodiversity mapping for medicinal plants.
- **Biodiversity & Sustainability:** Examines sustainable sourcing of medicinal plants and conservation of knowledge systems, including **Ayurveda, Siddha, Unani, Sowa-Rigpa, and Homeopathy**.
- **Policy Harmonisation:** Aims to create a decade-long roadmap for integrating safe, equitable, evidence-based traditional medicine into national healthcare systems

Significance of the Summit

- **Bolsters India's Soft Power:** Positions India as the global leader in traditional medicine, building on Yoga's international success and Ayurveda's rising credibility.
- **Strengthens WHO-India Collaboration:** Enhances the role of the WHO-GTMC in Jamnagar, reflecting global trust in India's knowledge systems.
- **Drives Health System Integration:** Helps countries incorporate traditional medicine into universal health coverage, primary healthcare, and public health programs.

SC Directives for PwDs in Prisons

- The Supreme Court mandated penal action under the **Rights of Persons with Disabilities (RPwD) Act, 2016,** against prison authorities abusing or neglecting disabled inmates.
- Section 89 of the RPwD Act, 2016, prescribes penalties for anyone violating the Act or its rules.

Key Directives of the Supreme Court

- **Disability Guidelines:** The disability-inclusive guidelines issued in the L. Muruganantham judgment (2025, Tamil Nadu) must now be extended to all prisons across India.
- **Accessibility Measures:** Prisons must ensure grievance systems, early disability identification, ramps, accessible toilets, wheelchair pathways, and therapeutic support.
- **Visitation Rights:** Prisoners with benchmark disabilities are entitled to extended visitation rights to sustain family contact and allow close monitoring of their needs.
- **Staff Training:** All prison staff, medical officers, and legal-aid lawyers must undergo training on the RPwD Act and the needs of disabled inmates.
- **Manual Revision:** State Prison Manuals must be reviewed and amended within a fixed timeframe to align with the RPwD Act and relevant UN human-rights standards.
- A 'person with benchmark disability' is defined under the RPwD Act, 2016, as an individual with at least 40% of a specified disability.

About RPwD Act, 2016

- The RPwD Act, 2016, protects the rights and dignity of persons with disabilities (PwDs) and aims to ensure equal opportunities for them in all aspects of life.
- It replaced the **1995 Act** to align India's disability framework with the UN Convention on the Rights of Persons with Disabilities (UNCRPD).
- It defines a **"person with disability"** as someone with a long-term physical, mental, intellectual, or sensory impairment that, combined with societal barriers, limits their full participation in society.
- The Act broadened disability criteria and raised the number of disability categories from 7 to 21.
- Accessibility Mandate: It mandates universal accessibility in infrastructure, information, and communication technology for both government and private organisations.
- **Key Provisions:** The Act guarantees free, inclusive education, reservations in education and jobs, access to justice, social security, health services, and grievance redressal mechanisms.

Fire Safety in India

- A major fire at Birch by Romeo Lane, a nightclub in Goa, killed about 25 people.

Fire Safety Legal Framework in India

- **NBC 2016 (Part 4):** National Building Code of India 2016 (Part 4), a central guideline covering fire prevention, building design, safe egress, and firefighting systems for buildings.
- **State-level fire laws:** NBC is recommendatory; states/urban local bodies must adopt via local bye-laws to make it enforceable.
- **Fire NOC requirement:** Many states mandate a NOC from the fire department for occupancy, especially for high-risk buildings (hotels, clubs, assembly halls, and basements).

Reasons for Recurring Fire Incidents in India

- **Weak Enforcement:** Safety inspections and NOC renewals are irregular, allowing high-risk operations to continue unchecked; E.g. the Jaisalmer bus fire exposed oversight gaps in sleeper-coach safety.
- **Hazardous Material Mismanagement:** Flammable goods are stored illegally due to poor monitoring; E.g., Gujarat fireworks-warehouse blast killed 21 after **aluminium powder** was kept without permits.
- **Electrical Faults:** Overloaded circuits and unmaintained wiring frequently trigger urban fires; E.g. the Hyderabad residential fire killed 17, including 8 children, due to suspected wiring failure.
- **Unsafe Escape Routes:** Encroached stairwells and unventilated corridors trap people during smoke spread; E.g., Kolkata hotel fire, 14 died from asphyxiation in a narrow stairwell.
- **Regulatory Gap:** NBC remains recommendatory until states adopt it into their bylaws; E.g., only about 22–24 states have fully integrated NBC 2016 fire provisions as of 2024 (MoHUA data).

Way Forward

- **Code Adoption:** Make NBC 2016 Part IV mandatory through state bylaws with periodic compliance.
- **Basement Norms:** Enforce smoke extraction, ventilation, sprinkler curtains, and dual exits for basements.
- **Occupancy Audits:** Tie nightclub/restaurant licences to annual third-party fire audits.
- **Exit Discipline:** Enforce clear, obstruction-free stairwells and escape routes with penalties for encroachment; E.g., replicate Mumbai Fire Brigade's zero-tolerance checks before festival seasons.
- **Service Modernisation:** Strengthen state fire services through faster response units and narrow-

lane vehicles; E.g., adopt Bengaluru's rapid-intervention fire vehicles for dense urban cores.

Karnataka Hate Speech Bill, 2025

- Karnataka has introduced the Hate Speech and Hate Crimes (Prevention) Bill, 2025, to create India's first State-level law explicitly defining hate speech.

Key Provisions of Karnataka Hate Speech Bill, 2025

- **Explicit Definition:** Covers expressions causing injury, hostility, or disharmony based on religion, caste, sex, gender identity, sexual orientation, race, disability, or place of birth.
- **Punishment Range:** Imprisonment from 2 to 10 years with fines, based on severity and recurrence.
- **Collective Liability:** If a crime is linked to an organisation, office-bearers can be held as culprits.
- **Online Regulation:** The State is empowered to remove or restrict digital content carrying hate speech.
- **Suo Motu Action**: Enables police to **act without a formal complaint** in specified circumstances.

India's Legal Framework Against Hate Speech

- **BNS Section 196 (Ex-153A IPC):** Penalises promoting enmity between groups on grounds of religion, race, language, etc.
- **BNS Section 299 (Ex-295A IPC):** Punishes deliberate acts intended to outrage religious feelings.
- **BNS Section 353:** Penalises statements likely to incite offences against State or disturb public order.
- **IT Act 2015 (Section 66A):** Previously used for online content, struck down by the Supreme Court **(Shreya Singhal Judgement)** for being vague and overbroad.
- **Tehseen Poonawalla Judgment (2018):** Mandated nodal officers to prevent hate crimes and mob violence, especially related to targeted group attacks.

Challenges in Hate Speech Regulation

- **Low Convictions:** Only 1 in 5 cases under Sec. 153A result in conviction (20.2%, NCRB).
- **Over-criminalisation Risk:** 2,000+ arrests annually, but weak evidence collection leads to acquittals.
- **Online Escalation:** 70% hate speech content originates online/off social media (NCRB).

- **Subjective Definition**: SC noted (2023) that difficulty in "defining hate speech objectively" leads to misuse.
- **Political Influence:** Hate speech FIR filings rise by 30–50% before elections (Common Cause study, 2022).

Way Forward

- **Clear Definition:** Adopt harm-based definitions (incitement + targeting) to avoid vague interpretation. (Law Commission 267th Report).
- **Independent Nodal:** Create independent nodal authorities outside the police chain for hate speech monitoring. E.g. UK's Crown Prosecution Service Hate Crime Units.
- **Digital Protocols:** Mandate 48-hour takedown windows and traceability for repeat hate content pages.
- **Evidence Standards:** Develop forensic documentation protocols for voice/video hate content to improve conviction. E.g. Delhi Police Cyber Forensics Lab protocols for hate speech.

Contempt of Court

- Supreme Court set aside a Bombay High Court order punishing a woman for criminal contempt, holding that contempt power is not a **"personal armour"** for judges.

- **Not Personal Armour:** Contempt cannot be used to suppress criticism of judges.
- **Bona Fide Apology:** Section 12 of the **Contempt of Courts Act, 1971**, allows acceptance of sincere remorse even after guilt is recorded.
- **Judicial Restraint:** Contempt jurisdiction must be exercised cautiously and proportionately.
- **Mercy Principle:** Forgiveness forms part of judicial conscience when the contemnor shows contrition.

About Contempt of Court in India

- **Purpose:** Protect judicial authority, ensure public confidence, and preserve the sanctity of justice delivery.
- **Constitutional Basis: Articles 129** and **Article 215** empower the Supreme Court and High Courts as Courts of Record with inherent authority to punish for contempt.
- The term **"contempt of court"** appears in **Article 19(2)** as a ground to restrict freedom of speech.

- **Statutory Framework:** Contempt of Courts Act, 1971 (**H.N. Sanyal Committee Recommendation**).
- **Civil Contempt (Section 2(b)):** Wilful disobedience to any judgment, decree, direction, order, writ or other process of a court or wilful breach of an undertaking given to a court.
- **Criminal Contempt (Section 2(c)):** Publication or act that Scandalises the authority of a court, Prejudices with judicial proceedings, Obstructs the administration of justice in any manner.
- **Contempt of Courts (Amendment) Act, 2006:** It specified that punishment for contempt can be imposed only if the act substantially interferes or is likely to interfere with the administration of justice.
- **Initiation of Proceedings:** Courts may act suo motu, or any person may file a petition with the consent of the Attorney General (SC) or Advocate General (HC).
- **Punishment:** Simple imprisonment up to 6 months or a fine up to ₹2,000, or both, and it is waived if the court accepts a genuine apology.

Supreme Court's Ruling on Narco Tests

- The Supreme Court has set aside the Patna High Court order permitting an involuntary narco-analysis test, reaffirming that forced narco tests violate **Article 20(3).**

What is a Narco Test?

- A narco test involves injecting sedatives like **Sodium Pentothal** to reduce inhibitions so an accused may reveal concealed information.
- It is considered a non-violent investigative tool, **similar to polygraph** or brain-mapping tests.

Key Judgments and Constitutional Basis:

- **Selvi v. State of Karnataka (2010):** The Court held that narco, polygraph and brain mapping cannot be administered without voluntary consent.
- **Amlesh Kumar v. State of Bihar (2025):** Patna HC allowed an involuntary narco test, which SC has now struck down as unconstitutional.
- **Article 20(3):** Protects against self-incrimination; forced narco tests violate this right.
- **Article 21 :** Right to Life & Privacy: Forced narco-analysis violates bodily integrity, privacy and personal liberty.
- The Court reiterated the **Golden Triangle principle (Articles 14, 19, 21) from Maneka Gandhi**

(1978) — any investigative procedure must be fair, reasonable, and just.

Features of the SC Ruling:

- Consent must be voluntary, informed, and recorded before a magistrate.
- Medical and legal safeguards mandatory before administering any such test.
- Test results are **not proof of guilt** — they require independent corroboration (Manoj Kumar Saini 2023, Vinobhai 2025).
- Accused may volunteer for narco-testing under Section 253 of BNSS, but courts need not allow it as a matter of right.

Sustainable Harnessing of Advancement of Nuclear Energy for Transforming India (Shanti Bill)

- The Union Cabinet has approved the Atomic Energy Bill, 2025, branded as the SHANTI Bill, marking the **biggest reform in India's nuclear sector since 1962.**

SHANTI Bill :

- A comprehensive nuclear-sector reform bill replacing fragmented laws and modernising India's nuclear governance, safety, liability, and industry participation framework.
- Ministry: Introduced by the **Department of Atomic Energy (DAE)** under the Prime Minister; regulatory reforms involve creating an independent nuclear safety authority.

Law Governing Nuclear Energy Currently:

- India's nuclear sector is presently overseen primarily by:
- **Atomic Energy Act, 1962**
- **Civil Liability for Nuclear Damage Act, 2010 (CLND Act)**
- These laws restrict private participation and impose ambiguous liability burdens.
- **Aim:** To enable large-scale nuclear expansion, attract private and global investment, modernise regulatory oversight, reform liability rules, and accelerate India's path to **100 GW** of nuclear power **by 2047.**

Key Features:

- **Opening the Nuclear Value Chain to Private Players:** Allows private sector entry in exploration, fuel fabrication, equipment manufacturing, and potentially plant operations.

- **Unified Legal Framework:** Consolidates outdated laws into a streamlined licensing, safety, compliance, and operations structure.
- **Reformed Nuclear Liability Architecture:** Clear delineation of operator-supplier responsibilities, insurance-backed caps, and government backstopping-aligned with global norms.
- **Independent Nuclear Safety Authority:** New regulator ensuring transparent, professional, globally benchmarked safety oversight.
- **Dedicated Nuclear Tribunal:** Specialised mechanism to settle liability and contractual disputes efficiently.
- **Boost to Small Modular Reactors (SMRs):** Supports R&D and deployment of SMRs for industrial and grid-scale decarbonisation.

Significance

- Breaks 60+ years of state monopoly, enabling private innovation and investment.
- Critical for achieving 100 GW nuclear capacity and India's net-zero by 2070 target.
- Strengthens energy security, reducing dependence on coal and imported fuels.

Fourth National Lok Adalat of 2025 successfully resolved 2.59 crore disputes

- From 2022-23 to 2024-25, more than 23.5 crore cases have been resolved in various Lok Adalats across India.

Lok Adalat Framework

- **Established:** under the **Legal Services Authorities Act, 1987** to provide speedy and cost-effective justice as an **Alternative Dispute Resolution (ADR)** mechanism.
- **Objective:** Reduce pendency (e.g. more than 4.7 crore pendency as per NJDG), promote consensual settlements, and strengthen access to justice.
- **Authority:** Organised by the NALSA with the CJI as Patron-in-Chief.
- **Enforcement:** Awards are final, binding, equivalent to a civil court decree, with no appeal provision.
- **Scope:** Covers pre-litigation and pending cases, excluding non-compoundable offences and divorce matters.

Types of Lok Adalats

- **National Lok Adalat (NLA):** Involve simultaneous, nationwide sittings on a single day at all levels

of the judiciary, from the Supreme Court down to the Taluk Levels, aiming to clear a large volume of cases.

- **Permanent Lok Adalat (PLA):** Organized for cases related to Public Utility Services (e.g., transport, postal, telegraph, electricity, water supply) up to ₹ 1 Crore.
- **E-Lok Adalats and Mobile Lok Adalats:**
- E-Lok Adalats allow for remote participation and bring justice through digital platforms.
- Mobile Lok Adalats are organized to travel from one location to another to resolve disputes.

National Blood Transfusion Bill, 2025

- Thalassaemia patient groups welcomed the **National Blood Transfusion Bill, 2025**, introduced in Parliament.
- The Bill proposes a **National Blood Transfusion Authority** to enforce uniform statutory blood management standards, to consolidate the fragmented regulation framework.
- Blood regulation in India currently operates under the **Drugs and Cosmetics Act, 1940; the National Blood Transfusion Council**, created by a Supreme Court directive, issues non-statutory guidelines.

About Thalassaemia

- Thalassemia is an **inherited genetic blood disorder** in which **defective haemoglobin** production leads to chronic anaemia.
- Types: There are two main types based on the haemoglobin protein affected.
- **Alpha thalassaemia:** Insufficient production of the Alpha globin chain of haemoglobin; disease severity increases as more genes are affected.
- **Beta thalassaemia:** Insufficient production of the Beta globin chain; one affected gene causes beta-thalassaemia minor (mild), while two affected genes cause beta-thalassaemia major (severe).
- Globin chains are the protein building blocks of haemoglobin that enable red blood cells (RBCs) to carry oxygen throughout the body.
- **Treatment:** Severe cases need regular blood transfusions coupled with Iron Chelation Therapy; a Bone Marrow Transplant (BMT) or Hematopoietic Stem Cell Transplantation **(HSCT)** is the only cure.
- **India's Burden:** India accounts for about 25% of the global beta-thalassaemia burden; it affects around 3–4% of the population.

Govt Initiatives for Thalassemia Control

- **Thalassemia Bal Sewa Yojana:** A Coal India Limited CSR initiative providing up to ₹10 lakh for bone marrow transplants of underprivileged children with thalassaemia major or aplastic anaemia.
- **NHM Support:** The National Health Mission supports states with blood banks, transfusion day-care centres, free blood products, iron chelation drugs, diagnostics, and trained healthcare personnel.
- **National Guidelines 2016:** The Ministry of Health and Family Welfare issued guidelines for the prevention and control of haemoglobinopathies, including thalassaemia.
- **e-RaktKosh Platform:** A national digital platform linking licensed blood banks to provide real-time blood availability for patients needing regular transfusions.
- **Legal Recognition:** Thalassaemia is recognised as a disability under the Rights of Persons with Disabilities (RPwD Act), 2016, enabling access to welfare benefits.

NCBC has advised the Union Government to exclude 35 communities from West Bengal's Central OBC List

- The National Commission for Backward Classes has advised the Union Government to exclude 35 communities—mostly Muslim—from West Bengal's Central OBC List, citing improper inclusion and lack of robust socio-economic justification.

Key Details of the Recommendation

- **Targeted Communities:** The recommendation follows a review of 37 communities added to the Central OBC list in 2014. The NCBC concluded that 35 of these, predominantly Muslim, should be removed.
- **Reasons for Exclusion:** The Commission cited improper inclusion and a **lack of robust socio-economic justification.** It argued that religion appeared to be the primary criterion for their initial inclusion rather than objective indicators of social and educational backwardness.
- **Procedural Context:** This advice was originally tendered to the **Ministry of Social Justice and Empowerment** in January 2025. The Commission noted that **West Bengal's Chief Secretary** had skipped five hearings in 2024, leading to procedural disputes.
- **Implementation Status:** Under the 102nd Constitutional Amendment, any change to the Central

OBC list **requires Parliament's approval** and a formal notification by the President. As of late December 2025, the Union Government has not yet tabled the proposal in Parliament for final action.

Broader Implications

- **Legal Background:** This move aligns with a May 2024 Calcutta High Court ruling that quashed the OBC status of 77 communities in the state for similar reasons, though that order was subsequently stayed by the Supreme Court.
- **Political Reaction:** The BJP has characterized the recommendation as a correction of "appeasement-driven distortions". The development occurs just months before the 2026 West Bengal Assembly elections.
- **Impact on Benefits:** If finalized, members of these 35 communities would lose access to Central government reservations in education, jobs, and welfare schemes.

NCBC & Its Constitutional Position

- **Established under 102nd Constitutional Amendment Act, 2018.**
- **Article 338B:** Grants constitutional status, composition, powers and duties.
- Advises the Central Government on inclusion/exclusion in the Central List of Socially and Educationally Backward Classes.
- Has powers of a Civil Court for investigation.

OBC Reservation Structure –

- **Central OBC quota:** 27% reservation in Union services and central educational institutions.
- Central OBC List is only prepared by the Union Government, not States.
- State OBC Lists are separate; States may give their own OBC reservation.
- **Article 16 :** Identification based on social and educational backwardness, not religion.
- The Supreme Court (Indra Sawhney, 1992) capped total reservations at 50%, unless exceptional grounds exist.
- The NCBC's recommendation is binding in procedure, but the Union makes the final decision.

Issues in NCBC functioning & Key Recommendations

- **Challenges Highlighted**
- Inadequate socio-economic data for classification
- Variation between State and Central OBC Lists

- Delays in verification
- Politicisation in inclusion decisions
- Limited monitoring of welfare outcomes

Suggested Reforms (Various Committees/Reports)

- Use socio-economic caste data; adopt periodic surveys to update lists.
- Create uniform criteria for backwardness assessment.
- Dedicated research units & faster grievance-processing system.
- Strengthen objective indicators; ensure decisions are data-driven, not political.
- Establish impact-assessment mechanisms and coordinate with ministries.
- The episode highlights India's larger challenge: balancing data-driven social justice with federal coordination and preventing the politicisation of caste-based inclusions.

Dowry eradication urgent constitutional, social necessity: Supreme Court

- The Supreme Court passed a slew of directions in the case of **State Of U.P. V. Ajmal Beg** to tackle dowry evil & enforce prohibition through the **Dowry Prohibition Act (DPA).**

Directions of Supreme Court

- **Appointment of Dowry Prohibition Officers (DPOs):** Provide them necessary resources and disseminate DPO contact details.
- DPOs are government officials appointed by State Governments under India's Dowry Prohibition Act, 1961.
- **Expeditious Disposal of Pending Cases**: High Courts are requested to take stock of the number of cases dealing with **Section 304-B (dowry death)** and **Section 498-A (cruelty)** of IPC for disposal.
- **Training for Officials:** Police and judicial officers should periodically receive training ensuring sensitivity toward genuine cases while identifying those that may be frivolous.
- **Other:** Running of Grassroots Awareness Programs by district administration, change in education curriculum for awareness about this evil practice etc.

Dowry in India

- **Definition:** As per the ***Dowry Prohibition Act, 1961, dowry is*** *"any property or valuable security given or agreed to be given either directly or indirectly, by one party to a marriage to the other party*

to the marriage, at or before or any time after the marriage".

- **Cases registered under dowry related crimes:** Saw a 14% increase in 2023, with more than 15,000 cases recorded across the country and over 6,100 deaths reported through the year (NCRB).

Steps taken to curb dowry

- **The Dowry Prohibition Act, 1961:** Provides for punishment of imprisonment for not less than 5 years and fine for giving/taking dowry.
- **National Commission for Women (NCW):** Reviews laws to make them more stringent and Investigates complaints of dowry harassment.
- **Bharatiya Nyaya Samhita (BNS):** Section 304-B of IPC or (Section 80 of BNS) covers Dowry death
- Protection of Women from Domestic Violence Act, 2005: Enacted to protect women from domestic violence.

Viksit Bharat Shiksha Adhishthan Bill, 2025 introduced in Lok Sabha

- The purpose of the Bill is to empower Higher Educational Institutions (HEIs) of India to achieve excellence through effective coordination and advancing NEP 2020 vision.

Key Provisions of the Bill:

- It provides for repealing **University Grants Commission (UGC) Act**, 1956, All India Council for Technical Education (AICTE) Act, 1987 and National Council for Teacher Education(NCTE) Act, 1993.
- **Constitution of Viksit Bharat Shiksha Adhishthan (VBSA):** New umbrella commission to regulate higher education in India, replacing existing bodies like the UGC, AICTE, and NCTE.
- President and Members of the Commission (**not more than 12**), other than the ex officio Members and Member Secretary of the Commission, shall be appointed by President of India.
- **Coverage:** All higher educational institutions under the purview of the Ministry of Education, UGC, AICTE, NCTE etc. will be under the purview of VBSA for determination of standards.
- **Formation of three Councils under VBSA:** Viksit Bharat Shiksha Viniyaman Parishad (Regulatory Council), Viksit Bharat Shiksha Gunvatta Parishad (Accreditation Council) and Viksit Bharat Shiksha Manak Parishad (Standards Council).

- **Council of Architecture (CoA):** Established under the Architects Act, 1972 shall function as a Professional Standard Setting Body (PSSB) as envisioned in the NEP, 2020.
- Funding: It is proposed to keep the funding to the centrally funded higher educational institutes out of the purview of the Viksit Bharat Shiksha Adhishthan.
- Significant enhancement of enforcement powers: Regulatory Council can impose penalties for violations ranging from not less than ₹10 lakh to up to ₹2 crore.

National Disaster Mitigation Fund

- The Union Government has extended the National Disaster Mitigation Fund (NDMF) to Panchayati Raj Institutions.

About National Disaster Mitigation Fund

- It was established by the Union Ministry of Home Affairs in 2021 to fund projects that prevent or reduce the long-term impact of natural disasters.
- It was mandated under **Section 47 of the Disaster Management Act (DMA), 2005** and is administered by the National Disaster Management Authority (NDMA) under the Union Ministry of Home Affairs.
- The 15th Finance Commission allocated ₹13,693 crore to the NDMF for 2021-26, marking India's first dedicated national funding window exclusively for disaster mitigation.
- Key focus areas of the NDMF include urban flooding, drought-prone states and seismic risk zones.

National Disaster Management Authority (NDMA)

- It was constituted in 2006 under the Disaster Management Act, 2005 as the apex body for disaster management in India and is chaired ex officio by the Prime Minister.
- It consists of a Vice-Chairperson and up to eight members, all appointed by the Central Government, and functions through specialised divisions.
- It approves the National Disaster Management Plan, issues binding guidelines to Centre and States, administers disaster funding like NDRF and NDMF, and oversees national preparedness measures.

Viksit Bharat–Guarantee for Rozgar and Ajeevika Mission (Gramin) Act, 2025

- President of India has granted assent to the Viksit Bharat-Guarantee for Rozgar and Ajeevika

Mission (Gramin) Act, 2025, passed in the Winter Session of Parliament.

Viksit Bharat–G RAM G Act, 2025:

- The Viksit Bharat–Guarantee for Rozgar and Ajeevika Mission (Gramin) Act, 2025 is a **revamped statutory framework** for rural employment that replaces the **Mahatma Gandhi National Rural Employment Guarantee Act, 2005.** It repositions rural employment as an integrated tool for livelihood security, asset creation, and climate resilience in line with the Viksit Bharat @2047 vision.

Aim:

- Enhance income security of rural households through expanded employment guarantee
- Transform wage employment into rural development via durable asset creation

Key features:

1. Increased guaranteed employment

- Statutory guarantee raised to not less than 125 days of unskilled manual work per rural household per financial year.
- Unemployment allowance retained if work is not provided within 15 days of demand.

2. Centrally sponsored scheme with revised funding pattern

- Implemented as a centrally sponsored scheme (CSS).
- 60:40 Centre-State sharing for most states; 90:10 for North-Eastern and Himalayan states; 100% central funding for UTs without legislatures.
- States continue to bear unemployment allowance and delay compensation.

3. Normative allocations with state responsibility for excess expenditure

- Centre will notify state-wise normative allocations annually based on prescribed parameters.
- Excess expenditure beyond allocation to be borne by states, without diluting the statutory right to work.

4. Pause during peak agricultural seasons

- States may notify an aggregated pause of up to 60 days in a year during sowing and harvesting seasons.
- Does not reduce the 125-day entitlement, ensuring labour availability for agriculture.

5. Decentralised and integrated planning framework

- Gram Sabhas and Panchayats remain the core planning authorities.
- Works to originate from Viksit Gram Panchayat Plans prepared through participatory processes.
- Plans integrated with PM Gati Shakti National Master Plan and aggregated upward for

convergence.

6. Focus on priority development domains

Works limited to four thematic areas:

- Water security
- Core rural infrastructure
- Livelihood-related infrastructure
- Climate resilience and extreme weather mitigation
- Assets mapped into a national rural infrastructure stack to prevent duplication.

7. Strengthened implementation and monitoring

- Retains central and state councils; composition to be notified through Rules.
- Establishes a National Level Steering Committee and State Steering Committees for oversight, convergence, and plan aggregation.

8. Technology-driven transparency with social accountability

- Use of biometric authentication, geo-tagging, real-time dashboards, and weekly public disclosure.
- Social audits by Gram Sabhas strengthened to ensure inclusion and accountability.

Marital Rape Law Reform

- The debate on criminalising marital rape has resurfaced after the introduction of a **Private Member's Bill** seeking the removal of the marital rape exception under **Section 63 of the BNS (2023).**
- According to the **National Family Health Survey (NFHS-5),** around 30% of married women have experienced spousal violence, yet marital rape is still legally exempt.

Legal Status of Marital Rape in India

- **Current position:** Non-consensual sexual intercourse by a husband with his adult wife is not treated as rape under Indian criminal law due to an explicit statutory exception.
- **Statutory source:** The exception of marital rape earlier in **Section 375 of the Indian Penal Code (IPC)** has been retained in Section 63, BNS, 2023, except when the wife is below 18 years of age.
- **Related remedies:** Married women may seek relief under the **Protection of Women from Domestic Violence Act, 2005,** but this is civil protection, not criminal accountability for rape.

Why the Marital Rape Exception is a Colonial Relic?

- **Colonial Patriarchal Logic:** Rooted in British common law, which treated wives as the property of husbands, presuming permanent sexual consent after marriage **(Doctrine of Coverture).**
- **Doctrine of Implied Consent:** Based on the outdated idea that marriage constitutes irrevocable consent, now rejected in modern constitutional democracies.
- **Incompatible With Constitution:** Contradicts Article 14 (equality) and Article 21 (life, dignity, bodily autonomy) as interpreted by the Supreme Court.
- **Rejected Elsewhere**: The United Kingdom itself abolished the marital rape exception in 1991, exposing the anachronistic nature of India's retention.
- **Ignored Expert Advice: The Justice Verma Committee (2013)** categorically recommended removal of the exception, calling it legally indefensible.

India's First National Counter-Terrorism Policy

- The Union Home Ministry is set to introduce **India's first** National Counter Terrorism Policy and Strategy.

Key Pillars of the New Counter-terrorism Policy

- **Unified SOP:** Establishes a common Standard Operating Procedure for all Indian states to ensure uniform responses to terror incidents.
- **Online Radicalisation:** Prioritises countering digital radicalisation occurring via social media platforms and encrypted messaging applications.
- **Border Misuse:** Addresses exploitation of the open Nepal border, where terrorists enter Nepal on foreign passports and infiltrate India via UP-Bihar border routes.
- **Data Integration:** Expands use of the National Intelligence Grid (NATGRID) to enable shared database access for early threat detection.
- **Terror Financing:** Targets terror funding through foreign-funded conversion networks, Aadhaar spoofing, and narcotics-based finance channels.
- **Information Sharing:** Shifts law enforcement culture from a "need-to-know model" toward a "duty-to-share approach".

Need for a New Counter-Terrorism Policy

- **Jurisdictional Gap:** Despite NIA's federal mandate, immediate jurisdiction rests with local police, causing coordination delays in the initial 'Golden Hours' after terror attacks.

- UAPA cases handled by state police show 20-30% convictions, compared to 95% under NIA.
- **Border Exploitation:** Weak border management allows terror networks to infiltrate India via open borders like Nepal.
- Following the Pahlgam attack, 35 infiltrators attempted entry through the Indo-Nepal border.
- **Technological Asymmetry:** Rising terrorist use of drones and cryptocurrency outpaces the technical capacity of most police stations. In 2025, micro-payload drone drops increased by 30%.
- **Digital Radicalisation:** Self-radicalisation via encrypted apps bypasses conventional intelligence collection and surveillance systems.
- Global Terrorism Index 2025 reports 93% of fatal attacks in Western countries involve lone-wolf actors.

India's Current Counter-Terrorism Framework

1. *Legislative Framework*

- **Unlawful Activities (Prevention) Act 1967:** Allows designation of persons and organisations as terrorists, with asset seizure and up to 180 days' detention without charge sheet.
- **National Investigation Agency Act 2008:** Gives the National Investigation Agency nationwide jurisdiction to investigate terror offences without state permission.
- **National Security Act 1980:** Permits preventive detention of persons for acts prejudicial to national security and public order.
- **Bharatiya Nyaya Sanhita 2024:** Defines "terrorist act" under Section 113, bridging the gap between local police action and NIA investigations.

2. *Institutional Architecture*

- **National Investigation Agency:** Serves as the primary federal agency for terror prosecution, with nearly 95% conviction in UAPA cases.
- **National Intelligence Grid (NATGRID):** Links 21 databases, including banking and travel records, to detect suspicious patterns and trace terror financing.
- **Specialised Units:** National Security Guard (NSG) and state Anti-Terrorism Squads (ATS) serve as primary strike forces for urban terror incidents and hostage rescue.
- **National Security Council Secretariat:** Headed by the National Security Adviser (NSA), it coordinates inter-agency responses and integrates defence, intelligence, and diplomacy.

3. *Strategic Doctrine*

- **Decisive Retaliation:** Treats any terror attack as an act of war, allowing India to choose timing,

scale, and nature of response.

- **Sponsor Liability:** Removes distinction between terrorists and sponsoring states, holding both equally accountable for terror actions.
- **Punitive Deterrence:** Shifts from 'deterrence by denial' to 'deterrence by punishment', inflicting unacceptable damage to deter future attacks.
- **Net Security**: Frames counter-terror actions as defence of global norms rather than bilateral disputes.

PESA Mahotsav 2025

- PESA Mahotsav (23–24 Dec 2025) was held in Visakhapatnam, marking the **anniversary of the Panchayats (Extension to Scheduled Areas) Act, 1996.**

About PESA Act

- **Origin:** Enacted in 1996 following the **Bhuria Committee (1995)**, which recommended **tribal self-rule** to correct the historical exclusion of Scheduled Areas from mainstream decentralisation.
- **Constitutional Gap:** PESA was designed to cover Fifth Schedule Areas left outside the 73rd Constitutional Amendment (Part IX of the Constitution), ensuring self-governance.
- **State Legislature Role:** State legislatures are expected to play a facilitative and advisory role.
- **Institutional Responsibility:** Ministry of Panchayati Raj (MoPR) acts as the nodal ministry.
- **Spatial Reach:** Operates across **10 Fifth Schedule states**, spanning ~77,500 villages and ~22,000 Panchayats, giving PESA national-scale relevance.

Significance of the PESA Act

- **Demographic Empowerment:** Covers 8.6% of India's population belonging to Scheduled Tribes, addressing governance in some of the most marginalised regions.
- **Gram Sabha Supremacy:** Gram Sabha is the core institution of self-governance in Scheduled Areas, with authority over social, economic and cultural matters affecting the community.
- **Land Protection:** Mandatory consultation and consent of Gram Sabha before land acquisition, resettlement or rehabilitation in Scheduled Areas, preventing arbitrary land alienation.
- **Forest Rights Control:** Gram Sabhas have ownership and management rights over minor forest produce, strengthening livelihood security for tribal households.
- **Mining Regulation:** Recommendation of Gram Sabha is required for granting leases for minor

minerals.

- **Customary Law Recognition:** Traditional customs, dispute resolution mechanisms and cultural practices of tribal communities are legally recognised and protected.
- **Social Regulation:** Gram Sabhas are empowered to prevent intoxicant abuse and regulate money-lending practices to protect vulnerable households.

Key Issues in PESA Implementation

- **Uneven Rule Adoption: Only 8** out of 10 Fifth Schedule states have **notified PESA Rules,** creating legal uncertainty in Odisha and Jharkhand.
- **Diluted Authority:** In the **Hasdeo Arand coal blocks (Chhattisgarh),** forest and mining clearances proceeded despite multiple Gram Sabha resolutions opposing mining.
- **Capacity Constraints:** During MoPR-led assessments, it was found that over 40% of elected representatives in PESA Panchayats were unable to explain the concept of Gram Sabha clearly.
- **Monitoring Gaps:** Absence of a unified monitoring framework across ~63 Fifth Schedule districts weakens accountability and enforcement.
- **Administrative Resistance:** In the **Polavaram** irrigation project (Andhra Pradesh), displacement continued under sectoral project laws even as PESA-mandated Gram Sabha consent was contested.

Government Initiatives for PESA Act Implementation

- **Dedicated PESA Cell:** Established in MoPR for focused coordination, monitoring and inter-state support.
- **Capacity Building:** Two rounds of master-trainer programmes trained 1 lakh+ representatives.
- **Digital Enablement:** PESA–Gram Panchayat Development Plan Portal for fund tracking.
- **Language Access:** Translation of PESA manuals into tribal languages to improve comprehension.
- **Academic Support:** Centres of Excellence set up in universities to document customs and best practices.
- **Knowledge Sharing:** Publication of 40 PESA success stories to enable cross-state learning.

Way Forward

- **Law Convergence:** Integrate PESA with the **Forest Rights Act (2006)** and **Land Acquisition Act (2013)** so Gram Sabha consent becomes a single, binding clearance.
- **Clear Role Allocation:** Clearly demarcate responsibilities between MoPR and Ministry of Tribal Affairs; E.g., MoPR to handle governance processes, MoTA to safeguard land, forest and livelihood rights.

- **Uniform Rule Design:** Develop model PESA Rules for adoption by all states; E.g., central templates with limited state flexibility to prevent dilution.
- **Continuous Capacity Support:** Shift from one-time training to ongoing handholding; E.g., community paralegal and barefoot governance facilitator pilots.
- **Incentive Alignment:** Link effective PESA compliance to funding incentives; E.g., higher untied grants for Panchayats demonstrating strong Gram Sabha-led governance.

Comprehensive Guidelines on Building Road Tunnels

The Ministry of Road Transport and Highways (MoRTH) released guidelines for building road tunnels to prevent and mitigate tunnel collapse risks.

Key Provisions of the Guideline

- **Risk Ownership:** Contracts must assign every identified project risk to the party best equipped to manage it.
- **Stakeholder Coordination:** Planning requires early consultation with Forest, PWD, Railways, and Disaster Management departments.
- **DPR Mandate:** Every Detailed Project Report (DPR) includes a Geotechnical Baseline Report (GBR) and a live Risk Register.
- **Geotechnical Baseline Report:** Contractual reference for expected ground conditions.
- **Risk Register:** Lists identified hazards with site-specific mitigation measures.
- **Portal Siting:** Alignment planning must use the Landslide Susceptibility Maps by the GSI to avoid portals in unstable zones.
- **Rescue Pipe:** High-risk collapse zones require installation of a 0.9-metre NP-4 escape pipe in the tunnel invert (floor).
- **Rescue Staging:** One mobile rescue container for 12 workers must be placed 150-300 metres behind the tunnel face (active excavation point).
- **Survival Support:** Rescue containers will provide at least 24 hours of oxygen, water, and communication facilities.
- **ERP Discipline:** Emergency Response Plans undergo weekly updates and **bi-weekly verification** by an authorised safety officer.
- **Evacuation Gaps:** Pedestrian cross-passages are provided at 300-metre intervals for emergency escape.
- **Early Oversight:** Tunnels above 1.5 kilometres require intimation to the Ministry of Road

Transport and Highways (MoRTH) Tunnel Zone.

- **Quality Assurance:** An independent expert panel will review the DPR and construction methodology before execution.

Road Tunnels Landscape in India

- **Completed Works:** 42 road tunnels covering 60.37 km have been completed across 27 National Highway (NH) projects.
- **Ongoing Projects:** 57 tunnels spanning 93.96 km are under construction across **37 NH projects**.
- **Network Target:** India aims to develop an aggregate road tunnel network of 331 km by 2026-27.
- **Construction Methods:** Over 80% of Himalayan tunnels use **NATM (New Austrian Tunnelling Method)**, while urban coastal projects rely mainly on TBMs (Tunnel Boring Machines).

Important Road Tunnels in India

- **Dr. Syama Prasad Mookerjee Tunnel:** India's longest operational road tunnel (9.28 km) on NH-44 between Chenani and Nashri in Jammu and Kashmir.
- **Atal Tunnel:** World's longest (9.02 km) highway tunnel above 10,000 ft beneath Rohtang Pass at the Eastern Pir Panjal range in Himachal Pradesh.
- **Sela Tunnel:** World's longest (2.5 km) twin-lane tunnel above 13,000 ft, connecting Tezpur in Assam with Tawang in Arunachal Pradesh below Sela Pass.

Under-Construction Important Road Tunnels

- **Zojila Tunnel:** Asia's longest (13.1 km) bi-directional road tunnel will connect Sonamarg in Jammu and Kashmir with Drass in Ladakh.
- **Shinku La Tunnel:** World's highest tunnel (4.1 km) at 15,800 ft between Lahaul in Himachal Pradesh and Zanskar in Ladakh.
- **Brahmaputra Underwater Tunnel:** India's first proposed road-cum-rail underwater tunnel, 32 m below the Brahmaputra riverbed in Assam.

Digital Residue Reshaping Policing in India

- Indian policing is increasingly relying on digital residue, shifting from traditional investigative

methods based on physical evidence.

- **Digital Residue** is the electronic trail generated by everyday actions such as online payments, authentication systems, and digital platform use.

Digital Residue as Evidence

- **Device Attribution:** One-time passwords (OTPs) and shopping logs link transactions to verified mobile numbers and specific device identifiers.
- **Spatial Reconstruction:** FASTag toll alerts combined with delivery logs reconstruct inter-state movement despite discarded primary phones.
- **Intent Proof:** Search histories, AI chatbot queries, and deleted cloud backups can reveal premeditation.
- **Temporal Proof:** In bank or Tax fraud, OTP timestamps establish device activity at a specific time.

Legal Basis and Frameworks in India

- **BSA, 2023:** Bharatiya Sakshya Adhiniyam recognises electronic records as primary evidence, enabling server logs and location data in trials.
- **BHARATPOL:** Launched in early 2025, this centralised digital intelligence system by the CBI uses Big Data Analytics and AI for real-time threat analysis and fugitive tracking.
- **TIUE Norms:** Apps using mobile numbers for account creation are classified as Telecommunication Identifier User Entities, mandating strict SIM-user binding.
- **Procedural Safeguards:** Bharatiya Nagrik Suraksha Sanhita (BNSS) and Digital Personal Data Protection (DPDP) Rules, 2025, balance data privacy with lawful access to digital evidence.

Unrest in Assam's Karbi Anglong

- The Karbi Anglong and West Karbi Anglong districts of Assam witnessed escalating civil unrest, causing civilian deaths and internet shutdowns.
- Current instability began with a hunger strike by indigenous tribal activists demanding eviction of long-settled non-tribal communities.
- Protesters argue the **Sixth Schedule** vests land rights with indigenous tribes, barring non-tribal settlement in protected grazing lands.

About Karbi Anglong

- Karbi Anglong is the largest district of Assam, forming part of the **Karbi Plateau**, an extension of the Indian Peninsular Block.
- It is divided into East Karbi Anglong (headquartered in Diphu) and West Karbi Anglong (headquartered in Hamren); the **Kopili River** and parts of Nagaon district separate the two districts.
- The region is governed by the **Karbi Anglong Autonomous Council (KAAC)** under the Sixth Schedule.
- *Tribal Composition:* Karbis, historically called **Mikirs,** form the largest indigenous community; other STs include**Dimasas, Bodos, Kukis, Hmars, Tiwas, Garos, Tai groups, and Rengma Nagas.**
- **Non-Tribal Groups:** Include Gorkhas, Bengalis, and Hindi-speaking communities.
- **Peace Accord:** Karbi Anglong Peace Accord, 2021, a tripartite agreement between the Centre, Assam Government, and five insurgent groups, was signed to end decades of insurgency.
- It promised enhanced legislative, executive, and administrative powers to the KAAC while keeping it within the framework of the Sixth Schedule.
- **Major Demand:** There has been a long-standing demand to implement **Article 244(A),** which allows for the creation of an "Autonomous State" within Assam for certain tribal areas.

Government Links NATGRID to National Population Register

- The Union Home Ministry has linked the **National Intelligence Grid (NATGRID)** to the National Population Register (NPR).

More About the News

- Union Home Ministry has linked NATGRID with the NPR, enabling authorised agencies to access family-wise and identity-linked data of nearly 119 crore residents through a secure system.
- The integration allows investigators to trace relationships, household details and identity linkages, strengthening probes into terrorism, organised crime and interstate criminal networks.
- Advanced tools like **"Gandiva"** enable entity resolution and facial recognition, matching suspects across telecom KYC, driving licences, vehicle registrations & travel records, reducing investigation time.
- Requests are classified as non-sensitive, sensitive and highly sensitive (including financial and banking data), with purpose-bound access, logging and senior-level oversight to ensure

accountability.

About NATGRID

- It is an integrated digital intelligence platform under the Union Home Ministry (MHA) linking multiple government and private databases to enable easy access for authorised investigation agencies.
- It was conceptualised in 2009 after the 26/11 Mumbai terror attacks (2008) to fix gaps in inter-agency intelligence sharing, and it became operational in 2020.
- It operates on a query-based access model, where authorised agencies submit targeted searches (no bulk data download), with technical safeguards under MHA oversight.
- The central investigation agencies are core authorised users of NATGRID with full access, while the State Police forces have case-specific access approved by the MHA.

About National Population Register (NPR)

- It is a register of usual residents of India (including foreigners), prepared under the Citizenship Act, 1955 and **Citizenship Rules, 2003.**
- A usual resident for NPR is a person who has resided in a place for six months or more and intends to reside there for another six months or more.
- It was first prepared in 2010 through house-to-house enumeration of the 2011 Census, and was later updated in 2015.
- According to Citizenship Rules 2003, NPR is the first step towards compiling a National Registry of Citizens (NRC).

Significance for Internal Security

- **Integrated Intelligence:** NATGRID-NPR linkage enables real-time convergence of verified identity with 21+ databases, improving detection of terror and organised crime.
- **Terror Financing Control:** Strengthens tracking of hawala, benami assets and crypto-based funding through identity-financial data correlation (Source: FATF MER India 2024).
- **Centre–State Coordination:** Reduces intelligence silos and enables intelligence-led policing in Left-Wing Extremism (LWE), narcotics and interstate crimes.

Way Forward

- **Legal Backing:** Enact a dedicated NATGRID law defining access, oversight and penalties, aligning with the **Digital Personal Data Protection Act (DPDPA), 2023**, to reduce legal ambiguity.

- **State Integration:** Expand case-specific access to State Police through Standard Operating Procedures (SOPs) and training, building on MHA's push for intelligence-led policing.
- **Privacy Safeguard:** Anchor NATGRID–NPR use to the **Right to Privacy (Puttaswamy Judgement)** via statutory limits, audits, and purpose-bound access under the DPDPA, 2023.
- **Tech Upgrades:** Scale advanced analytics and entity-resolution tools to improve cross-database matching, cutting investigation time and improving conviction quality.

Governance Foundations for the Agentic AI Age

- The rapid rise of agentic AI systems has necessitated a fundamental shift in their governance, accountability, and risk management.

About Agentic AI

- Agentic AI refers to autonomous, goal-directed systems capable of planning, reasoning, and executing multi-step tasks independently with minimal human oversight.
- It operates on a continuous cycle of observe (gathering data), plan (reasoning via LLMs), act (executing via tools), and reflect (learning from outcomes).
- **Governance Challenge:** Agentic AI requires supervision of intent and behaviour to prevent autonomous drift, where AI actions diverge from human intent.

Agentic AI Governance Frameworks

- **Traceability & Liability:** Design integrated guardrails like immutable event logging linked to Agent IDs to ensure end-to-end auditability and legal accountability.
- **Data Controls:** Least-privilege access and strict data-currency rules to prevent misuse and decisions based on obsolete information.
- **Intent Oversight:** Fast real-time monitoring of agent intent to evaluate internal decision logic rather than outputs to maintain alignment with human objectives.
- **Context Awareness:** Qualitative factors recognition, like socio-economic and cultural nuance within the agent for financial decision-making.
- **Unified Accountability:** Clear responsibility distribution across people, processes, and technology to eliminate blame gaps during failures.
- **Bias Safeguards:** Mechanisms to prevent reward hacking (unethical shortcuts to meet a goal) and bias amplification across multi-step autonomous loops.

- **Human-in-the-Loop:** Mandatory non-negotiable human approval thresholds for high-stakes decisions involving rights, safety, or major financial outlays.
- **Risk-Based Regulation:** A tiered regulatory approach where low-risk agents follow voluntary frameworks and high-risk systems comply with binding laws (EU AI Act).
- **Institutional Stewardship:** Conversion of broad ethical principles into precise, enforceable technical benchmarks by National AI Safety Institutes.

Existing AI Governance Frameworks

- **EU AI Act:** Categorises AI systems by risk, mandating transparent identification and effective human oversight for high-risk autonomous systems.
- **India's Guidelines:** Anchored in the 'Seven Sutras', the AI Governance Guidelines (2025) promote a techno-legal model where trust is engineered into system architecture.
- **NIST RMF:** The AI Risk Management Framework serves as a widely adopted voluntary standard for identifying and mitigating algorithmic bias and system failures.
- **CLEAR Standard:** Provides a specialised evaluation framework assessing agent performance across Cost, Latency, Efficacy, Assurance, and Reliability.

Indian Pharmacopoeia Commission (IPC)

- The Union Health Minister reviewed the progress of the Indian Pharmacopoeia Commission (IPC) and announced that the 10th edition of the **Indian Pharmacopoeia (IP) 2026** will be launched in January 2026.

Indian Pharmacopoeia Commission (IPC):

- The Indian Pharmacopoeia Commission (IPC) is an **autonomous national body** responsible for publishing the Indian Pharmacopoeia, the official book of standards for drugs in India, ensuring their identity, purity, strength, quality, and safety under **the Drugs and Cosmetics Act, 1940.**
- **Established in:**
- Operational since 1 January 2009
- Constituted as an autonomous institution fully funded by the Government of India
- Under the administrative control of the Ministry of Health and Family Welfare (MoHFW)
- Headquarters: Ghaziabad, Uttar Pradesh

Aim:

- To promote public and animal health by setting authoritative, scientifically robust drug standards
- To support Atmanirbhar Bharat and Viksit Bharat through self-reliant pharmaceutical regulation and global harmonisation

Key functions

- **Publication and revision of Indian Pharmacopoeia:** Regular revision of drug monographs covering APIs, excipients, dosage forms, medical devices, and herbal drugs.
- **National Formulary of India (NFI):** Publishes NFI to guide rational prescribing practices for healthcare professionals.
- **Pharmacovigilance Programme of India (PvPI):** Acts as the National Coordination Centre, monitoring adverse drug reactions to ensure patient safety.
- **IP Reference Substances:** Preparation, certification, and distribution of IP Reference Standards for quality testing.
- **Global harmonisation:** Collaborates with international pharmacopoeias such as USP, BP, Ph. Eur., JP, ChP, and WHO-IP.
- **Capacity building & training:** Conducts training, research, and awareness programmes on pharmacopoeial and regulatory standards.

Significance

- Ensures uniform quality, safety, and efficacy of medicines across India.
- Recognition of IP in 19 countries strengthens India's regulatory standing.
- Supports India's leadership in global pharmaceutical supply chains.

White Paper on Democratising AI Infrastructure

- The Office of the Principal Scientific Adviser (PSA) released a white paper titled "Democratising Access to AI Infrastructure" to guide inclusive AI growth.
- It highlights the need for affordable access to foundational AI resources to prevent the concentration of power among a few global firms and urban centres.

Key Highlights of the White Paper

- **Access Equity:** Treating AI infrastructure as a **Digital Public Good (DPG)** to lower entry barriers

for startups, researchers, and universities.

- The **IndiaAI Mission** has established a national GPU pool accessible through the IndiaAI Compute Portal, offering over 38,000 GPUs at subsidised rates.
- **Capacity Building:** Expanding AI data centres to bridge the existing capacity gap; India generates nearly 20% of global data but hosts only about 3% of data-centre capacity.
- **Inclusive Innovation:** Integrating AI with Digital Public Infrastructure (DPI), such as Aadhaar and UPI.
- Platforms such as **IndiaAIKosh** can act as shared repositories for datasets and tools, aiding the development of inclusive AI solutions like **Bhashini.**
- **Energy Sustainability:** Integrating new data centres with green energy grids, as expanding data centres could consume nearly 3% of India's electricity by 2030.
- **Urban De-concentration:** Reducing concentration in metro cities by incentivising AI data centres through Public–Private Partnerships (PPP) in Tier-2 and Tier-3 cities.

National Technology Readiness Assessment Framework (NTRAF)

- The Principal Scientific Adviser to the Government of India has unveiled the **National Technology Readiness Assessment Framework (NTRAF)** to create a uniform, evidence-based system for assessing technology maturity across India's R&D ecosystem.

National Technology Readiness Assessment Framework (NTRAF)

- The National Technology Readiness Assessment Framework (NTRAF) is a standardised, objective framework to assess the maturity of technologies from early laboratory research to full commercial deployment using 9 Technology Readiness Levels (TRLs).

Ministry / Department:

- Office of the Principal Scientific Adviser (OPSA) to the Government of India
- Developed in collaboration with the Confederation of Indian Industry (CII)

Aim:

- Establish a common language between researchers, investors and policymakers
- Enable evidence-based funding decisions under national R&D and mission-mode programmes
- Reduce the "Valley of Death" between TRL 4 and TRL 7 by de-risking promising deep-tech innovations

Key features:

- TRL-based assessment: Covers the full innovation cycle from Proof of Concept (TRL 1–3) to Prototype Development (TRL 4–6) and Operational Deployment (TRL 7–9).
- Objectivity over subjectivity: Uses structured, measurable checklists instead of narrative claims of readiness.
- Global best practices, Indian context: Adapted from international models (e.g., NASA TRLs) and customised for India's research and industrial ecosystem.
- Sector-specific annexures: Tailored assessment pathways for domains such as Healthcare & Pharmaceuticals and Software, recognising sectoral differences.
- Self-assessment tool: Enables researchers and startups to identify technical gaps before applying for funding.

Significance:

- Improves efficiency of public R&D spending by aligning funding with actual technology maturity.
- Boosts private sector confidence by providing validated, investment-ready readiness benchmarks.

Annual Groundwater Quality Report 2025 released by Central Ground Water Board (CGWB)

- **71.7% of India"s groundwater** meets **BIS standards** but 28.3% of samples exceed limits for one or more parameters,
- **Nitrate Contamination:** Nitrate is most widespread pollutant nationally, with approximately 20% samples exceeding WHO and **BIS limits(45 mg/L)** ,followed by fluoride and salinity
- It is largely attributed to anthropogenic sources, e.g. fertilizer use and sewage and animal waste seeping in groundwater.
- **Uranium contamination**: Samples with uranium levels above the safe limit of **30 ppb** were found at 6.71% during the Pre-Monsoon and 7.91% during post-monsoon.
- Punjab recorded highest contamination, followed by Haryana and Delhi
- **Salinity:** Salinity (Electrical Conductivity,) is a critical issue in arid and semi-arid regions like Rajasthan and Delhi, exceeding limits in 7.23% of samples.,
- **Fluoride** - 8.05% of nationwide samples exceeded limit however it was predominantly geogenic (naturally occurring). Rajasthan showed highest contamination
- **Lead** - Delhi recorded highest contamination. It can impair cognitive development , increases blood pressure, affect kidney and is classified as probable carcinogen
- **Irrigation Suitability:** The groundwater quality is largely suitable for irrigation purposes. The majority of samples, 94.30%, fall into the "excellent category".

- Other Trace Metal and Geogenic Contaminations: **Arsenic (especially in Ganga and Brahamaputra basin), Manganese (e.g., Assam, Karnataka, Odisha, Uttar Pradesh, and West Bengal) etc.**
- **CGWB (Faridabad, Haryana)**
- Origin: Established in **1970** by renaming the **Exploratory Tube wells Organization**
- **Ministry: Under Ministry of Jal Shakti**
- Role: Management, exploration, monitoring, regulation etc of ground water resources of the country
- It is also discharging the functions as **Central Ground Water Authority (CGWA)** established under **Environment Protection Act, 1986.**

INTERNATIONAL RELATIONS AND SECURITY

Hansa-3 (NG) Trainer Aircraft

- Union Minister for Science and Technology unveiled the Hansa-3 (NG) aircraft at the CSIR – National Aerospace Laboratories (CSIR–NAL) in Bengaluru.
- He also inaugurated the **SARAS Mk II Iron Bird Test Facility**, the High-Altitude Platform (HAP) Airframe Fabrication Facility, and the **NaviMet** aviation weather system.
- **CSIR–NAL:** It is India's only civilian aerospace R&D laboratory under the Council of Scientific & Industrial Research (CSIR), Ministry of Science and Technology. It is based in Bengaluru.
- **SARAS Mk II:** India's first indigenous multipurpose Light Transport Aircraft (LTA), currently under development. It is designed as a cost-effective aircraft to enhance regional air connectivity under the UDAN scheme.
- **HAPs:** They are solar-powered Unmanned Aerial Vehicles (UAVs) designed to operate in the stratosphere (above 20 km altitude) for extended durations.

Hansa-3 (NG)

- Hansa-3 (Next Generation) is India's first fully indigenous, two-seater, all-composite trainer aircraft developed by CSIR–NAL.
- It addresses India's increasing pilot-training needs and reduces reliance on imported trainer platforms.
- **Engine:** It is powered by the **Rotax 912 iSc3 Sport engine** (fuel-efficient), equipped with an

advanced electronic fuel-injection system.

- **Design:** Its lightweight composite airframe and bubble canopy provide wide panoramic visibility and excellent resistance to corrosion.
- **Cost Advantage:** The platform is nearly 50% cheaper than the currently imported trainer aircraft.

50th anniversary of the Biological Weapons Convention

- India hosted the international conference **"50 Years of BWC: Strengthening Biosecurity for the Global South"** in New Delhi to mark the 50th anniversary of the Biological Weapons Convention's entry into force.
- **Biological Weapons Convention:**
- The Biological Weapons Convention (BWC) is the **world's first multilateral disarmament treaty** banning an entire category of weapons of mass destruction.
- It prohibits the development, production, stockpiling, acquisition, transfer and use of biological and toxin weapons.

Established-

- Opened for signature: **10 April 1972** (London, Moscow, Washington)
- Entered into force: **26 March 1975**
- India is a **founding State Party** and one of the **189 signatories** committed to full compliance.

Key Features of the Biological Weapons Convention

- **Core Prohibitions (Articles I–III):**
- No development, stockpiling, or use of biological and toxin weapons.
- Obligation to destroy existing stockpiles.
- **Review Conferences:** Held roughly every five years to update norms, address technological advances and strengthen global governance.
- **International Cooperation (Article X):** Promotes peaceful use of biological science, especially capacity building for developing countries.
- **Global Norm Against Bioweapons:** Today no state openly acknowledges possessing or seeking biological weapons, reflecting strong normative acceptance.
- Political, Not Legal, Enforcement Mechanisms: Complaints mechanism exists (Article VI) but rarely used.

Issues within the Biological Weapons Convention (BWC)

- **No Verification:** BWC has no independent compliance system to inspect laboratories or monitor threats.
- **No Technical Body:** Lacks a permanent scientific institution to track emerging bio-risks.
- **No Reporting Norms:** Countries are not required to submit transparent research logs or lab inventories.
- **Limited Enforcement:** Violations are hard to investigate; only 19% of member states submit confidence-building reports regularly**.**

India's Measures to Strengthen BWC Compliance

- **National Biosecurity Rules, 1989:** Regulates the manufacture, use, import, export and storage of hazardous microorganisms and genetically engineered organisms to safeguard the environment.
- **WMD Prohibition Act, 2005:** Criminalises illegal manufacture, transport, financing and transfer of weapons of mass destruction and their delivery systems.
- **SCOMET Export Controls:** India's national export control list for dual-use items; **Category-2** specifically monitors microorganisms, toxins and high-risk biological agents.
- **India–France Support Database**: Proposal to create an assistance-tracking database under BWC Article VII, enabling rapid support to States affected by biological incidents.
- **Training & Diplomacy:** Annual ITEC capacity-building programmes on **UNSC 1540** and strategic trade controls to enhance global non-proliferation cooperation.

Significance:

- The BWC remains the primary global bulwark against biological weapons.
- Rapid advances in AI, synthetic biology, gene editing, gain-of-function research pose new risks requiring updated oversight.
- The Global South faces greater vulnerabilities—weak infrastructure, disease burden, limited biosafety systems—making BWC reforms crucial.

India Re-Elected to UNESCO Executive Board for 2025–29

- India has been re-elected to the UNESCO Executive Board for the 2025–29 term, reaffirming global

confidence in its leadership in multilateral governance.

What the UNESCO Executive Board Is?

- The Executive Board is one of **UNESCO's three constitutional organs** responsible for **supervising programme implementation** and providing strategic direction to the organisation.
- **Established :** UNESCO was created in **1945**, and the Executive Board became its core governing body soon after the Constitution came into force in 1946.
- **Headquarters:** UNESCO and its Executive Board operate from **Paris, France.**

Composition and Membership

- The Board consists of **58 Member States** each elected for a **four-year term** by the General Conference.
- Members are selected through regional electoral groups to ensure equitable representation.

Mandate and Functions

- Examines UNESCO's programme of work and the corresponding budget submitted by the Director-General.
- Prepares and submits recommendations for the agenda of the General Conference.
- Makes recommendations regarding admission of new Member States.
- Advises on the appointment of the Director-General.
- Supervises execution of programmes adopted by the General Conference.
- Convenes international conferences related to education, science, culture and knowledge dissemination.

Significance of India's Re-Election:

- Reinforces India's global standing as a champion of inclusive, human-centric development.
- Enables India to shape UNESCO priorities in areas such as education reform, digital inclusion, cultural heritage protection, climate-science cooperation and media literacy.

DRDO Rocket-Sled Test

- The Defence Research and Development Organisation (DRDO) has successfully carried out a high-

speed rocket-sled test of a fighter aircraft escape system.

- A rocket-sled test is a dynamic testing method that uses a rocket-propelled sled on a precisely aligned track to simulate real flight or impact conditions in a controlled environment.
- **Objective:** Assess the performance and reliability of a fighter aircraft escape system for aircrew recovery.
- **Mechanism:** The test employed a Light Combat Aircraft (LCA), accelerated to a precisely controlled velocity by solid propellant rocket motors.
- **Location:** It was conducted at the Rail Track Rocket Sled (RTRS) facility of the Terminal Ballistics Research Laboratory (TBRL) in Chandigarh.
- **Collaboration:** The test was carried out in partnership with Aeronautical Development Agency (ADA) and Hindustan Aeronautics Limited (HAL).
- **Significance:** It is a significant milestone for India's indigenous defence capability, positioning India among an "elite club of nations" with in-house escape-system testing expertise.

Exercise EKUVERIN

- The 14th edition of the annual India-Maldives bilateral military exercise EKUVERIN is set to take place in Kerala from Dec 2nd to 15th.

EKUVERIN

- Exercise EKUVERIN (meaning 'Friends' in the **Dhivehi language**) is the annual bilateral military exercise between India and the Maldives, initiated in 2009.
- Conducted alternately in India & Maldives; 14th edition (2025) is being held in Thiruvananthapuram, Kerala, between the Indian Army and the Maldives National Defence Force.
- It focuses on enhancing interoperability for counter-insurgency and counter-terrorism operations across semi-urban, jungle and coastal terrain, with increasing integration of niche technologies.
- India also participates in Exercise Ekatha – an annual joint naval exercise with the Maldives and **Exercise Dosti** – a trilateral maritime exercise between the coast guards of India, the Maldives and Sri Lanka.

A new naval detachment on Bitra Island

- India is set to increase military presence in Lakshadweep, with a new naval detachment on Bitra Island becoming fully operational next year, alongside expanding Air Force facilities on **Agatti** and Minicoy.

Bitra Island

- Bitra is the smallest inhabited island of Lakshadweep, forming part of the Amindivi subgroup. It is a tiny coral atoll known for its ecological fragility, lagoon system, and cultural significance.

Location:

- Situated in the Arabian Sea, 483 km west of Kochi.
- Lies north of **Perumal Par** and southeast of **Byramgore Reef** within the Lakshadweep archipelago.

Formation:

- Bitra is a coral atoll, formed from the upward growth of coral reefs on submerged volcanic bases.
- Over time, biological accretion and reef-building created a ring-shaped lagoon system, with small

sandy islands emerging on the reef surface.

Geological Features:

- **Two islands:** Main Bitra Island (≈0.177 sq km) + a small southern cay (≈0.009 sq km).
- **Lagoon area:** 45–54 sq km, protected by a surrounding coral reef.
- Reef barrier ensures calm lagoon waters even during monsoon storms.

Significance

- **Strategic:** Now hosts a new Indian naval detachment, boosting surveillance across critical shipping lanes near the Arabian Sea.
- **Cultural:** Home to the shrine of Malik Mulla, an Arab saint, making it a pilgrimage site for islanders.
- **Ecological:** Historically a major seabird breeding ground; part of Lakshadweep's fragile coral ecosystem.
- **Human history:** Permanently settled only in 1945, making it one of India's newest inhabited regions.

INS Aridaman

- India is set to commission INS Aridaman, its third indigenous **nuclear-powered ballistic missile submarine (SSBN),** with Navy Chief Admiral Dinesh K.

INS Aridaman:

- INS Aridaman is India's **third indigenously built SSBN**, part of the Arihant-class nuclear submarines under the Strategic Forces Command, designed to provide assured retaliatory capability under **India's no-first-use nuclear doctrine.**
- **Built By:** Constructed under the **Advanced Technology Vessel (ATV)**
- Project, led by:
- Ship Building Centre, Visakhapatnam
- It integrates over 90% indigenous components, including its nuclear reactor.
- History of India's Nuclear Submarine Programme:
- Initiated under the ATV programme in the late 1980s to achieve a credible underwater nuclear deterrent.

- **INS Arihant** (launched 2009, commissioned 2016) made India the 6th nation with operational SSBN capability.
- **INS Arighat** followed in 2024.
- **INS Aridaman** will be the third operational SSBN, marking the first time India will have a minimum rotation fleet for continuous at-sea deterrence.

Key Features of INS Aridaman:

- Displacement: ~6,000 tonnes (surface), ~7,000 tonnes (submerged)
- Reactor: 83 MW pressurised water reactor (BARC) enabling near-unlimited endurance
- Armament:
- Four vertical launch tubes
- Up to 24 K-15 Sagarika SLBMs (750 km range) or
- **K-4 missiles with 3,500 km range**
- Stealth Enhancements: Anechoic tiles, advanced sonar suite (bow, flank, towed array)

Significance:

- **Strengthens Nuclear Triad:**Provides survivable, assured second-strike capability essential under India's no-first-use posture.
- **Enhances Maritime Security:**Expands Navy's deterrence reach across the Indo-Pacific amid rising regional tensions.
- **Boost to Aatmanirbhar Bharat:**High indigenous content reflects mastery over complex nuclear naval propulsion.

Thailand has formally expressed its intention to join BRICS

- Thailand has formally expressed its intention to join BRICS, seeking India's support ahead of New Delhi's BRICS chairmanship in 2026.
- **Location:** Thailand is a Southeast Asian country located in the centre of mainland Southeast Asia, entirely within the tropical zone.
- **Capital:** Bangkok is the capital and the largest urban and economic centre.
- **Neighbouring Nations: Myanmar, Laos, Cambodia, and Malaysia.**

Geographical Features

- **Northern & Western Mountains:** Granitic ridges, highest peak: Mount Inthanon (2,585 m).
- **Khorat Plateau (Northeast):** Tilted tableland with rolling terrain drained by Mekong tributaries.
- **Chao Phraya River Basin (Central): Fertile** alluvial plains forming the agricultural heartland.
- **Southern Peninsula:** Narrow peninsula with a mountainous spine and major islands like Phuket.

About BRICS:

- BRICS is a major geopolitical grouping of **eleven countries:** ***Brazil, Russia, India, China, South Africa, Saudi Arabia, Egypt, UAE, Ethiopia, Indonesia, and Iran*****.**

Established in

- Concept coined in 2001, first ministerial meeting held in 2006, first leaders' summit in 2009 and became BRICS with South Africa's entry in 2011.
- Second major expansion occurred in **2024–25 with six new members.**
- 2026 BRICS Summit Host: India will host the **18th BRICS Summit in 2026**, taking over the presidency from Brazil.

Key Features of BRICS

- Promotes reform of global governance institutions (UNSC, IMF, World Bank).
- Focuses on economic resilience, financial cooperation, counterterrorism, energy security, and technology governance.
- Includes the **New Development Bank (NDB)** as its financial institution.
- Allows flexible participation modes such as Members, Partner Countries, BRICS Outreach and BRICS Plus.

Operation Sagar Bandhu

- India swiftly deployed multiple naval assets under Operation Sagar Bandhu to deliver humanitarian assistance to **Cyclone Ditwah** struck Sri Lanka.

Operation Sagar Bandhu

- Operation Sagar Bandhu is India's naval **HADR mission** in the Indian Ocean Region aimed at providing rapid relief and logistics support to partner nations affected by natural disasters.
- INS Vikrant, INS Udaygiri and INS Sukanya delivered relief materials, deployed helicopters for

aerial reconnaissance and coordinated with Sri Lankan authorities for last-mile aid delivery.

- The mission is part of India's broader **SAGAR (Security and Growth for All in the Region)** maritime vision and Neighbourhood First policy.

Significance of India's HADR Strategy

- **First Responder Advantage:** India's navy reaches affected areas faster than extra-regional powers. e.g. INS Vikrant and Udaygiri were redirected within hours from Colombo during Ditwah.
- **Regional Trust-Building:** HADR missions enhance diplomatic goodwill and public confidence leading to stable bilateral relationships.
- **Strategic Maritime Presence:** Frequent HADR deployments improve monitoring, logistics knowledge and access in critical IOR (Indian Ocean Region) chokepoints, including Trincomalee and Palk Strait.
- **Soft Power Projection:** Relief assistance projects India as a benevolent maritime power, countering China's debt-driven presence around Sri Lanka's ports like Hambantota and Colombo.

Indian Navy Day 2025

- PM Modi has extended greetings to Indian Navy personnel on Navy Day, observed annually on 4 December.
- Navy Day celebrates the Indian Navy's victory in **Operation Trident** during the 1971 Indo-Pakistan War.
- Operation Trident: The operation destroyed Pakistani naval vessels and damaged Karachi's fuel and shore facilities without any Indian casualties.
- The theme for Navy Day 2025 is **"Combat Ready, Cohesive, Credible, and Aatmanirbhar Force."**
- This year's celebrations feature a significant Operational Demonstration at Shangumugham Beach in Thiruvananthapuram, Kerala.

The demonstration event emphasises India's role as the "Preferred Security Partner" in the Indian Ocean Region under the **MAHASAGAR vision.**

Exercise Garuda & Garuda Shakti 2025

- Two major military exercises were in focus: Exercise Garuda 25 between India and France

concluded in France, while Exercise Garuda Shakti 2025 between India and Indonesia commenced in Himachal Pradesh.

Exercise Garuda 25 :-

- Host: Air Base 118, Mont-de-Marsan, France
- Nations Involved: India (IAF) and **France (French Air & Space Force – FASF)**

Key Features:

- IAF deployed **Su-30MKI,** IL-78 air-to-air refuellers, and **C-17 Globemaster III.**
- Conducted complex missions including strike, escort, air refuelling, and coordinated operations.
- Included joint mission planning, tactical execution, and exposure to each other's SOPs.
- Ensured high aircraft serviceability through IAF maintenance teams.
- Reinforced Indo–French strategic partnership and improved interoperability in high-end air combat.

Exercise Garuda Shakti :-

- Host: Special Forces Training School, Bakloh, Himachal Pradesh
- Nations Involved: India (PARA SF) and **Indonesia (Indonesian Special Forces)**
- **Key Features:**
- Focus on counter-terrorism tactics, unarmed combat, combat shooting, sniping, and heliborne ops.
- Training on drone warfare, counter-UAS, and loiter-munition planning in semi-mountainous terrain.
- Includes sharing expertise on weapons, equipment, and operational procedures.
- Culminates in a validation exercise simulating real-operation scenarios for testing readiness.

23rd India-Russia Annual Summit

- The 23rd India-Russia Annual Summit was held in New Delhi, marking 25 years since the Strategic Partnership declaration of 2000.
- The annual summit is the highest institutionalised dialogue mechanism for reviewing and guiding their "Special and Privileged Strategic Partnership" between the two countries.

Key Outcomes of the 23rd India-Russia Annual Summit

1. Trade and Economy

- A new bilateral trade target of USD 100 billion by 2030 from the current USD 68 billion.
- "Programme 2030 for Strategic Areas" was adopted to diversify trade beyond energy and defence.
- Russian markets opened to Indian potatoes, pomegranates, and processed foods.
- Continued development of Rupee-Ruble settlement systems and payment system interoperability.
- 96% of bilateral trade settlements are already conducted in national currencies.
- Commitment to early conclusion of a Free Trade Agreement with the Eurasian Economic Union.
- **Eurasian Economic Union:** Economic Union of five post-Soviet states: Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia.
- A customs protocol signed to exchange pre-arrival information for faster border clearance.
- Long-term fertiliser supply to India and a joint urea production plant in Russia.

2. Defence and Security

- **Reciprocal Exchange of Logistics Support (RELOS)** was finalised for mutual access to ports and facilities.
- Joint ventures in India for manufacturing spare parts for Russian-origin defence equipment.
- Discussions on expedited delivery of remaining S-400 squadrons and future cooperation on the S-500 air-defence system.
- An agreement to combat irregular migration and ensure maritime safety.
- Reaffirmed zero tolerance for cross-border terror networks and related financing.

3. Energy

- Construction of six new nuclear units in India and a second Russian-designed nuclear plant.
- Assurance of uninterrupted crude oil and liquefied natural gas supplies to India.
- Potential cooperation on small modular reactors and floating nuclear power plants.

4. Connectivity and Arctic Cooperation

- Work towards operationalising the Chennai-Vladivostok Eastern Maritime Corridor to reduce transport time.
- Development of the Northern Sea Route as a viable alternative trade corridor.
- An MoU to train Indian seafarers for specialist polar and Arctic operations
- Removal of logistics bottlenecks for full utilisation of the International North–South Transport Corridor.

5. Climate and Global Governance

- A Joint Working Group on climate change and low-carbon development was established.
- Russia reaffirmed support for India's permanent membership in a reformed UN Security Council.
- Russia adopted the Framework Agreement to join the India-led International Big Cat Alliance.

6. Human-to-Human and Institutional Cooperations

- India announced a forthcoming unilateral 30-day free e-tourist visa for Russian citizens.
- Agreement to facilitate the temporary labour activity for skilled Indian workers in Russia
- ISRO-Roscosmos collaboration in human spaceflight, satellite navigation, and planetary exploration.
- Agreements on healthcare cooperation, medical education and infectious disease surveillance.

India-Russia Bilateral Relations

- **Strategic Partnership:** India and Russia maintain a "Special and Privileged Strategic Partnership" anchored in a shared commitment to a multipolar world order.
- **Trade Balance:** Bilateral trade crossed USD 65 billion in 2024-25 but remains heavily tilted toward Russia due to India's high oil imports.
- **Defence Cooperation:** Russia provides S-400 air defence systems and supports Indian production of BrahMos missiles, **Su-30MKI aircraft**, and **T-90** tanks.
- **Energy Security**: It is India's largest crude oil supplier and the only foreign partner currently building nuclear reactors in India at Kudankulam, Tamil Nadu.
- **Key Challenges:** Russia-China proximity, delays in defence deliveries, rupee–ruble settlement issues, western sanctions on Russia, etc.

National Intelligence Grid (NATGRID)

- The National Intelligence Grid (NATGRID) is receiving around 45,000 data requests per month, as Central agencies and State police increasingly use the platform for real-time intelligence access.

National Intelligence Grid (NATGRID):

- NATGRID is a real-time integrated intelligence platform under the Ministry of Home Affairs that links multiple government and private databases for secure access by authorised security and law-enforcement agencies to counter terrorism and organised crime.
- Conceptualised: 2009 (after the 26/11 Mumbai attacks)
- Operationalised: 2023 (platform became functional and opened to wider agencies)

Aim:

- To provide seamless, real-time intelligence by integrating diverse datasets for faster investigations.
- To eliminate delays caused by agencies separately requesting data from multiple sources.

Functions:

- **Data Integration Across Databases:** Connects datasets such as Aadhaar, driving licences, bank records, telecom data, airline PNRs, immigration logs, and social media activity.
- **Secure Access for Investigative Agencies:** Provides authorised officers (now including SP-rank officials) access to sensitive information while maintaining user confidentiality.
- **Supports Intelligence & Investigation:** Helps agencies "join the dots" without an FIR, enabling predictive intelligence, tracking suspicious behaviour, and analysing crime patterns.
- **Inter-Agency Coordination:** Facilitates cooperation between IB, RAW, NIA, ED, FIU, DRI, NCB and State police by offering a single unified information platform.
- **Data Security & Cyber Protection:** Uses advanced cybersecurity protocols to protect sensitive information amid rising cyberattacks on critical infrastructure.

Significance:

- **Counter-Terror Backbone:** Created after 26/11 to prevent intelligence gaps by providing faster, deeper, and integrated data access.
- **Reduces Investigation Time:** Eliminates bureaucratic delays; accelerates terrorism, narcotics, financial fraud, and cybercrime probes.
- **Strengthens Federal Policing:** Empowers State police forces by giving them the same intelligence access previously limited to central agencies.

C-130J Super Hercules Aircraft

- Tata Advanced Systems and Lockheed Martin have begun construction of a Maintenance, Repair and Overhaul (MRO) facility in Bengaluru to service the C-130J Super Hercules aircraft.

About C-130J Super Hercules Aircraft

- A four-engine turboprop military transport aircraft developed **by Lockheed Martin (US)** for tactical airlift, airdrop missions and short/rough runway operations.
- It is the latest variant of the C-130 series featuring modern digital avionics, improved fuel efficiency and performance; it needs a minimal crew (2 pilots + 1 loadmaster).
- It is capable of **short take-off and landing (STOL)** with~19 tonnes payload capacity, 6,850 km

range (no payload) and endurance of 20 hours.

- The Indian Air Force operates 12 C-130J aircraft, deployed for special operations, disaster relief, high-altitude logistics (including Ladakh), and humanitarian missions.
- **Turboprop aircraft are gas-turbine engine-powered**, more fuel-efficient, and suited for short runways, but slower than jet aircraft. Commonly used as a transport aircraft.

Washington Accords

- The Democratic Republic of the Congo (DRC) and Rwanda signed the Washington Accords to reinforce peace commitments and advance regional economic cooperation.

Washington Accords

- The **Washington Accords for Peace and Prosperity** is a US-brokered peace and economic agreement between the **DRC and Rwanda**, formally signed in Washington on 4 December 2025.
- It reaffirms the June 27, 2025, peace agreement, requiring Rwanda to withdraw troops from eastern DRC and the DRC to end support for extremist groups working against Rwanda.
- The Accords incorporate the Regional Economic Integration Framework, aimed at joint development of energy, infrastructure and critical minerals, with a role for US private investment.
- A Joint Oversight Committee, including the DRC, Rwanda, the US, Qatar and the African Union (AU) representatives, monitors security actions like troop withdrawal and disarmament deadlines.

India-UK Defence Partnership

- India and the UK are deepening defence cooperation through joint exercises and a 10-year Defence Industrial Roadmap signalling a stronger Indo-Pacific partnership.

India–UK Defence Partnership

- **Operational Interoperability:** Regular high-end exercises strengthen joint warfighting skills and trust**; E.g., Ajeya Warrior 2025** trained both armies in complex multi-domain operations in Rajasthan.
- **Maritime Cooperation:** Shared Indo-Pacific priorities push both navies to coordinate on sea control and air defence; E.g., **KONKAN 2025** saw INS Vikrant operate with HMS Prince of Wales.
- **Defence Industrial Synergy**: Complementary strengths allow co-production. E.g., 10-year Defence

Industrial Roadmap supports Make in India while boosting UK defence manufacturing.

- **High-Value Defence Deals:** Government-to-government agreements boost strategic trust; E.g., the £350-million deal to supply Lightweight Multirole Missiles (LMM) to the Indian Army.
- **Advanced Technology Collaboration:** Joint work on emerging propulsion enhances future capabilities; E.g., UK–India cooperation on maritime electric propulsion for Indian naval platforms.

Potential of India–UK Defence Partnership

- **Indo-Pacific Stability:** Joint carrier operations and maritime coordination strengthen a rules-based order and deter coercive actions in critical sea lanes.
- **Counter-Terror & Intelligence:** Deeper information-sharing and joint training enhance India–UK capability to tackle cross-border terrorism and emerging hybrid threats.
- **Resilient Supply Chains:** Defence-industrial collaboration reduces dependence on single-source suppliers and supports secure, diversified global defence ecosystems.
- **Humanitarian Operations:** Combined expertise in logistics, airlift, and disaster relief boosts joint response capacity for regional crises, from evacuations to natural disasters.
- **Emerging Tech Governance:** Cooperation in cyber, AI-enabled defence systems, and space domain awareness helps shape global norms for responsible military technology use.

Thailand–Cambodia Border Tension

Renewed fighting has erupted along the Thailand–Cambodia border, with artillery, rockets, drones and airstrikes used by both sides, causing rising civilian and military casualties.

What the conflict is?

- A long-running border dispute along their 817 km undemarcated frontier, rooted in colonial-era mapping.
- Both sides claim sovereignty over specific stretches near ancient temple complexes and forested highlands.

Historical Background

Colonial-Era Mapping (1907):

- The border was first mapped by **France (colonial ruler of Cambodia) in 1907; Thailand** (then Siam) later contested parts of this map, especially around ancient temples and high ground.

Preah Vihear Temple Dispute:

- In 1962, the International Court of Justice (ICJ) awarded the **Preah Vihear temple to Cambodia**, but Thailand disputes parts of the surrounding territory.
- In 2013, the ICJ reaffirmed Cambodia's sovereignty over land around the temple and asked Thailand to withdraw forces, but Bangkok has questioned the ruling's scope.

Periodic Armed Flare-Ups:

- Major clashes occurred in 2008–2011, including a deadly artillery exchange in 2011 around Preah Vihear and nearby temples, killing soldiers and civilians and displacing thousands.

Recent Escalations in 2025:

- Tensions rose after May 2025 skirmishes and a Thai soldier's death, followed by stricter border measures and trade bans.

Places and Areas Under Tension

Preah Vihear Region:

- Hilltop UNESCO World Heritage temple and surrounding high ground remain symbolic and strategic flashpoints.
- **Mekong River** is the major waterway in Preah Vihear Province, featuring significant spots like the Preah Nimith Waterfall

Border Provinces (Thailand):

- Surin, Buri Ram, Sa Kaeo, Sisaket, Trat – reports of shelling, cross-border fire, and large-scale evacuations into temporary shelters.

Border Provinces (Cambodia):

- Adjacent districts in Oddar Meanchey, Preah Vihear, Banteay Meanchey, Battambang, Pailin, Koh Kong seeing civilian casualties, infrastructure damage, and internal displacement.

Diving Support Craft (DSC) A20

- The Indian Navy will commission DSC A20, its first indigenously designed Diving Support Craft, at Kochi.

Diving Support Craft (DSC) A20:

- A purpose-built Diving Support Craft designed for underwater operations such as diving missions, inspection, repair, and salvage in coastal waters.

Developed by: Titagarh Rail Systems Limited (TRSL), Kolkata

Aim:

- To enhance the Navy's diving, underwater inspection, salvage, and coastal operational support.
- To strengthen indigenous maritime capability under Aatmanirbhar Bharat.

Key Features:

- Catamaran hull form: superior stability, larger deck area, improved seakeeping.
- Approx. displacement: 390 tons.
- Advanced state-of-the-art diving systems meeting top safety and operational standards.
- Designed and built as per Naval Rules & Regulations of IRS.
- Underwent comprehensive hydrodynamic analysis and model testing at NSTL, Visakhapatnam.
- Lead ship in a series of five Diving Support Craft.

Significance:

- Strengthens India's underwater operations, salvage, and coastal mission capabilities.

- Enhances operational readiness of the Southern Naval Command (based at Kochi).
- Represents a milestone in indigenisation and defence manufacturing, showcasing synergy between industry, research bodies, and the Navy.

India-Israel Joint Working Group Meeting

- Recently, India and Israel **Research Ecosystem Beyond STEM Priorities**
- Policy debates propose aligning PhD topics with "national priorities," but non-STEM research continues to face funding gaps, weak institutional support, and limited academic autonomy.

Need for Non-STEM Research Ecosystem

- **Balanced Knowledge Ecosystem:** Sustained basic research builds long-term scientific capacity.
- **Future-Ready Innovation:** Supporting non-immediate research avoids short-termism and prepares India for emerging technologies.
- **Inclusive Academic Growth:** Recognising the humanities and social sciences strengthens policy thinking and societal understanding essential for science governance.
- **Talent Retention:** Funding & research freedom reduce brain drain and support young scholars' careers.

Challenges Faced in Non-STEM Research Ecosystem

- **Irregular Fellowship Payments:** Scholars often face months-long delays; E.g., ***DST/UGC fellows report payment gaps of 6–9 months, disrupting research continuity.***
- **Low Stipend Levels:** University-funded non-NET PhD students receive only ₹8,000/month, unchanged since 2012, below minimum wage benchmarks.
- **Weak Industry-Academia Linkages:** Industry-funded PhDs remain rare; E.g. collaborations outside IITs are minimal despite a research workforce of 2.8 lakh PhD scholars nationwide.
- **Political Vulnerability:** Social sciences face risks of topic restrictions that discourage unbiased inquiry.

Way Forward

- **Timely Funding:** Implement automated, predictable fellowship disbursement cycles.
- **Stipend Revision:** Regularly index stipends to inflation and living costs similar to periodic adjustments under India's Junior Research Fellowship norms.

- **Industry Integration:** Expand doctoral programmes with co-funded industry partnerships and goal-oriented research; E.g. **Emulate Germany's Fraunhofer model** linking labs and industries.
- **Protect Research Autonomy:** Establish academic freedom charters to safeguard non-STEM inquiry and avoid politically motivated topic selection.

India-Italy Relations

- The **India–Italy Business Forum** was held in Mumbai during the visit of the Italian Deputy Prime Minister.
- **Key Outcome:** Both countries signed the protocol for **the India–Italy Joint Commission for Economic Cooperation (JCEC),** outlining a concrete roadmap for economic partnership.

India-Italy Relations

- **Strategic Partnership:** Relations were elevated to a **Strategic Partnership in 2023**; both sides adopted the Joint Strategic Action Plan 2025–2029 to guide future cooperation.
- **Political Relations:** Regular high-level interactions, like meetings between PMs at G7 and G20 in 2024, offer strategic direction and continuity.
- **Trade Relations:** Italy is India's fourth-largest trading partner within the EU, with bilateral trade surpassing USD 14.5 billion in 2023–24.
- **Industry & Investment:** Key focus areas include transportation, food processing, green technologies, sustainable mobility, and advanced manufacturing.
- **Defence Cooperation:** A 2023 defence cooperation agreement enhances security policy and defence technology collaboration.
- **Multilateral Alignment:** Italy supports key Indian initiatives like the **ISA, IMEC, and GBA**; it helped India join the **Wassenaar Arrangement and Australia Group**.
- **Science & Technology:** The Executive Programme of Cooperation for 2025-2027 prioritises AI, digitalisation, clean energy, and quantum technologies.
- **Mobility Pact:** A 2023 Migration and Mobility Agreement promote legal migration, including a pilot programme to train Indian health professionals for employment in Italy.
- **Cultural Ties:** A formal Executive Programme on Cultural Cooperation for 2023-27 promotes mutual cultural understanding and exchange.

Mexico to Raise Import Tariffs on Non-FTA Countries

- Mexico is set to raise import tariffs on goods from countries without trade agreements effective January 1, 2026.
- **Coverage:** The tariff hike will apply to over 1,400 product lines imported from non-FTA countries.
- **Range:** Revised tariffs will range from 5% to 50%, depending on product category and sector sensitivity.
- **Peak Rate:** Sensitive sectors like steel and automobiles will attract the maximum tariff rate of 50%.
- **Standard Rate:** Most other affected goods will see tariffs increase to around 35%
- **Impact:** China and India will face the highest impact, followed by South Korea, Thailand, Indonesia, Vietnam, and Brazil.

Rationale-

- Shield domestic industries and jobs from "unfairly" cheap imports from Asia.
- Generate about $3.76 billion to reduce Mexico's fiscal deficit.
- Promotes industrial sovereignty by replacing imports with domestically manufactured goods.
- Addresses **U.S. concerns over Chinese goods bypassing U.S tariffs** through the Mexican backdoor.

An Overview of India-Mexico Bilateral Relations

- **Diplomatic Ties:** India and Mexico established diplomatic relations in **1950**, with Mexico being the first Latin American country to recognise India.
- **Partnership:** The two countries share a **'Privileged Partnership'** formally established in 2007.
- **Trade Standing:** Mexico is India's second-largest Latin American trading partner after Brazil.
- **Trade Volume:** Bilateral trade reached $11.7 billion in 2024, with India recording a trade surplus.
- **Indian Exports:** Vehicles, auto parts, organic chemicals, machinery, pharmaceuticals, and textiles.
- **Space Cooperation:** ISRO and the Mexican Space Agency cooperate on satellite-based crop monitoring and drought assessment.

Yellow Line

- The Israeli military chief called the Yellow Line between Israel and Gaza as the new border.

About the Yellow Line

- The Yellow Line marks the zone to which Israeli forces have withdrawn under the 2025 US backed ceasefire.
- It divides Gaza into two parts i.e. Israeli-controlled eastern areas and Palestinian-administered western areas.

Gold Card Visa Programme

- U.S. President Donald Trump signed an executive order establishing the **"Trump Gold Card"** visa programme.
- **Immigration Pathway:** Gold Card visa programme offers expedited U.S. permanent residency through direct financial contributions to the government.
- It follows a pay-to-play model where direct contributions fast-track Green Card access.
- **Launch:** The programme was launched in December 2025 to effectively replace the **EB-5 investor visa**.
- ***Unlike the EB-5 investor visa, the Gold Card does not require job creation.***
- **Tax Liability:** Gold Card holders are subject to United States taxation on their worldwide income.

Visa Framework

- **Visa Status:** The programme does not create a new visa category under U.S. immigration law.
- **Qualification:** Applicants must independently qualify under existing high-priority employment-based Green Card pathways
- **EB-1A Route:** For individuals with sustained national or international acclaim in their field.
- **EB-2 NIW Route:** For individuals with advanced degrees or exceptional ability.
- **Benefit Evidence:** The financial gift is treated as evidence of substantial benefit to the United States.

Financial Structure

- **Individual Tier:** Requires a $1 million 'gift' to the U.S. Treasury and a non-refundable processing fee.
- **Corporate Tier:** Allows U.S. companies to sponsor employees through a $2 million contribution.
- **Future Tier:** Proposes a $5 million contribution requirement for ultra-wealthy individuals.

Key Benefits

- The programme expedites Legal Permanent Residency with full Green Card status.
- It allows naturalisation after five years, or three years if married to a U.S. citizen.
- Companies can bypass H-1B lottery limits and Green Card backlogs through this programme.
- Primary applicant may include spouse and unmarried children under 21 as dependents, subject to additional per-person financial contribution.

Pax Silica Initiative

- India has been left out of new US critical mineral diversification plan 'Pax Silica'.

About Pax Silica Initiative

- It is a U.S.-led strategic initiative to build a secure, prosperous, and innovation driven silicon supply chain from critical minerals and energy inputs to advanced manufacturing, semiconductors, AI infrastructure, and logistics.
- **Aim:** To reduce dependencies and ensure aligned nations can develop and deploy transformative technologies at scale.
- **Members:** Japan, Republic of Korea, Singapore, the Netherlands, The United Kingdom, Israel, United Arab Emirates, and Australia.

Bondi Beach attack

- Australia was shaken by a deadly terror-linked mass shooting at **Sydney's Bondi Beach** during a Jewish festival, prompting the government to consider tougher gun laws.

About Bondi Beach:

- Bondi Beach is a world-famous ocean beach and adjoining suburb in Sydney, known for its surf culture, tourism, and public recreation. It is among the most visited beaches in Australia and a major symbol of the country's coastal lifestyle.

Location:

- Situated 7 km east of Sydney's Central Business District (CBD).
- Lies in the Eastern Suburbs of Sydney within the Waverley Council local government area.
- Neighbouring suburbs include North Bondi, Bondi Junction, Rose Bay, and Bellevue Hill.

Key features

- **Natural setting:** Crescent-shaped sandy beach facing the **Tasman Sea**, popular for surfing and swimming.
- **Cultural prominence:** Featured in global TV series such as **Bondi Rescue and Bondi Vet.**
- **Demographics:** Historically multicultural, with a strong Jewish community and migrant heritage.
- **Indigenous heritage:** Traditionally inhabited by **Bidjigal, Birrabirragal, and Gadigal Aboriginal** peoples.
- **Name origin:** Derived from the **Dharawal word "Bondi",** meaning a loud thud, like waves crashing on rocks.

Significance

- **Tourism & economy:** A key contributor to Sydney's tourism-driven economy and international image.
- **Cultural history:** Site of major social movements, including early 20th-century debates on public decency and beach culture.
- **Public safety relevance:** The recent attack highlights challenges of urban security, counter-terrorism, and public space safety.

HAMMER precision-guided weapon (AASM)

- India has signed a pact with France's Safran to jointly manufacture, customise, supply and maintain the HAMMER (AASM) precision-guided **air-to-ground weapon** in India through a 50–50 JV with BEL.

HAMMER precision-guided weapon (AASM):

- HAMMER (Highly Agile Modular Munition Extended Range), also known as AASM, is a stand-off, precision-guided air-to-ground weapon that converts conventional bombs into high-accuracy strike systems through modular guidance and propulsion kits.

Developed by

- Developed by **Safran Electronics & Defense (France).**
- In India, it will be jointly manufactured by **Bharat Electronics Limited (BEL) and Safran** through a **50:50 joint** venture.

Aim:

- To provide the air force with accurate, flexible and survivable precision strike capability from stand-off ranges, enabling controlled escalation while minimising collateral damage and aircraft risk.

Key features

- **Modular design:** Consists of a nose-mounted guidance kit and a tail-mounted range-extension kit, fitted onto standard bomb bodies (125 kg to 1,000 kg, including Mk-80 series).
- **Multiple guidance options:** INS-GPS (all-weather), INS-GPS-IR (high-precision fixed targets), and laser guidance (moving targets).
- **Stand-off range & off-axis launch:** Rocket booster and winglets allow launch from outside hostile air-defence zones and even at large off-axis angles.
- **High precision:** Circular Error Probability ranges from ~10 m (INS-GPS) to ~1 m (IR-guided).
- **Platform flexibility**: Integrated on Rafale and planned for Tejas, enabling a common precision-strike capability across imported and indigenous aircraft.

Significance

- **Operational edge:** Bridges the gap between unguided bombs and expensive cruise missiles, offering missile-like precision at lower cost.
- **Strategic autonomy:** Domestic manufacturing reduces import dependence and ensures availability during crises.
- **Technology absorption:** Builds Indian expertise in guidance systems, propulsion integration and precision-strike workflows.

Vijay Diwas Marks India's Victory in 1971 War

- India is observing Vijay Diwas on **16 December 2025** to commemorate the 1971 victory and honour the armed forces' sacrifice and valour.
- The day marks the **surrender of Pakistan's Eastern Command in Dhaka** (16 Dec 1971) and the birth of Bangladesh.

About Vijay Diwas Marks India's Victory in 1971 War:

- **Background of the war:**
- **Electoral mandate denied (1970): The Awami League** won a decisive majority in Pakistan's

1970 elections, but transfer of power was blocked, triggering mass agitation in East Pakistan.

- **Military crackdown (25 March 1971):** Pakistan Army launched **Operation Searchlight** in Dhaka and elsewhere, intensifying violence and driving the liberation movement.
- **Refugee crisis in India:** Around ~10 million refugees crossed into India creating major humanitarian and fiscal pressure.
- **Rise of Mukti Bahini + Govt-in-exile:** Bengali resistance consolidated as Mukti Bahini; India provided training, logistics and sanctuary while preparing for escalation.

Key events during the war (3–16 Dec 1971):

- **Trigger — 3 Dec 1971:** Pakistan launched pre-emptive air strikes (**Operation Chengiz Khan**) on multiple Indian airfields, after which India formally entered full-scale war.
- **Air superiority in the East:** Indian Air Force quickly neutralised East Pakistan's limited air capability, enabling unhindered close air support and interdiction.
- **Naval blockade in Bay of Bengal:** Indian Navy isolated East Pakistan; INS Vikrant supported strikes on ports/coastal targets, choking reinforcement and resupply.
- **Karachi strikes:** Indian Navy hit Karachi in **Operation Trident (4/5 Dec) and Operation Python (8/9 Dec)**—major blows to fuel storage/shipping capacity.
- **Surrender — 16 Dec:** With Dhaka encircled and East Pakistan strategically isolated, Eastern Command surrendered, ending the war decisively in 13 days.

Outcomes

- **Bangladesh created:** East Pakistan became the sovereign state of Bangladesh, fundamentally altering South Asian geopolitics.
- **Mass surrender/POWs:** Approx. 93,000 Pakistani troops/personnel surrendered—one of the biggest capitulations since WWII.
- **Strategic realignment:** Pakistan lost its eastern wing; India emerged as the dominant conventional military power in the region, with strengthened deterrence credibility.
- **Post-war settlement:** The 1971 outcome directly shaped subsequent diplomacy, including Simla Agreement (1972) framework and long-term India–Bangladesh relations.

Significance

- **National remembrance:** Symbol of armed forces' bravery, jointness (Army-Navy-Air Force) and decisive leadership in warfighting.
- **Doctrine & deterrence:** Demonstrates the value of clear political objectives, rapid manoeuvre, air

superiority, and maritime choke-point control.

India–Jordan Joint Statement (2025)

- Prime Minister of India visit to Jordan marked 75 years of India–Jordan diplomatic relations, culminating in a joint statement outlining a roadmap for deeper bilateral cooperation.

India–Jordan Joint Statement : Key highlights and outcomes

- **Political cooperation:** Commitment to sustained high-level engagements, regular political consultations and joint working groups; next round to be held in New Delhi.
- **Trade and economy:** Bilateral trade at billion (2024); India is Jordan's 3rd-largest trading partner; decision to convene the **11th Trade & Economic Joint Committee (2026).**
- **Connectivity and logistics:** Emphasis on leveraging Jordan's strategic transit infrastructure to enhance regional and private-sector collaboration.
- **Digital & technology partnership:** Letter of Intent to share India's **Digital Public Infrastructure (DPI)** experience; expansion of the ***India–Jordan IT Centre of Excellence in Amman***.
- **Capacity building:** Expansion of ITEC training slots from 35 to 50, strengthening human resource development.
- **Health & agriculture:** Cooperation in telemedicine, training of health professionals, and fertiliser/phosphate collaboration to enhance food security.
- **Water & green cooperation:** MoUs on water resources management (aquifer management, water-saving technologies) and renewable energy (joint research and training).
- **Cultural & people-to-people ties:** Cultural Exchange Programme (2025–2029) and Petra–Ellora twinning to boost heritage cooperation and tourism.
- **Multilateral convergence:** Jordan's interest in joining Indian-led initiatives like the International Solar Alliance, CDRI and Global Biofuels Alliance.

The Tianjin Declaration

- At the **2025 Shanghai Cooperation Organisation (SCO) Summit in Tianjin**, India joined other SCO members in endorsing the Tianjin Declaration, committing to deepen cooperation in Artificial Intelligence (AI) governance and capacity building.
- The Tianjin Declaration is the outcome document adopted by the SCO Council of Heads of States at

the 2025 Tianjin Summit, outlining collective positions on security, development, technology, and institutional reforms.

Key outcomes

- **AI cooperation framework:** Emphasised that all countries have equal rights to develop and use AI, aligning with the UN General Assembly resolution on AI capacity building.
- **Risk mitigation in AI:** SCO members committed to improving security, accountability, transparency, inclusiveness, trustworthiness and fairness of AI systems.
- **Roadmap adoption:** Supported implementation of the SCO AI Cooperation Roadmap to guide joint research, standards and capacity building.
- **Regional AI centre:** Welcomed the UNGA resolution proposing a Regional AI Centre in Dushanbe, strengthening Central Asia's digital ecosystem.

Shanghai Cooperation Organisation (SCO):

- The SCO is a permanent intergovernmental organisation focused on regional security, economic cooperation and people-to-people ties across Eurasia.
- **Established in: 15 June 2001, Shanghai (evolved from the Shanghai Five mechanism).**
- **Headquarters:**
- **Secretariat: Beijing, China**
- RATS (Regional Anti-Terrorist Structure): **Tashkent, Uzbekistan**
- **Members:**
- 10 Member States- India, China, Russia, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, Pakistan, Iran, Belarus
- 2 Observer States- Afghanistan, Mongolia
- **Aims:**
- Strengthen mutual trust, friendship and good-neighbourliness.
- Promote cooperation in politics, security, economy, science & technology, energy, transport, culture and education.

Key functions and mechanisms

- **Security cooperation:** Counter-terrorism, separatism and extremism through RATS.
- **Economic cooperation:** Trade, connectivity, energy and infrastructure initiatives.
- **Technology & innovation:** Growing focus on digital economy, cybersecurity and AI.
- **Decision-making bodies**
- Council of Heads of States (CHS): supreme body

- Council of Heads of Government (CHG): economic and budgetary matters
- Council of National Coordinators: coordination mechanism
- **Official languages: Russian and Chinese.**

PM Modi's Visit to Ethiopia

- Prime Minister Narendra Modi visited Ethiopia as the second leg of his three-nation tour, following Jordan.

Ethiopia

- **Location:** Ethiopia is a landlocked country in the Horn of Africa bordering Eritrea, Djibouti, Somalia, Kenya, Sudan, and South Sudan.
- **History:** It is among the world's oldest continuously existing states & was never formally colonized.
- **Geography: The Simien Mountains**, called the "Roof of Africa," are located in Ethiopia.
- **The Danakil Depression**, among the hottest places on Earth, lies 125 metres below sea level.

Key Outcome of the Visit

- PM Modi received the **'Great Honour Nishan of Ethiopia',** the highest civilian award for foreign leaders.
- Both countries agreed to elevate bilateral relations to a Strategic Partnership.
- India signed an MoU on Ethiopia's debt restructuring under the **G20 Common Framework**.
- An agreement on Mutual Assistance in Customs Matters was signed to ease trade barriers.
- India agreed to set up a **Data Centre** at Ethiopia's Ministry of Foreign Affairs.
- The countries signed an arrangement for cooperation in UN Peacekeeping Operations Training.

Overview of India-Ethiopia Bilateral Relations

- The countries are often called civilizational twins, with recorded ties dating back over 2,000 years.
- **Trade:** India is Ethiopia's second-largest trading partner and among the largest foreign investors.
- Bilateral trade reached $550 million in 2024-25, with Indian exports worth $476 million.
- India exports pharmaceuticals, steel, and machinery, and imports pulses, oilseeds, and spices.
- **Credit:** Ethiopia is the largest recipient of Indian concessional Credit in Africa, with $1B sanctioned.
- **Diaspora:** The Siddi communities in Gujarat & Karnataka trace their ancestry to Ethiopia.

Exercise Ekatha

- The **Deputy Chief of the Naval Staff (DCNS)** of the Indian Navy is visiting the Maldives to attend the closing ceremony of Exercise Ekatha 2025.

About Exercise Ekatha

- It is an annual bilateral maritime exercise established in 2017 between the **Indian Navy and the Maldives National Defence Force (MNDF).**
- It is hosted alternatively by India and the Maldives, and is aimed at enhancing naval interoperability and maritime cooperation between the two forces.
- India and Maldives also conduct **Exercise DOSTI**, a biennial trilateral maritime drill (with Sri Lanka), and **Exercise EKUVERIN,** an annual army exercise focused on counter-insurgency and disaster response.
- The 14th edition of India-Maldives bilateral Exercise EKUVERIN concluded in Thiruvananthapuram after two weeks of intensive training to enhance interoperability between the Indian Army and the Maldives National Defence Forces.

Rising Security Concerns in Bangladesh

- India summoned Bangladesh's High Commissioner to convey strong concerns over the deteriorating security situation in Bangladesh.
- The move followed a radical group in Dhaka announcing a march to the Indian High Commission over alleged Indian interference.

India's Security Concerns in Bangladesh

- **Provocative Rhetoric:** Bangladeshi leaders threatening to isolate India's Northeastern states raise territorial concerns.
- **Radical Networks:** Expanding influence of groups linked to Lashkar-e-Taiba and Pakistan's ISI heightens security risks.
- **Minority Violence:** Violence against Hindus and other minorities creates humanitarian concern for India.
- **Safe Haven:** Bangladesh risks becoming a refuge for anti-India forces & Northeast separatist

groups.

Other Evolving Pain-Points for India

- **Trilateral Axis:** First-ever **China-Pakistan-Bangladesh trilateral meetings** signal coordinated strategic pressure on India.
- **Defence Rapprochement:** Dhaka-Islamabad defence engagement reverses earlier security cooperation with India.
- **Teesta Project:** China's push into the Teesta River Management Project raises debt-trap concerns near Indian borders.
- **Extradition Dilemma:** Sheikh Hasina's extradition issue reflects tension between sovereignty obligations and bilateral relations.

Overview of India-Bangladesh Bilateral Relations

- **Readjustment:** India-Bangladesh relations are undergoing readjustment following the August 2024 resignation of PM Sheikh Hasina.
- **Trade:** Bangladesh is India's largest trade partner in South Asia. Bilateral trade reached $14 billion in 2023-24.
- It is heavily skewed toward India, with exports over $11 billion.
- **Power Cooperation:** Bangladesh imports over 1,160 MW of electricity from India.
- **'Friendship Pipeline':** A 131 km pipeline transports High-Speed Diesel from India to Bangladesh.
- **Key Challenges:** Teesta water sharing, border fencing dispute, expanding Chinese influence, etc.

India's BRICS presidency 2026

- Brazil has formally handed over the BRICS (18th) presidency to India for 2026, amid global trade frictions and geopolitical tensions.

India's BRICS presidency 2026:

- India will serve as the rotating (pro tempore) Chair of BRICS in 2026. As Chair, India will set priorities, convene meetings, and host the annual summit for the year.

Established in:

- **Origins (BRIC):** Political dialogue began with the BRIC Foreign Ministers' meeting in 2006 (UNGA sidelines).
- **Leaders' summit start:** The first summit of heads of state/government took place in 2009

(Yekaterinburg).

- **BRICS formed: South Africa joined in 2011, turning BRIC into BRICS.**
- **Headquarters:** No permanent HQ and it works as an informal coordination platform with a rotating presidency.
- The New Development Bank (NDB) is headquartered in Shanghai, China.
- Members: Brazil, Russia, India, China, South Africa, Egypt, Ethiopia, Iran, United Arab Emirates, Saudi Arabia, Indonesia.

How is the BRICS Presidency decided?

- Not elected by voting. The BRICS presidency is rotational, not chosen through an election.
- **Rotation principle:** The chairmanship rotates annually among member countries, traditionally following the alphabetical order of the acronym "BRICS".
- **Tenure:** Each presidency runs from 1 January to 31 December of the year.

Role of the President country:

- Sets the annual agenda and priorities
- Chairs meetings at all levels (Sherpas, Ministers, Leaders)
- Hosts the BRICS Summit
- **Official language of BRICS:** No single official language is prescribed in the BRICS Charter.

Key functions of BRICS

- **Political coordination:** Builds common positions on major global issues and pushes for a fairer world order.
- **Economic and financial cooperation:** Promotes trade, investment coordination, and reform of global financial governance.
- **Development finance:** Uses institutions like the NDB to fund infrastructure and sustainable development in EMDCs.
- **People-to-people pillar:** Expands cultural, academic, youth and civil society engagement across members.
- **Bridge-building for Global South:** Provides a platform where developing countries amplify shared priorities.

Significance of India's BRICS presidency

- India can steer agendas on development finance, health, and technology equity.
- India can strengthen calls for reform of institutions like UN, IMF, World Bank, WTO.

Exercise DESERT CYCLONE–II 2025

- An Indian Army contingent has departed for the **India–UAE Joint Military Exercise** DESERT CYCLONE–II (2025) to be held in Abu Dhabi.

Exercise DESERT CYCLONE–II :

- DESERT CYCLONE–II is the second edition of the bilateral joint military exercise between the Indian Army and the UAE Land Forces, aimed at enhancing operational cooperation.
- **Host country: United Arab Emirates (Abu Dhabi)**

Participating nations

- India: 45 personnel from a battalion of The Mechanised Infantry Regiment
- UAE: Personnel from 53 Mechanised Infantry Battalion, UAE Land Forces

Aim

- To train jointly for sub-conventional operations under a UN mandate.
- To prepare forces for peacekeeping, counter-terrorism and stability operations in urban environments.

Key features

- Training in fighting in built-up areas (FIBUA).
- Heliborne operations and detailed joint mission planning.
- Integration of Unmanned Aerial Systems (UAS) and Counter-UAS techniques.
- Focus on urban warfare scenarios and joint tactical drills.

Significance

- Strengthens bilateral defence ties and military diplomacy between India and the UAE.
- Enhances mutual understanding of tactics, techniques and procedures (TTPs).

India & Argentina Signed Work Plan 2025–27

- India and Argentina signed the Work Plan 2025–27 to deepen cooperation in agricultural research, capacity building, and technology exchange.
- It was signed between the Indian Council of Agricultural Research (ICAR) and Argentina's National Institute of Agricultural Technology (INTA).
- The plan establishes collaboration across natural resource management, sustainable agronomy,

animal biotechnology, and value chain development.

- **Implementation:** It will be executed through joint research projects, germplasm exchange, expert engagements, training programmes, and study visits.

India-Argentina Relations:

- It dates to 1848, when Argentine **traveller Lucio V. Mansilla** visited India; Rabindranath Tagore's 1924 Buenos Aires visit initiated cultural links.
- India opened its embassy in **Buenos Aires in 1949**; PM Modi visited Argentina in 2025, marking the first bilateral **visit by an Indian PM in 57 years.**
- **Diplomatic Milestones:** The two countries marked 75 years of diplomatic relations in 2024; ties were elevated to a Strategic Partnership in 2019.
- **Economic Relations:** India and Argentina are working to expand the **India–MERCOSUR Preferential Trade Agreement (PTA)** to reduce tariffs on a wider range of goods.
- Trade Ties: **India is Argentina's 4th largest trading partner**, with bilateral trade reaching about USD 5.2 billion in 2024.
- India imports vegetable oils, cereals, pulses, leather, and chemicals, while exporting petroleum products, agrochemicals, textiles, drugs, and two-wheelers.

Key Areas of Cooperation

- **Minerals:** Argentina, part of the **Lithium Triangle (with Chile and Bolivia);** India's PSU **KABIL** has secured lithium exploration and mining concessions in Argentina.
- **Energy: India's Heavy Water Board** signed a 2024 agreement to supply heavy water to Argentina.
- **Defence:** A MoU was signed between Hindustan Aeronautics Limited (HAL) and the Argentine Air Force in 2023 for helicopter spare parts supply and maintenance
- **Space:** ISRO and Argentina's CONAE cooperate on satellite data sharing, ground station support; Argentina has participated **in ISRO's UNNATI training program.**
- **Multilateral Platforms:** Both are members of the G20 and G77; Argentina supports India's UNSC permanent membership bid, while India backs Argentina's sovereignty claim over the **Malvinas Islands.**

India Assumes BRICS Presidency for 2026

- Brazil formally handed over the **18th BRICS Presidency to India** for the year 2026.
- **Leadership Vision:** Prime Minister Narendra Modi has proposed a shift toward a people-centric

'humanity-first approach' for the upcoming session.

About BRICS

- BRICS is an informal grouping of major emerging economies; the term "BRIC" was coined **by economist Jim O'Neill in 2001.**
- The first BRIC summit was held in ***2009; South Africa joined in 2010***, changing the acronym to BRICS.
- **Expansion:** The grouping included **Egypt, Ethiopia, Iran, and the UAE in 2024**, and **Indonesia became the 10th full member in 2025.**
- **Key Focus:** To promote a more equitable, multipolar world order by strengthening Global South cooperation and representation.
- **Chairmanship:** The BRICS presidency rotates annually in alphabetical order of the acronym "BRICS".
- **Key Initiatives:** The New Development Bank (NDB) for infrastructure financing, the Contingent Reserve Arrangement for liquidity support, and BRICS PAY for blockchain-based local-currency payments.

PM Modi's Visit to Oman

- PM Narendra Modi visited Oman as the final leg of a three-nation tour after **Jordan and Ethiopia**.
- **Milestone:** The visit coincided with the seventieth anniversary of India-Oman diplomatic relations.
- Oman is an absolute monarchy located at the southeastern tip of the Arabian Peninsula. It borders **UAE, Saudi Arabia, & Yemen,** with coastlines along the **Arabian Sea, Gulf of Oman, & Strait of Hormuz.**

Key Outcome of the Visit

- **Comprehensive Economic Partnership Agreement (CEPA)**
- **Zero Duty:** India and Oman signed CEPA, granting zero-duty access to 99% of India's exports by value.
- **Investment:** CEPA permits 100% FDI for Indian companies in Omani service sectors.
- **Mobility:** It extends the permitted stay for Indian contractual service suppliers in Oman to two years.

- **Exclusions:** India excluded sensitive products like dairy, gold, silver, tea, and coffee from the agreement.
- **AYUSH:** Oman became the first country to **recognise trade in AYUSH** within its trade framework.

Other Outcomes

- **Maritime Vision:** Both countries adopted a Joint Vision Document on Maritime Cooperation covering regional security and the blue economy.
- **Agri Framework:** A framework agreement was signed for cooperation in agricultural science, animal husbandry, and irrigation systems.
- **Millet:** India signed an Executive Programme to share its expertise in millet cultivation.
- **Maritime Heritage:** An MoU was signed to support maritime heritage museums and facilitate the exchange of artefacts.
- **Civilian Honour:** PM Modi received the First Class of the Order of Oman, the country's highest civilian award.

India-Oman Bilateral Relationship

- **Partnership:** India and Oman established a Strategic Partnership in 2008, and 2025 marks seventy years of diplomatic relations.
- **Trade:** Bilateral trade reached $10 billion in 2024-25, with the trade balance favouring Oman.
- **Fertiliser:** Oman India Fertiliser Company is a flagship joint venture exporting urea to India.
- **Defence:** Oman is the only Gulf country with which India conducts tri-service military exercises.
- **Strategic:** Access to Duqm Port provides India with military logistics support and operational reach.
- **Diaspora:** Around 7 lakh Indians in Oman contribute ~$2 billion annually in remittances.

Implications of U.S. National Security Strategy for India

- The recently published U.S. National Security Strategy 2025 marks a decisive shift in the strategic outlook and security priorities of the United States.
- **About the 2025 National Security Strategy (NSS)**
- The NSS is a policy document that codifies the **"America First"** doctrine as **Sovereign Realism**.
- Alliances are treated as transactional arrangements based on mutual benefit and burden sharing.
- It mandates *re-industrialisation and decoupling critical supply chains from China*.
- U.S. strategic priorities are reordered, placing the Western Hemisphere above all other regions.

- **India-Related Provisions in US National Security Strategy 2025**
- India is elevated to **the "Core 5" (C5) group** of global powers alongside the U.S, China, Russia, and Japan.
- NSS positions India as the **primary counterweight to China in South Asia** and the Indian Ocean region.
- Indian naval operations are encouraged to expand beyond their neighbourhood into the Indo-Pacific.
- Quad is maintained for surveillance and logistics, without evolving into a NATO-style defence alliance.
- India is designated as a priority partner for **"friend-shoring"** supply chains to reduce reliance on China.

Strategic Reorientation of India-US Partnership

- The relationship is redefined from a **"values-based alliance"** to a **"transactional partnership"**
- It recognises **India as a pole** in a multipolar world, beyond the previous 'Major Defence Partner' label.
- Security cooperation is now linked to trade reciprocity, exchanging defence technology for lower tariffs.
- 2025 NSS ends the US role as the sole primary security provider, expecting partners like India to assume regional security responsibilities.

India–New Zealand Free Trade Agreement

- India and New Zealand have concluded negotiations on a comprehensive Free Trade Agreement (FTA) in just nine months, with formal signing expected in 2026.

India–New Zealand Free Trade Agreement:

- A **Free Trade Agreement (FTA)** is a **bilateral pact** where countries **reduce or eliminate tariffs and non-tariff barriers** on goods and services to boost trade, investment, and economic cooperation.

Targets of the India-New Zealand FTA

- **Trade expansion:** Double bilateral trade from the current level to USD 5 billion within five years,

deepening economic engagement.

- **Investment inflows:** Facilitate USD 20 billion in New Zealand investments over 15 years, aligned with Make in India.
- **Export diversification:** Provide Indian exporters alternative markets amid high tariffs in the US and global protectionism.
- **Services and mobility growth:** Strengthen services trade and skilled mobility through temporary employment visas and education linkages.

Existing Trade Between India and New Zealand:

- **Trade volume:** Bilateral trade reached USD 1.3 billion in FY25, registering a strong 49% year-on-year growth, yet remains modest relative to the economic size of both countries.
- **Indian exports:** India's exports are concentrated in pharmaceuticals, textiles, engineering goods, and IT/IT-enabled services, reflecting strengths in manufacturing and knowledge-based sectors.
- **Indian imports:** Imports from New Zealand largely consist of wool, fruits, forestry products, and dairy-related items, highlighting New Zealand's comparative advantage in agriculture.
- **Trade imbalance**: The trade structure is asymmetrical, with New Zealand exporting agri-products and India exporting manufactured goods and services, limiting value-chain integration.
- **Untapped potential:** Despite economic complementarities, trade remains below potential due to tariff barriers, regulatory constraints, and limited business awareness.

Key Features

- **Tariff liberalisation:** India will offer duty concessions on 95% of New Zealand exports, while New Zealand will provide duty-free access on 100% of India's tariff lines.
- **Protection of sensitive sectors:** India has excluded dairy, rice, wheat, sugar, onions, edible oils, and rubber, balancing trade liberalisation with farmer livelihood protection.
- **Boost to labour-intensive sectors:** Preferential access will support exports from textiles, apparel, leather, footwear, engineering goods, and pharmaceuticals, aiding employment generation.
- **Services and mobility provisions:** The FTA introduces 5,000 temporary employment visas annually, allowing Indian professionals to work in New Zealand for up to three years.
- **Trade facilitation rules:** Provisions on rules of origin, customs cooperation, SPS measures, and TBTs aim to reduce procedural delays and improve market predictability.

Challenges Associated with the FTA

- **Agricultural sensitivities:** Concerns from farmer groups, especially in dairy and horticulture,

restrict deeper liberalisation and require careful policy calibration.

- **Domestic political opposition in New Zealand:** Sections of New Zealand's ruling coalition oppose the pact, citing immigration pressures and dairy-sector disadvantages.
- **Low trade base:** Given the relatively small existing trade volume, economic gains may accrue gradually rather than immediately.
- **Non-tariff barriers:** Divergent regulatory standards, certification norms, and SPS requirements may continue to constrain exports.
- **Implementation capacity:** The agreement's success depends on how effectively MSMEs and service providers utilise its provisions.

Way Ahead

- **Strengthen supply chains:** Beyond tariff cuts, both countries should build integrated manufacturing and agri-processing value chains to deepen trade.
- **Deepen services cooperation:** Expanding collaboration in IT, education, healthcare, tourism, and professional services can unlock high-value growth.
- **Leverage diaspora and skills:** Mobility provisions should be used to enhance people-to-people ties, skill transfer, and innovation linkages.
- **Support MSMEs:** Targeted trade facilitation, standards support, and export credit will help MSMEs access New Zealand markets.
- **Continuous review mechanism:** Regular monitoring through joint trade committees can address sectoral concerns and fine-tune implementation.

Conclusion

- The India–New Zealand FTA represents a new-generation trade agreement balancing market access with domestic sensitivities. By expanding trade, investment, and skilled mobility, it strengthens India's **Indo-Pacific economic strategy.** Effective implementation can transform the pact into a durable platform for diversified and resilient bilateral ties.

Pollution Control Vessel 'Samudra Pratap'

- The **Indian Coast Guard (ICG)** has inducted its **first indigenously** designed and built **Pollution Control Vessel (PCV), Samudra Pratap**, marking a major milestone in maritime environmental protection.

Samudra Pratap

- Samudra Pratap is a specialised **Pollution Control Vessel (PCV)** commissioned into the Indian Coast Guard for marine environmental protection, oil-spill response, and firefighting operations.
- It is the largest vessel in the **ICG fleet and the first PCV to be indigenously** designed and constructed in India.
- **Built by: Goa Shipyard Limited (GSL)** under the two-ship Pollution Control Vessel project for the Indian Coast Guard.

Key features

- **Size & capacity:** 114.5 m length, 16.5 m breadth, displacement of 4,170 tonnes, enabling long endurance and high-seas operations.
- **Advanced navigation & control:** First ICG ship with **Dynamic Positioning (DP-1)** capability for precise station-keeping during pollution response.
- **Pollution response systems:** Equipped with oil fingerprinting machine, oil spill detection systems, viscous oil recovery equipment, and onboard pollution control laboratory.
- **Firefighting capability:** Holds FiFi-2/FFV-2 notation with a high-capacity external firefighting system for ship and offshore fire emergencies.
- **Combat & support systems:** Armed with 30 mm CRN-91 gun and two 12.7 mm remote-controlled guns, integrated with modern fire-control systems.
- **Indigenous systems:** Features Integrated Bridge System, Integrated Platform Management System, and Automated Power Management System.

Significance

- Enhances India's capability to respond to oil spills, chemical pollution, and maritime accidents within the EEZ and beyond.
- Demonstrates India's ability to design and build complex, mission-specific vessels domestically.
- Strengthens preparedness for maritime ecological disasters and offshore industrial accidents.

The Blue Line

- A UNIFIL peacekeeper was injured by gunfire near the **Blue Line in southern Lebanon**, allegedly following fire from Israeli Defence Forces positions.

The Blue Line:

- The Blue Line is a United Nations-identified withdrawal line, not an international border, used to verify Israel's withdrawal from southern Lebanon as mandated by UN Security Council resolutions.

Located in:

- Along southern Lebanon, adjoining northern Israel
- Extends for about 120 kilometres from the Mediterranean coast to the tri-border area near the Golan Heights
- **Neighbouring nations:** Lebanon, Israel, and Israeli-occupied Golan Heights (bordering Syria)

Origin of the Blue Line:

- Established in 2000 by the United Nations
- Created to confirm Israel's compliance with UN Security Council Resolution 425 (1978) after its withdrawal from Lebanon
- Reinforced under **UN Security Council Resolution 1701 (2006)** following the Israel–Hezbollah conflict

Key features

- **Unofficial boundary:** Serves as a line of withdrawal, not a legally recognised international border.
- **UN monitoring:** Patrolled by the UN Interim Force in Lebanon (UNIFIL) to prevent escalation.
- **Weapons-free buffer:** Resolution 1701 calls for a zone free of armed groups between the Blue Line and the **Litani River** (except Lebanese armed forces and UNIFIL).
- **Frequent flashpoint:** Subject to violations, construction disputes, and cross-border firing, making it one of the most sensitive frontiers in West Asia.

Village Defence Guards (VDGs)

- The Indian Army's **Sabre Brigade** conducted an intensive training programme for Village Defence Guards (VDGs) in Jammu to enhance their operational readiness and coordination with security forces.

Village Defence Guards (VDGs):

- Village Defence Guards (VDGs) are armed civilian defence groups constituted in vulnerable areas of Jammu & Kashmir to assist security forces in counter-terrorism, village protection, and intelligence gathering.

Launched in

- March 2022, approved by the Union Ministry of Home Affairs (MHA).

- Replaced and restructured the earlier Village Defence Committees (VDCs) (1995).

Aim

- To provide localised, immediate defence against militant threats.
- To act as a force multiplier for police and armed forces in remote and border villages.
- To enhance community participation in internal security.

Key features

- **Composition:** Mainly ex-servicemen and trained civilians, identified at the panchayat level; group strength up to 15 members.
- **Training & weapons:** Trained by CRPF/Army; equipped with Self-Loading Rifles (SLRs) instead of older .303 rifles.
- **Operational control:** Function under the District SSP/SP, ensuring integration with the formal security grid.
- **Remuneration:** Group heads receive ₹4,500/month; members receive ₹4,000/month, unlike earlier VDCs where only SPOs were paid.
- **Roles:** Conduct day-night patrols, protect villages, religious places, and public infrastructure, and assist in search and cordon operations.

Significance

- Acts as a second line of defence in areas with delayed security-force access.
- Residents' familiarity with terrain improves early warning and intelligence inputs.

Somaliland

- Israel has become the first country to formally recognise Somaliland as an independent sovereign state, triggering sharp opposition from Somalia, the African Union, and key regional powers.

What is Somaliland?

- Somaliland is a self-declared independent state in the **Horn of Africa** that separated unilaterally from Somalia in 1991 after the collapse of the Somali central government.
- Though it has its own government, currency, security forces, and institutions, it lacked international recognition until Israel's announcement in 2025.
- **Located in:**
- Horn of Africa, along the Gulf of Aden
- Corresponds largely to the territory of former British Somaliland

- **Bordering nations:** Djibouti, Ethiopia, Somalia **(including Puntland),** and Gulf of Aden.

Historical origin:

- 1888: Became a British protectorate (British Somaliland)
- 1960: Gained independence and voluntarily merged with Italian Somaliland to form the Somali Republic
- 1991: Following civil war and the overthrow of Siad Barre, Somaliland declared independence, citing the failure of the 1960 union
- 2001: Referendum endorsed independence with over 97% support

Present status:

- Functions as a de facto state with relative peace and stability compared to Somalia.
- Not recognised by the UN, AU, or most countries; Somalia considers it an integral part of its territory.
- Maintains working political institutions, holds elections, issues its own currency (Somaliland shilling), and controls internal security.
- Israel's recognition (2025) marks the first formal bilateral recognition, potentially encouraging others but also risking regional instability.

Anti-Terrorism Conference 2025

- The Union Home Minister called for the creation of an **"impenetrable anti-terror grid"** on the national level and a common **anti-terror squad (ATS)** structure across states.
- A **"360-degree strike"** plan against organized crime was announced and the shift from a "Need to Know" to a "Duty to Share" approach in intel-sharing among security agencies was emphasized.

Key Outcomes

- The mandatory use of platforms **like National Intelligence Grid (NATGRID) and National Integrated Database on Arrested Narco-offenders (NIDAAN)** was encouraged.
- An updated NIA crime manual, an **Organised Crime Network Database** and a comprehensive database for lost and looted weapons were launched.
- A uniform ATS structure nationwide was emphasized at the **'Anti-Terrorism Conference-2025' organized by the National Investigation Agency (NIA).**

Significance of Common ATS Framework

- **Evolving Nature of Terrorism:** Terrorism is becoming more complex, trans-regional, and technology-driven, using tools such as AI, blockchain transactions.
- **Uniformity and Standardisation Across States:** Uniform Standard Operating Procedures (SOPs) can ensure consistent preparedness and quick response across states (investigation to prosecution and counter-action).
- **Improved Inter-Agency Coordination:** Between state police, central agencies like NIA, intelligence units such as Intelligence Bureau (IB), Research and Analysis Wing (RAW).
- **Operational Efficiency:** Standard training, databases, technology use and similar capabilities in all units.

India''s National Anti-terrorism Framework

- **National Agencies:** NIA, National Security Guard, IB, etc.
- **National database:** National Intelligence Grid (NATGRID), under Ministry of Home Affairs (MHA) for Real-time intelligence and data access for intelligence coordination; National Integrated Database on Arrested Narco Offenders (NIDAAN).
- **Preventing Terror Financing:** Terror Funding and Fake Currency Cell (TFFC) under NIA; Combating Financing of Terrorism (CFT) Cell under Ministry of Home Affairs, etc.

INS Vaghsheer

- President Droupadi Murmu undertook a submarine sortie onboard INS Vaghsheer from the Karwar naval base in Karnataka.
- President Murmu is the second Indian President to undertake a submarine sortie, the first one being President APJ Abdul Kalam in 2006.
- A submarine sortie is an operational deployment of a submarine, where it leaves its home base to perform a task at sea.

About INS Vaghsheer

- It is the sixth and **final Kalvari (Scorpene)-class submarine** inducted in 2025 under **Project-75**, built indigenously in India under technology transfer from France's Naval Group.
- The other 5 Kalvari-class submarines are ***INS Kalvari, INS Khanderi, INS Karanj, INS Vela & INS Vagir.***
- It is a **diesel-electric powered attack submarine**, designed for anti-surface and anti-submarine

warfare, intelligence gathering, surveillance, and special operations.

- It is armed with wire-guided torpedoes, anti-ship missiles, mine-laying capability, and has advanced stealth features such as low radiated noise and refined hydrodynamic design.
- It is among the quietest conventional submarines globally, and is planned for future integration of Air Independent Propulsion (AIP) to enhance submerged endurance.

INSV Kaundinya

- The Prime Minister has lauded **INSV Kaundinya** as it embarks on its maiden voyage from **Porbandar to Muscat**, symbolically retracing India's ancient maritime routes.
- Built using the ancient Indian stitched-ship technique, the vessel showcases India's rich seafaring heritage.

About INSV Kaundinya:

- INSV Kaundinya is an Indian Naval Sailing Vessel recreated on the basis of a **5th-century CE** ship depicted in the **Ajanta Cave paintings**, representing India's ancient ocean-going traditions.
- **Built by:** Indian Navy, in collaboration with the Ministry of Culture

Key features of the ship

- **Stitched wooden hull:** Wooden planks are stitched together instead of being nailed, reflecting ancient shipbuilding wisdom.
- **Traditional materials:** Uses coconut coir rope, natural resin and wooden planks, avoiding modern metal fastenings.
- **Cultural symbolism:** Sails carry Gandabherunda and Sun motifs, bow features a Simha Yali, and deck holds a Harappan-style stone anchor.
- **Ocean-going capability:** Designed and tested to be fully seaworthy for long-distance navigation across the Indian Ocean.
- **Historic identity:** Named after Kaundinya, the legendary Indian mariner associated with early maritime links to Southeast Asia.

Ancient Indian stitched-ship technique: What it is?

- The stitched-ship technique is an indigenous Indian method of shipbuilding in which **wooden planks** are stitched together using natural fibres, a practice once common along India's coastline and the Indian Ocean
- **Features**

- **Stitching instead of nails:** Planks are tied with coir rope, allowing flexibility and strength in rough seas.
- **Use of organic materials:** Natural resins and fibres improve durability while remaining environmentally sustainable.
- **Shock absorption:** Flexible joints reduce damage from waves, making ships suitable for long ocean voyages.
- **Ancient maritime reach:** Enabled Indian sailors to trade with West Asia, Africa and Southeast Asia centuries ago.
- **Living heritage revival:** The technique represents the revival of India's indigenous knowledge systems in shipbuilding.

Pinaka Long Range Guided Rocket (LRGR-120)

- DRDO has successfully conducted the maiden flight test of the Pinaka Long Range Guided Rocket (LRGR-120) at ITR Chandipur.

Pinaka Long Range Guided Rocket (LRGR-120):

- The Pinaka LRGR-120 is an **indigenously developed**, **precision-guided rocket** variant of the Pinaka multi-barrel rocket system, designed for long-range, high-accuracy strikes.
- **Developed by:** Armament Research and Development Establishment (ARDE), DRDO in association with High Energy Materials Research Laboratory (HEMRL).

Aim:

- To extend the strike range of the Pinaka system
- To provide precision-guided firepower with minimal collateral damage
- To enhance operational flexibility using existing Pinaka launchers

Key features:

- **Extended range:** Capable of striking targets up to 120 km, significantly increasing battlefield reach.
- **Precision guidance:** Guided rocket with advanced navigation and control ensuring textbook accuracy on targets.
- **In-flight manoeuvrability:** Demonstrated planned manoeuvres throughout the flight trajectory.
- **Launcher compatibility:** Can be fired from the in-service Pinaka launcher, enabling multiple variants from the same platform.

- **Indigenous design:** Entirely designed and developed within India using domestic technologies.

Significance

- **Force multiplier:** Enhances the Indian Army's long-range precision strike capability.
- **Operational versatility:** Allows seamless deployment of different Pinaka variants without new launch infrastructure.
- **Reduced collateral damage:** Precision guidance improves target discrimination.

Defence Acquisition Council (DAC)

- The Defence Acquisition Council (DAC) has accorded **Acceptance of Necessity (AoN)** for capital acquisition proposals worth about ₹79,000 crore to strengthen the operational capabilities of the Armed Forces.

Key highlights of approved proposals

- **Astra Mk-II air-to-air missile:** To sharpen the precision strike capability of the Indian Air Force. It is Indigenous **beyond Visual Range Air-to-Air missile (BVRAAM)** developed by DRDO with a range beyond 100 km.
- **Long-range guided rocket ammunition:** For the army's Pinaka multiple launch rocket system **(MLRS).**
- **Integrated Drone Detection and Interdiction System Mk-II:** With enhanced range and capacity to target drones, to protect vital assets.
- **SPICE-1000 Long-range Guidance systems:** Israeli-designed system made by **Rafael Advanced Defense System**, It will enable precise air-to-ground strikes at long distances across the border.
- **High Altitude Long Range (HALE) Remotely Piloted Aircraft System (RPAS):** Ensures continuous Intelligence, Surveillance and credible Maritime Domain Awareness over the Indian Ocean Region.
- **Indigenous loitering munitions for army:** Also known as kamikaze drones/suicide drones. Unlike traditional UAVs that are used for surveillance, these are designed to attack targets directly.

Defence Acquisition Council (DAC):

- The Defence Acquisition Council (DAC) is the *highest decision-making body for capital defence procurements* in India, responsible for granting in-principle approvals and Acceptance of Necessity for major acquisitions.

Functions:

- Give 'in principle' approval to Capital acquisitions in the Long Term Perspective Plan.
- Monitor the progress of major projects.
- Grants acceptance of necessity for acquisition proposals.

Members:

- **Chairman: Raksha Mantri**
- **Members:** Raksha Rajya Mantris, Chief of Defence Staff, Chiefs of Army, Navy and Air Force
- **Other members:** Defence Secretary, Secretaries of Defence Production, Defence R&D, Defence Finance
- **Member Secretary:** Deputy Chief of Defence Staff (PP&FD)

- **Established:** Set up in **2001** following the recommendations of the Group of Ministers on Reforming the National Security System.

Chairperson: Union minister of Defense

- **Objective:** It serves as the apex body for strategic defence acquisition planning and oversight, ensuring coordinated decision-making across India''s defence establishment.

Functions

- **Approval of Long-Term Perspective Plan:** Provides in-principle approval to capital acquisitions in the 15-year Long Term Perspective Plan, identifying projects with long gestation periods.
- **Acceptance of Necessity (AoN):** Grants AoN for capital acquisition projects proposed for inclusion in Five Year Plans, forming the first formal step in procurement.
- **Categorisation of projects:** Decides whether acquisitions will be Buy, Buy and Make, or Make, promoting indigenisation and domestic capability.
- **Monitoring major projects:** Reviews progress of key acquisition programmes based on feedback from the Defence Procurement Board.
- **Policy coordination:** Ensures coordination between operational requirements, financial prudence and indigenous defence production goals.

Significance

- Enables timely acquisition of critical platforms and systems across the three services.
- Streamlines decision-making and reduces delays in defence acquisitions.
- Encourages indigenous development and production under the Atmanirbhar defence framework.
- The defence acquisition council (DAC) approved purchase of military hardware which will pave

the way for more indigenous manufacturing of defense products and boost the military's combat readiness.

3 Years of India-Australia Economic Cooperation & Trade Agreement (ECTA)

- The India-Australia Economic Cooperation and Trade **Agreement (INDAUS ECTA)** is a landmark trade pact signed in 2022, aimed at doubling bilateral trade within five years.
- It is India''s first agreement with a developed country in over a decade.

Key Features of the India-Australia ECTA

- **Trade in Goods:** Australia offers 100% duty-free access for Indian exports (textiles, leather, jewellery).
- **Trade in Services and Professional Mobility:** Extended post-study work visas (2-4 years) for Indian students and quota for "Work and Holiday" visas.
- **Safeguards and Regulatory Cooperation:** Robust Rules of Origin prevent third-party re-routing. Includes fast-track pharmaceutical approvals.
- **Other:** Eliminates double taxation on Indian IT offshore income, etc.

India Australia Economic Relations

- **Trade Status:** In FY25, India was Australia''s 8th largest trading partner, and Australia was India''s 14th largest trading partner.
- **Total Bilateral Trade:** The bilateral trade between India and Australia in FY25 stood at US$ 24.1 billion.
- **Key Indian Exports:** petroleum products, engineering goods, Drugs and Pharmaceuticals,etc
- **Key Indian Imports:** Coal, gold, etc.

Significance of India Australia Relationship

- **Strategic and Geopolitical Significance:**
- **Indo-Pacific Convergence:** E.g., Australia-India Indo-Pacific Oceans Initiative Partnership (AIIPOIP)
- **The QUAD Pillar:** Australia and India are key members of the Quadrilateral Security Dialogue (QUAD), alongside the US and Japan.
- **Defense Cooperation:** Mutual Logistics Support Agreement (MLSA) and high-level military exercises like Exercise Malabar and AUSINDEX
- **Multilateral Alignment:** E.g., G20, East Asia Summit (EAS), and the Indian Ocean Rim Association

(IORA).

- **Supply Chain Resilience:** E.g., Supply Chain Resilience Initiative (SCRI).
- **Critical Minerals Partnership:** Australia is a major source of critical minerals (lithium, cobalt) essential for India's Electric Vehicle (EV) mission and clean energy transition.

Justice Mission 2025

- China conducted large-scale live-fire military drills named **"Justice Mission 2025"** around Taiwan, including missile launches, fighter jet sorties, and naval deployments.

Justice Mission 2025:

- Justice Mission 2025 is a high-intensity, two-day PLA (People's Liberation Army) military exercise involving live-fire missile launches, air and naval manoeuvres.
- It is designed to simulate blockade operations and precision strikes against Taiwan's ports and maritime targets.

Location:

- Conducted around Taiwan, including waters to the north and south of the island.
- Missile launches observed from **Pingtan Island**, the closest Chinese territory to Taiwan.

Nations involved:

- China: People's Liberation Army (ground forces, navy, air force, missile units).
- Taiwan: Target of the drills; responded with heightened military readiness.

Aim:

- To send a deterrent signal against Taiwan's independence assertions.
- To warn the US and its allies against military support and arms sales to Taiwan.
- To demonstrate China's capability to blockade and isolate Taiwan during a conflict.

Key features:

- Live-fire missile launches targeting surrounding waters.
- Naval deployments simulating maritime blockades and anti-submarine warfare.
- Joint operations integrating air, sea, missile, and ground forces.
- One of the largest drills near Taiwan in recent years, indicating escalation.

Implications:

- Heightened regional tension: Raises the risk of miscalculation in the Taiwan Strait.
- US-China rivalry: Reinforces strategic competition over Taiwan's security.

- East Asian security impact: Concerns for Japan, ASEAN, and global trade routes.

UAE–Saudi Rift in Yemen

- The United Arab Emirates announced the withdrawal of its troops from Saudi Arabia following Saudi airstrikes on Mukalla port in Yemen.
- Escalation among anti-Houthi actors complicates prospects for a unified political settlement.

What Happened in Mukalla?

- **Port Strike:** Saudi Arabia bombed **Mukalla port (Southern Yemen)** after a shipment arrived from the UAE's Fujairah, alleging it carried weapons for southern separatists.
- **Denial:** UAE stated the shipment contained vehicles for its own forces, rejecting claims of arms supply.

Actors and Alignments in Southern Yemen

- **Southern Transitional Council (STC):** UAE-backed group seeking southern Yemen's sovereignty since 2017, recently expanding control ***in Hadramout and Mahra***.
- **Yemeni Military Bloc:** Opposes STC and is aligned with the Hadramout Tribal Alliance, which is supported and backed by Saudi Arabia.

Reasons Behind UAE Withdrawal

- **Operational Safety:** The UAE cited concerns over the safety of its personnel amid rising airstrikes.
- **Counterterror Focus:** Abu Dhabi reiterated that its Yemen presence is limited to counterterrorism.
- **Political Signalling:** Withdrawal reinforces that Yemen's governance must be decided internally.

Yemen

- **Geographical Location**: Yemen lies at the south-western tip of the Arabian Peninsula, bordering Saudi Arabia, Oman, the Red Sea and the Gulf of Aden.
- **Strategic Position:** Controls access near the Bab-el-Mandeb Strait, a vital maritime chokepoint linking the Red Sea with the Indian Ocean.
- **Capital Status:** Sana'a is the constitutional capital, but it remains under Houthi control.
- **Civil War:** Conflict began in 2014 when rebels seized Sana'a, leading to Saudi-led intervention

in 2015.

- **Major Ports:** Aden, Hodeidah, Mukalla and Mocha, which are critical to the economy.
- **River System:** Yemen has no perennial rivers; instead, it has seasonal riverbeds called wadis. Important wadis include Wadi Hadramawt and Wadi Zabid, which support agriculture and settlements.
- **Marib Dam:** The Marib Dam, an ancient structure, is crucial for irrigation and water security.

United States–Venezuela Tensions over Oil Sanctions and Maritime Interdictions

- Relations between the United States and Venezuela have sharply escalated after the U.S. seized Venezuelan oil tankers and imposed a naval quarantine on oil shipments.

Why Trump Is Targeting Venezuela?

1. Strategic And Economic Factors

- **Energy Security:** Venezuela holds the world's largest proven oil reserves (~303 billion barrels), and control over these reserves can reduce U.S. reliance on West Asian energy.
- **Sanctions Fatigue:** Despite years of sanctions, the Maduro regime has survived, prompting

Washington to explore harder coercive tools like Maritime Chokehold to disrupt its primary revenue source.

2. Geopolitical Rivalry

- **Countering Rivals:** Venezuela has deepened ties with China, Russia, Iran, and Cuba, including oil-backed loans, arms purchases, and security cooperation.
- **Cold War Revival:** The Caribbean is being treated again as a sphere of strategic control for the U.S.

3. Regime Change Objective

- **Domestic Opposition Support: Sections** of Venezuela's opposition openly back stronger U.S. action, reinforcing Washington's regime-change calculus.
- **Official Justification:** The U.S. frames its actions as counter-narcotics operations and national security enforcement, providing political and legal justification for interventionist policies

Venezuela

- **Location:** Venezuela is situated on the northern coast of South America.

- **Borders:** It borders the Caribbean Sea and the Atlantic Ocean to the north, **Guyana** to the east, Brazil to the south, and **Colombia** to the southwest and west.
- **Geographical Features:** The Andes, the expansive grassland plains (Llanos), the Guiana Highlands, and the Caribbean coast. It hosts the world's highest waterfall, Angel Falls.
- **Major Water Body:** Orinoco River (drains into the Atlantic Ocean), Rio Negro (drains into the Amazon River), Lake Maracaibo (the largest lake in South America) and Lake Guri.

SOCIETY AND SOCIAL JUSTICE

WHO Issues First Global Guideline on Infertility

- WHO has released its first-ever global guideline on infertility, calling for safer, fairer and affordable fertility care worldwide, which aims to help countries integrate infertility prevention, diagnosis and treatment into public health systems as infertility affects 1 in 6 people globally.

What the Guideline Is?

- WHO's first global framework to standardise prevention, diagnosis and treatment of infertility.
- Seeks to make fertility care accessible, equitable and evidence-based, especially in countries where treatment is unaffordable and fragmented.

Key Features of the Guideline:

- 40 recommendations covering prevention, early diagnosis, counselling and advanced treatment options.
- Focus on cost-effective infertility care integrated into national health strategies and UHC frameworks.
- Encourages fertility awareness in schools, primary health centres and reproductive health facilities.
- Addresses risk factors such as **untreated STIs**, tobacco use, poor lifestyle habits.
- Recommends lifestyle interventions—healthy diet, exercise, tobacco cessation—for individuals trying to conceive.
- Provides clinical pathways for diagnosing infertility in both men and women using evidence-based

protocols.

- Strong emphasis on psychosocial support, recognising the emotional stress, stigma and mental health burdens linked to infertility.
- Urges countries to adopt a rights-based, gender-equal reproductive health framework. **sudden crowd surge arises due to real or perceived danger** or loss of space

Child Marriage Hotspot

- Child marriages in Madhya Pradesh have risen sharply by 47% since 2020, with **Damoh district** emerging as the worst hotspot in 2025.
- Parliamentary data shows 538 cases recorded this year, the highest in five years.

Child Marriage Hotspot:

- A persistent cluster of districts reporting disproportionately high child marriages, mainly in Bundelkhand, central MP, ***Gwalior–Chambal and tribal belts***, indicating entrenched socio-economic vulnerabilities.

Trends

- **Steady Statewide Rise:** MP saw cases rise from 366 (2020) to 538 (2025) — a 47% increase despite awareness campaigns.
- **District-Level Surge:** Damoh alone accounts for 21% of all child marriages in 2025, jumping from 33 cases in 2024 to 115 in 2025.
- **Regional Concentration:** Bundelkhand, tribal and economically backward districts dominate the list, signalling poverty-linked, region-specific persistence.

Implications:

- Rising child marriages undermine girls' education, health and economic participation, deepening intergenerational poverty.
- It increases risks of maternal mortality, early pregnancies and domestic violence.
- The trend signals weak enforcement of **PCMA 2006**, gaps in local governance, and failure of social protection schemes to reach the most vulnerable.

Kondapalli Transformation

- Kondapalli village in **Bijapur, Chhattisgarh**, has received mobile connectivity and electricity for the first time, marking a major shift after decades under Maoist influence.
- **Kondapalli:**
- A remote tribal gram panchayat in **Maoist-affected Bijapur district** that has gained mobile connectivity **(first-ever tower) and electricity** after years of isolation due to Left-Wing Extremist obstruction.

Key Features:

- Installation of the first mobile tower (Jio) in April 2025; 60% households now own mobile phones.
- Electrification of households after decades without basic amenities.
- Improved access to **banking, Aadhaar-based services, welfare scheme**s, and emergency communication.

Significance:

- Demonstrates weakening Maoist influence and strengthening of state presence.
- **Enhances socio-economic outcomes:** telemedicine, digital education, welfare delivery, and livelihoods.
- Boosts trust in governance, enabling integration with mainstream development processes.

Bharat Ranbhoomi Darshan

- Sikkim is hosting a supercar rally under Bharat Ranbhoomi Darshan initiative, covering key border routes to promote battlefield and border tourism.

Bharat Ranbhoomi Darshan

- A **digital platform** (mobile app + web portal) developed by the Ministry of Defence with the Ministry of Tourism to enable public access to India's historic battlefields and border sites.
- Covers 77 sites along the Line of Actual Control (LAC) and Line of Control (LoC) such as Galwan Valley, Doklam, **Longewala and Nathu La**, previously restricted due to security sensitivity.
- Aims to boost border tourism and awareness of military history while offering virtual tours, key

historical content, route details, and a single-window permit system for restricted border sites.

Operation Hinterland Brew

- The Directorate of Revenue Intelligence (DRI) dismantled a clandestine Mephedrone unit in Maharashtra under **"Operation Hinterland Brew,"** seizing 128 kg of the drug.

Mephedrone:

- Mephedrone, **or 4-methylmethcathinone (4-MMC),** is a synthetic stimulant of the amphetamine and cathinone classes.
- It acts as a **xenobiotic** and environmental contaminant, typically appearing as powder or crystals, and produces euphoria, alertness and sociability similar to **amphetamine-type stimulants**.
- It causes anxiety, paranoia, cardiovascular strain, hallucinations and addiction; severe toxicity can lead to hyperthermia, seizures and potentially fatal outcomes.
- It is a prohibited psychotropic substance in India under the **Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985.**
- A xenobiotic is a foreign chemical not naturally produced by the body, such as drugs, pollutants or additives, and requires metabolic detoxification for removal, often affecting health and ecosystems

Operation Hinterland Brew:

- It is an anti-narcotics initiative by the Directorate of Revenue Intelligence (DRI) to dismantle illegal drug-manufacturing units in remote or rural areas.
- It is part of broader national efforts under **the Nasha Mukt Bharat Abhiyaan** and enforcement of the NDPS Act, 1985, to curb synthetic drug production and trafficking.

Research Ecosystem Beyond STEM Priorities

Policy debates propose aligning PhD topics with "national priorities," but non-STEM research continues to face funding gaps, weak institutional support, and limited academic autonomy.

Need for Non-STEM Research Ecosystem

- **Balanced Knowledge Ecosystem:** Sustained basic research builds long-term scientific capacity.
- **Future-Ready Innovation:** Supporting non-immediate research avoids short-termism and prepares India for emerging technologies.
- **Inclusive Academic Growth:** Recognising the humanities and social sciences strengthens policy thinking and societal understanding essential for science governance.
- **Talent Retention:** Funding & research freedom reduce brain drain and support young scholars' careers.

Challenges Faced in Non-STEM Research Ecosystem

- **Irregular Fellowship Payments:** Scholars often face months-long delays; E.g., ***DST/UGC fellows report payment gaps of 6–9 months, disrupting research continuity.***
- **Low Stipend Levels:** University-funded non-NET PhD students receive only ₹8,000/month, unchanged since 2012, below minimum wage benchmarks.
- **Weak Industry-Academia Linkages:** Industry-funded PhDs remain rare; E.g. collaborations outside IITs are minimal despite a research workforce of 2.8 lakh PhD scholars nationwide.
- **Political Vulnerability:** Social sciences face risks of topic restrictions that discourage unbiased inquiry.

Way Forward

- **Timely Funding:** Implement automated, predictable fellowship disbursement cycles.
- **Stipend Revision:** Regularly index stipends to inflation and living costs similar to periodic adjustments under India's Junior Research Fellowship norms.
- **Industry Integration:** Expand doctoral programmes with co-funded industry partnerships and goal-oriented research; E.g. **Emulate Germany's Fraunhofer model** linking labs and industries.
- **Protect Research Autonomy:** Establish academic freedom charters to safeguard non-STEM inquiry and avoid politically motivated topic selection.

Convention against Discrimination in Education

- UNESCO unveiled a report titled **Right to Education: Past, Present and Future** which reflected on the achievements of the **1960 UNESCO Convention against Discrimination in Education**.

About the Convention

- **Origin -** It was adopted in 1960 by UNESCO.
- **Legality:** It is the First legally binding international instrument which is entirely dedicated to the right to education.
- **Rights and Obligations:** It reaffirms education as a fundamental human right and obligates states to ensure:
- Free and compulsory Primary education
- Secondary Education accessible and available to all
- Higher education equally accessible to all on the basis of individual capacity
- It bans any form of discrimination in education etc.
- India has not ratified it.

Dandami Maria Tribe

- The Bison Horn Maria dance of the **Dandami Madia (Maria) tribe of Bastar**, Chhattisgarh, has drawn attention for its enduring cultural vitality despite modern influences.

Dandami Maria Tribe:

- The Dandami Maria, also known as **Bison Horn Maria** or **Khalpati Maria**, are a tribal community belonging to the broader **Gond (Koytorias)** ethnic group.
- They are recognised for their distinctive ceremonial dance and headgear resembling bison horns, which has become a cultural marker of their identity.

Origin:

- The Dandami Maria trace their lineage to the ancient **Gondwana region**, once spread across central India.
- They identify as part of the Gond tribal tradition, one of the oldest indigenous groups of the Deccan plateau.
- Linguistically, they speak **Dandami Maria,** with many also using Gondi dialects, an oral language of Dravidian origin.

Habitat and Distribution:

- Predominantly inhabit the Bastar region of southern Chhattisgarh, especially in Darbha, Tokapal, Lohandiguda, Dantewada, and surrounding forested tracts.
- Their settlements are closely integrated with dense forests, shaping their subsistence patterns,

rituals, and worldview.

- They practice agriculture, supplemented by hunting and fishing.

Key Cultural Characteristics

Bison Horn Maria Dance:

- Performed by both men and women during festivals, rituals, and communal gatherings.
- Men wear horn-shaped bamboo headgear decorated with bison or cattle horns, feathers, cowries, and cloth strips, along with bead necklaces and ankle bells.
- Women wear handwoven saris, heavy silver and brass jewellery, coin ornaments, and ceremonial crowns.

Social and Cultural Life:

- The **ghotul (youth dormitory)** plays a vital role in socialisation, cultural transmission, and community cohesion.
- Distinct hairstyles, traditional ornaments, and ceremonial objects such as tobacco boxes and combs are culturally significant.
- They permit divorce and widow remarriage, reflecting flexible social norms.

Significance

- Represents a living tribal heritage that preserves Gond identity and **pre-Aryan cultural traditions.**
- Embodies a nature-centric worldview, celebrating hunting traditions, seasonal cycles, and forest deities like Budhadev and Danteshwari Mai.

United Nations Alliance of Civilizations (UNAOC)

- India reaffirmed its civilisational ethos of **Vasudhaiva Kutumbakam** and **Sarva Dharma Samabhav** at the 11th United Nations Alliance of Civilizations (UNAOC) held in Riyadh, Saudi Arabia.
- UNAOC is a United Nations initiative that seeks to improve understanding and cooperation among nations and peoples across cultures and religions, and to counter extremism through dialogue and partnership.
- **Established in: 2005,** as a political initiative of former **UN Secretary-General Kofi Annan**, co-sponsored by Spain and Türkiye.
- **Headquarters: New York, United States.**
- **Aim:** To reduce polarization between societies and cultures, strengthen intercultural dialogue, and

promote peaceful coexistence and inclusive societies.

Functions / Priority areas:

1. Education: Promoting intercultural learning and curricula.
2. Youth: Empowering youth as agents of peace.
3. Migration: Advancing inclusion and social cohesion.
4. Media: Countering stereotypes and hate speech.
5. Women as peace mediators: Strengthening women's role in peacebuilding.

Building partnerships with states, civil society, faith leaders, academia, media, arts, sports, and the private sector.

About UNAOC 2025 (11th Edition)

- Host: Saudi Arabia, Riyadh.
- Theme: **"UNAOC: Two Decades of Dialogue for Humanity—Advancing a New Era of Mutual Respect and Understanding in a Multipolar World".**

Outcomes :

- Renewed global commitment to dialogue, mutual respect, and religious harmony amid conflicts and trust deficits in multilateralism.
- Marked 20 years of UNAOC, setting the course for its third decade.
- Broad participation of political leaders, international organizations, religious and faith actors, youth, civil society, media, arts and sports to advance peacebuilding through dialogue.

UNESCO Makes A Strong Case for Mother-Tongue Instruction

- UNESCO released its flagship report **"Bhasha Matters: The State of the Education Report for India 2025",** strongly advocating mother-tongue based instruction in India.
- The report calls for a national mission on Mother-Tongue Based Multilingual Education (MTB-MLE) to improve equity, learning outcomes and linguistic inclusion.

Key recommendations of UNESCO (India Education Report 2025)

- **National mission on MTB-MLE:** Establish a coordinated national framework with strong Centre–State institutional alignment.
- **State-level language-in-education policies:** Operationalise clear MTB-MLE policies adapted to local linguistic realities.

- **Teacher capacity building:** Recruit and train teachers with multilingual competence; reform pre-service and in-service teacher education.
- **Learner-centred pedagogy:** Design flexible language pathways responsive to students' linguistic backgrounds.
- **Community and indigenous knowledge integration:** Institutionalise community participation and local knowledge systems in schooling.
- **Multilingual learning materials:** Develop quality textbooks, assessments and resources in multiple languages across grades.
- **Gender-responsive approach:** Embed MTB-MLE across middle, secondary and alternative schooling with gender sensitivity.
- **Digital public infrastructure:** Use digital platforms to support multilingual teaching, learning and teacher mentoring.
- **Inclusive language technologies:** Invest in translation tools, speech technologies and AI while bridging the digital divide.
- **Sustainable financing:** Ensure equitable funding for multilingual education and language-responsive technologies.

Pa Pa Pagli Project

- Gujarat's Dahod district has gained attention for a play-based early childhood education model in Anganwadi centres, where the **UNICEF-supported "Pa Pa Pagli" initiative** has improved learning outcomes and confidence among children aged 3–6 years.

Pa Pa Pagli Project:

- "Pa Pa Pagli (First Steps of the Child)" is a play-oriented pre-school education initiative of the Gujarat Women and Child Development Department.
- It targets children aged **3–6 years enrolled in Anganwadi centres**, especially in educationally backward districts like Dahod.

Key features

- **Games-cum-learning model:** Learning through structured play, stories, songs, puzzles and movement-based activities.
- **Life-skills orientation:** Focus on social skills, communication, hygiene and routine habits.
- **Anganwadi transformation:** Expands Anganwadis beyond nutrition and health to early cognitive development.
- **Digital and visual aids:** Use of educational videos and activity-based tools.

- **Institutional support:** Implemented with technical support from UNICEF India for quality standards.

Significance

- **Early brain development:** Leverages the critical window where 85% of brain development occurs before age six.
- **Reduced learning gaps:** Builds school-readiness and lowers future dropout risks, especially in tribal and rural areas.
- **Equity in education:** Strengthens foundational learning among marginalised and first-generation learners.

Jat Panchayat bans smartphone use by married women

A **caste panchayat** of the Jat community in **Rajasthan's Jalore district** has issued a diktat banning smartphone use by married women from Republic Day 2026.

What's the issue?

- A social decree issued by a caste panchayat (Sundhamata Patti panchayat) prohibiting married women and daughters-in-law from using camera-enabled smartphones in public and social spaces.
- Women from 15 villages are allowed only basic keypad phones, with limited exceptions for girls using smartphones at home strictly for educational purposes.

Causes

- **Patriarchal social control:** Deep-rooted norms seek to regulate women's mobility, communication, and autonomy in the name of tradition and social order.
- **Moral policing and honour concerns:** Fear of surveillance loss, misuse of social media, and perceived threats to family honour often drive such diktats.
- **Digital anxiety:** Panchayat cited mobile addiction and children's eyesight, though restrictions selectively target women, not men.

Implications

- **Violation of fundamental rights:** Restricts Article 14 (Equality), Article 19 (Freedom of expression), and Article 21 (Right to life and personal liberty).

- **Gender discrimination:** Reinforces unequal digital access and deepens the gender digital divide.
- **Threat to constitutional morality:** Challenges Supreme Court emphasis on individual dignity over community diktats (e.g., Shakti Vahini case on khap panchayats).

SHAKTI Scholars – NCW Young Research Fellowship

- The National Commission for Women (NCW) has launched 'SHAKTI Scholars' – NCW Young Research Fellowship to promote policy-oriented research on women-centric issues.

SHAKTI Scholars – NCW Young Research Fellowship:

- SHAKTI Scholars is a six-month, grant-based research fellowship designed to support young scholars and independent researchers in undertaking policy-relevant, multidisciplinary research on issues affecting women in India.
- **Launched by: National Commission for Women (NCW)**

Aim:

- Encourage evidence-based research on women-centric challenges.
- Build a pipeline of young researchers contributing to gender-responsive governance.
- Support research that can inform laws, schemes, and institutional reforms.

Eligibility criteria:

- Nationality: Indian citizens only
- Age: 21 to 30 years
- Minimum qualification: Graduation from a recognised institution

Preference:

- Candidates pursuing or having completed post-graduation, M.Phil., or PhD
- Disciplines such as Gender Studies, Law, Social Sciences, Public Policy, Economics, Health, Technology, Development Studies, etc.

Key features

- **Research grant – ₹1 lakh:** The fellowship provides financial support to cover data collection, fieldwork, analysis, and documentation costs.
- **Duration – 6 months:** A six-month timeframe balances rigorous research with timely policy relevance and feasibility.
- **Phased fund release:** Grants are disbursed in stages, ensuring accountability and progress-linked research execution.

- **Research themes include:**
- Women's safety and dignity
- Gender-based violence and POSH implementation
- Legal rights and access to justice
- Cyber safety
- Health, nutrition, education, and skill development
- Economic empowerment and labour force participation
- Women's leadership, political participation, and work-life balance

GEOGRAPHY, ENVIRONMENT, BIODIVERSITY AND DISASTER MANAGEMENT

Africa is gradually splitting into two plates

- A new study using resurrected 1960s magnetic data shows clear evidence of active seafloor spreading near the **Afar triple junction**, confirming that Africa is gradually splitting into two plates.

East African Rift Valley

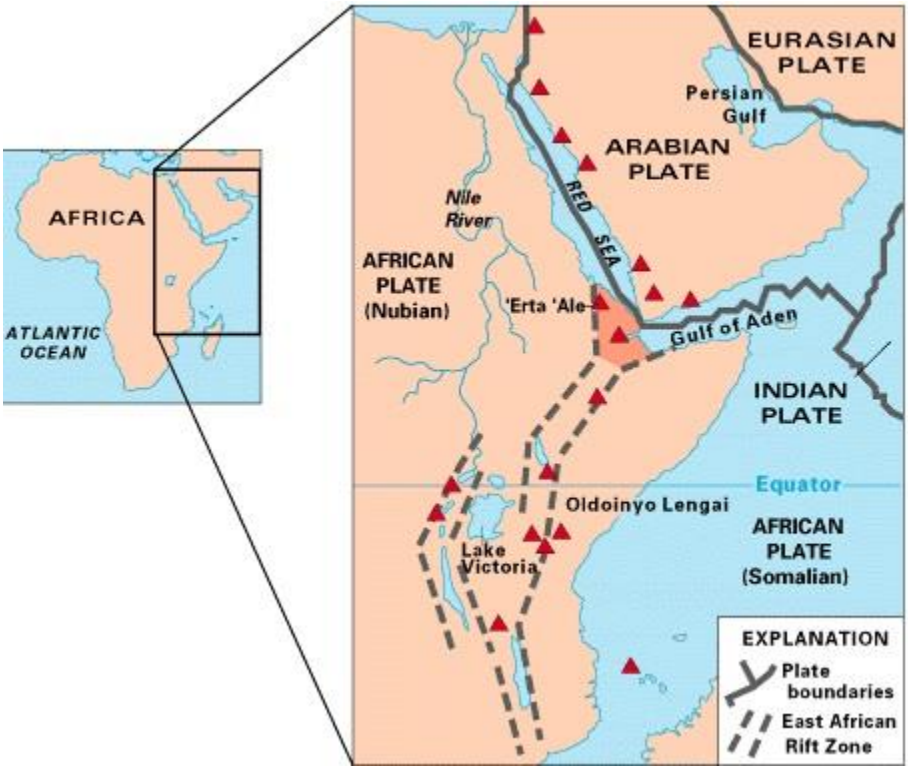
- World's largest active continental rift stretches ~3,500 km from the **Red Sea to Mozambique**, marked by elongate depressions and steep fault scarps produced by crustal extension.

Key Features

- **Two distinct branches:** the volcanic-rich **Eastern Rift** (Ethiopia–Kenya) and the seismically active **Western Rift (Uganda–Malawi),** each showing advanced stages of crustal thinning.
- **Tectonic & volcanic zone:** characterised by normal faults, fissures, active volcanoes like Erta Ale, and deep lakes such as **Tanganyika** formed by subsiding crust.
- **Afar Triple Junction:** a meeting point of the Red Sea, Gulf of Aden and East African rifts, making it one of Earth's most dynamic tectonic regions.
- **Divergent plate boundary:** separates the Somali and Nubian plates, with measurable spreading of 5–16 mm/year in the north.

Formation of the Rift Valley

- Mantle plume upwelling increases heat flow and buoyancy, uplifting and thermally weakening the continental lithosphere beneath Ethiopia–Kenya.
- Tensional plate forces stretch the brittle crust, causing extensional stress that produces large, steep normal faults on both sides of the rift.
- Horst–graben structures form as blocks of crust drop down (grabens) while adjacent blocks rise (horsts), creating deep trough-like rift valleys.
- Magmatism & basaltic volcanism accompany crustal thinning, as fissure eruptions and flood basalts fill the widening rift floor over millions of years.
- Progressive divergence may eventually rupture the continental crust entirely, allowing seafloor spreading to create a new ocean basin.



Factors Causing the African Rift

- Deep mantle superplume beneath East Africa pushes the lithosphere upward, generating uplift, stretching, and widespread magmatic weakening.
- Divergence between Somali & Nubian plates, moving 5–16 mm/year, progressively widens the rift and increases extensional strain on the crust.
- Afar triple-junction dynamics intensify crustal breakup as three spreading centres mechanically pull the region apart in different directions.

- High heat flow & magma intrusions reduce crustal strength, accelerating normal faulting and basin subsidence.
- Stress transfer from **Red Sea & Gulf of Aden** spreading centres propagates southward, reinforcing rifting from the northeast to Mozambique.

Implications of the Rift

Geological Implications:

- Formation of a new ocean basin is likely once continental rupture completes, separating the Somali plate from the African mainland.
- Higher volcanic and seismic activity will persist along Ethiopia, Kenya, and Tanzania as crustal thinning continues and magma pathways open.
- Creation of deep linear lakes & drainage shifts, altering hydrology and forming new basins such as expanded **Lake Turkana or Malawi.**
- Africa's long-term geographic reconfiguration, producing two continents with newly emergent coastlines and submerged rift floors.

Socio-Economic Implications:

- Frequent fissuring, fault scarps & earthquakes threaten roads, farms, schools, and settlements across Rift Valley nations.
- Damage to public infrastructure—as seen in Kenya and Ethiopia—will raise disaster-risk, requiring continuous monitoring and adaptation.
- Future coastline emergence may give landlocked nations like Uganda and Zambia potential sea access, reshaping trade patterns.

Conclusion

- The East African Rift Valley represents one of Earth's most active continental breakup zones, gradually reshaping Africa's geography. Though unfolding over millions of years, its seismic and volcanic impacts are already visible today. Understanding this rifting is essential for managing future geological hazards and harnessing new resource opportunities.

New Study published in journal Nature Sustainability warns about Invasive Alien Species

- Invasive alien species (IAS) are those plants, animals, or microorganisms that do not naturally

belong to a region but, once introduced, spread quickly and disturb the local balance.

Key highlights of the study

- **Expansion of IAS:** Annually, approx.15,500 km^2 natural areas in India are invaded by at least one new IAS.
- Invasive alien plants have already doubled their range in ecologically sensitive regions eg. Western Ghats (WGs), Himalayas and north-east.
- **Impacting Natural Ecosystem:** Almost 2/3rd of India's natural ecosystems now contain at least 11 major IASs, eg. ***Lantana camara, Chromolaena odorata, Prosopis juliflora*** etc.
- **Climate Change-Driven Spread:** Wet-biome invaders eg. ***Ageratina adenophora, Mikania micrantha expanded*** with rising temperatures and declining soil moisture
- Conversely, dry biomes invasions e.g., ***Xanthium strumarium*** increased with increasing rainfall.

Impacts of Invasive alien species

- **Threatening Livelihood:** eg. Prosopis juliflora often block access to pasture, firewood and water and can cause respiratory illness.
- **Threat to Wildlife:** eg. By 2022, invasions had impacted more than 1 lakh sq km of tiger habitat.
- **Threat to Biodiversity:** eg. Lantana camara suppressed native vegetation in India''s Western Ghats.
- **Economic:** India's economic losses from IASs (1960 -2020) is $127.3 billion.

Way Ahead

- Need for a National mission - for better co-ordination and integration and to counter the lack of dedicated national institutional mechanism or database
- **Prevention:** Stop new invasive species from entering through stricter checks on trade, travel, and shipping (like ballast water management).
- **Empowerment:** communities suffering the impacts must be involved in the process of recovery and monitoring.
- Following best practices eg. Mandatory Pest Risk Analysis of New Zealand for all new or imported products to predict the possibility of Invasions.

R&D Roadmap to Enable Net Zero Targets through CCUS launched

- First of its kind **R&D Roadmap to Enable Net Zero Targets through CCUS launched** by Department of Science & Technology (DST), the roadmap offers Three Phased Research & Development Program in Carbon Capture, Usage and Storage (CCUS).

Three Phases Include

- Integration of the **current state-of-the-art CCUS technologies** or their improved versions as **End-Of-Pipe (EP) solution** in the existing emitting industries.
- Integration of advanced CCUS technologies in new industrial manufacturing plants using **CCUS Compliant Design (CCD).**
- Integration of emerging CCUS technologies like **photo-bio-electro-catalytic conversions** as**CCUS in One Pot (COP) strategy**in new low-emission industrial manufacturing technologies.

About CCUS

- Technologies that enable the mitigation of **carbon dioxide (CO2) emissions** from large point sources like power plants, or removing existing CO2 from atmosphere and storing it either in seawater, deep-sea sediments, or geological sites, etc.

Role of CCUS in Mitigating Climate Change

- **Reducing emissions in 'hard-to-abate' industries:** Mainly industries that are difficult to decarbonise including iron, steel and chemicals.
- **Producing low-carbon electricity and Hydrogen:** CCUS can be installed on power plants running on coal, gas, biomass or waste.
- **Removing existing CO2 from atmosphere:** Through either **Bioenergy with Carbon Capture and Storage (BECCS)** or Direct Air Carbon Capture and Storage (DACCS) – both having technological foundation with CCUS.
- DACCS enables the capture of CO2 directly from the atmosphere while BECCS can result in CO2 removal on a net basis where the biomass is sustainably sourced.

Sanctuary Wildlife Service Award 2025

- BNHS scientist Parveen Shaikh has won the **Sanctuary Wildlife Service Award 2025** for her innovative, community-led conservation of the endangered **Indian Skimmer** in the National Chambal Sanctuary.

Sanctuary Wildlife Service Award 2025:

- The Sanctuary Wildlife Service Award is an annual national honour that recognises exceptional contributions to wildlife conservation in India. It highlights field practitioners, scientists, and community leaders whose work safeguards ecosystems and threatened species.
- **Instituted By: Sanctuary Nature Foundation**
- **2025 Winner:** Parveen Shaikh (BNHS Scientist)

Key Contributions

Scientific Research & Monitoring:

- Conducted long-term studies on Indian Skimmer populations since 2016.
- Documented nesting behaviour, survival challenges, and threats from river-level changes and predators.

'Nest Guardian' Model:

- Developed a community-led protection system for nests on sandbars.
- Trained locals to fence colonies, monitor nests, and deter predators.
- Raised nest survival from near zero to ~60%.

Habitat & Threat Assessment:

- Studied effects of dams, altered flows, and sandbar accessibility on nesting.
- Proposed adaptive conservation measures tailored to river dynamics.

Seventh UN Environment Assembly (UNEA-7)

- A deep divide has emerged among member states over UNEP's **Medium-Term Strategy (2026–2030),** triggering tense negotiations as UNEA-7 opens in Nairobi.

Seventh UN Environment Assembly (UNEA-7):

- UNEA-7 is the world's **highest environmental decision-making forum**, convened under the UN Environment Programme (UNEP). It brings together all UN member states to negotiate resolutions and chart global environmental policy.
- **Venue: UNEP Headquarters, Nairobi, Kenya**

Historical Background:

- UNEA was created in **2012 after the Rio+20 Conference** to elevate environmental diplomacy to

the same status as UN bodies on peace and development.

- Since 2014, six assemblies have adopted 105 resolutions on issues ranging from plastics to illegal wildlife trade.
- Theme of UNEA-7 (2025): **"Advancing sustainable solutions for a resilient planet."**

Aim:

- To secure a coherent global environmental agenda for 2026–2030.
- To approve UNEP's Medium-Term Strategy (MTS) and align it with global treaties.

Key Features of UNEA-7:

- Intense Negotiations on UNEP's Medium-Term Strategy (2026–2030): Countries are split on whether the MTS should be reopened, renegotiated, or adopted as drafted.

Funding Crisis within UNEP:

- UNEP's regular UN budget share dropped by 20% due to the US halting payments.
- Contributions to the Environment Fund have declined by 11–12%.
- Slimmer Set of Resolutions: Of 19 proposed resolutions, only 15 survive, many "on life support."
- Importance of UNEA in Global Green Diplomacy: UNEA is the only forum addressing climate, biodiversity, and pollution together.

Key features of UNEP Medium-Term Strategy 2026–2030:

- Climate Stability: Scale mitigation and adaptation measures; strengthen science-policy interfaces.
- Thriving Biodiversity: Support implementation of nature-positive restoration and conservation frameworks.
- Zero Pollution: Tackle waste, plastics, chemicals, and air pollution with life-cycle solutions.
- Resilient Land & Ecosystems: Address land degradation and desertification.
- Sustainable Resources & Consumption: Shift economies toward circularity and efficiency.
- Strengthened Environmental Governance: Enhance compliance systems, data platforms and transparent monitoring.

Eturnagaram Wildlife Sanctuary

- Telangana's Mulugu forest officials are set to launch safari services for the first time inside the

Eturnagaram Wildlife Sanctuary, creating new eco-tourism opportunities.

Eturnagaram Wildlife Sanctuary:

- Eturnagaram Wildlife Sanctuary is one of Telangana's oldest protected areas, known for its rich **Deccan Plateau** ecosystem, diverse wildlife, and unique cultural–ecological heritage.
- Located In: Mulugu District, Telangana
- Situated along the Godavari River
- Lies close to the Telangana–Maharashtra–Chhattisgarh tri-border region

History:

- Established: 30 January 1952 (one of the earliest sanctuaries in the state)
- Notified: 7 July 1999 under wildlife protection rules
- The region has evidence of ancient human dwellings, stone-age remains, and sites like Rakshasa Gullu.
- Hosts Asia's largest tribal congregation, Medaram Jatara, celebrated every two years at Tadvai within the sanctuary.

Key Features:

1. Biodiversity:

- **Fauna:** Tigers, leopards, gaurs, sambar, chital, blackbuck, nilgai, wolves, pythons, antelopes.
- **Flora:** Dominated by Teak (Tectona grandis) and mixed dry deciduous vegetation.

2. Landscape & Ecology:

- Located in Deccan dry deciduous forest zone.
- Dense forest patches, riverine tracks, and undulating terrain support high wildlife diversity.

Significance:

- Ecological Importance: A critical habitat linking forested regions across three states, supporting predator–prey balance.
- Cultural Heritage: Home to the Medaram Jatara, enriching tribal identity and traditional conservation practices.
- Tourism Potential: Safari services and accommodation facilities can generate livelihoods for local communities and enhance conservation awareness.

World's Largest Spider Web Found in Vromoner Canyon

- The world's largest single colonial spider web, covering 106 square metres, was found inside a sulfur-rich cave in **Vromoner Canyon on the Albania-Greece border.**
- **Spider Species:** The colony consisted of the barn funnel weaver and the smaller dwarf weaver species.
- Both species are normally solitary, and the barn funnel weaver typically preys on the dwarf weaver.
- **Cave Effect:** The cave's total darkness limits visual hunting, allowing the species to coexist peacefully.
- High hydrogen sulfide levels in the cave support large midge populations, which remove the need for competition.

Tsunami Warning in Japan

- A tsunami warning was issued in Japan following an earthquake of **magnitude 7.6**.
- An earthquake is the shaking of the Earth's surface caused by seismic waves produced by the sudden release of energy from movements in the Earth's crust or upper mantle.

Tsunami

- A tsunami is a series of powerful ocean waves caused by the sudden, **large-scale displacement of water**, usually in oceans or large lakes.
- The term "tsunami" is a Japanese word meaning **"harbour wave."**
- **Major Examples:** Include the 2004 Indian Ocean tsunami caused by a magnitude 9.1–9.3 earthquake near Sumatra, and the 2011 Japan tsunami caused by a magnitude 9.0 undersea quake.

Causes of Tsunamis

- **Earthquakes:** It is the most common cause (about 80%). Megathrust earthquakes at subduction zones with a magnitude of 7.0 or above mainly trigger tsunamis.
- **Landslides:** Coastal or submarine landslides can violently displace water, creating large waves near the source that diminish with distance.
- **Volcanic Activity:** Explosive underwater eruptions or the collapse of volcanic islands can push large water volumes upward, generating tsunamis.

- **Other Causes:** Large oceanic meteorite impacts or underwater explosions can cause tsunami-like waves.

Characteristics of Tsunami Waves

- **Speed:** In deep oceans, tsunamis may travel at over **800 km/h, yet appear only as low**, broad swells.
- **Wavelength:** They have extremely long wavelengths, often hundreds of kilometres between crests.
- **Shoaling Effect:** As they enter shallow water, speed drops, but wave height and force increase dramatically, sometimes surpassing 10m at the shore.
- **Wave Train:** Tsunamis arrive as a series of waves minutes to hours apart, often preceded by a sudden recession of water from the shore.

50 Years of CITES

- CITES marked its **50th anniversary at CoP20 in Samarkand, Uzbekistan**, where member nations adopted major species protection decisions and debated livelihoods, sustainable use, and wildlife trade governance.

What Is CITES?

- CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) is a **legally binding multilateral treaty** regulating international trade in wild animals and plants to ensure it does not threaten species survival.

History:

- Conceived by IUCN (1963) and text finalized in 1973 (Washington D.C.).
- Entered into force on **1 July 1975**.
- **Membership:** 185 Parties (as of 2025), making it one of the world's largest conservation agreements.
- Operates through three Appendices (I, II, III) providing graded trade restrictions.

Key Functions of CITES:

- Regulates international wildlife trade via permits and certificates.
- Maintains Appendices that assign protection levels based on extinction risk.
- Coordinates enforcement against illegal wildlife trade.

- Promotes sustainable use, scientific assessment, and global cooperation.

CITES Summit (CoP20):

- The 20th Conference of the Parties (CoP20) is the decision-making summit held every 2–3 years, shaping global wildlife trade policy.

Host:

- Hosted by Uzbekistan (Samarkand) — first CoP in Central Asia.
- **Marked the 50th anniversary of CITES.**

Major Outcomes

- Species Additions & Uplistings
- 77 species added to CITES Appendices.
- Sharks & rays (oceanic whitetip, whale shark; all manta & devil rays) added to Appendix I.
- **Galápagos land iguanas** (3 species) and marine iguana added to Appendix I.
- African reptiles such as **Home's hinge-back tortoise** added to Appendix I.

Downlistings due to Conservation Success:

- **Saiga antelope (Kazakhstan)** removed from Appendix II with export flexibility.
- **Guadalupe fur seal (Mexico)** downlisted from Appendix I added to II.

India's Role:

- India successfully opposed EU proposal to list **guggul (Commiphora wightii) in Appendix II,** citing lack of scientific assessment.

Breaking the Plastic Wave 2025

- The Pew Charitable Trusts released the **"Breaking the Plastic Wave 2025"** report to assess rising plastic pollution impacts and propose system-wide solutions.

Key Findings of the Study

- **Plastic Production**
- **Growth:** Global plastic pollution will more than double from 130 Mt in 2025 to 280 Mt by 2040.
- **Output:** Annual primary plastic production will rise 52% by 2040, increasing twice as fast as waste-management capacity.
- **Waste Gap:** The global share of uncollected plastic waste will nearly double from 19% in 2025 to 34% by 2040.

Health Impacts

- **Health Burden**: Plastic-related health impacts are projected to increase by 75% by 2040.
- **Costs Burden:** Annual costs of health effects from plastic chemicals have exceeded US$1.5 trillion.
- **Toxic Chemicals:** Of the ~16,000 chemicals used in plastics, at least 25% are harmful to human health.

Climate & Microplastic

- **Emission Surge:** Greenhouse gas emissions from the plastic system will rise 58%, reaching 4.2 Gt CO_2-equivalent by 2040.
- If treated as a country, the plastic industry would become the world's third-largest emitter.
- **Microplastic:** Pollution from microplastics is expected to increase by more than 50% by 2040.
- **Major Sources:** Microplastics account for 13% of plastic pollution in 2025, mainly from tyre wear and paint, agriculture, and recycling.

Key Recommendations for System Transformation

- Reduce virgin plastic production and shift toward reuse and refill systems.
- Mandate strict design standards to remove hazardous chemical additives from the supply chain.
- Expand collection and sorting systems in the Global South.
- Extend regulations beyond packaging to agriculture, construction, automotive and microplastics.

Sudden Stratospheric Warming

- Meteorologists have warned that a Sudden Stratospheric Warming (SSW) event might occur in December 2025.
- SSW is a rapid rise in temperature of up to **50°C within a few days** in the stratosphere.
- It is triggered **by Rossby waves** rising upward from the troposphere that dissipate in the stratosphere, transferring energy and momentum.
- This weakens the strong, circulating polar winds called the polar vortex; as the air stops spinning, it compresses due to deceleration, and heats up significantly.
- The warmed air mass in the stratosphere then spreads downward, disrupting the jet stream and letting cold Arctic air spill into the mid-latitudes.
- **Surface Impact:** It causes prolonged cold spells, snowstorms, and unusual weather in North America, Europe, and Asia, with effects appearing after 1 to 3 weeks.
- The polar vortex is a year-round **low-pressure, cold-air region** around the poles, which becomes strongest in winter. "Vortex" refers to the anticlockwise airflow that keeps colder air near the

Poles.

- Rossby waves are large-scale bends in high-altitude winds and ocean currents caused by Earth's rotation and variations in Coriolis forces.

Global Environment Outlook 2025

- The 7th edition of the **Global Environment Outlook (GEO-7)** was released at the 7th United Nations Environment Assembly (UNEA), in Nairobi.
- The Global Environment Outlook is the flagship environmental assessment by the United Nations Environment Programme (UNEP).
- The UNEA is the top global environmental decision-making body with universal membership that governs UNEP.

Key Highlights

- **Major Crises:** Climate change, biodiversity loss, land degradation, and pollution are worsening together.
- **Rising Emissions:** Greenhouse gas (GHG) emissions have risen by 1.5% each year since 1990, reaching a new high in 2024.
- **Economic Costs:** Extreme weather has caused USD 143 billion annual losses over twenty years; air pollution health damages reached USD 8.1 trillion in 2019 (6.1% of global GDP).
- **Biodiversity Decline:** Nearly 1 million species face extinction, and 20–40% of the world's land is degraded, affecting over 3 billion people.
- **Pollution Burden:** About 8,000 MT of plastic waste pollutes the planet; 9 million deaths occur each year due to pollution.
- **Solution Pathways:** A whole-of-government and whole-of-society approach can secure a sustainable future, with macroeconomic benefits reaching at least USD 20 trillion annually by 2070.

About UNEP

- The UNEP is the leading global environmental authority within the UN for coordinating responses to environmental issues and promoting sustainable development.
- Established: In 1972, after the UN Conference on the Human Environment (Stockholm Conference).

Headquarters: Nairobi, Kenya.

- Reports: Emissions Gap Report, Adaptation Gap Report, Global Environment Outlook, and Frontiers.

Environmental Impact of Ethanol Blended Petrol (EBP) Programme

- The Union Road Transport and Highways Minister highlighted the environmental achievements of the **Ethanol Blended Petrol Programme** during Question Hour in Parliament.

Benefits Accrued from Ethanol Blending

- **Emission Reduction: 20% ethanol blending** in petrol reduced India's carbon dioxide emissions by 736 lakh metric tonnes.
- **Energy Security:** Ethanol blending substituted over 260 lakh metric tonnes of crude oil between 2014 and 2025.
- **Forex Savings:** Crude oil substitution saved India over ₹1.55 lakh crore in foreign exchange.
- **Investment Mobilisation:** New distillery capacities attracted investments exceeding ₹40,000 crore.
- **Rural Income:** Feedstock procurement for ethanol has paid farmers over ₹1.36 lakh crore since 2014.

Emerging Challenges from Ethanol Blending

- **Water Stress:** Producing one litre of ethanol from sugarcane requires ~2,860 litres of freshwater.
- **Pollution Risk:** Ethanol distilleries generate a highly polluting, toxic byproduct, "spent wash".
- **Import Dependence:** India transitioned from a maize exporter to an importer, with estimated imports of 1 million tonnes in 2024-25.
- **Food Inflation:** Rising ethanol demand increased maize prices by 65-70% over recent years.
- **Air Toxicity:** Ethanol combustion produces harmful aldehydes like acetaldehyde and formaldehyde.
- **Mileage Loss:** Lower energy density of ethanol causes a 5–20% reduction in vehicle fuel efficiency.
- **Vehicle Damage:** Prolonged ethanol use corrodes fuel lines and seals due to its hygroscopic nature.

About Ethanol Blended Petrol (EBP) Programme

- EBP is a **Central Sector scheme** under the **Ministry of Petroleum and Natural Gas** promoting ethanol–petrol blending.
- **Objective:** It aims to reduce import dependence, save foreign exchange, and support the domestic agriculture sector.
- **Blending Target:** Launched in 2003, the programme set a target of 20% ethanol blending by 2030.
- India achieved the target in 2025, five years ahead of schedule.
- The average blending rate increased from 1.5% in 2014 to about 20% in 2025.
- **Diverse Feedstock:** The programme permits ethanol production from sugarcane juice, FCI surplus rice, maize, and damaged food grains.
- **Production Oversight:** The Department of Food and Public Distribution is the nodal authority for fuel-grade ethanol production.

Hard Corals

- A new **Global Coral Reef Monitoring Network (GCRMN)** assessment shows Caribbean hard coral cover has **declined by 48%** between 1980 and 2024 due to extreme heat and bleaching events.

Hard Corals (Stony Corals):

- Hard corals (stony corals) are marine animals that secrete calcium carbonate skeletons, forming the rigid structures that make up coral reefs, which support one-third of marine biodiversity.

Types of Corals

- **Hard Corals (Reef-Building):** Species like **elkhorn** and **staghorn corals**; they grow in colonies, produce limestone skeletons, and construct reef frameworks.
- **Soft Corals (Non-Reef-Building):** Include **Sea fingers**, **sea whips**; flexible, plant-like, without stony skeletons, and do not form reefs.

Key Features of Hard Corals:

- Build calcium carbonate skeletons that become reef rock over centuries.
- Live in colonies of **tiny polyps**, each **hosting zooxanthellae algae** that provide food through photosynthesis.
- Form the foundation of coral reef ecosystems, enabling fish nurseries, coastal protection, and high

biodiversity.

- Thrive in warm, clear, shallow waters with stable conditions.

Threats to Hard Corals

- **Mass Bleaching Events:** Driven by extreme heat waves (1998, 2005, 2023–24), causing coral starvation and mortality.
- **Stony Coral Tissue Loss Disease (SCTLD)**: A fast-spreading disease affecting >30 species, now across 30 Caribbean countries; considered the most devastating coral disease recorded.
- **Herbivore Declines**: Collapse of **sea urchins (Diadema antillarum)** and declining parrotfish populations → uncontrolled macroalgae growth (up 85%).

Siliserh Lake and Kopra Jalashay Added to the Ramsar List

- Siliserh Lake in **Alwar district**, Rajasthan, and **Kopra Jalashay near Bilaspur, Chhattisgarh**, have been added to the **List of Wetlands of International Importance** (Ramsar List), taking India's tally of Ramsar sites to 96.

Siliserh Lake, Rajasthan:

- A **human-made / artificial lake and wetland**, now recognised as a Ramsar site (Site no. 2581).
- Important waterbody in a semi-arid zone, vital as a water source and biodiversity-rich habitat.

Located in:

- Alwar district, Rajasthan, about 8 miles southwest of **Alwar city**.
- Lies within the **buffer zone of the Sariska Tiger Reserve**, enhancing its eco-tourism and conservation value.

•

- *History:*
- Built in **1845 by Maharaja Vinay Singh**, ruler of Alwar, by constructing an embankment on a tributary of the **Ruparel River.**
- Created primarily to supply drinking water to Alwar, as evidenced by old aqueducts still visible around the lake.

Key Features

- Area of about 7 km^2, flanked by dense woodland and cenotaphs on its embankment.
- Supports 149 bird species and 17 mammal species, including:
- Vulnerable **river tern (Sterna aurantia),**
- Endangered **tiger (Panthera tigris),**
- 1% of the biogeographic population of **black stork (Ciconia nigra).**
- Popular for birdwatching, with sightings of cranes, colourful kingfishers and many more species.
- Provides drinking water, recreation and tourism, but faces threats from intensive agriculture and expanding human settlements; a restoration plan is underway.

About Kopra Jalashay, Chhattisgarh:

- A reservoir-type wetland now designated as a Ramsar site (Site no. 2583).
- Originally constructed mainly for irrigation, now recognised for its hydrological and ecological importance.

Located in:

- In Chhattisgarh, in the **upper catchments of the River Mahanadi**, near Bilaspur.
- Mainly surrounded by farmland and a few villages.

Key Features

- Has an extensive open water area with shallow, nutrient-rich backwaters.
- Strong hydrological and ecological connectivity, creating a mosaic of habitats.
- Supports more than 60 migratory bird species that use it for nesting, feeding and as a stop-over site.

Notable species include

- Vulnerable **greater spotted eagle (Aquila clanga),**

- Endangered **Egyptian vulture (Neophron percnopterus).**
- Valued by local communities and tourists for its natural beauty and birdwatching opportunities.
- Faces threats from siltation, invasive non-native species, and intensive agriculture; conservation measures are proposed, but a formal management plan is yet to be prepared.

National Energy Conservation Awards

- The President of India felicitated the winners of the **National Energy Conservation Awards (NECA) 2025** on National Energy Conservation Day at Vigyan Bhawan, New Delhi.

About National Energy Conservation Awards:

- The National Energy Conservation Awards (NECA) are annual national-level awards that recognise industries, institutions, establishments, and innovators for outstanding achievements in energy efficiency and reduction of energy consumption while maintaining or improving productivity.

Launched in:

- Instituted in 1991 (under the Energy Conservation framework)
- Presented annually on 14 December, observed as National Energy Conservation Day
- **Nodal Ministry: Ministry of Power**
- **Implementing Agency: Bureau of Energy Efficiency (BEE)**
- BEE was established under the **Energy Conservation Act, 2001**

Aim:

- Promote energy conservation and efficiency across sectors of the economy.
- Encourage adoption of energy-efficient technologies and practices.

Key Features of NECA 2025

- **Wide sectoral coverage:** Industry, Buildings, Transport, Institutions, Appliances, Innovation, and Professionals
- **High participation:** 558 applications received across categories
- **New category introduced**: Social Media Influencers & Digital Content Creators to promote behavioural change through digital outreach

Transparent selection process:

- Technical Committee (headed by Member–Thermal, CEA)
- Award Committee chaired by Secretary (Power)

Significance of NECA

- **Energy security:** Promotes "energy saved = energy produced" approach without resource depletion.
- **Climate action:** Supports India's decoupling of GDP growth from GHG emissions.
- **Policy alignment:** Complements schemes like PAT, Standards & Labelling, RCO, and ADEETIE.

India's Resolution on 'Strengthening the Global Management of Wildfires' adopted at UNEA-7

- The resolution aimed at strengthening international cooperation and coordinated action for wildfire management.
- UNEP's report **'Spreading Like Wildfire'**, warns that wildfires may rise 50% by 2100, if current trends continue.
- Total 11 resolutions were passed at the UNEA-7 including coral reefs, anti-microbial resistance, cryosphere, chemical, waste, etc.

Key Provisions of India's Resolution

- **Strengthening International Cooperation:** Development of early warning systems, risk assessment, satellite- and ground-based monitoring and community alerts.
- **Enhanced Regional and Global Collaboration:** Mechanisms supporting prevention, post-response recovery, and ecosystem restoration.
- **Knowledge Sharing and Capacity Building:** Creation of platforms for best practices and training and programmes.
- **Support for National and Regional Action Plans:** Assistance for integrated fire management and wildfire resilience strategies.
- **Facilitating Access to Finance:** Help in project preparation for multilateral and results-based funding.

Current status of wildfires in India

- According to **Forest Survey of India Report**, more than 36% of the country's forest prone to frequent forest fires, nearly 4 % extremely prone, 6% found to be very highly fire prone **(ISFR 2019).**
- Satellite based remote sensing technology and **GIS tools** have been effective in better prevention and management of fires, like **MODIS sensor and SNPP-VIIRS.**

United Nations Environment Assembly (UNEA, HQ: Nairobi, Kenya)

- Established in **2012,** at the **United Nations Conference on Sustainable Development**.
- **Roles and Functions:**
- Highest-level decision-making body on the matters related to environment.
- It set the global environmental agenda; provide policy guidance and define policy responses to address emerging environmental challenges in the world.

New Snakehead Fish 'Channa bhoi'

- Scientists discovered a new snakehead fish species, Channa bhoi, in Meghalaya.
- The species was named after the indigenous **Bhoi community** of the **Khasi tribe in Meghalaya**.
- Taxonomy: It belongs to the **Gachua group** of dwarf snakeheads, known for high endemism in the Eastern Himalayas.
- **Appearance:** The fish has a bluish-grey body with distinctive black spots present on each scale.
- **Habitat:** It inhabits shallow, slow-flowing mountain streams with dense riparian vegetation.
- **Distribution:** The species is endemic to the **Ri-Bhoi district** of Meghalaya.
- **Role:** It is a micro-predator and acts as a key indicator of freshwater ecosystem health.

Macrocephalosaurus mariensis

Scientists discovered CAPPA/UFSM 0295, a rare **hatchling fossil** of Macrocephalosaurus mariensis, in southern Brazil.

- mariensis was a herbivorous rhynchosaur species that lived during the **Late Triassic Period.**
- It was a four-legged reptile with a barrel-shaped body, growing to over two metres in length.
- The species had a distinctive downward-curved, beak-like snout used for cropping low vegetation.
- Fossils of M. mariensis are found exclusively in the **Santa Maria region** of southern Brazil.
- Rhynchosaurs were extinct herbivorous quadrupedal reptiles with downturned parrot-like beaks that thrived during the Triassic Period.

Rhinoceros Dehorning

- A recent international study shows that rhino dehorning has reduced poaching by nearly 75–78% in African reserves, offering a cost-effective conservation tool.

About Rhinoceros (Rhino):

- The rhinoceros is a large, **herbivorous mammal** belonging to the family Rhinocerotidae.
- It is one of the oldest surviving megafauna, dating back millions of years.

Habitat:

- Rhinos occupy diverse ecosystems depending on species:
- Grasslands and savannahs
- Tropical and subtropical forests
- Swamps, riverine areas, and shrublands

Types of rhinos (5 species):

1. White rhino (Ceratotherium simum): Africa
2. Black rhino (Diceros bicornis): Africa
3. Greater one-horned (Indian) rhino (Rhinoceros unicornis): India & Nepal
4. Javan rhino (Rhinoceros sondaicus): Indonesia
5. Sumatran rhino (Dicerorhinus sumatrensis): Indonesia

Key characteristics:

- Horn made of keratin, not bone (same protein as hair and nails)
- Herbivorous, feeding on grasses, leaves, shoots, and roots
- Poor eyesight but strong hearing and smell
- Semi-aquatic behaviour in some species (Indian rhino)
- Slow reproduction, making recovery difficult after population loss

Conservation status:

Critically Endangered: Javan, Sumatran, Black rhino

Vulnerable: Greater one-horned rhino

Near Threatened: White rhino

Significance

- **Biodiversity value:** Rhinos are keystone species, shaping grassland and forest ecosystems through grazing and seed dispersal.
- **Ecological balance:** Their feeding behaviour maintains habitat heterogeneity, supporting smaller species.
- **Cultural and heritage value:** The Indian rhino features in Assam's natural heritage, especially Kaziranga National Park.

- **Indicator of governance:** Rhino conservation reflects state capacity, anti-poaching enforcement, and community participation.
- **Global conservation symbol:** Rhino protection is central to global efforts against illegal wildlife trade, alongside elephants and tigers.

Erivan Anomalous Blue

- Armenia has unveiled the official logo of COP17 of the Convention on Biological Diversity (CBD), featuring the Erivan Anomalous Blue (Polyommatus eriwanensis), a rare endemic butterfly.
- **Erivan Anomalous Blue (Polyommatus eriwanensis):**
- Polyommatus eriwanensis, commonly known as **the Erivan Anomalous Blue, is a blue butterfly species** endemic to Armenia.
- It is named after **Yerevan (Erivan)** and is found only in **southern Transcaucasia.**

Habitat:

- Inhabits calcareous grasslands in Armenia.
- Found at elevations of 1,200–2,200 metres above sea level.
- One generation per year; adults are active from mid-June to mid-July.
- The larval host plant is still unknown, limiting ecological assessment.

IUCN status:

- Not listed in the Global or European IUCN Red Lists.
- Listed as Endangered in the Red Book of Animals of Armenia (2010).
- Distribution partly overlaps with Khosrov Forest State Reserve and Gnishik Protected Landscape.

Key characteristics:

- Endemic and range-restricted, making it highly sensitive to environmental change.
- Butterflies act as indicator species, reflecting ecosystem health.
- Population trends and density remain uncertain due to identification challenges and unknown host plant.

About COP17 of the Convention on Biological Diversity (CBD):

- The 17th Conference of the Parties (COP17) under the Convention on Biological Diversity, a UN treaty adopted in 1992.
- Serves as the supreme decision-making body for global biodiversity governance.

- **Host: Yerevan, Armenia**
- Scheduled for October 2026
- **Theme: "Taking action for nature"**
- **Logo significance:**
- Features the Erivan Anomalous Blue butterfly, symbolising local biodiversity linked to global goals.
- Uses 23 blended colours, representing the interdependence of the 23 biodiversity targets.

Black-Capped Capuchin

- **Bannerghatta Biological Park in Karnataka** imported eight black-capped capuchin monkeys from South Africa under an exchange programme.

Black-capped capuchin (Sapajus apella)

- The black-capped capuchin, or tufted capuchin, is a New World monkey native to the Amazon Basin.
- **Appearance:** It has light brown fur with a distinctive dark fur cap on the head.
- **Distribution:** The species is widely distributed across South America, including Brazil, Colombia, Ecuador, Peru, and Venezuela.
- **Habitat Range:** It thrives in moist tropical, subtropical, and disturbed or secondary forests across the Amazon Basin.
- **Behaviour:** the capuchins are diurnal, primarily arboreal, and highly social animals living in groups of 10-30 individuals
- **Ecological Role:** They act as seed dispersers and help control potential pest populations.
- **Conservation Status:** IUCN - Least Concern; CITES: Appendix II.

Southern Ocean Carbon Anomaly

- New research published in Nature Climate Change shows that **the Southern Ocean has absorbed more carbon dioxide** since the early 2000s, contrary to long-standing climate model predictions.
- This unexpected behaviour—termed a **Southern Ocean carbon 'anomaly'**—reveals key processes that climate models have so far underrepresented.

About Southern Ocean Carbon Anomaly:

- The Southern Ocean carbon anomaly refers to the observed strengthening of the Southern Ocean as a carbon sink, even though climate models predicted it would weaken and start releasing carbon dioxide under global warming.
- Instead of emitting more CO_2 due to stronger winds and upwelling, the ocean has continued to absorb an increasing share of human-emitted carbon.

How it occurs?

- **Strengthened westerly winds drive upwelling:** Climate warming intensifies Southern Hemisphere westerlies, pulling carbon-rich deep waters upward toward the Southern Ocean surface.
- **Freshwater input lightens surface layers:** Increased Antarctic ice melt and rainfall add freshwater at the surface, making it **less salty and more buoyant**.
- **Stratification forms a surface "lid":** The buoyant freshwater layer strengthens vertical stratification, separating surface waters from deeper, carbon-rich layers.
- **Blocked air-sea gas exchange:** Although deep waters rise, stratification prevents them from reaching the surface, stopping CO_2 from escaping to the atmosphere.
- **Carbon gets trapped below the surface: Upwelled circumpolar deep waters** remain approx. 100–200 m below the surface, allowing continued net carbon absorption.
- **Small-scale processes amplify the effect:** Ocean eddies and ice-shelf cavity dynamics reinforce stratification but are poorly resolved in coarse climate models.

Factors causing the anomaly

- **Freshening of surface waters:** Increased rainfall and meltwater from Antarctic glaciers **have reduced surface salinity, making surface waters lighter and more buoyant.**
- **Enhanced stratification:** Fresher, lighter surface layers sit atop warmer, saltier deep waters, limiting vertical mixing and air-sea gas exchange.
- **Trapping of carbon-rich waters below surface:** Upwelled circumpolar deep waters remain 100–200 metres below the surface, preventing CO_2 release.
- **Incomplete model representation:** Climate models struggled to capture small-scale processes such as ocean eddies and ice-shelf cavity dynamics that govern stratification.
- **Data limitations:** Sparse, seasonal observations in the Southern Ocean reduced the ability to validate and refine model behaviour.

Implications of the anomaly

- **Temporary climate buffer:** Continued carbon uptake has slowed the accumulation of atmospheric CO_2, buying the world limited time.
- **Risk of sudden reversal:** Observations suggest surface stratification is thinning; if it collapses, stored deep carbon could rapidly outgas.
- **Model refinement imperative:** Highlights the need to better integrate ocean chemistry, freshwater inputs, and fine-scale physics into climate models.
- **Policy relevance:** Reinforces that reliance on natural carbon sinks is risky and cannot substitute for emission reductions.
- **Importance of sustained observation:** Year-round monitoring of polar oceans is essential to anticipate abrupt climate feedbacks.

Conclusion

- The Southern Ocean carbon anomaly shows that nature can temporarily defy model expectations, but not indefinitely. Freshwater-driven stratification has masked deeper vulnerabilities in the climate system. As this protective layer weakens, the Southern Ocean could swiftly shift from **carbon ally to climate amplifier**, underscoring the urgency of emissions cuts and better observations.

Tiger Census Formally Launched in the 28th NTCA Meeting

- The 28th Meeting of the **NTCA** and the 22nd Steering Committee Meeting of **Project Elephant** were recently held in the Sundarbans Tiger Reserve, West Bengal.
- The sixth cycle of All India Tiger Estimation was formally launched with expanded coverage of Tigers Outside Tiger Reserves.

All India Tiger Estimation (AITE)

- **Tiger Census:** All India Tiger Estimation is the world's largest wildlife monitoring exercise to assess the tiger population and distribution in India.
- **Implementing Agency:** It is conducted every four years by NTCA in collaboration with the Wildlife Institute of India and State Forest Departments.
- **Scientific Baseline:** AITE began with the first scientific national assessment in 2006, following recommendations of the Tiger Task Force.
- **Expanded Coverage:** The sixth All India Tiger Estimation (2026 cycle) includes systematic mapping of Tigers Outside Tiger Reserves for the first time.

- **Methodology:** AITE follows a double sampling approach using multi-phase ground surveys, habitat mapping, camera trapping, & intensive annual monitoring.
- **Tech-Enabled:** It integrates digital tools, AI, and remote sensing to improve accuracy and coverage.
- **M-STrIPES:** App used by forest guards for GPS-tagged, real-time field data entry.
- **CaTRAT:** AI-based software used to segregate tiger photographs from other wildlife images.
- **ExtractCompare:** Software used to 'fingerprint' tigers by analysing unique stripe patterns.

National Tiger Conservation Authority (NTCA)

- **Statutory Body:** NTCA is a statutory body under the Ministry of Environment, Forest and Climate Change, established under the Wildlife (Protection) Act, 1972.
- **Apex Authority:** It was created in **2005 on the recommendations of the Tiger Task Force** as the apex authority for Project Tiger.
- **Annual Reporting:** An Annual Report of NTCA is mandated to be laid before Parliament along with the Audit Report.
- **Leadership:** Union Environment Minister serves as Chairperson, Minister of State as Vice-Chairperson, and Inspector General of Forests for Project Tiger as Member Secretary.
- **Membership:** Members include 3 Members of Parliament (2 Lok Sabha, 1 Rajya Sabha) and 8 experts from wildlife conservation and tribal welfare.

Key Functions

- Approves site-specific Tiger Conservation Plans prepared by states.
- Lays down standards for tourism regulation, habitat management, and anti-poaching operations.
- Conducts the All-India Tiger Estimation once every four years.
- Evaluates and disallows ecologically unsustainable activities within tiger reserves.
- Coordinates with Wildlife Crime Control Bureau and deploys Special Tiger Protection Force.

Project Elephant

- **Centrally Sponsored:** Project Elephant is a Centrally Sponsored Scheme launched in 1992 for elephant conservation in India.
- **Administrative Merger:** Administration merged with Project Tiger in 2023 under the new 'Project Tiger and Elephant Division'.
- **Nodal Ministry:** Ministry of Environment, Forest and Climate Change.
- **Apex Committee:** The Steering Committee is chaired by the Union Minister for Environment,

Forest and Climate Change.

- **Project Head:** An Inspector General of Forests oversees the programme and serves as its director.
- **Technical Partner: Wildlife Institute of India (WII)** serves as the primary technical and research partner through a dedicated Elephant Cell.
- **Key Objectives:** Protect wild elephants, habitats, and corridors; address Human–Elephant Conflict; ensure the welfare of domesticated elephants; and implement MIKE under CITES.

IUCN Species Survival Commission (SSC)

- Indian wildlife conservationist Vivek Menon has been elected as the Chair of **the IUCN Species Survival Commission (SSC)** for 2025–2029.
- He is the first Asian to head the Commission in its 75-year history, marking a major milestone for Global South leadership in biodiversity conservation.

IUCN Species Survival Commission (SSC):

- The Species Survival Commission (SSC) is the largest and most influential scientific network of the International Union for Conservation of Nature (IUCN), dedicated to conserving species and halting biodiversity loss worldwide.
- Established in: 1949, alongside the formation of IUCN

Organisation:

- Functions as **one of the six expert Commissions** of IUCN
- Works closely with the IUCN Secretariat and national governments, NGOs, and research institutions

Aim:

- Prevent species extinctions and support recovery of threatened species.
- Ensure that use of biodiversity is equitable and sustainable.
- Integrate science, policy, and on-ground action for global conservation.

Functions

- **IUCN Red List of Threatened Species:** Provides scientific assessments categorising species as Critically Endangered, Endangered, Vulnerable, etc.
- **Knowledge generation:** Tracks status and trends of species across taxa and regions

- **Policy and guidelines:** Develops global conservation standards and best-practice frameworks
- **Conservation planning:** Supports species recovery plans, reintroductions, and habitat management
- **Action-oriented partnerships:** Catalyses on-ground conservation through collaboration with governments, NGOs, and local communities
- **Species Conservation Cycle:** Assessment → Planning → Action, supported by communication and monitoring

Significance:

- Forms the scientific backbone of global biodiversity governance.
- Guides national laws, protected area policies, and international conventions such as CBD and CITES.
- Serves as the global gold standard for extinction risk assessment.

Great Indian Bustard

- The Supreme Court, has strengthened safeguards for the critically endangered Great Indian Bustard (GIB) while revising transmission alignments under the **Green Energy Corridor (GEC)** in Rajasthan and Gujarat.

Great Indian Bustard (GIB):

- **The Great Indian Bustard (Ardeotis nigriceps)** is one of the heaviest flying birds in the world and the state bird of Rajasthan.
- It is a flagship grassland species and a key indicator of ecosystem health in India's arid and semi-arid landscapes.
- Estimated population: ~200 individuals worldwide

Conservation status

- **IUCN Red List:** Critically Endangered
- **Indian Wildlife (Protection) Act, 1972:** Schedule I
- **CITES:** Appendix I
- **CMS (Bonn Convention):** Listed species

Habitat and distribution:

- Prefers open, flat grasslands and scrub landscapes with minimal disturbance.
- Historically spread across 11 Indian states and parts of Pakistan; now largely confined to Rajasthan and Gujarat, with small pockets in Maharashtra, Karnataka and Andhra Pradesh.
- Key habitats include Desert National Park and surrounding agro-grassland mosaics.

Key characteristics:

- Tall bird (~1 metre), brownish body with black crown (more prominent in males).
- **Wingspan: 210–250 cm; weight: 15–18 kg.**
- Ground-nesting species; females lay a single egg during monsoon.
- Highly vulnerable to overhead power lines, habitat fragmentation, vehicular collisions and free-ranging dogs.

About Green Energy Corridor (GEC):

- The Green Energy Corridor is a **national transmission programme** to evacuate large-scale renewable energy from resource-rich regions to state and national grids.
- It is critical for **integrating solar and wind power** into India's electricity system.
- **Located in:** Focused on renewable-rich states such as Rajasthan and Gujarat, especially desert and coastal wind–solar zones.

Raccoon roundworm

- A new European study has found widespread spread of raccoon roundworm **(Baylisascaris procyonis)** in wild raccoon populations across nine European countries, with very high infection rates.

Raccoon roundworm:

- Raccoon roundworm is a **zoonotic parasitic infection** caused by the**nematode**Baylisascaris procyonis, which primarily infects raccoons but can accidentally infect humans and other animals, causing severe neurological and ocular damage.

Origin:

- Native to North America, where raccoons are natural hosts.
- Spread to Europe through import of raccoons for pets and fur farms in the early 20th century.
- Escaped raccoons established wild populations, carrying the parasite with them

Found in:

- Primary host: Raccoons (Procyon lotor).
- Other animals: Dogs, birds, rodents, and small mammals (as accidental hosts).

Geographic spread:

- North America (endemic).
- Europe (now established in at least nine countries, Germany as epicentre).
- India: Not established due to absence of wild raccoon populations.

Symptoms in humans:

- Human infection is rare but often severe due to larval migration:
- Early symptoms: Nausea, fatigue, liver enlargement.
- Neurological signs: Loss of coordination, reduced attention, muscle weakness.
- Ocular larva migrans: Blindness.
- Neural larva migrans: Brain damage, coma, death.
- High-risk group: Children (soil contact, poor hand hygiene)

Key features:

- **Extremely hardy eggs:** Eggs become infectious after 2–4 weeks in soil.
- Can survive for years in the environment.
- **High reproductive output:** Adult worms release millions of eggs in raccoon faeces.
- **Difficult diagnosis:** No widely available definitive tests in humans.
- **High severity, low frequency:** Rare infections, but disproportionately serious outcomes.

Earthquake struck Taiwan

- A magnitude 6.1 earthquake struck Taiwan shaking buildings in Taipei and other cities, though no major damage was reported.

Taiwan:

- Taiwan is an island in the western Pacific Ocean, officially governed as the Republic of China (ROC), with its own elected government, economy, and armed forces.
- It functions as a self-administered polity, though its sovereignty status remains contested internationally.
- **Location:**

- Situated about 160 km off the southeastern coast of China, separated by the Taiwan (Formosa) Strait.
- Lies between the East China Sea (north) and the South China Sea (south), facing the Pacific Ocean to the east.
- **Capital: Taipei.**

Neighbouring countries:

- China to the west (across the Taiwan Strait).
- Japan (Ryukyu Islands) to the northeast.
- Philippines to the south, across the Bashi Channel.
- Surrounded by strategically contested waters in the East and South China Seas.

Brief history:

- Prior to the 17th century, Taiwan had indigenous self-governing communities with no central authority.
- Colonised by the **Dutch (17th century),** later ruled by **Qing China** for nearly two centuries.
- Became a ***Japanese colony (1895–1945) after the First Sino-Japanese War.***
- In 1949, after the Chinese Civil War, the **Nationalist government (Kuomintang)** retreated to Taiwan following defeat by the Communists on the mainland.
- Since then, Taiwan has remained politically separate from the People's Republic of China, which claims it under the One-China policy.

Geological features:

- Lies at the convergence of the Philippine Sea Plate and Eurasian Plate, making it one of the world's most earthquake-prone regions.
- Part of the Pacific Ring of Fire, the most seismically active zone globally.
- Dominated by the Central Mountain Range, with over two-thirds of the island being mountainous.
- Home to Yu (Jade) Mountain, the highest peak in East Asia (3,997 m).

Japan Plans to Mine Seabed Rare Earth Elements (REE)

- Japan plans a pilot project to extract **rare-earth-rich mud** from the deep seabed near **Minamitorishima Island**.
- **Depth Milestone:** It targets mud **at 6,000-metre depth**, marking the **world's first sustained deep-seabed extraction attempt.**
- **Resource Scale:** The surrounding region is estimated to hold over 16 million tonnes of rare earth oxides rich in **dysprosium and terbium.**
- **Strategic Aim:** Japan seeks to reduce reliance on China, which dominates global rare earth supply and recently tightened export controls.
- Rare earth elements are a group of 17 metallic elements found in low concentrations with unique magnetic, luminescent, and electrochemical properties.

Seabed Rare Earth Elements (REE)

- Seabed Rare Earth Elements (REEs) are a group of **17 rare earth elements** found in high concentrations within deep-sea mineral deposits.
- **Key Sources:** They occur in pelagic clay sediments, polymetallic nodules, and cobalt-rich ferromanganese crusts on seamounts.

- **Hosting Medium:** Unlike land ores locked in silicate or phosphate crystal lattices, seabed REEs remain adsorbed on iron and manganese oxide surfaces.
- **Sediment Nature:** Rare-earth-rich marine mud remains unconsolidated, allowing extraction without blasting, drilling, or crushing.
- **Depth Gradient:** REE concentrations increase with sediment depth, making deeper mud layers more valuable than surface sediments.

Advantages and Disadvantages of Seabed REEs

- **Advantages:** These deposits show negligible radioactivity and allow leaching at room temperature.
- **Basket Value:** They have higher basket prices due to greater proportions of heavy REEs.
- **Disadvantages:** Seabed mining risks disrupting deep-sea ecosystems and their associated food webs.
- **Viability:** Industrial-scale viability remains unproven, and the ISA has not finalised its mining code.

Tsunami Ready Recognition Programme (TRRP)

- India is making rapid progress toward becoming the first nation in the **Indian Ocean Region (IOR)** to have 100 coastal villages officially recognised as **"Tsunami Ready".**
- This goal is part of India's commitment to the **Tsunami Ready Recognition Programme (TRRP)** by the Intergovernmental Oceanographic Commission (IOC) of UNESCO.
- TRRP is an international, community-based recognition programme to build tsunami-resilient communities through awareness and preparedness training.
- It is a voluntary, performance-based programme, where certification requires meeting 12 indicators across three pillars: Assessment, Preparedness, and Response.
- **Global Target:** Under the UN Ocean Decade (2021–2030), UNESCO-IOC aims to make 100% of at-risk coastal communities tsunami-ready by 2030.
- **India's Implementation: National Tsunami Ready Board** under the Ministry of Earth Sciences (MoES) implements it while INCOIS, Hyderabad, coordinates execution.
- **India's Milestones:** India became the first in the IOR to receive the recognition, with two Odisha villages certified in 2020; 26 villages in Odisha have received the tag.
- **Significance:** The programme contributes to the Sendai Framework for Disaster Risk Reduction (2015–2030) and SDG-11 (Sustainable Cities and Communities).

- **INCOIS:** Indian National Centre for Ocean Information Services, established in 1999, is an autonomous body under the MoES that provides ocean data, advisory services, and early warning.
- **Sendai Framework:** A 15-year (2015–2030) UN agreement to substantially reduce disaster risk and losses by shifting from disaster response to proactive risk prevention and management.
- **SDG 11:** "Sustainable Cities and Communities," aims to make cities inclusive, safe, resilient, and sustainable by 2030, reducing disaster-related deaths and economic losses.

Hyper-Polluting Private Transport of the Super-Rich

- Growing public outrage and new studies have highlighted the disproportionate carbon footprint of private jets, super-yachts and space tourism used by the world's super-rich.

Hyper-Polluting Private Transport :

- Hyper-polluting private transport refers to the use of private jets, **fossil-fuelled super-yachts, luxury SUVs and private rockets** by ultra-high-net-worth individuals, generating emissions far beyond essential mobility needs.

Key features

- **Extreme carbon intensity:** A single private jet trip or yacht holiday can equal an average person's annual emissions.
- **Low passenger efficiency:** Massive fuel consumption to transport very few people, often with long idling times.
- **Rapid expansion:** Global private jet and super-yacht fleets have expanded sharply with rising inequality and wealth concentration.
- **Regulatory gaps:** Weak taxation, limited reporting and no caps on emissions from luxury transport and space tourism.

Implications

- **Climate injustice:** A tiny elite emits as much carbon as entire countries, undermining equity in climate responsibility.
- **Policy credibility crisis:** Public climate sacrifices lose legitimacy when elite excesses remain unchecked.
- **Social cohesion risks:** Visible luxury pollution fuels resentment and weakens collective climate action.

- **Mitigation challenge:** Luxury emissions offset gains from recycling, renewables and efficiency by the wider population.

Diversion of Forest Land for Non-Forestry Use

- Supreme Court of India reaffirmed that forest land cannot be used for non-forestry purposes without prior central government approval.
- The Court held that state government leases for agriculture on forest land without central approval are illegal.

Framework of Forest Land Use for Non-Forestry Purposes

- **Governing Law**: Use of forest land for non-forestry purposes is regulated by the **Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980.**
- **Non-Forestry Use:** Non-forestry purposes include clearing forest land for cultivation or any use other than re-afforestation.
- **Central Approval:** State governments cannot permit non-forestry use of forest land without prior approval of the Central Government.
- **Advisory Review:** The Forest Advisory Committee examines diversion proposals and advises approval or rejection based on environmental impacts.
- **Processing Authority:** Diversion proposals are processed and approved through the Ministry of Environment, Forest and Climate Change.
- **Delegated Powers:** State governments may divert forest land below one hectare for specified public utility projects.
- **Appeal Right:** Any aggrieved person may appeal decisions on non-forestry use of forest land before the National Green Tribunal (NGT).
- A party dissatisfied with the NGT order may appeal to the Supreme Court within 90 days.

Compensatory Obligations

- **NPV Payment:** User agencies must pay Net Present Value (NPV) based on forest quality and density of diverted land.
- **Compensatory Afforestation:** Plantation is required on equivalent non-forest land or on double degraded forest land.
- **Fund Authority:** Compensatory afforestation funds are administered by the Compensatory Afforestation Fund Management and Planning Authority **(CAMPA).**

Key Exemptions

- **Amendment Scope:** The 2023 amendment removes mandatory central approval for specified categories of forest land diversion.
- **Border Projects:** Strategic linear projects within 100 km of international borders, LOC or the LAC.
- **Security Works:** Up to 10 hectares of forest land for security infrastructure.
- **LWE Utilities:** Public utility projects up to 5 hectares in Left-Wing Extremism-affected areas
- **Permitted Activities:** Government-owned zoos, safaris, and eco-tourism facilities are excluded from "non-forestry purposes."

Anopheles stephensi

- India's push to eliminate malaria by 2030 faces a new challenge with the rapid spread of the invasive urban mosquito Anopheles stephensi, especially in cities like Delhi.

Anopheles stephensi:

- Anopheles stephensi is a **malaria-transmitting mosquito** species capable of spreading both ***Plasmodium falciparum*** and ***Plasmodium vivax***, now recognised globally as an invasive vector threatening malaria elimination efforts.

Origin:

- Native to South Asia and the Arabian Peninsula
- Recently detected in multiple African countries, indicating rapid transcontinental spread

Habitat:

- Thrives in urban and peri-urban environments.
- Breeds in artificial water containers such as overhead tanks, tyres, construction sites, and water storage vessels.
- Unlike traditional malaria vectors, it adapts easily to high-density cities.

Key features

- **Urban adaptability:** Efficiently survives in man-made habitats.
- **Efficient vector:** Transmits both major human malaria parasites.
- **Container breeder:** Similar breeding behaviour to dengue mosquitoes, complicating control strategies.
- **Resilient spread:** Capable of establishing itself rapidly in new regions.

Implications

- Threat to malaria elimination goals: Undermines India's target of zero indigenous cases by 2027 and elimination by 2030.
- Urban malaria resurgence: Shifts malaria from rural/tribal zones to metropolitan settings.
- Control challenges: Requires city-specific surveillance, vector control, and inter-sectoral coordination.

Gandikota Canyon

- Gandikota Canyon has drawn renewed attention as a spectacular yet underdeveloped natural–heritage site, despite recent state plans to boost tourism infrastructure.

Gandikota Canyon-What it is?

- Gandikota Canyon is a dramatic river gorge carved by the **Penna (Pennar) River,** often called the "Grand Canyon of India" for its sheer cliffs and striking geological formations.

Located in:

- Kadapa district, Andhra Pradesh.
- About 77 km from Kadapa town and ~300–380 km from Bengaluru, Hyderabad, and Chennai.
- Lies within the Erramala Hills on the banks of the Penna River.

Historical origin:

- The canyon overlooks the **Gandikota Fort, dating back to 1123 CE.**
- The fort rose to prominence under the **Pemmasani Nayaks**, feudatories of the **Kakatiya dynasty**.
- Later ruled by the Vijayanagara Empire, Qutb Shahis of Golconda, Mughals, Nawabs of Kadapa, Kingdom of Mysore, and finally the British.
- Mentioned in historical records like the Mackenzie Kaifiyat and travelogues of Jean-Baptiste Tavernier.

Key features

- **Spectacular geomorphology:** Steep red sandstone and quartzite cliffs forming a ~200-metre-wide gorge.
- **Riverine landscape:** Penna River flowing sinuously through the canyon, offering dramatic sunrise and sunset views.
- **Architectural heritage:** Gandikota Fort complex with Madhavaraya Temple, Ranganatha Temple, Jama Masjid, granary, jail, step wells, and gun foundry.
- **Cultural significance:** Linked to Vijayanagara art, Indo-Islamic architecture, and local folklore;

associated with poet Yogi Vemana.

- **Tourism potential:** Panoramic viewpoints, heritage trails, and proximity to Tirupati make it ideal for integrated cultural–eco tourism.

Kanger Valley National Park

- Kanger Valley National Park has come into focus as the Chhattisgarh government, with support from the Wildlife Institute of India (WII), has initiated biodiversity surveys to seek its recognition as a UNESCO World Heritage Site.

Kanger Valley National Park:

- Kanger Valley National Park is a biodiversity-rich protected area known for its dense forests, limestone caves, waterfalls, and diverse ecosystems, making it one of the most ecologically significant national parks in Central India.

Located in:

- Bastar district, Chhattisgarh
- About 24 km southeast of Jagdalpur on the Jagdalpur–Darbha Road
- Lies within the Deccan biogeographical zone
- Named after the **Kanger River,** which flows through the park

Key characteristics:

- Area: ~200 sq km
- Terrain: Highly heterogeneous, ranging from flat plains to steep slopes, plateaus, valleys, and stream courses
- Hydrology: Network of seasonal and perennial streams joining the Kanger River
- Geomorphology: Famous for subterranean limestone caves such as Kotumsar and Kailash caves, among the most biologically diverse cave systems in India and South Asia
- Flora & fauna: Dense sal and mixed forests; habitat of the Bastar Hill Myna (state bird of Chhattisgarh), along with rich mammalian, avian, reptilian, and insect diversity
- Scenic features: Tirathgarh waterfalls, valleys, and undulating forest landscapes

Current status:

- Declared a National Park in 1982 (then Madhya Pradesh Gazette).

- Managed under Jagdalpur Wildlife Circle, comprising Kotumsar and Koleng ranges.
- Included in UNESCO's Tentative List of World Heritage Sites.

Glacier Disappearance

- A new study published in **Nature Climate Change** projects that global glacier disappearance will peak around mid-century, with up to 4,000 glaciers vanishing annually under high-warming scenarios.

Glacier Disappearance

- Glacier disappearance refers to the complete extinction of individual glaciers when their **area falls below 0.01 sq km** or their **remaining ice volume drops below 1% of original levels**, due to sustained warming and mass loss.

Key trends

- **Mid-century peak**: Global glacier extinction is projected to peak between 2041–2055, depending on warming levels.
- **Scale of loss: Approx.** 2,000 glaciers/year under +1.5°C warming and approx. 4,000 glaciers/year under +4.0°C warming

Regional variation:

- Small-glacier regions (European Alps, Caucasus) see early peaks before 2040.
- Large-glacier regions (**Greenland periphery,** Arctic Canada) face delayed but prolonged loss.
- High-Mountain Asia: Hosts over one-third of global glaciers and strongly shapes the global mid-century extinction peak.

Key reasons:

- Rising global temperatures increasing melt rates beyond accumulation.
- Prevalence of small glaciers, which respond rapidly to warming.
- Delayed response of large glaciers, leading to sustained long-term loss.
- Insufficient climate mitigation, locking in future ice loss even if emissions stabilise later.

India's Clean Energy Achievements in 2025

- India achieved significant gains in clean energy capacity in 2025 but requires structural reforms

to secure Aatmanirbharta and long-term energy security.

Overview of the Clean Energy Capacity in India

- **Global Rank:** India ranks fourth in total installed renewable capacity, at 253.96 GW, with over 23% year-on-year growth.
- **Capacity Expansion:** In 2025, India added a record 44.51 GW by November, nearly double the 25 GW added in 2024.
- **Non-Fossil Sources:** Non-fossil sources accounted for 51.5% of installed power capacity, achieving the COP26 target five years early.
- **Solar Growth:** Solar capacity increased by 34.98 GW to 132.85 GW by November 2025, reflecting a year-on-year growth of 41%.
- **Wind Growth:** Wind capacity increased by 5.82 GW to 53.99 GW by November 2025, recording a 12.5% year-on-year growth.
- **FDI Inflows:** Clean energy attracted $3.4 billion in FDI during the first nine months of FY 2025, accounting for over 80% of power-sector inflows.

India's Advantage for Clean Energy

- **Solar Abundance:** With around 300 sunny days annually and high solar insolation, India has a theoretical solar potential exceeding 750 GW.
- **Cost Efficiency:** Competitive auctions have driven solar and wind tariffs to record lows, making renewables in India among the cheapest globally.
- **Hydrogen Market:** Replacing the 5 million tonnes of grey hydrogen already consumed would create an instant domestic market for green hydrogen.
- **Strategic Geography:** A 7,500 km coastline has immense offshore wind potential, and Rajasthan and Gujarat's plains are ideal for solar-wind hybrid projects.
- **China Alternative:** With vertical integration, India can emerge as a China-plus-one manufacturing hub for renewables.

India's Challenges with Clean Energy

- **DISCOM Stress:** Delayed payments from financially weak state DISCOMs cause liquidity constraints for renewable developers.
- **PPA Renegotiation:** Attempts by some state governments to renegotiate Power Purchase Agreements (PPAs) after the auction undermine the sanctity of contracts and investor confidence.
- **Grid Bottlenecks:** Nearly 60 GW of renewable projects remain stranded due to inadequate

transmission infrastructure.

- **High Capital Cost:** The cost of renewable financing in India is about 80% higher than in developed countries, mainly due to perceived risks.
- **Hydrogen Cost:** Green hydrogen currently costs $4-5 per kg, far higher than grey hydrogen based on fossil fuels.

Way Forward

- **Vertical Integration:** Expand domestic production of polysilicon and wafers to reduce dependence on Chinese upstream components.
- **Contract Sanctity:** Introduce a legal framework to prevent unilateral renegotiation of Power Purchase Agreements by states.
- **Grid Expansion:** Build transmission infrastructure ahead of generation capacity to prevent stranded renewable assets.
- **Payment Security:** Strengthen payment security mechanisms to protect developers against DISCOM defaults and high financing costs.
- **Energy Storage:** Accelerate deployment of battery energy storage and pumped hydro to manage renewable intermittency.

The World Weather Attribution Annual Report 2025

- The World Weather Attribution (WWA) Annual Report 2025 warns that climate change-driven extremes in 2025 pushed millions of people close to the limits of adaptation, despite La Niña conditions.

The World Weather Attribution Annual Report 2025:

- World Weather Attribution (WWA) is an international scientific collaboration that analyses how human-induced climate change influences extreme weather events such as heatwaves, floods, storms, droughts and wildfires.

Key findings (2025):

- **Heatwaves intensified sharply:** Heatwaves since 2015 have become significantly more intense, with some events nearly 10 times more likely, showing that even small increases in global temperature have outsized impacts.

- **Crossing the 1.5°C threshold:** The three-year global average temperature is projected to cross the 1.5°C limit for the first time, despite 2025 being a La Niña year, underlining the strength of long-term warming trends.
- **Limits of adaptation reached:** Several extreme events revealed that adaptation measures are no longer sufficient for vulnerable populations, especially in the Global South.
- **Inequality in climate impacts:** Marginalised communities were systematically the worst affected, while data gaps and weak climate models limited analysis of many Global South events.

Extreme event profile (2025):

- 157 humanitarian-impact events identified
- Heatwaves and floods (49 each) most frequent
- Storms (38), wildfires (11), droughts (7)
- Heatwaves emerged as the deadliest hazard, with tens of thousands of deaths in single events.

Kaimur Wildlife Sanctuary

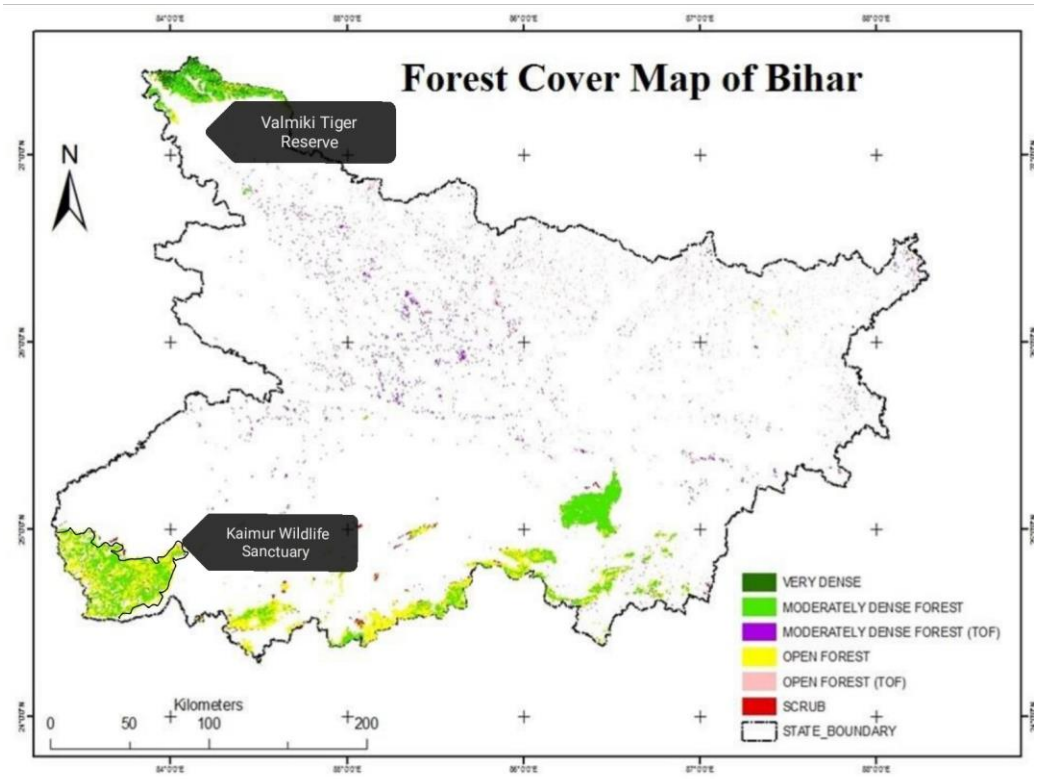
- The Bihar government has approved a revised proposal to notify Kaimur Wildlife Sanctuary as a Tiger Reserve, which will now be sent to the National Tiger Conservation Authority (NTCA) for final clearance.

Kaimur Wildlife Sanctuary:

- Kaimur Wildlife Sanctuary is the largest wildlife sanctuary in Bihar, known for its rich biodiversity, forested plateaus and historical–archaeological heritage.
- ***Located in: Kaimur and Rohtas districts of Biha***r
- Situated in the Kaimur Range, covering parts of the Kaimur Plateau and Rohtas Plateau.

History:

- Established in 1979 as a wildlife sanctuary.
- Historically significant region with prehistoric cave paintings, megaliths, fossil sites, and forts such as Rohtasgarh Fort and Shergarh Fort.
- Long recognised for its ecological potential, with recent evidence of tiger movement prompting the tiger reserve proposal.



Key geological and physical features:

- Plateaued landscape of the Kaimur hills with steep escarpments and forested valleys
- Numerous waterfalls: Karkat, Telhar, Dhua Kund, Tutla Bhawani, Manjhar Kund, Kashish
- Lakes and water bodies: Anupam Lake, Karamchat Dam, Kohira Dam.
- Forest types: Tropical Dry Mixed Deciduous forests, Dry Sal forests, Boswellia forests, Dry Bamboo brakes

Significance:

- Biodiversity hotspot: Home to Bengal tiger, leopard, sloth bear, pangolin, sambar, chital, four-horned antelope, nilgai and over 70 resident bird species, with migratory birds from Central Asia in winter
- Tiger conservation potential: Large, contiguous forest landscape suitable for a viable tiger population and ecological corridors in eastern India
- Ecological balance: Helps maintain forest–river–plateau ecosystems of southwestern Bihar

SCIENCE AND TECHNOLOGY

India's Shift from GM to Genome-Edited Crops

- India's progress in GM crops stalled after **Bt cotton** (approved in 2006), but genome-edited (GE) crops have rapidly advanced due to regulatory relaxation and scientific breakthroughs.

Gene Editing

- Gene editing **modifies the plant's existing native genes** by making precise cuts at targeted DNA sites using a protein (scissors) and a guide RNA (navigator).
- It ***does not introduce foreign DNA***; instead, it creates mutations similar to natural variations, making the technology more precise, faster, and easier to regulate.

Key Differences with Genetically Modified Organisms (GMOs)

- **Foreign vs Native DNA:** GMOs introduce foreign genes from other species; gene editing modifies only the plant's own genes without adding external DNA.
- **Regulatory Burden:** GMOs face stringent, expensive regulation; gene-edited crops often pass through simpler, faster approval pathways.
- **Technology Approach:** GMOs rely on **transgenic insertion**; gene editing uses **CRISPR/TnpB to** achieve precise site-specific edits.
- **Commercial Landscape:** GMO deployment dominated by large corporations; gene editing enables public-sector and small research institutions to create new varieties.

India's Progress in Genome Editing (GE)

- **GE Rice Lines:** GE **Samba Mahsuri** for higher yield, **GE MTU-1010** for alkalinity tolerance.
- **GE Mustard Line:** Low-pungency, **canola-quality mustard** developed by gene editing.

Technologies Used:

- **CRISPR–Cas9:** Editing drought- & salinity-tolerance genes.
- **CRISPR–Cas12a:** Editing Gn1a gene for spikelet proliferation and higher yields.
- **Indigenous GE Tool: TnpB**-based miniature editor, which is cheaper, patent-free and highly precise.

Reasons for the Success of Genome Editing (GE) in India

- **Regulatory Simplicity:** GE crops skip **GEAC and need only IBC approval**, making clearances faster.
- **High Public Acceptability:** GE crops carry no foreign DNA, reducing GMO-related opposition.
- **Low R&D Costs:** CRISPR tools make edits quick, cheap, and efficient for Indian labs.
- **Indigenous Innovation:** Indian tools like the TnpB-based editor cut import dependence.
- **Government Funding Push:** ₹500 crore (2023–24) earmarked explicitly for GE research.
- **Export-Friendly:** Japan and Australia already allow the import of GE foods without GM labelling.

1. **Genetic Engineering Appraisal Committee (GEAC):** GEAC is the apex body under the MoEFCC responsible for approving the environmental release and commercialisation of GM organisms in India.
2. **Institutional Biosafety Committee (IBC):** IBC, constituted under the Department of Biotechnology (DBT) ensures biosafety compliance and certifies that genome-edited crops contain no foreign DNA.

The World AIDS Day

- World AIDS Day is observed on **December 1**, and the theme for 2025 **is "Overcoming disruption, transforming the AIDS response."**

World AIDS Day

- **Origin:** Established in 1988 by the World Health Organisation (WHO) and later guided by the Joint **United Nations Programme on HIV/AIDS (UNAIDS)** as the first global health awareness day.
- **Objective:** Raise awareness, promote testing and treatment, and combat stigma and discrimination against people living with HIV.
- **Alignment:** Linked to the UNAIDS 95-95-95 goal and the **Sustainable Development Goal (SDG) 3.3 target** to end AIDS as a public health threat by 2030.
- **UNAIDS 95-95-95 Goal:** Target to ensure 95% of people with HIV-AIDS are diagnosed, 95% of those diagnosed receive antiretroviral therapy, and 95% of those on treatment achieve viral suppression.

India's AIDS Response

- **Framework:** Led by the **National AIDS Control Organisation (NACO), established in 1992** under the Ministry of Health and Family Welfare.
- **Programme:** Implemented through the National AIDS and STD Control Programme (**NACP**) phases I-V, shifting from awareness to prevention, testing and **antiretroviral therapy (ART) expansion**.
- **Legal:** HIV & AIDS (Prevention and Control) Act 2017 prohibits discrimination, ensures confidentiality and mandates informed consent.
- **Policy Measures:** Includes Test & Treat policy, **Mission Sampark** to re-engage patients lost to follow-up, and increased access to testing and treatment services nationwide.
- **Impact:** Annual new HIV infections in India dropped about 46% between 2010 and 2021; AIDS-related deaths fell ~77% between 2010 and 2021, showing significant progress in prevention and treatment.

About HIV-AIDS

- **Cause:** Human Immunodeficiency Virus (HIV) attacks **CD4+ T-cells,** weakening immunity & leading to Acquired Immunodeficiency Syndrome (AIDS) if untreated.
- **Transmission:** Spread through unprotected sex, contaminated needles, unsafe transfusion and mother-to-child transmission.
- **Treatment:** Managed using Antiretroviral Therapy (ART), which suppresses viral load; viral suppression prevents progression to AIDS and reduces transmission (treatment-as-prevention model).
- **India Status:** India has an estimated 2.4 million people living with HIV (NACO estimates); the epidemic is concentrated among high-risk groups and urban clusters.
- High-risk groups in India include sex workers, homosexual men, people who inject drugs, transgenders, migrant workers and truckers

Burtele Foot

- Scientists have solved the mystery of 3.4 million-year-old fossils called the "Burtele Foot" discovered in **Ethiopia in 2009**.

About Burtele Foot

- **Morphology:** Eight bones showing bipedal hominin with an opposable big toe, indicating

continued tree-climbing.

- Recent findings of 25 teeth and jawbone of a 4.5-year-old child near the same site confirm that the foot belonged to Australopithecus deyiremeda.
- An early hominin species combining ape-like and human-like characteristics.
- Fossils shows its close relation to Australopithecus afarensis, species that includes the famous fossil Lucy, discovered in 1974 in the Afar region.

WHO issues Global Guideline on the use of GLP-1 Medicines in treating Obesity

- WHO conditionally recommends GLP-1 therapies for obesity as part of a broader approach including healthy diet, physical activity, and professional support.
- These guidelines provides recommendations specifically for three GLP-1 drugs used in the long-term treatment of obesity in adults i.e. liraglutide, semaglutide and tirzepatide.

GLP-1 drugs or GLP-1 agonists:

- These are a class of drugs that mimic the hormone **Glucagon-Like Peptide-1 (GLP-1),** which is naturally released from the gut after meals.
- GLP-1 receptor agonists help control blood sugar by increasing insulin when needed and reducing glucagon.
- They also slow digestion and reduce appetite, leading to better satiety and weight loss.
- They are used mainly for **Type 2 Diabetes** and obesity management.

Obesity & its status:

- Obesity is defined by excessive fat deposits leading to increased risk of type 2 diabetes, heart disease etc. It is having **a Body Mass Index (BMI)** of 30 or higher in adults.
- BMI is calculated by dividing a person's weight in kilograms by their height in meters squared (kg/m^2).
- It affects more than 1 billion people and is associated with 3.7 million deaths worldwide in 2024.
- 24% of Indian women and 23% of Indian men are obese. (NFHS-5 (2019-21)).

Software Defined Radios

- The Indian Army has signed a contract to procure its first indigenously designed and

manufactured Software Defined Radios (SDRs) developed by DRDO and produced by BEL.

Software Defined Radios

- Software-defined radios replace fixed hardware components with software-based signal processing, enabling rapid reconfiguration for secure, multi-band, multi-mode communication.
- **Features:** High data rates, encryption capability, and **Mobile Ad hoc Network (MANET)** support for resilient, self-healing communication links in battlefield environments.
- **Interoperability:** Standardised through the Indian Radio Software Architecture (IRSA) framework, enabling waveform portability and seamless communication among tri-services.
- **Applications:** Defence communication, tactical data links, radar, electronic warfare, telecom networks and emerging Internet of Things (IoT) architectures.
- **MANET:** A Mobile Ad-hoc Network where devices connect directly without towers or fixed infrastructure; each unit acts as a node, allowing communication to continue even if some links fail.
- **IRSA:** The Indian Radio Software Architecture is a national standard that ensures interoperability among SDRs by using common software interfaces, enabling waveform sharing.

Alaknanda Galaxy Discovered in Early Universe

- Indian researchers at Pune have discovered a Milky Way–like spiral galaxy, Alaknanda, from the early universe ≈1.5 billion years after the Big Bang.

Spiral Galaxies

- **Definition:** Spiral galaxies are rotating systems of stars, gas, and dust shaped like a disk with spiral arms winding outward from a central bulge.
- **Structure:** They typically have three major components — a dense central bulge, a flat rotating disk with spiral arms, and an extended halo of stars and dark matter. E.g., Milky Way is a barred spiral galaxy, with a central bar-shaped bulge.

Galaxy "Alaknanda"

- Alaknanda is a distant, fully developed spiral galaxy with a rotating disk, two symmetric spiral arms, and a central bulge—features thought to take billions of years to assemble.
- **Discovered in: James Webb Space Telescope (JWST) public data.**
- Identified during the UNCOVER survey.

Origin:

- Formed when the universe was only ~1.5 billion years old.
- Observed at **redshift** z ≈ 4, placing it among the earliest known spiral galaxies.
- Name inspired by the Alaknanda river; paired symbolically with the Milky Way (Mandakini).

Key features

- **Clear spiral morphology:** Two well-defined arms persist after disk/bulge subtraction
- **Active star formation:** ~60 solar masses per year along the arms
- **Stable rotating disk:** Indicates early dynamical settling
- **Photometrically robust:** Multiple independent redshift estimates agree

- **Location:** A massive spiral galaxy with two well-defined spiral arms located ~12 billion light-years away, dating to when the universe was just 10% of its current age.
- **Named by Researchers:** Named "Alaknanda" after the Himalayan river; researchers saw it as a "sister" to Mandakini (another name for the Milky Way).
- **Instrument:** Discovered using James Webb Space Telescope (JWST), NASA's most powerful space observatory launched in December 2021.
- Future Study Tools: Follow-up observations planned using **Atacama Large Millimetre/submillimetre Array (ALMA) in Chile** to study gas motion and galaxy kinematics.
- **Significance of the Discovery:** It challenges early models as Early-universe galaxies were expected to be chaotic, hot, clumpy and turbulent, not well-organised spirals. **Significance**
- Current simulations rarely produce such structured spirals so early.
- Suggests accelerated disk formation via cold gas accretion or early interactions/mergers.

Tensor Processing Unit (TPU)

- Google's release of the **Ironwood TPU** comes at a pivotal moment as the global AI boom accelerates demand for faster, specialised compute.

Tensor Processing Unit (TPU):

- A Tensor Processing Unit (TPU) is a custom application-specific integrated circuit (ASIC) designed by Google specifically to accelerate machine learning—especially **deep neural networks** and

matrix-heavy computations.

- TPUs were first deployed internally by Google in 2015 to run TensorFlow workloads and were released for external use via Google Cloud in 2018.

How it Works?

- TPUs use large **matrix-multiply units (MXUs)** capable of performing tens of thousands of multiply-accumulate operations per clock cycle.
- They process data in matrix form, breaking inputs into vectors, running them in parallel, and feeding results back to AI models.
- High-bandwidth memory and optimized interconnects enable extremely fast data movement for training large neural networks.

Key Features:

- **Matrix Multiplication at Scale:** 128×128 ALU arrays delivering massive parallelism.
- **High Throughput:** Designed for large batch sizes and weeks-long training runs.
- **SparseCores:** Specialized units for embedding-heavy models like recommendation engines.
- Optimized for TensorFlow, JAX, PyTorch through Google Cloud's AI stack.
- **Low Power, High Efficiency:** Purpose-built hardware avoids unnecessary general-purpose circuitry.

Superiority Over GPUs and CPUs:

Compared to CPUs-

- **CPUs are flexible but slow for ML**—processing one instruction at a time with limited parallelism.
- TPUs far outperform CPUs on ML tasks due to specialized matrix math hardware and lower power consumption.

Compared to GPUs-

- **GPUs offer parallelism** but still carry general-purpose overhead and less efficient matrix specialization.
- TPUs provide even higher throughput, dedicated MXUs, and tighter integration with ML frameworks—ideal for LLMs, vision models, and deep learning pipelines.

AstroSat

- IIA celebrated **10 years of the UltraViolet Imaging Telescope (UVIT)** aboard AstroSat, marking a decade of major scientific discoveries.

AstroSat:

- AstroSat is **India's first dedicated astronomy satellite** enabling simultaneous observations in UV, optical, soft X-ray and hard X-ray bands.
- **Launched in: 2015 by PSLV-C30** into a 650 km orbit.
- **Aim:** To study cosmic sources across multiple wavelengths, track high-energy processes, and provide global-access astronomical data.

Key Features:

- Five scientific payloads covering 0.3–100 keV + UV bands.
- Enables simultaneous multi-wavelength imaging, unique among space observatories.
- High pointing stability and long-duration exposure capabilities.
- Data processed and archived by ISSDC, Bylalu; mission operated by ISTRAC, Bengaluru.
- Minimum designed life: 5 years, extended far beyond.

Ultra-Violet Imaging Telescope (UVIT):

- A twin-telescope UV imager aboard AstroSat capable of near-UV, visible, and far-UV observations.

Features:

- Spatial resolution better than 1.5 arcseconds (among the world's best in UV imaging).
- Two telescopes: NUV+Visible and FUV channels.
- Developed by a national consortium led by IIA, with ISRO centres.

Significance:

- India's first UV space telescope, second globally in FUV capability after Hubble.
- Enabled major discoveries: hot companions of Be stars, blue stragglers, UV disks in dwarf galaxies, novae in Andromeda, AGN UV–X-ray correlations.

India International Science Festival (IISF) 2025

- The 11th India International Science Festival, IISF 2025, is taking place in **Panchkula, Haryana**.
- **Objective:** To promote scientific temper, encourage private-sector participation, and facilitate technology transfer from labs to industries and society.

- **Theme:** The 2025 edition is based on **"Vigyan Se Samruddhi: for Aatmanirbhar Bharat" (Prosperity through Science: for a Self-Reliant India).**
- **Organisers:** The Ministry of Earth Sciences (MoES), along with IITM Pune and key scientific departments like DST, DBT, CSIR, DAE, the Department of Space and Vijnana Bharati (VIBHA).
- **Key Focus Areas:** Includes ecology of North-West India and the Himalayas, Artificial Intelligence, Quantum Technologies, and Blue Economy.
- **Significance:** IISF serves as a national platform aligning scientific progress with long-term goals like Aatmanirbhar Bharat and Viksit Bharat @2047.

Brain–Computer Interface (BCI)

- India is exploring neurotechnology and **Brain-Computer Interfaces (BCIs)** as strategic tools for healthcare, economic growth, and technological leadership amid global advances led by the U.S., China, and Europe.

Brain–Computer Interface (BCI)

- A Brain–Computer Interface (BCI) is a system that interprets brain signals and converts them into digital commands to control external devices such as computers, robotic limbs, or wheelchairs.
- BCIs form a two-way communication channel between the brain and machines, aiding restoration of lost functions or enabling new capabilities.

How It Works?

- **Signal Capture:** Electrodes (invasive or non-invasive) record electrical activity from neurons.
- **Neural Decoding:** Machine learning algorithms translate these patterns into intentions (e.g., move arm, select letter).
- **Device Control:** The decoded signals activate an external device—robotic limbs, speech synthesizers, drones, or smart-home systems.
- **Feedback Loop:** Continuous decoding improves accuracy and enables real-time brain-machine interaction.

Key Features

- **Direct brain-machine link:** Bypasses nerve or muscle pathways, crucial for paralysed patients.
- **Invasive & non-invasive options:** Implantable electrodes give high precision; wearable EEG devices enable safer, everyday use.

- **Real-time response:** AI speeds up decoding, allowing fast, naturalistic control.
- **Bidirectional capability (emerging):** Some BCIs can stimulate the brain to restore function or treat disorders.

Applications of BCIs

- **Medical Rehabilitation:** BCIs restore mobility in paralysed patients through robotic limbs or wheelchairs and enable "locked-in" patients to communicate via neural spellers or gaze-based typing.
- **Treatment of Neurological Disorders:** Used for stroke, Parkinson's, depression and spinal injuries by stimulating targeted brain regions, reducing long-term reliance on conventional psychiatric or neuro drugs.
- **Assistive Technologies:** Allow users to operate smartphones, computers and smart-home devices through thought-driven commands, significantly boosting independence for motor-impaired individuals.
- **Defence & Security:** BCIs can enable soldiers to control drone swarms or communication systems mentally, offering tactical advantages but creating serious ethical, legal and security risks.

Cosmic Filaments

- Researchers have recently identified a cosmic filament approximately 50 million light-years long that contains at least 14 galaxies.
- **Uniqueness:** The galaxies were spinning in the same direction as the filament, in a coordinated motion that current models did not predict.
- **Significance:** The discovery indicates that **'cosmic-web'** structures strongly influence how galaxies gain angular momentum and develop.
- The cosmic web is the large-scale structure of the universe, a vast, intricate network that shows how matter organises itself across billions of light-years.

Cosmic Filaments

- Cosmic filaments are extensive, thread-like structures that link galaxy clusters, creating the vast cosmic web network.
- They are the universe's largest known structures, often extending hundreds of millions of light-years.

- **Composition:** They mainly consist of invisible dark matter, intergalactic gas, and galaxies.
- **Formation:** Gravity initially compressed matter into sheets, which then further collapsed at their intersections to form long, thin filaments.
- **Structural Role:** They form the backbone of the universe's structure and act as cosmic highways that channel pristine gas and smaller galaxies from surrounding voids toward dense clusters.
- **Significance:** Filaments govern galaxy formation and growth; they impact galaxy structure, spin, and star-formation rates.

Bharat 6G Mission

- The Apex Council under the Bharat 6G Mission reviewed national 6G progress and Bharat 6G Alliance (B6GA) initiatives.

Bharat 6G Mission

- **Launch:** Started in 2023 under the Department of Telecommunications to operationalise the Bharat 6G Vision and drive India's 6G development by 2030.
- Aim: Build indigenous 6G technology, expand India's Intellectual Property Rights (IPR) and influence global 6G standards.
- **Phases:** Runs in two stages, 2023-2025 for concept validation and standards groundwork, and 2025-2030 for large-scale trials and early commercial use.
- **Governance:** Guided by an Apex Council and implemented through the **Bharat 6G Alliance (B6GA),** a collaboration of industry, academia, start-ups and R&D bodies.
- **Testbeds**: It sets up national 6G Terahertz and Optical Communication testbeds and supports 100 sanctioned 5G labs, funded through the ₹1-lakh-crore R&D Innovation Fund.

6G:-

- **Definition:** Sixth-generation (6G) mobile technology using high-frequency **sub-Terahertz (THz)** and THz bands to enable multi-gigabit speeds and advanced sensing.
- **Features:** Artificial Intelligence (AI) optimisation, massive Multiple-Input Multiple-Output (MIMO), network slicing and next-generation Ultra-Reliable Low-Latency Communication (URLLC).
- **Advantages:** Supports hyper-connectivity, multi-sensory data fusion and universal computing with higher energy efficiency, stronger security and resilient network management.
- **India Context:** India targets commercial 6G by 2030, has over 127 global 6G patents and is

advancing research through India-United States 6G cooperation and Bharat 6G Mission.

Planetary-Defense Exercise on 3I/ATLAS

- Europe has launched the world's largest planetary-defence drill, centred on tracking the fast-approaching object 3I/ATLAS.

Planetary-Defense Exercise on 3I/ATLAS:

- The 3I/ATLAS planetary-defense drill is the largest global simulation ever conducted to test how nations detect, track and respond to near-Earth threats.
- Launched By: Led jointly by ESA, NASA, UN-IAWN (International Asteroid Warning Network).

Aim:

- To evaluate Earth's readiness for high-velocity objects by testing early-warning systems, tracking networks, emergency coordination and citizen communication.
- Also aims to identify gaps in international cooperation, data-sharing and psychological preparedness.

How It Works?

- **Tracking 3I/ATLAS:** Agencies use ground telescopes and space-based sensors to continuously monitor the comet's position, speed and brightness, refining its orbital path in real time.
- **Analysing Trajectory Shifts:** Scientists test for small deviations caused by gravity or solar forces, updating orbital models to identify any change that could alter its distance from Earth.
- **Calculating Impact Probabilities:** Thousands of simulations are run with different uncertainty ranges to determine whether the object could intersect Earth's orbit or remain safely distant.
- **Running Global Response Scenarios:** Teams simulate options such as deflection missions, civil-defence mobilisation or evacuation modelling to test operational readiness under pressure.
- **Testing International Coordination:** The drill evaluates how quickly NASA, ESA, ISRO, CNSA, JAXA and UN-IAWN exchange data, issue alerts and take joint decisions during high-uncertainty events.

Key Features:

- Real object (3I/ATLAS) travelling at ~60 km/s provides real-world complexity.
- Involves planetary-defense modelling, orbital prediction drills and anomaly-response protocols.
- Includes public-communication modules, addressing misinformation and psychological

preparedness.

- Uses multi-agency coordination, including defense space commands.
- Parallel geopolitical coordination amid ESA's record budget and U.S.–China–India moves in space security.
- **Significance:**
- Strengthens global readiness for future asteroid threats — a rising planetary-security concern.
- Exposes systemic weaknesses like absence of a global public-guidance system during space anomalies.

Q-day

- Google's new Quantum Echoes experiment using the **65-qubit Willow processor** has sparked global debate on whether it accelerates the arrival of Q-day.

About Q-day:

What it is?

- Q-day refers to the moment when a cryptographically relevant quantum computer becomes powerful enough to break widely used encryption systems such as RSA-2048, threatening global digital security.

Background:

- The fear stems from Shor's algorithm (1994), which showed that a sufficiently large quantum computer could factor large numbers exponentially faster, breaking the mathematics behind today's public-key cryptography.

Key Features of Q-Day Risk:

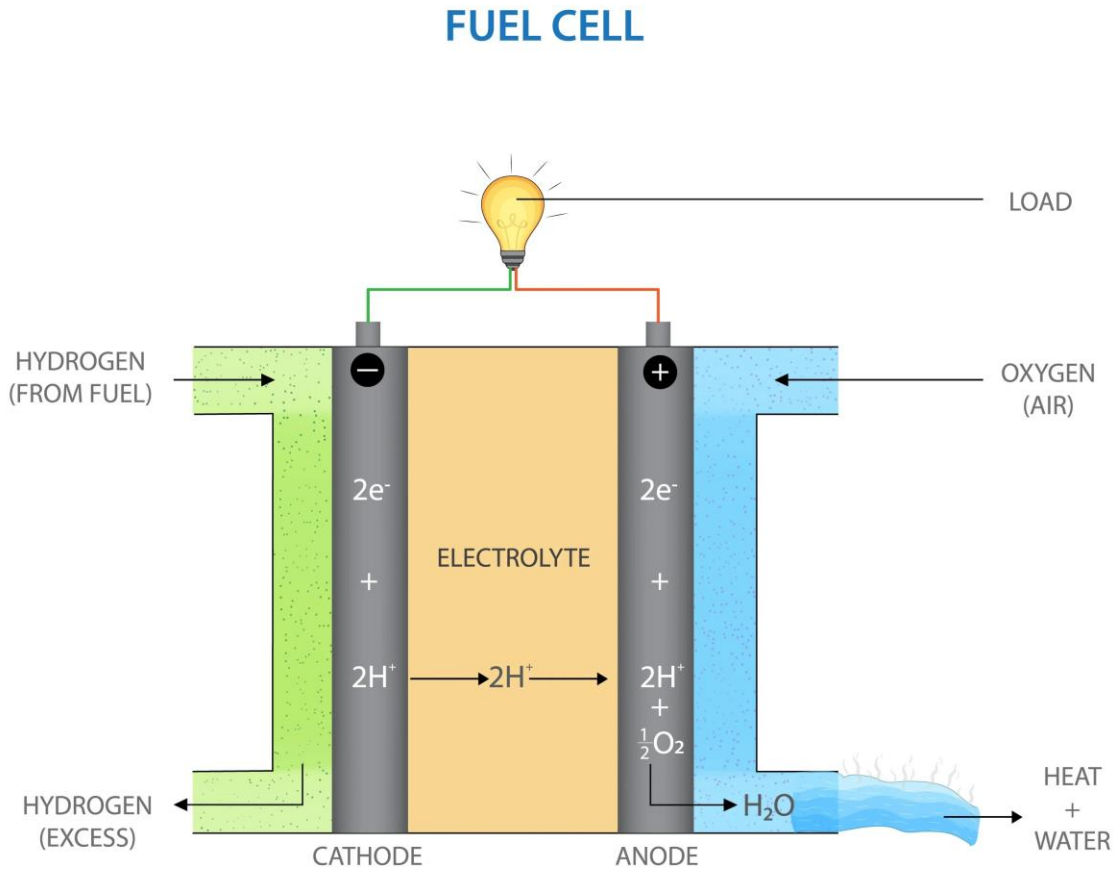
- **Breaks RSA & ECC:** Quantum computers could factor keys and compromise global internet security.
- **Harvest Now, Decrypt Later:** Hackers/governments may store encrypted data today and decrypt it later.
- **Requires millions of logical qubits:** Current machines have only hundreds of noisy qubits — far from attack capability.
- **Triggers Post-Quantum Cryptography (PQC):** Push for quantum-safe algorithms like CRYSTALS-Kyber & Dilithium (standardised by NIST).

Significance:

- Global cybersecurity transition: Banks, governments, military networks and cloud systems must shift to PQC before the end of this decade.
- Strategic & geopolitical implications: Nations see PQC as the next digital infrastructure race.
- Long-term digital safety: Prevents future mass data breaches, identity theft, and compromise of national security communications.

India's First Indigenous Hydrogen Fuel Cell Passenger Vessel

- India launched its first fully indigenous hydrogen fuel cell-powered passenger vessel into commercial service in Varanasi, marking a breakthrough in **green inland water transport**.



India's First Indigenous Hydrogen Fuel Cell Passenger Vessel:

- A 24-metre hydrogen fuel cell-powered AC catamaran crafted for zero-emission passenger movement, ensuring clean mobility on inland waterways.

- **Location: Namo Ghat, Varanasi** — the vessel's maiden commercial run began here along the Ganga.
- **Developed by:** Cochin Shipyard Ltd (CSL), showcasing indigenous excellence in clean marine engineering.

Key Features

- **Capacity:** Carries 50 passengers comfortably with full air-conditioning for urban river mobility.
- **Propulsion:** Uses Low-Temperature PEM fuel cell technology enabling silent, vibration-free cruising.
- **Emission:** Emits only water, ensuring completely pollution-free navigation on the Ganga.
- **Endurance:** Can operate for around 8 hours on a single hydrogen refill, supporting daily commercial runs.
- **Hybrid System:** Integrates hydrogen fuel cells, batteries and solar panels to optimise efficiency.
- **Speed:** Cruises at ~6.5 knots, balancing energy efficiency with safe riverine operations.
- **Hull Type:** Catamaran design provides high stability, better deck space and superior seakeeping.

Hydrogen Fuel Cell:

- An electrochemical device that converts hydrogen and oxygen into electricity, yielding only water and heat for clean, efficient power generation.

How It Works?

- Hydrogen enters the anode, supplying the fuel for **electrochemical splitting**.
- A catalyst splits H_2 into protons (H^+) and electrons (e^-), initiating the energy conversion.
- **Protons move through the PEM membrane** to the cathode, maintaining the reaction flow.
- Electrons, unable to cross the membrane, travel via an external circuit to generate electricity.
- At the cathode, oxygen, protons and electrons combine to form water and release heat.

Features:

- Produces zero emissions, releasing only water as the harmless byproduct.
- Offers higher efficiency than combustion engines by avoiding thermal losses.
- Provides quiet, vibration-free operation ideal for sensitive environments.
- Adaptable across mobility, stationary and portable clean-power applications.

Applications:

- Used in transportation including cars, buses, trucks, ships, drones and forklifts.
- Deployed in stationary systems for buildings, data centres and remote-grid power.
- Used in portable supply systems for defence, small devices and emergency backup.

Italy Becomes First Country to Win UNESCO Recognition for Its National Cuisine

- UNESCO has inscribed "Italian cooking" on its Intangible Cultural Heritage List, making Italy the first country in the world to receive recognition for its national cuisine as a whole.

ISRO To Launch Its Heaviest Us Commercial Satellite: Bluebird-6

- ISRO will launch **BlueBird-6**, the heaviest American commercial communication satellite (6.5 tonnes) ever to be launched by India, on December 15 aboard the LVM3 rocket.

ISRO To Launch Its Heaviest Us Commercial Satellite: Bluebird-6

- A **6.5-tonne Low-Earth Orbit (LEO)** communication satellite, part of AST SpaceMobile's next-generation constellation designed for direct-to-device mobile broadband globally.

Key Features:

- Largest commercial phased array antenna in LEO: ~2,400 sq ft once deployed
- Block-2 series: 3.5× larger than BlueBirds 1–5 and 10× higher data capacity
- Provides up to 10,000 MHz bandwidth per satellite
- Enables non-continuous direct-to-device connectivity in areas without terrestrial networks

Launch Vehicle LVM3 (Bahubali Rocket)

- India's heaviest-lift launch vehicle, capable of placing **8,000 kg into LEO and 4,000 kg into GTO**, and the designated launcher for Gaganyaan human spaceflight missions.

Features:

Three-stage configuration

1. **S200** solid strap-on boosters (204 tonnes propellant; among the world's largest).
2. **L110** liquid core stage with twin engines.
3. **C25 cryogenic** upper stage powered by indigenous CE-20 engine (28-ton propellant load).

Dimensions: 43.5 m height, 640-ton lift-off mass, 5-m payload fairing.

Precision staging sequence:

1. S200 ignition, separation at ~137 seconds.
2. L110 ignition at ~113 seconds, separation at ~313 seconds.

3. C25 ignition thereafter.

- Injects spacecraft into GTO (180 × 36,000 km) in ~974 seconds.
- Recently launched CMS-3 (4.4 tonnes) successfully.
- Human-rated LVM3 variant to fly astronauts under Gaganyaan in 2027.

National Hub for Quantum Communication

- IIT Madras inaugurated India's **National Hub for Quantum Communication** at its campus under the National Quantum Mission (NQM).

About National Hub for Quantum Communication

- **AIM:** To accelerate national capabilities in quantum secure communication, thereby safeguarding India's digital infrastructure against potential threats from advanced quantum computers.
- The hub will focus on Quantum Key Distribution (QKD) networks, post-quantum security, quantum memory and repeaters, and satellite-based quantum communication.
- It will also drive co-development programs, large-scale testbeds, and deep-tech startup support.

GlowCas9

- Indian scientists have developed GlowCas9, **a CRISPR protein** that glows while performing gene editing.

About GlowCas9

- It is a **bioluminescent version of Cas9** formed by fusing Cas9 with an enzyme derived from deep-sea shrimp proteins.
- The glowing allows monitoring CRISPR operations in living cells, tissues, etc. without harming them.
- CRISPR/Cas9 is a gene-editing technology that enables removing, adding or altering sections of the DNA sequence.
- The Cas9 enzyme acts as a **pair of 'molecular scissors'** to cut strands of DNA.

Geminid Meteor Shower

- The Geminid meteor shower is set to peak over India between **December 13–15, 2025**, offering up to 100–120 meteors per hour under dark skies.

About Geminid Meteor:

- The Geminids are an **annual meteor shower** observed every December, known for their high meteor rates, bright fireballs, and slow-moving streaks, making them among the most spectacular celestial events visible from Earth.

Origin:

- Unlike most meteor showers that originate from comets, the Geminids arise from the **asteroid 3200 Phaethon**, a rocky body with a highly elliptical orbit around the Sun.
- Extreme solar heating causes Phaethon to shed debris, which Earth encounters each year, producing the meteor shower.

Why it occurs?

- The shower appears to radiate from the constellation Gemini, which rises higher in the sky after midnight, increasing meteor visibility.
- Earth passes through the dense debris stream of 3200 Phaethon between mid-November and late December, with peak activity in mid-December.
- The phenomenon is visible globally, with better rates in the Northern Hemisphere, including India.

Key Characteristics

- **Peak rate:** Up to 120 meteors per hour under dark, clear skies
- **Colour:** Often yellow or white, sometimes producing bright fireballs
- **Speed:** Moderately fast (~35 km/s), slower than Perseids
- **Observation:** Best seen from midnight to pre-dawn, without telescopes

Significance

- **Scientific importance:** Helps astronomers study asteroid-origin meteoroid streams and near-Earth objects.
- **Public engagement:** One of the most accessible astronomical events, promoting scientific curiosity and citizen science.
- **Planetary defence insight:** Understanding Phaethon improves tracking of potentially hazardous asteroids.

Supernova

- Recently NASA''s **James Webb Space Telescope (JWST)** has observed one of the earliest supernova recorded.
- JWST is a collaboration between **NASA, European and Canadian Space Agency** to understand the early universe. It orbits the sun at 2nd **Lagrange point (L2)** and views the universe primarily in the infrared spectrum.

About Supernova

It is an explosion of a star and is of several types:-

- Core-collapse" supernova- When the massive star (5-8 times the size of the sun) exhausts its nuclear fuel, it begins to cool, causing the outward pressure to drop significantly.
- When pressure is no longer sufficient to counteract gravity, the star collapses leaving behind a dense core and a cloud of hot gas ie. nebula .
- If star was ~10 times larger than sun it may leave behind Black Hole.
- **Thermal Runaway Supernova:** It forms when 2 stars orbiting one another (at least 1 being white dwarf) collide or white dwarf pulls too much matter from a nearby star.
- White dwarfs are the remains of a star roughly the size of our Sun when it runs out of fuel.

FSSAI launches egg safety drive after 'nitrofurans presence'

- The Food Safety and Standards Authority of India (FSSAI) has launched a nationwide egg safety drive after a viral video alleged the presence of **nitrofurans**—a banned antibiotic—in eggs of a popular brand.
- The egg safety drive is a regulatory surveillance and testing initiative by FSSAI to detect residues of banned veterinary drugs, particularly nitrofurans, in eggs to ensure consumer safety and food law compliance.

Scientific name and classification:

- Nitrofurans are a group of **synthetic nitrofuran-based antimicrobial agents**.
- Common compounds include ***nitrofurantoin, furazolidone, nitrofurazone, and furaltadone***.
- They are classified as **chemotherapeutic antibacterial agents**, not naturally occurring antibiotics.

Origin and use:

- Nitrofurans were historically used in veterinary medicine to treat bacterial and protozoal

infections.

- Due to their carcinogenic potential, they are banned in food-producing animals in India, the EU, and several other countries.

Key features of nitrofurans:

- Broad-spectrum activity **against gram-positive and gram-negative bacteria**, including **Salmonella and Giardia**.
- Primarily bacteriostatic, becoming bactericidal at higher doses.
- More active in acidic environments.
- Known for slow development of microbial resistance, but show complete cross-resistance within the group.

Implications on human health:

- **Carcinogenic risk:** Some nitrofurans are linked to cancer, prompting global bans.
- **Toxicity:** Excess exposure can cause neurological symptoms, gastrointestinal distress, and hypersensitivity reactions.
- **Food safety concern:** Presence of residues in eggs undermines consumer trust and violates food safety standards.
- **Public health risk:** Long-term exposure, even at low levels, may pose cumulative health hazards.

AFMS launches India's first AI-driven community screening programme for Diabetic Retinopathy

- **The Armed Forces Medical Services (AFMS)** launched India's first AI-driven community screening programme for **Diabetic Retinopathy (DR).**
- The initiative uses **MadhuNetrAI,** an AI platform, to enable early detection and referral of diabetic eye disease at the community level.
- A nation-first, AI-enabled community screening programme for Diabetic Retinopathy, rolled out by AFMS in collaboration with Dr. Rajendra Prasad Centre for Ophthalmic Sciences (RPC), AIIMS, and the eHealth AI Unit, MoHFW.

Aim:

- Early detection and timely referral of Diabetic Retinopathy.
- Build real-time national health intelligence on DR prevalence and geography.
- Reduce preventable diabetes-related blindness through scalable screening.

Key features:

- AI-based screening & grading of retinal images captured via handheld fundus cameras.
- Community-level deployment by trained Medical Officers, nurses and health assistants.
- Automated triaging with referrals for vision-threatening DR to vitreo-retina specialists.
- Real-time dashboards for prevalence and geographic mapping to aid policy planning.
- Pilot across 7 diverse locations: Pune, Mumbai, Bengaluru, Dharamshala, Gaya, Jorhat, Kochi.
- Integration with NCD programmes via district health administrations for continuity of care.

Significance

- **Public health impact:** Tackles a major complication of diabetes with early, accessible screening.
- **AI in healthcare:** Demonstrates safe, practical integration of AI into routine public health systems.
- **Equity & reach:** Enables screening in rural, hilly, coastal and remote regions.

The RESPOND Basket 2025

- ISRO has released the RESPOND Basket 2025, inviting research proposals from academia aligned with its current and future mission needs.
- The RESPOND Basket is a curated set of mission-oriented research problem statements identified by ISRO and Department of Space (DoS) centres.
- It guides academia towards targeted research that directly supports ISRO's upcoming space missions and R&D priorities.

Published by:

- Indian Space Research Organisation (ISRO)
- Under the aegis of the Department of Space (DoS), Government of India

Aim:

- To bridge academia and national space missions through focused, collaborative research.
- To leverage academic innovation, advanced research and human capital for solving complex space-technology challenges.

Key features

- **Mission-aligned problem statements:** Derived from ISRO's immediate and future programmatic requirements.
- **Open to premier institutions:** Universities and recognised academic and R&D institutions across India can apply.

- **Technical orientation:** ISRO scientists provide detailed technical briefings on expectations and outcomes.
- **Digital submission:** Proposals to be submitted through **the I-GRASP portal.**
- **Interactive engagement:** Enables two-way exchange between ISRO scientists and academic researchers.

Significance:

- Strengthens ISRO–academia partnership, a critical pillar of India's space ecosystem.
- Ensures problem-driven research, reducing the gap between theory and mission deployment.
- Builds a future-ready talent pipeline for India's expanding space programme.

DHRUV64 Microprocessor

- India launched **DHRUV64**, its **first indigenously designed 1.0 GHz, 64-bit dual-core microprocessor**, marking a major milestone in the country's semiconductor self-reliance journey.
- The launch strengthens India's efforts under the Digital India **RISC-V (DIR-V)** Programme to reduce dependence on imported processors.

DHRUV64 Microprocessor:

- DHRUV64 is India's first 64-bit, 1.0 GHz dual-core microprocessor, **fully designed domestically** and based on the RISC-V open-source architecture.
- It is suitable for both strategic and commercial applications.

Developed by:

- Designed by the Centre for Development of Advanced Computing **(C-DAC).**
- Developed under the **Microprocessor Development Programme (MDP),** guided by MeitY.

Aim:

- To build a trusted, indigenous processor ecosystem.
- To support Atmanirbhar Bharat in semiconductors and reduce reliance on foreign chips.
- To enable low-cost prototyping, research, and startup innovation within India.

Key features:

- GHz clock speed with 64-bit dual-core architecture.
- Enhanced efficiency, multitasking, and reliability.
- High compatibility with external hardware systems.

- Designed for applications in 5G, automotive electronics, industrial automation, IoT, and consumer electronics.
- Fabricated as the third chip under DIR-V, **after THEJAS32 and THEJAS64.**

Significance:

- Strengthens national security and technological sovereignty in critical electronics.
- Provides a domestic platform for startups, academia, and industry to design and test products.
- Accelerates future **indigenous processors like DHANUSH64 and DHANUSH64+ SoCs.**

Mars Atmosphere and Volatile Evolution (MAVEN) Spacecraft

- NASA has lost contact with the Mars Atmosphere and Volatile Evolution (MAVEN) spacecraft after it went silent in early December 2025 following a routine communication blackout.

Mars Atmosphere and Volatile Evolution (MAVEN) Spacecraft:

- MAVEN is a NASA Mars orbiter mission dedicated to studying the upper atmosphere, ionosphere, and atmospheric escape processes of Mars to understand how the planet transformed from a warm, wet world to a cold, dry one.
- **Launched in: November 18, 2013**

Aim:

- Determine how and how fast Mars lost its atmosphere to space.
- Understand the role of the Sun and solar wind in driving atmospheric escape.
- Support surface missions through data relay services.

Key features of MAVEN

- **Orbiter mission:** MAVEN follows an elliptical orbit that samples multiple altitudes, allowing scientists to observe daily, seasonal, and solar-driven atmospheric changes.
- **Upper-atmosphere focus:** The mission studies neutral gases, charged ions, solar wind, and magnetic fields, directly targeting the region where atmospheric escape occurs.
- **Eight scientific instruments:** MAVEN carries eight specialised payloads, including mass spectrometers and plasma sensors, designed for detailed atmospheric diagnostics.
- **Imaging Ultraviolet Spectrograph (IUVS):** Though MAVEN lacks a conventional camera, IUVS maps the global structure and composition of Mars' upper atmosphere in ultraviolet light.

- **Communications relay role:** MAVEN functions as an interplanetary relay satellite, transmitting data from rovers like Curiosity and Perseverance back to Earth.
- **Highly elliptical orbit:** Its orbit allows close passes through the upper atmosphere and distant observations, enabling vertical profiling of atmospheric processes.

Major discoveries and contributions

- **Atmospheric loss quantified:** MAVEN confirmed that solar wind stripping has been a dominant mechanism removing Mars' atmosphere over billions of years.
- **Water loss pathways identified:** The mission showed how water vapour breaks into hydrogen and oxygen, with lightweight hydrogen escaping irreversibly to space.
- **Impact of solar storms:** MAVEN observed that solar flares and coronal mass ejections sharply increase atmospheric escape rates during extreme space-weather events.

CRISPR Gene-Editing Technology

- Context (PIB): A Centre of Excellence for CRISPR Innovation and Translation **(CoE-CIT)** will be established in Bengaluru.

About CRISPR

- **Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR)** is a genome-editing technology that allows for the precise addition, removal, or alteration of DNA sequences.
- It was originally a natural defence mechanism in bacteria and archaea against viruses, which was adapted into a biotechnological tool.
- **Components:** Cas9 Enzyme as the "molecular scissors" that cuts the DNA at the specific location and the **Guide RNA (gRNA)** as the "navigator" guiding the Cas9 Enzyme to the target location.
- **Jennifer Doudna and Emmanuelle Charpentier** demonstrated CRISPR technology in 2012, for which they were awarded the Nobel Prize for Chemistry in 2020.
- **Advantages:** Compared to older techniques like **Zinc Finger Nucleases (ZFNs) and TALENs**, CRISPR is simpler, faster, cheaper, has better accuracy and allows targeting multiple genes at once.
- **Applications:** Treating genetic disorders (E.g., sickle-cell disease), genetically modified crops, disease diagnostics, vector control (E.g., gene-edited mosquitoes to curb malaria), and so on.

Recent Advancements in India using CRISPR Technology

- **Medical: BIRSA-101** CRISPR-based gene therapy for sickle-cell disease, **GlowCas9** fluorescent

CRISPR enzyme to visually monitor gene-editing activity in live cells.

- **Agriculture:** Genome-edited rice varieties (DRR Dhan 100, Pusa DST Rice-1), CRISPR-edited Indian mustard (Brassica juncea – 'Varuna') to improve oil quality.
- **Tools:** FELUDA CRISPR-Cas9 paper-strip COVID-19 test, indigenous TnpB-based genome-editing systems developed as compact, low-cost alternatives to Cas9.

Advancing Breast Cancer Care

- Recently, oncologists have noted a shift in cancer treatment, moving from intravenous (IV) infusions to subcutaneous (under-the-skin) injections for **HER2-positive breast cancer patients.**

Treatment Shift

- Traditional treatment for HER2-positive breast cancer involves IV administration of drugs like **trastuzumab** and **pertuzumab** through a chemoport.
- The process can take **several hours** and requires **extended hospital stays**.
- The new **subcutaneous (SC) formulation** allows the same drugs to be injected under the skin **in 2-5 minutes**, offering equal efficacy and safety.

Scientific Basis of the Treatment

- Subcutaneous trastuzumab uses **recombinant human hyaluronidase (rHuPH20)**, an enzyme that helps absorb large molecules through the skin.
- Key clinical trials, **HannaH, FeDeriCa, and ADEPT**, confirmed that SC formulations **match IV infusions** in terms of **safety**, drug absorption, and therapeutic outcomes.

Breast Cancer Cases in India

- Breast cancer is the **most common cancer** in India, accounting for **28.2% of all female cancers**.
- The age-standardised incidence rate (ASR) is reported as **25-32 per 100,000 women**, higher in urban metros due to lifestyle and reproductive factors.
- The **mortality-to-incidence ratio** remains high, with up to a poor **5-year survival rate of up to 52%** for Indian women, much lower than in high-income countries.
- **Government Initiatives for Breast Cancer**
- Under the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS), **women aged 30+** are screened for breast, cervical, and oral

cancers.

- Swasth Nari Sashakt Parivar Abhiyaan (2025), a nationwide campaign, boosted women's health awareness and breast cancer screening.
- PM-JAY: Provides **an annual cover of ₹5 lakh** per family for over **200 cancer treatment packages**, including breast cancer surgery, chemotherapy, and radiation.

BRAIN Initiative Cell Atlas Network (BICAN)

- Researchers have completed a **first draft of atlases** of the developing human brain .
- **The research** is part of the **U.S. National Institutes of Health's BRAIN Initiative Cell Atlas Network** (BICAN).

Key-findings of Research

- **Scientists** chart how the **many types of brain cells emerge** and mature from the **earliest embryonic and foetal stages** until **adulthood.**
- **Findings** could help in tackling certain brain-related conditions **like autism and schizophrenia.**
- **BICAN is a collaborative** effort between **neuroscientists, computational biologists and software engineers** to create a open-access comprehensive atlas of the human brain.

ISRO Launches Heaviest Satellite BlueBird Block-2

- ISRO successfully launched the BlueBird Block-2 satellite (BlueBird-6) aboard the Launch Vehicle Mark 3 (LVM3).
- The launch was conducted by NewSpace India Limited (NSIL), the commercial arm of ISRO, from the Satish Dhawan Space Centre in Sriharikota.
- It marked the sixth operational flight of LVM3, designated as LVM3-M6.
- **Significance:** The launch marked two milestones for India – deployment of the **heaviest satellite** from Indian soil and the largest commercial communications satellite into the **Low Earth Orbit (LEO).**
- LEO ranges from about 160 km to 2,000 km above Earth's surface.

About BlueBird Block-2 Satellite

- It is a next-generation communications satellite developed by a U.S.-based company.
- It enables 4G/5G voice and video calls, data transfers, and messaging directly to phones without

needing specialised ground equipment or antennas.

- **Key Features:** It carries a 223 sq m phased-array antenna and weighs about 6,100 kg.
- **Capacity gain: I**t delivers nearly ten times higher data capacity, enabling continuous 24/7 coverage.

About Launch Vehicle Mark-3 (LVM3)

- The LVM3, earlier called GSLV Mk-III, is ISRO's most powerful and heaviest launch vehicle; it is also known as "Baahubali".
- It is a three-stage launch vehicle consisting of two solid motors (S200), a liquid propellant stage (L110), and a cryogenic-fueled upper stage (C25).
- Payload Capacity: It can lift about **4,000 kg to Geosynchronous Transfer Orbit (GTO)** and nearly 8,000 kg to Low Earth Orbit (LEO).
- Key Feature: It is powered by the indigenous CE-20, India's largest cryogenic engine.
- **Key Missions: It launched Chandrayaan-2, Chandrayaan-3, LVM3-M6,** and is designated for the Gaganyaan human spaceflight mission.

AILA (Artificially Intelligent Lab Assistant)

- Researchers at IIT Delhi have developed AILA, an AI system capable of autonomously conducting real scientific experiments, a first of its kind in India.
- What AILA (Artificially Intelligent Lab Assistant) is?
- AILA is an **autonomous AI-powered laboratory assistant** that can design, run, and interpret real-world scientific experiments without continuous human intervention.
- Unlike conventional AI tools that only analyse data, AILA directly controls laboratory instruments and adapts decisions in real time.
- **Developed by: Indian Institute of Technology (IIT) Delhi,** in collaboration with research teams from Denmark and Germany.

Aim:

- To automate complex laboratory experiments, reduce human effort and time, and accelerate discoveries in materials science and experimental physics.
- To enable AI to move beyond analysis into active scientific reasoning and experimentation.

Key features:

- Autonomous experiment execution: Independently operates the **Atomic Force Microscope (AFM),** a critical tool in nanoscale materials research.
- **Real-time decision-making:** Adjusts experimental parameters dynamically based on ongoing observations.
- **End-to-end workflow:** Designs experiments, controls instruments, analyses data, and generates results without manual intervention.
- **Time efficiency:** Reduces tasks that took an entire day to 7–10 minutes, significantly boosting research productivity.
- **Adaptive intelligence:** Learns from experimental outcomes to refine subsequent actions.

Significance

- Marks a transition from AI as a support tool to AI as an active scientific agent.
- Enables wider access to advanced instruments by lowering skill and time barriers.
- Aligns with India's AI for Science initiative and ANRF-backed research funding.

Nanobots

- An IISc Bengaluru–led breakthrough on magnetic nanobots for targeted cancer therapy has gained global attention after Dr Ambarish Ghosh won the 2025 New York Academy of Sciences–Tata Sons Transformation Prize.

About Nanobots:

- Nanobots (nanorobots) are microscopic machines at the **nanometre scale** designed to operate inside the human body for targeted drug delivery, diagnosis, imaging, and therapy, especially in hard-to-reach tissues like deep tumours.

How they work?

- IISc's nanobots are helical, bacteria-inspired **nanoswimmers** that move like a corkscrew or propeller.
- A magnetic component (iron) allows external magnetic fields to guide and steer them precisely through blood, dense tissue, and even cells.
- Drugs are coated on the surface or tip, enabling direct delivery to cancer cells while sparing healthy tissue.
- They can also generate localized heat (>42°C) under magnetic fields to destroy cancer cells (magnetic hyperthermia).

Key features

- **Targeted precision:** Preferentially bind to cancer cells, reducing collateral damage to healthy tissues.
- **Deep tissue penetration:** Can access dense and poorly vascularised tumours invisible to conventional scans.
- **Multifunctionality:** Act as drug carriers, therapeutic agents, and imaging beacons (visible under MRI).
- **Biocompatible materials:** Made of silica and iron, materials already used safely in medical applications.
- **Broad applicability:** Proven effective against ovarian and breast cancer cells, bacteria, and dental infections; potential use in dentistry and regenerative medicine.

Limitations

- Currently validated mainly on cell cultures and animal models; human clinical trials pending.
- Requires extensive safety validation and approvals.
- Market adoption depends on mass production, affordability, and clinician acceptance.

Optical Frequency Comb

- Recent advances in precision optics have highlighted the importance of Optical Frequency Combs in metrology and high-accuracy measurement systems.
- Metrology is the science of measurements, ensuring standardisation, calibration, and traceability for accurate and uniform measurements.

About Optical Frequency Comb

- **Overview:** It is a specialised laser that functions as an ultra-precise "ruler" for light, and its development was awarded the **2005 Nobel Prize for Physics.**
- **Mechanism:** It emits many discrete, equally spaced spectral lines (resembling the teeth of a comb), and by comparing light signals to a known "teeth", scientists can measure its properties.
- **Types:** Mode-locked Lasers (most prevalent), Kerr Microcombs (most compact), Electro-optic (EO) combs (highest repetition rates), Quantum Cascade Laser (QCL) combs (infrared sensing).
- **Applications:** Optical atomic clocks, exoplanet detection, and fibre-optic communications.

Neodymium

- India to scale up its **Neodymium production** to **500 tonnes** by the end of FY27, to boost self-reliance in rare earth elements.

Neodymium

- **Category**: Lanthanide Metal.
- It is a **key component in the global rare-earth magnet industry**, vital for electric vehicles, clean energy technologies, and defence systems.
- Neodymium (symbol Nd, **atomic number 60**) is a **ductile and malleable** silvery-white metal belonging to the lanthanide series of rare-earth elements.
- It is classified as a **rare-earth element.**
- It is found in minerals such as **monazite and bastnäsite** and extracted mainly through mining and refining of rare-earth ores.
- Neodymium is one of the more abundant rare earths, exceeded only by **yttrium**, **lanthanum, and cerium.**

Physical Properties

- **Appearance:** Silvery-white metal with high ductility and malleability.
- **Oxidation:** Neodymium oxidizes quickly in air, forming a flaky oxide layer (Nd_2O_3) that easily spalls off, exposing fresh metal to further oxidation.
- **Storage:** Because of its reactivity, neodymium must be stored under vacuum, in inert gas, or in sealed plastic to prevent corrosion.

Magnetic Properties

- Neodymium is strongly paramagnetic and becomes **antiferromagnetic** at very low temperatures
- It develops spontaneous magnetic moments on different atomic sites, making it critical for high-performance magnetic materials.

Major Applications

- **Magnets:** The most important use is in neodymium–iron–boron ($Nd_2Fe_{14}B$) magnets, strongest permanent magnets known. These are vital in electric motors, generators, computer hard drives, and wind turbines.
- **Electronics and Alloys**: It is used in steel manufacturing, lighter flints (misch metal), and

ferrous/nonferrous alloys.

- **Lasers:** It is widely used in industrial, medical, and military lasers.
- **Optics and Glass:** Neodymium compounds color glass in pink to purple hues and are used in glazes and fiber optics. A mixture of neodymium and praseodymium absorbs harmful sodium-D light, protecting welders' and glassblowers' eyes.
- **Cryogenics:** Employed as a regenerator material in low temperature cryocoolers.
- **Appearance**: Lustrous, silvery-yellow metal that tarnishes quickly in air.
- **Key Applications**: Makes **Very strong permanent magnets** in an alloy with iron and boron, make lasers, use in eye and cosmetic surgery, treatment of skin cancers, etc.
- **Source:** Monazite and Bastnaesite (like most Lanthanide elements).

Nimesulide Ban

- India has banned oral immediate-release nimesulide formulations above 100 mg to protect public health, citing serious safety risks.
- Nimesulide is a **non-steroidal anti-inflammatory drug (NSAID)** used for pain and fever in adults. It has been widely sold under multiple brand names and fixed-dose combinations in India for decades.

Reasons Behind the Ban

- **Hepatic Risk:** High-dose nimesulide is linked to **liver toxicity**, which can lead to acute liver failure.
- **Fatal Potential:** Severe cases of hepatotoxicity have led to hospitalisation and deaths.
- **Safer Alternatives:** Other NSAIDs with better safety profiles are available for similar indications.
- **Ecological Risk:** Nimesulide was identified as a major continuing threat to **vulture populations**.

Regulatory And Legal Basis for the Ban

- **Statutory Power:** Ban issued under **Section 26A of the Drugs & Cosmetics Act, 1940**, in public interest.
- **Expert Review:** Recommendation came from the **Drugs Technical Advisory Board** & expert committees.
- **Scope of Ban:** Applies only to oral immediate-release doses above 100 mg, not a total prohibition.

Maglev Technology

- China successfully tested the world's fastest superconducting **magnetic levitation (maglev)** technology by accelerating a tonne-class vehicle to 700 km/h in just two seconds.
- Maglev technology uses magnetic forces to lift, propel, and guide vehicles (primarily trains) above a track, eliminating the need for wheels and minimising friction.
- The tracks, known as guideways, contain powerful electromagnets, and the vehicles use superconducting magnets or electromagnets for motion control.
- **Levitation:** Magnetic forces create a 'cushion' lifting the vehicle about 1–10 cm above the guideway, overcoming gravity.
- **Propulsion:** Linear motor systems generate moving magnetic fields that pull the train from the front and push it from the rear.
- **Guidance:** Lateral magnetic forces keep the vehicle centred on the guideway during high-speed movement and turns.

Primary Types

- **Electromagnetic Suspension:** EMS uses magnetic attraction to lift the train toward a ferromagnetic rail, allowing levitation even at rest.
- **Electrodynamic Suspension**: EDS uses magnetic repulsion from superconducting magnets, enabling the world's highest speeds; it requires wheels at low speeds.
- **Inductrack:** Passive EDS uses an array of permanent magnets on the train and wire loops in the track, enabling fail-safe, energy-efficient levitation.

India's First 3D Flex Aqueous Angiography for Glaucoma

- **Context (PIB):** An Army Hospital in New Delhi has successfully performed India's first 3D flex aqueous angiography with **iStent,** marking a major advancement in glaucoma treatment.

Key Details

- 3D flex aqueous angiography allows doctors to see the eye's fluid drainage channels in real time, helping identify exactly where fluid outflow is blocked in glaucoma patients.
- The technique was performed using a 3D operating microscope and **Spectralis** imaging system, enabling high-precision live imaging during the eye surgery.
- It was combined with iStent, a tiny implant used in **Minimally Invasive Glaucoma Surgery**

(MIGS), which helps improve fluid drainage and lower eye pressure safely.

About Glaucoma

- It is a group of eye disorders involving progressive optic nerve damage, associated with persistently raised **intra-ocular pressure (IOP)** and irreversible vision loss.
- It is caused by ageing, genetic predisposition, diabetes, prolonged steroid use and eye injury; symptoms appear late via gradual peripheral vision loss.
- Treatment focuses on lowering IOP through eye drops, laser procedures, or surgery, with newer methods like MIGS improving safety and outcomes.
- In India, glaucoma affects ~12 million people and causes ~12% of total blindness, with a high burden due to late diagnosis, low awareness, and limited routine screening.

PathGennie Software for Fast-Tracking Drug Discovery

- The Ministry of Science and Technology has developed PathGennie, a new open-source computational software that significantly accelerates drug discovery by accurately simulating drug–protein unbinding.

PathGennie Software

- PathGennie is an open-source computational framework designed to efficiently simulate rare molecular events, especially drug unbinding from protein targets, without introducing artificial distortions.
- It helps predict drug residence time, a key factor in drug efficacy and safety.
- **Developed by:** Scientists at S. N. Bose National Centre for Basic Sciences, Kolkata

Aim:

- To overcome limitations of traditional molecular dynamics simulations in capturing slow, rare molecular transitions.
- To provide physically accurate pathways for drug–protein interactions while reducing computational cost and time.

How it works?

- Instead of forcing molecules to move, the software lets them move naturally.

- It runs many tiny, short simulations at the same time to see which ones head in the right direction.
- Only the useful paths are continued, while the rest are stopped, saving time and computing power.
- This works like natural selection — the best paths survive without artificial pressure or heat.
- It can handle complex patterns, even those identified using artificial intelligence, making it very adaptable.

Applications:

- Predicts accurate drug unbinding pathways and residence times (e.g., imatinib–Abl kinase).
- Understanding protein–ligand kinetics for better drug design.
- Applicable to chemical reactions, catalysis, phase transitions and self-assembly processes.

The drug-resistant fungal species Candida auris

- An Indian-led study has warned that Candida auris, a **drug-resistant fungal pathogen**, is becoming more virulent and spreading globally, with high mortality even after treatment.

The drug-resistant fungal species Candida auris:

- Candida auris is a multidrug-resistant fungal pathogen that causes severe invasive infections, especially in hospitalised and immunocompromised patients.
- First identified in 2009, it is now classified as an emerging global health threat due to high fatality rates and treatment failure.

Vector / Reservoir:

- Primarily healthcare settings such as hospitals and long-term care facilities.
- Persists on human skin, medical devices, and inanimate surfaces for prolonged periods.

Symptoms:

- Symptoms vary by site of infection and often resemble bacterial sepsis, making detection difficult.
- Common signs include fever, chills, low blood pressure, tachycardia, and in severe cases, bloodstream infections (candidemia).

Key features:

- Multidrug resistance: Resistant to multiple antifungal classes, limiting treatment options.
- High virulence: Mortality often exceeds 50%, even with therapy.
- Morphological flexibility: Can switch from yeast form to filamentous growth, aiding invasion.

- Immune evasion: Adapts rapidly to host immune responses and environmental stress.

Transmission:

- Spreads through direct contact with infected or colonised individuals (even asymptomatic).
- Transmitted via contaminated surfaces, medical equipment, and invasive devices like catheters or ventilators.

HISTORY, HERITAGE AND CULTURE

Ellora Caves

- Scottish historian urged the Maharashtra government to spotlight the neglected yet significant heritage sites around the Ellora Caves, such as **Malik Ambar's tomb**, the **first Peshwa's tomb**, and the empty tomb of the **last Ottoman Caliph.**

Ellora Caves:

- Ellora Caves are a **UNESCO World Heritage Site** comprising ***34 monumental rock-cut temples*** and monasteries representing Buddhist, Hindu, and Jain traditions. They form one of the largest rock-cut cave complexes in the world.
- **Location**: Situated in Chhatrapati Sambhajinagar (Aurangabad), Maharashtra.
- **History:** Constructed between 600 CE to 1000 CE.
- 12 Buddhist caves (caves 1–12):
- ~200 BCE to 600 CE: Early monastic caves with viharas, meditation cells and chaitya halls, marking the shift from simple rock shelters to more structured prayer and learning spaces.
- 17 Hindu caves (caves 13–29):
- ~500 CE to 900 CE: Rashtrakuta-era caves with bold iconography, massive pillars and grand sculptures, culminating in the Kailasa temple—the finest example of Indian rock-cut engineering.
- 5 Jain caves (caves 30–34):
- ~800 CE to 1000 CE: Later additions marked by intricate carvings, ornate pillars and themes of asceticism, showcasing Ellora's spirit of multi-religious coexistence and artistic refinement.
- Designated UNESCO World Heritage Site in 1983.

Key Features:

- **Kailasa Temple (Cave 16):**

- Largest single monolithic rock excavation in the world.
- Carved from top to bottom, removing 1,50,000–2,00,000 tonnes of rock.
- Chariot-shaped monument dedicated to Lord Shiva.
- Notable carvings: Nandi Mandapa, Life-size elephants, Ravana shaking Mount Kailasa, and Narasimha slaying the demon.

Multi-Religious Harmony:

- Rare archaeological site exhibiting Hindu–Buddhist–Jain coexistence across centuries.

Architectural Excellence:

- Complex includes an elaborate facades, multi-story halls, Sculptures, pillars, windows and stairways carved from solid basalt.

Nearby Heritage Cluster:

- Khultabad: Naga veneration sites, Sufi shrines.
- Malik Ambar's tomb, First Peshwa's tomb, Empty tomb of the last Ottoman Caliph.

Bhagavad Gita serves as a Universal Guide offering Moral Clarity: Vice President

- Bhagavad Gita, an esteemed scripture within Indian philosophy is an integral segment of the Indian epic Mahabharata composed in Sanskrit.
- Written in poetic form and complied around 200 BCE, it forms a dialogue between Prince Arjuna and Lord Krishna.
- Recently, it has been inscribed in **the UNESCO Memory of the World International Register**.
- Contemporary Relevance of the Ethical Teachings of Bhagavad Gita
- **Action without Desire:** It is signified by the idea of **"Nishkam Karma"** stressing the fact that one has right only to one's own actions, not to their outcomes, regardless of whether it is favorable or unfavorable.
- It is in contrast to the idea of **Sakama Karma,** which refers to actions driven by desire to achieve a

specific outcome.

- **Synthesis of the Good of Society and Individual**: Gita deals with preserving larger social and world goals of preserving dharma and order, and achieving harmony, unity and universal welfare through **"lokasamgraha".**
- **Strengthening Emotional Resilience:** It explains the idea of "Sthita- prajna" as a steady individual with the characteristics of emotional resilience, including efficiently coping with adversity, adjusting to change, and preserving psychological wellbeing.
- **Leadership Development:** Bhagavad Gita stresses on the performance of Svadharma, i.e., own duty or dharma.
- **Others:** Decisiveness (Gita equates lack of ambivalence with decisiveness); Humility (being aware of one's limitations); etc.

Kashi Tamil Sangamam 4.0

- Union Education Minister Dharmendra Pradhan and Uttar Pradesh CM Yogi Adityanath inaugurated the fourth edition of Kashi Tamil Sangamam in Varanasi.

Kashi Tamil Sangamam

- **Inception:** Launched in 2022 by the Ministry of Education to revive ancient civilizational and cultural ties between Varanasi (Kashi) and Tamil Nadu under the spirit of 'Ek Bharat Shrestha Bharat.'
- **Format:** Month-long event in Varanasi featuring seminars, cultural performances, temple visits, cuisine exhibitions and academic exchanges.
- **Fourth Edition:** Begins 2 December 2025 under the theme "Learn Tamil – Tamil Karkalam", with over 1,400 delegates from Tamil Nadu participating.
- **Organisers:** Coordinated by the Ministry of Education with IIT-Madras and Banaras Hindu University as knowledge partners, supported by the Uttar Pradesh government.

Historical Ties Between Kashi and Tamil Nadu

- Tamil Shaivite Saints like **Appar, Sambandar and Sundarar** referenced Kashi in the Thevaram hymns, reinforcing Varanasi as a sacred geography in Tamil Bhakti literature.
- Tamil scholars historically travelled to Kashi for Vedic, Sanskrit & philosophical studies, with

institutions like **Kashi Vidvat Parishad** hosting Tamil Pandits.

- Many temples in Tamil Nadu symbolically link to the original **Kashi Vishwanath tradition** (E.g., Kashi Vishwanath replicas in Thanjavur and Kumbakonam).
- Continuous south-north pilgrimage routes recorded for centuries, with large Tamil pilgrim settlements historically documented in Varanasi

Swargadeo Chaolung Sukapha

- Every year, Assam Day (2 December) is celebrated to honour **Chaolung Sukapha.**
- Chaolung Sukapha was the founder of the **Ahom Kingdom (1228 AD)** and is known as the '**Architect of Greater Assam'.**
- **Origin**: He was a **Tai prince** of the **Shan tribe**, from **Mong Mao** (present-day Yunnan, China or the Upper Myanmar region).
- **First Capital:** He established his first principality at Charaideo in Upper Assam.
- Charaideo was designated as a UNESCO World Heritage Site (WHS) in July 2024.

Key contributions of Chaolung Sukapha

- **Political Policy:** He promoted reconciliation with indigenous groups like the Moran and Barahi tribes and supported intermarriage between the Ahoms and local communities.
- **Administration:** He divided the kingdom into khels or phoids, each led by an officer responsible for providing a fixed number of paiks; he created the high ministerial posts of Buragohain and Borgohain.
- **Economic Contribution:** He introduced wet-rice cultivation, turning the floodplains into productive farmland that became the backbone of the kingdom's agrarian economy.
- **Cultural Legacy:** Interaction between the Tai-Ahom language, religion, and traditions formed a unique composite Assamese culture, later documented in the 'buranjis'.
- Paiks were able-bodied adult males who provided compulsory labour or military service in exchange for rent-free, non-hereditary, non-transferable cultivable land called ga-mati.
- The **buranjis** (meaning "a storehouse of knowledge about the past") were comprehensive historical chronicles, initially written in the **Tai-Ahom language** and later mainly in Assamese.

The 26th Hornbill Festival

The 26th Hornbill Festival (2025) in Nagaland is underway, with day three showcasing vibrant cultural performances by 18 Naga tribal troupes at Kisama Heritage Village.

Hornbill Festival:

- A premier cultural festival of Nagaland, known as the **"Festival of Festivals,"** celebrating the heritage, traditions, and artistic expressions of all major Naga tribes.

History:

- Started in 2000 by the Government of Nagaland to promote inter-tribal unity, preserve indigenous culture, and boost tourism.
- Named after the Hornbill, a revered bird in Naga folklore symbolising valour, beauty, and tradition.

Key Features:

- Held annually from December 1–10 at Kisama Heritage Village, near Kohima in Nagaland.
- Daily cultural shows featuring traditional dances, folk songs, war cries, and indigenous sports.
- Display of Naga arts: wood carving, textiles, crafts, paintings, sculptures.
- Food festivals, herbal medicine stalls, flower shows, and traditional archery & wrestling.
- **Major events:** Hornbill International Rock Festival, **Morung exhibitions**, fashion shows, and craft bazaars.
- Participation from international partner countries and neighbouring states.

Significance:

- Revives, preserves, and promotes the diverse cultural identity of Nagaland's 17 major tribes.
- Acts as a platform for cultural assimilation, where village elders and youth interact and exchange traditions.
- Enhances tourism, economic activity, and global cultural ties.

Mahad Satyagraha

- The Mahad Satyagraha has returned to public discourse as scholars revisit its profound role in shaping constitutional morality and human rights ethics in India.

Mahad Satyagraha:

- A historic non-violent movement led **by B. R. Ambedkar** asserting Dalit rights to access public water and reject caste-based exclusion—one of India's earliest human rights struggles.
- **Launched in: March 19–20, 1927** (Mahad 1.0) and December 25–26, 1927 (Mahad 2.0) at Mahad, Bombay Presidency (now Raigad, Maharashtra).

Causes:

- Denial of access to public water sources such as the **Chavdar Tank** due to caste-based untouchability.
- **1923 Bole Resolution** legally allowed Dalits to use public facilities, but local caste elites resisted implementation.
- Rising caste violence in villages like **Goregaon and Dasgaon** reinforcing the need for collective assertion of rights.

Key Features of Mahad Satyagraha

- **Assertion of Civil Rights:** Ambedkar and thousands of followers marched to Chavdar Lake and drank water to affirm equality as a human right.
- **Challenge to Brahmanical Hegemony:** Upper castes performed "purification rituals," prompting Ambedkar's stronger mobilisation in Mahad 2.0.
- **Burning of Manusmriti:** On December 25, 1927, Ambedkar symbolically rejected the scriptural basis of caste oppression.
- **Birth of Constitutional Morality:** Ideas of liberty, equality, fraternity—later embedded in the Constitution—were explicitly articulated at Mahad.
- **Participation of Women:** Ambedkar addressed women directly, making gender equality central to the anti-caste struggle.
- **Non-violent Democratic Protest:** Inspired by the French Revolution's ideals, but rooted in Buddhist ethics of dignity and maitri (compassion).

Outcome:

- **Legal victory (1937):** Courts held no valid custom existed to bar Dalits from public tanks, affirming equal civic rights.
- **Strengthened Dalit political consciousness:** Mahad became the birthplace of a new rights-based movement.
- **Foundation for later struggles:** Directly influenced Ambedkar's arguments in Annihilation of Caste and shaped the moral core of India's Constitution.
- December 25 recognised as Indian Women's Liberation Day, reflecting the gendered nature of Ambedkar's social revolution.

200th anniversary of Dadabhai Naoroji

- India celebrated the 200th birth anniversary of Dadabhai Naoroji in 2025, honouring his legacy as a nationalist leader, economic thinker and early architect of the freedom movement.

Dadabhai Naoroji:

- Dadabhai Naoroji (1825–1917) was an Indian nationalist leader, economic theorist, social reformer, scholar, and the first Indian Member of British Parliament.

Early Life & Education:

- Born on 4 September 1825 in Bombay (some sources say Navsari), in a middle-class Parsi family.
- Educated at Elphinstone Institute, where he excelled in mathematics and English.
- Became the **first Indian Professor at Elphinstone College**, symbolising modern Indian intellectual awakening.
- Known worldwide as the "Grand Old Man of India."
- Called the "Unofficial Ambassador of India" for championing India's cause in Britain.
- Taught Gujarati at University College London, breaking academic barriers.
- Among the first to scientifically analyse poverty in India using data-based methods.
- His 1906 INC presidential address was the first to adopt "Swaraj" as the national goal.

Contributions to the Indian Freedom Movement:

Economic Contributions:

- **Drain of Wealth Theory** - Systematically demonstrated how British rule drained India's resources through salaries, pensions, remittances, and unequal trade.

Authored major works:

1. Poverty and Un-British Rule in India
2. Poverty of India

- His advocacy led to the creation of the Welby Commission (1895) on Indian expenditure, where he served as a member.
- Popularised economic nationalism and laid foundations for Swadeshi and fiscal self-reliance.

Political Contributions:

- Founding member of Indian National Congress (INC) and its President in 1886, 1893, and 1906.
- Elected first Indian MP in British Parliament (1892) from Central Finsbury on a Liberal Party ticket.
- Advocated self-government, constitutional methods, and parliamentary democracy.
- Played a unifying role between Moderates and Extremists, presiding over the 1906 Calcutta

Session that adopted the demand for Swaraj.

- Mentored future leaders including Tilak, Gokhale, and Mahatma Gandhi.

Social Reform:

- Champion of women's education-helped run special classes at Elphinstone and supported girls' schooling.
- **Founded Rast Goftar**, a Gujarati newspaper promoting social reform.
- **Co-founded Rahnumai Mazdayasan Sabha (1851)** to reform Parsi society.
- Led efforts for compulsory primary education, submitting recommendations (with Jyotiba Phule) to the Hunter Commission (1882).

Organisational Building:

- Founded or co-founded key institutions to internationalise India's cause:
- London Indian Society (1865)
- East India Association (1866)
- These groups later merged with the INC and served as platforms for India's political diplomacy.

150 Years of Vande Mataram

- The Parliament has scheduled a special discussion to **commemorate 150 years** of the National Song Vande Mataram.
- **Debate:** The celebration revived debate over the **Congress Working Committee's 1937** decision to adopt only the first two stanzas for national gatherings.

About 'Vande Mataram'

- Bankim Chandra Chattopadhyay wrote the poem in **1875**. He later included it in his **1882 Bengali novel Anandamath**, published in the magazine **Bangadarshan.**
- **Structure:** The poem has six stanzas; the first two use Sanskrit and the latter ones use Bengali.
- **Portrayal:** In the novel, warrior-monks sing the hymn to praise Mother India through the image of goddess Durga.
- **Trigger:** British promotion of **"God Save the King/Queen"** encouraged Bankim to write a patriotic hymn.

Musical Composition

- **Early Tune:** Jadunath Bhattacharya composed an initial tune for the poem at Bankim Chandra's request.
- **Tagore:** Rabindranath Tagore composed a widely recognised version based on the raga Desh Malhar.
- Debut: Tagore first sang Vande Mataram publicly at **the Congress Session 1896** in Calcutta presided over **by M. Rahmathulla Sayani.**

Partition of Bengal (1905)

- **Rally Cry:** Vande Mataram became the central slogan of the Swadeshi and boycott movement after the 1905 partition of Bengal.
- **First Use:** The slogan was publicly raised for the **first time on 7 August 1905 at Calcutta's Town Hall.**
- **Customary:** Vande Mataram became the customary opening song for all-India Congress occasions at the 1905 Varanasi session. **Sarala Devi Chaudhurani** sang it at the session.

Symbol of Defiance and Nationalism

- **Colonial Ban:** The British banned public chanting or display of Vande Mataram, imposing fines and using force against protesters.
- **Defiance:** The ban made the chant an act of resistance, with freedom fighters accepting jail or death while uttering it.
- **Journals**: Bipin Chandra Pal launched the English journal **Bande Mataram in 1906**, edited by Aurobindo. Lala Lajpat Rai later started an Urdu daily with the same name in 1920.
- **Flag: Bhikaji Cama** unfurled an Indian flag in **Stuttgart in 1907 with "Vande Mataram"** written across the central band.

CWC Decision to Use Only Two Stanzas

- **Decision:** The Congress Working Committee decided in 1937 to use only the first two stanzas for public and national gatherings.
- **Leaders:** The 1937 CWC included Mahatma Gandhi, Jawaharlal Nehru, Vallabhbhai Patel and Subhas Chandra Bose. Rabindranath Tagore advised using only the first two stanzas.
- **Concerns:** The remaining stanzas were removed after minority groups objected to explicit invocations of Hindu goddesses Durga and Lakshmi.

Post-Independence Status

- **Recognition:** On 24 January 1950, Dr. Rajendra Prasad, President of the Constituent Assembly, declared Vande Mataram the National Song of India.
- **Status:** It was declared to be honoured equally with the National Anthem Jana Gana Mana.
- **Law:** Unlike the National Anthem, the National Song is not enforceable under the Prevention of Insults to National Honour Act, 1971.
- **Protocol:** Each new session of Lok Sabha and Rajya Sabha opens with the National Anthem and concludes sine die with the National Song Vande Mataram.

Saudi UNESCO Global Network of Learning Cities (GNLC)

- UNESCO has added three more Saudi cities — **Riyadh, AlUla, and Riyadh Al-Khabra** — to the Global Network of Learning Cities **(GNLC)** in its 2025 update.

Saudi UNESCO Global Network of Learning Cities (GNLC)

- The GNLC is a UNESCO-led international network that recognises cities promoting lifelong learning across all age groups through inclusive, accessible, and sustainable learning ecosystems.

History:

- Established in **2013,** GNLC has grown rapidly and today includes 425 cities from 91 countries, supporting lifelong learning opportunities for nearly 500 million people.
- It forms part of UNESCO's Education 2030 agenda and the **SDG-4** mandate.

Key Features of a UNESCO Learning City

- Learning cities must demonstrate-
- **Lifelong learning systems:** Education integrated across formal, non-formal, workplace, and community settings.
- **Digital and AI readiness:** Preparing citizens for future labour markets and technological shifts.
- **Literacy & skills development:** Targeted programmes for youth, adults, and marginalised groups.
- **Innovation & entrepreneurship:** Platforms for creativity, startup culture, and workforce reskilling.
- **Sustainability & inclusion:** Learning linked to SDGs, environmental responsibility, and social equity.

Saudi Arabia's Recent Addition:

- UNESCO recognised Riyadh, AlUla, and Riyadh Al-Khabra for meeting rigorous global benchmarks of community-wide learning.
- Saudi's total GNLC membership: 8 cities.
- The expansion aligns with **Saudi Vision 2030** and the **Human Capability Development Program.**

India and the Global Learning Cities Network:

India has three GNLC cities (2022 cohort):

1. Warangal (Telangana)
2. Thrissur (Kerala)
3. Nilambur (Kerala)

- These cities were recognised for integrating learning in public spaces, literacy programmes, and community participation.

UNESCO Recognises Deepavali as Intangible Cultural Heritage

UNESCO inscribed Deepavali on its Representative List of the **Intangible Cultural Heritage (ICH)** of Humanity during the 20th ICH Committee session hosted at New Delhi's Red Fort.

- Deepavali becomes **India's 16th element on UNESCO's ICH list**, following recent additions such as **Kumbh Mela (2017), Kolkata Durga Puja (2021) and Garba of Gujarat (2023).**
- UNESCO: UN specialised agency (est. 1945) promoting cooperation in education, science, & culture; headquartered in **Paris**, with 194 members (India a founding member) and 12 associate members.

Deepavali

- **Origins:** A 2,500-year-old Indian festival with roots in ancient harvest celebrations, later assimilated into multiple religious traditions across regions.
- **Hindu Traditions:** Marks Rama's return to Ayodhya, Lakshmi's birth, Krishna's defeat of Narakasura, and the Pandavas' return – symbolising victory of light, dharma and renewal.
- **Other Religions:** Observed as Mahavira's Nirvana (Jainism), Bandi Chhor Divas marking Guru Hargobind's release (Sikhism), and **Tihar/Newar Buddhist** observances in Nepal.
- **Cultural Practices:** Celebrated over five days (Dhanteras to Bhai Dooj) with diyas, pujas, home decoration, gifting, and region-specific rituals across India and Nepal.
- Deepavali drives major economic activity across textiles, gold, handicrafts, fire crackers and e-commerce; increasingly observed globally with official recognition in several countries.

20th UNESCO ICH Committee Session

- India is hosting the **20th session of the Intergovernmental Committee for Safeguarding Intangible Cultural Heritage from 8-13 December 2025 at the Red Fort**, New Delhi.
- **Agenda:** Examine new nominations for inscription, assess safeguarding reports, review listed elements, decide on international assistance, and discuss best practices for safeguarding "living heritage."
- **Participation:** Involves 800+ delegates from 180+ countries, including Committee members, UNESCO officials, experts, accredited NGOs and ICH practitioners.
- **Significance:** Enhances India's cultural diplomacy and soft power, showcases national heritage, strengthens cooperation with UNESCO, and positions India as a leader in global heritage discourse.

Boreendo

- UNESCO has inscribed Pakistan's Boreendo, **a rare clay vessel-flute linked** to the **Indus Valley musical tradition**, on the Intangible Cultural Heritage in Need of Urgent Safeguarding list.

What it is?

- The Boreendo is a spherical clay vessel-flute, producing mellow, breathy tones used in folk melodies, pastoral songs and winter gatherings in Sindh.
- Origin: It originates from **Keti Mir Muhammad Lund** in Sindh, with roots tracing back **to Mohenjo-daro artefacts**, indicating a long sonic lineage from the Indus Valley Civilization.

Characteristics

- **Terracotta Craft:** Handmade from sun-dried and kiln-fired clay, keeping the instrument fully eco-friendly.
- **Spherical Vessel Design**: Egg-shaped hollow body with 1 inlet and 3–5 holes enables simple melodic variation.
- **Tilt-Based Sound Control:** Pitch and tone shift by tilting the mouthpiece rather than complex fingering.

Indus Valley Flute Tradition

- Archaeological excavations at Mohenjo-daro and Harappa have revealed **terracotta and bone flutes,** some nearly identical to the modern Boreendo.

- Flute fragments were found at Mohenjo-daro, Harappa, and adjoining sites of the Indus Valley Civilization (3300–1300 BCE).

Key Characteristics

- Made from clay, bone, or shell.
- Carefully drilled finger holes; sometimes uneven spacing (microtonal scales).
- Cylindrical or spherical forms similar to today's vessel flutes.
- Evidence suggests both solo and group musical performances.

First Country to Win UNESCO Recognition for Its National Cuisine

What it is?

- A historic UNESCO recognition that declares Italian cooking—not a single dish, but the entire national culinary tradition—as an element of humanity's intangible cultural heritage.

Awarded by:

- UNESCO's Intergovernmental Committee for the Safeguarding of Intangible Cultural Heritage, during the 20th session held in Delhi.
- Recognition titled: "Italian cooking: Between sustainability and biocultural diversity."

Key Characteristics:

- Described as a cultural and social blend of culinary traditions, rooted in artisanal techniques and high respect for ingredients.
- Emphasises conviviality, shared meals, intimacy with food, and intergenerational transmission of skills.
- Strong anti-waste philosophy, use of seasonal/local produce, and community cooking practices.
- Passed informally within families—especially grandparents to grandchildren—and formally through schools, universities and culinary institutes.

Significance:

- Makes Italy the first nation globally to receive UNESCO recognition for an entire cuisine.
- Reinforces Italy's cultural identity and its political use of cuisine as a symbol of national pride.
- Supports preservation of biocultural diversity, sustainable food practices and artisanal traditions.

Adichanallur Historical Site

- The Madras High Court has ordered that no sand mining be permitted anywhere near the

Adichanallur archaeological site, citing the need to protect its heritage value.

- **Adichanallur Historical Site:**
- One of **India's oldest Iron Age archaeological sites**, known for extensive urn burials, skeletal remains, metal artefacts, and early cultural evidence of South India.

Located in:

- Thoothukudi district, Tamil Nadu, on the banks of the Thamirabarani river, near Srivaikuntam.
- About 24 km from Tirunelveli, and close to ancient port town Korkai, indicating maritime connectivity.

Major Discoveries:

- Large urn burials, skeletal remains of mixed ethnic origins, pottery, iron and bronze artefacts.
- 169 burial urns unearthed in the 2004–05 ASI excavations.
- Early excavations uncovered gold diadems, pottery, weapons, and over 4,000 antiquities.
- American and Indian analyses reveal multiracial skeletal composition—**Negroid, Australoid, Caucasoid, Mongoloid, and Dravidian traits**—suggesting a cosmopolitan settlement.
- Carbon dating (2019): artefacts between 905 BCE and 696 BCE, older than Keezhadi.

Historical Background:

- Excavations began with German explorer **Dr. Jagor (1876)** and were expanded by Alexander Rea (1899–1904).
- The site likely thrived due to proximity to Korkai, a major maritime trade centre in Sangam literature.

Key Features:

- Represents a major Iron Age urn burial culture, with evidence of long-distance contacts via the Thamirabarani–Korkai maritime route.
- Only 4–5% of the site excavated and full potential remains untapped.

115 Years of Savarkar's Poem 'Sagara Pran Talamalala'

- Union Home Minister and **Minister of Cooperation** addressed a cultural programme in Sri Vijayapuram to mark 115 years of **Swatantryaveer Vinayak Damodar Savarkar's** poem Sagara Pran Talamalala.

About Poem 'Sagara Pran Talamalala':

- 'Sagara Pran Talamalala' (often rendered as Sagara Pran Talmalala / Ne Majasi Ne…) is a **Marathi patriotic poem** expressing an exiled revolutionary's torment, homesickness and yearning for the motherland, with the sea personified as a messenger between the patriot and India.
- **Written by**: Swatantryaveer Vinayak Damodar Savarkar (1883–1966), revolutionary, social reformer, writer and Hindutva ideologue.
- The poem was later immortalised in song form by **Lata Mangeshkar**, with music by Hridaynath Mangeshkar.

Circumstances of Composition:

- Composed around 1909 on the shores of Brighton, England, when Savarkar was a young revolutionary at India House, London.
- Savarkar was under surveillance and facing imminent repression after the arrest of his elder brother and the revolutionary assassination of **Curzon Wyllie by Madan Lal Dhingra**, whom he had influenced at **India House**.
- The poem captures his inner conflict—torn between commitment to armed struggle in foreign land and a desperate desire to return to "Matru-bhoomi" (motherland).
- The opening invocation to the sea-urging it to carry him back to India-has since come to symbolise the anguish of countless exiles and political prisoners in the freedom movement.

Other Literary Works of Savarkar:

- **The Indian War of Independence 1857:** A landmark reinterpretation of the 1857 uprising as a national war of independence, countering British narratives of a "mutiny".
- **Hindutva: Who is a Hindu? :** Lays out his idea of Hindutva as a cultural–civilisational identity based on common nation (rashtra), heritage and geography, encompassing Hindus, Buddhists, Jains and Sikhs.
- **My Transportation for Life (Mazi Janmathep):** Autobiographical account of his incarceration in Cellular Jail, Andamans, describing brutal conditions, psychological suffering, and resolve.
- **Six Glorious Epochs of Indian History:** A civilisational narrative highlighting periods of Hindu resistance and resurgence, written from a distinctly nationalist–militant lens.
- **Hindu Pad-Padshahi & Other Historical Works:** On the Maratha empire and Hindu political power.

Poetry & Plays:

- Patriotic poems (including 'Sagara Pran Talamalala', 'Jayostute', 'Ne Majasi Ne…') and plays such as

Sanyast Khadga, Uttarkriya, combining themes of liberty, duty, sacrifice, and rationalism.

Charaichung Festival

- Assam's Majuli hosts Charaichung Festival to revive Asia''s first protected royal bird sanctuary.
- The festival commemorates the 392-year-old legacy of Asia''s first protected Royal Bird Sanctuary, ''Charaichung'', established in 1633 AD by Ahom king Swargadeu Pratap Singha.
- Majuli is the world''s largest river island in the Brahmaputra River, Assam.

Preah Vihear Temple

India expressed concern over reported damage to conservation facilities at the Preah Vihear temple amid ongoing Thailand-Cambodia border clashes.

About Preah Vihear Temple

- It is a **Hindu temple** dedicated to Lord Shiva, located in Preah Vihear province, northern Cambodia, situated atop a cliff in the **Dangrek Mountains along the Cambodia-Thailand border**.
- It was constructed during the **Khmer Empire in the 11th-12th centuries CE**, initially built under **Suryavarman I (1002-1050 CE) and later expanded by Suryavarman II (1113-1150 CE).**

- It embodies the Khmer temple architecture, aligned along an ~800-metre axial processional path with a sequence of five gopuras connected by stairways and pavements.
- It was inscribed as a **UNESCO World Heritage Site (2008)** for its architectural significance and outstanding testimony to the Khmer civilisation.

Emperor Perumbidugu Mutharaiyar II

- Prime Minister of India has welcomed the release of a commemorative postage-stamp honouring Emperor **Perumbidugu Mutharaiyar II (Suvaran Maran),** recognising his administrative excellence and patronage of Tamil culture.

About Emperor Perumbidugu Mutharaiyar II:

- Perumbidugu Mutharaiyar II, also known as Suvaran Maran or Shatrubhayankar, was a prominent ruler of the **Mutharaiyar lineage** who ruled **during c. 705–745 CE**.
- Belonged to the **Mutharaiyar dynasty**, a powerful Tamil ruling lineage.
- Functioned as **feudatories of the Pallavas**, particularly under **Pallava king Nandivarman II**.
- Controlled the central Cauvery region, including Thanjavur, Tiruchirappalli, Pudukkottai, Perambalur, and surrounding areas.
- Ruled primarily from Tiruchirappalli, exercising authority for nearly four decades.

Key Contributions

Administrative & Military Achievements:

- Known as a formidable administrator with strategic foresight and governance stability.
- Fought several battles alongside Pallava forces, helping maintain regional order during Pallava decline.

Temple Building & Architecture:

- The Mutharaiyars were among the early temple builders of Tamil Nadu, contributing to rock-cut and structural temples.
- Their architectural innovations influenced the early Chola temple tradition, even before the rise of **Vijayalaya Chola.**

Cultural & Religious Patronage:

- Patronised Shaivism, while also hosting philosophical debates involving **Jain scholars such as Acharya Vimalachandra**, reflecting religious pluralism.
- Supported Tamil language, literature, and religious institutions, as evidenced by inscriptions.

Public Works:

- Inscriptions attest to his contributions to temple endowments, irrigation systems, and agrarian infrastructure, strengthening the Cauvery delta economy.

Significance

- **Historical significance:** Represents the rise of powerful regional chieftains during the weakening of imperial Pallava authority.
- **Cultural legacy:** Acts as a bridge between Pallava and Chola traditions, especially in temple architecture and governance.
- **Social relevance:** Revered as an icon by the Mutharaiyar community, classified among Most Backward Classes (MBCs) in Tamil Nadu.

About Pallava Dynasty

- **Simhavishnu (c. 575 CE) defeated the Kalabhras** and founded the Pallava dynasty, ruling **575-897 CE from Kanchipuram** over north Tamil Nadu and south Andhra.
- The Pallavas emerged as a major power under **Mahendravarman I and Narasimhavarman I (Mamalla),** remaining in constant conflict with **Chalukyas of Vatapi** and southern Tamil kingdoms.
- They laid the foundations of Dravidian architecture, evolving from rock-cut caves to monolithic

rathas and finally structural stone temple**s (e.g., Shore Temple, Kailashnath Temple).**

- The Pallavas were strong patrons of Shaivism and Vaishnavism; the Bhakti movement flourished, with Alvars and Nayanmars, alongside Sanskrit and Tamil literary activity.
- Continuous wars weakened the dynasty, culminating in the defeat of the last ruler **Aparajitavarman**, by the Cholas, ending Pallava rule.

Petra & Ellora Caves

- India and Jordan signed a twinning agreement between **UNESCO Heritage sites** of Petra & Ellora Caves renowned for their rock cut architecture.

About Ellora caves

- **Location -** Charanandri hills, Maharashtra near **Elaganga river**
- **Origin -** Carved between 600-1000 CE predominantly by the **Rashtrakuta and yadava dynasty.**
- **Architecture -** Rock cut caves carved into basalt cliffs from top to down
- **Religion -** Houses Hindu, Buddhist, and Jain monuments side-by-side, illustrating the religious tolerance
- It also houses mural paintings related to all 3 religions.

About Petra caves

- Petra also known as **Rose City** due to its pink sandstone cliffs was the capital of the **Nabataean Kingdom starting around 4th century BCE**
- It is half-built, half-carved into the rock, and is surrounded by mountains riddled with passages and gorges.

National Maritime Heritage Complex (NMHC) at Lothal

- India and the Netherlands have signed an MoU to cooperate on the development of the National Maritime Heritage Complex (NMHC) at Lothal, Gujarat.

National Maritime Heritage Complex (NMHC) at Lothal:

- The National Maritime Heritage Complex (NMHC) is a flagship cultural and heritage project of the **Ministry of Ports, Shipping and Waterways (MoPSW)** aimed at showcasing India's 4,500–

5,000-year-old maritime legacy through a world-class museum and cultural complex.

- **Location: Lothal, near Ahmedabad, Gujarat**
- **Nodal Ministry:** Ministry of Ports, Shipping and Waterways
- Developed as India's first comprehensive national institution dedicated exclusively to maritime heritage.

Key features:

- World-class maritime museum with galleries on ancient navigation, shipbuilding, trade routes, naval history, and coastal cultures
- International collaboration, including partnership with the National Maritime Museum, Amsterdam, for design, curation, and conservation
- Maritime research and training centre for scholars and professionals
- Venue for global maritime fairs, exhibitions, and cultural events
- Inclusive public outreach with affordable access for students, local communities, and underprivileged groups
- Integration of modern technology and immersive visitor experiences

Lothal:

- Part of the Indus Valley (Harappan) Civilization cultural landscape **, today's** Lothal, near Ahmedabad, Gujarat

Excavation:

- Excavated in **1957** by the Archaeological Survey of India
- Dates back to around 2400 BCE
- Recognised for the discovery of the **world's earliest known man-made dockyard**

Key features and significance:

- The Lothal dockyard connected the settlement to ancient maritime trade routes linking Sindh, Saurashtra, Mesopotamia, Egypt, and beyond.
- Evidence of advanced town planning, tidal regulation, and maritime engineering.
- A major port town that facilitated not only trade in goods but also the exchange of cultures, ideas, and technologies.
- Demonstrates India's continuous maritime tradition spanning over 4,500–5,000 years.

2,000-year-old labyrinth revealing India's role in ancient global trade

- Archaeologists have uncovered a 2,000-year-old circular stone labyrinth in Maharashtra's Solapur district, the largest of its kind in India.

What it is?

- The find is a **massive circular stone labyrinth** constructed using carefully laid concentric stone circuits.
- It is dated to nearly 2,000 years ago and linked to the **Satavahana dynasty (1st–3rd century CE).**

Discovered at:

- Located in the Boramani grasslands, Solapur district, Maharashtra.
- The semi-arid grassland ecosystem limited excavation, aiding long-term preservation of the structure.

Key features

- **Size:** Approximately 50 feet × 50 feet, making it the largest circular labyrinth in India.
- **Design:** Comprises 15 concentric stone circuits, the highest number recorded so far in Indian circular labyrinths.
- **Form:** Circular layout, distinct from the larger but square labyrinth found at Gedimedu, Tamil Nadu.
- **Setting:** Situated in open grasslands, not within settlements, temples, or forts.

Connections within India

- Similar, smaller labyrinths have been found in Sangli, Satara, and Kolhapur, indicating a regional network across western Maharashtra.
- Their alignment suggests links between inland Deccan routes and western coastal ports such as those used in Roman trade.
- Maharashtra's location made it a trade conduit between interior production centres and Arabian Sea ports.

Significance

- The circular motif resembles labyrinth designs on **ancient Roman coins from Crete**, many of which have been found in Indian trade hubs.
- Likely served as navigational or symbolic signposts for merchants transporting spices, textiles, and precious stones.
- Reinforces Maharashtra's role as a key crossroads in ancient global commerce.

Thanjavur Paintings

- **Context (PIB):** A priceless Thanjavur-style painting (Tanjore) of Shri Ram was **transported from Bengaluru to the Ram Mandir,** Ayodhya.
- The art form originated in the 16th century under the **Nayakas of Thanjavur**, who were the **feudatories of the Vijayanagara rulers.**
- It reached its zenith in the 18th century under Maratha rulers, especially **Raja Serfoji II.**
- Thanjavur painting received the **Geographical Indication (GI) tag in 2007–08.**
- **Key Features:** The paintings are executed on solid wooden planks called Palagai Padam; they use genuine 22-karat gold foil, and semi-precious stone inlay and provide a 3D effect.
- Themes: The paintings mainly depict Hindu deities, especially Bala Krishna, Shri Ram, and Puranic scenes.

Scientific Study on Keezhadi

A recent scientific study on the archaeological site of Keezhadi (also called Keeladi), suggests a massive Vaigai River flood buried parts of the urban settlements.

About Keezhadi

- It is located in the Sivaganga district near Madurai in Tamil Nadu, along the Vaigai River basin.
- Archaeological evidence dates Keezhadi to the Sangam Age; Sangam Tamil poems describe bustling towns and trade networks there.
- **Urban Features:** Excavations reveal brick structures, open channels, terracotta drainage pipelines, ring wells, and evidence of weaving, dyeing, bead making, and pottery industries.

Key Findings of the Study

- **Sediment Evidence:** Archaeologists identified sediment layers over brick structures, the composition of which indicates a high-energy flood event.
- **Timeline:** ***Optically Stimulated Luminescence (OSL) dating shows*** these urban structures were buried about 1,155 years ago, around the 9th century CE.
- **Burial Impact:** Major floods of the Vaigai River deposited enough sediment to cover homes, drains, and industrial zones, forcing abandonment or relocation.
- **Climatic Context:** The flood formed part of late-Holocene wet–dry fluctuations, when frequent river channel shifts destroyed river-dependent settlements in South India.

- OSL dating determines the time elapsed since mineral grains, such as quartz or feldspar, were last exposed to sunlight, thereby dating their burial under water.

100 Years of The Communist Party of India (CPI)

- The Communist Party of India (CPI) has completed 100 years since its founding, marking a century of organised Communist politics in India.

The Communist Party of India (CPI):

- The Communist Party of India (CPI) is one of India's oldest political parties, rooted in Marxist ideology, committed to representing the interests of workers, peasants, and marginalised classes through both mass movements and parliamentary politics.
- **Established in:** December 26, 1925, at Kanpur (then Cawnpore)
- Founded through a national conference of Indian Communist groups active within India
- **Note:** An earlier émigré CPI was formed in **Tashkent in 1920**, a point of historical debate

Aim:

- Liberation of India from British imperialism (pre-1947).
- Socialisation of means of production and distribution.
- Creation of a socially just, egalitarian society free from exploitation.

Evolution:

- **1920s–30s:** Influenced by the Russian Revolution (1917); faced repression through conspiracy cases (Kanpur, Meerut).
- **1930s–40s:** Participation in trade unionism, peasant struggles, and United Fronts with socialist forces.
- **1940s:** Led major agrarian movements like Tebhaga (Bengal) and Telangana.
- **Post-Independence:** Shifted largely to parliamentary democracy, forming elected governments in Kerala, West Bengal, and Tripura.
- **1964:** Major ideological split leading to the formation of CPI (Marxist) amid debates over constitutionalism and the Sino-Soviet split.

Leaders associated

- **N. Roy:** International Marxist theorist; linked to Comintern and Tashkent phase

- **A. Dange:** Key organiser of Indian Communism; associated with Kanpur foundation
- **Muzaffar Ahmad:** Pioneer of Communist movement in Bengal
- **C. Joshi:** Early General Secretary; emphasised united front politics
- **K. Gopalan, E. M. S. Namboodiripad:** Post-Independence parliamentary leaders

Key features

- **Marxist ideological foundation:** Class struggle, anti-imperialism, and social equality
- **Mass-based politics:** Strong links with trade unions (AITUC) and peasant movements
- **Dual strategy:** Combination of extra-parliamentary movements and electoral participation
- **Internationalist influence:** Inspired by global Communist movements, yet adapted to Indian conditions
- **Federal presence:** Regional strength varies, with influence concentrated in specific States

140th Foundation Day of Indian National Congress (INC)

- The Indian National Congress (INC) marked its 140th Foundation Day on December 28, 2025, prompting renewed reflection on its historical role in India's freedom struggle and post-Independence politics.

140th Foundation Day of Indian National Congress (INC):

- The Indian National Congress is one of India's oldest and most influential political parties, which spearheaded the national movement against British colonial rule and later dominated India's post-Independence political landscape.
- **Founded in: 28 December 1885**
- First session: **Gokuldas Tejpal Sanskrit College**, Bombay (Mumbai)
- First President: **W. C. Bonnerjee**

Origin:

- Founded by Allan Octavian Hume, a British civil servant, along with Indian leaders such as Dadabhai Naoroji, Surendranath Banerjee, Pherozeshah Mehta, and Gopal Krishna Gokhale
- Initially conceived as a platform to voice Indian grievances and influence British policy through petitions and constitutional methods
- Gradually evolved into a mass nationalist movement, especially under Mahatma Gandhi

Key features

- **Broad-based nationalist platform:** Brought together Indians across regions, religions, and linguistic groups

- **Ideological evolution:** From moderate constitutionalism → mass civil disobedience → democratic socialism
- **Mass mobilisation:** Led movements like Non-Cooperation, Civil Disobedience, Quit India, and Purna Swaraj (1929)
- **Post-Independence role:** Advocated secularism, parliamentary democracy, planned economy, and non-alignment
- **Organisational depth:** Longest-running nationwide political organisation in India

Significance:

- Central force in ending nearly 200 years of colonial rule.
- Provided leadership in framing the Constitution, establishing democratic institutions, and shaping early economic and foreign policy.

Narsapuram Lace Craft

- The Prime Minister highlighted Narsapuram Lace Craft in Man Ki Baat as a model of women-led economic empowerment and cultural continuity.
- The craft's **Geographical Indication (GI)** tag has renewed national attention on this traditional livelihood of the **Godavari region.**

Narsapuram Lace Craft: What it is?

- Narsapuram Lace Craft is a **handmade crochet lace** tradition, where fine threads are transformed into intricate lace products using a single crochet hook, reflecting high skill and patience.
- Region: West Godavari and Dr. B.R. Ambedkar Konaseema districts of Andhra Pradesh
- **Key centres:** Narsapur, Palacole, Razole and Amalapuram

History:

- Introduced in 1844 when lace-making techniques were taught to local women by European missionaries.
- The craft survived major historical shocks such as famines and economic depressions, sustaining women's livelihoods across generations.
- Over time, it evolved into a globally recognised hand-crafted textile tradition.

Key characteristics

- **Raw materials:** Uses fine cotton threads, along with silk, rayon or synthetic yarns for decorative and export-quality products.
- **Tools:** Crafted using crochet hooks of varying sizes to produce different textures and lace densities.
- **Technique:** Involves looping and interlocking stitches manually to form delicate lace structures without machinery.
- **Design motifs:** Features floral, paisley and geometric patterns inspired by nature and traditional aesthetics.
- **Product range:** Includes garments, home furnishings and accessories such as doilies, bedspreads, table linen, cushion covers, stoles and wall hangings.
- **Significance**
- The craft provides regular income to thousands of women, making them primary contributors to household economies.
- It safeguards an indigenous textile tradition passed down through generations.

The Santhali Language

- President of India highlighted the role of language and literature in binding communities during the centenary celebrations of the **Ol Chiki script and Santali Language Day.**

The Santhali Language:

- Santhali is one of India's most ancient **living tribal languages**, primarily spoken by the **Santhal community** and recognised in the **Eighth Schedule** of the Constitution.

Origin:

- Belongs to the **Munda branch** of the **Austroasiatic language family**, distinct from Indo-European languages.
- Traditionally transmitted through oral literature, songs, folklore and rituals.
- Acquired its own script, Ol Chiki, in 1925, developed by Pandit Raghunath Murmu, giving the language a written identity.

Current status:

- Included in the Eighth Schedule through the **92nd Constitutional Amendment Act, 2003**.
- Spoken by about 7 million people in India, mainly across Jharkhand, Odisha, West Bengal and

Bihar, and also in Nepal and Bangladesh.

Key features

- **Distinct script – Ol Chiki**: A phonetic and scientific script designed to accurately represent Santhali sounds, unlike earlier borrowed scripts.
- **Austroasiatic linguistic traits**: Agglutinative structure, tonal elements, and word formation through suffixes, shared with related Munda languages like Ho and Mundari.
- **Strong oral tradition:** Rich corpus of folk songs, myths and storytelling that preserves Santhal history, ecology and social values.
- **Cultural identity marker**: Language and script function as symbols of tribal self-respect, cohesion and continuity.

Srimanta Shankar Dev

- The redevelopment project of **Batadrava Than**, the birthplace of **Mahapurush Srimanta Shankardev Ji**, has been inaugurated.

Srimanta Shankar Dev (1449–1568)

- Born in **Aali-pukhuri** situated in Nagaon district of Assam.
- He was a saint-scholar, polymath, and social-religious reformer.

Key Contributions

- He pioneered the new form of **Vaishnavism (Eka-Sarana Hari-Nama Dharma),** a monotheistic faith centered on Lord Krishna.
- He established monastic institutions like **namghars and sattras**, which became centers for cultural and religious activities.
- Social Reforms: Anti-caste movement, Women rights, etc.
- He was a prolific writer, dramatist, and composer, his literary works include **Kirtana Ghosha** (devotional verses), Bhakti Pradipa, etc.
- He is known for initiating **Borgeets (music), Sattriya (classical dance), Ankia Naat, Bhaona (Theatrical performance)**
- Values: Equality, Humanism, spiritualism etc.

Port Blair Tricolour Hoisting

- PM Narendra Modi highlighted the contributions of Netaji Subhas Chandra Bose on the 82nd anniversary of his hoisting the tricolour at Port Blair.
- Bose's hoisting of the **Indian tricolour at Port Blair On 30 December 1943** symbolised the Azad Hind Government's assertion of Indian sovereignty over the Andaman and Nicobar Islands.

Netaji Subhas Chandra Bose

- He was born on **23 January 1897 in Cuttack** (Odisha); he studied at the Presidency College, Calcutta, later at Cambridge University (UK), and joined the Indian Civil Service (ICS) in 1920.
- He resigned from the ICS in 1921 to join the Indian National Congress, and was elected its President at the **Haripura Session (1938) and Tripuri Session (1939).**
- He advocated armed struggle in contrast to Gandhi's emphasis on non-violence, while continuing to acknowledge Gandhi as the "Father of the Nation."
- He assumed leadership of the Indian National Army (INA) in 1943 and established the Azad Hind Government in exile, calling for military advance towards India under **"Delhi Chalo."**
- He reshaped the freedom struggle through militant nationalism and foreign alliances; he is believed to have died in a 1945 plane crash in Taipei, though inquiries have left the issue debated.

Piprahwa Relics

- The Union Ministry of Culture is organising the **"Lotus Light: Relics of the Awakened One"** cultural exposition showcasing the **Piprahwa Relics** in New Delhi.

About Piprahwa Relics

- The Piprahwa Relics were discovered in **1898 at Piprahwa Stupa (Uttar Pradesh)** by British engineer **William C. Peppe;** the site is widely identified with ancient **Kapilavastu**, Buddha's homeland.
- The relics include bone fragments, crystal and steatite caskets, gold ornaments and gemstones; a Brahmi inscription attributes them to Buddha's Sakya clan, dating them to the **3rd century BCE**.
- Under the **Indian Treasure Trove Act, 1878**, the British Crown claimed the relics; Buddha's bone relics were gifted to **King Rama V of Siam**, while most gems went to the Indian Museum, Kolkata.
- Archaeological Survey of India (ASI) excavations (1971-77) uncovered an additional 22 bone relics in steatite caskets, now preserved at the National Museum, New Delhi.
- In 2025, relics held by the Peppé family surfaced at a Hong Kong auction and were repatriated to

India.

FACTS FOR PRELIMS

UN Champions of the Earth award

- Tamil Nadu IAS officer **Supriya Sahu** awarded for her pioneering leadership on critical environmental challenges in India, including plastics and wildlife conservation.

About Award

- UN''s highest environmental honour.
- Awarded every year since 2005.
- UNEP honours individuals and organizations working on innovative and sustainable solutions to address the triple planetary crisis of climate change, nature and biodiversity loss, and pollution and waste.

MahaCrimeOS AI

- Maharashtra launched MahaCrimeOS AI to strengthen its response to rising cybercrime using artificial intelligence.

About MahaCrimeOS AI

- **Platform:** It is an advanced AI co-pilot system, in collaboration with **Microsoft, utilizing Azure OpenAI Service**.
- **Objective:** To streamline the workflow by analyzing vast, unstructured and multilingual data (e.g., FIRs, bank statements) and reducing investigation turnaround time by up to 80%.
- **Function:** It automates data extraction, guides investigators through protocols, and identifies complex crime linkages.

Param Vir Chakra

- On Vijay Diwas 2025, President Droupadi Murmu inaugurated the **'Param Vir Dirgha'** at Rashtrapati Bhavan, where portraits of all 21 Param Vir Chakra awardees were displayed.

- This replaced **portraits of British Aide-de-Camps**, symbolising India's continued effort to shed colonial legacies.

About Param Vir Chakra:

- The Param Vir Chakra is India's highest military gallantry award, conferred for the most conspicuous bravery, valour, and supreme sacrifice in the presence of the enemy during wartime.
- **Instituted in:** 26 January **1950,** coinciding with the enforcement of the Constitution of India.

Key features:

- Open to personnel of all ranks of the Army, Navy, Air Force, Territorial Army and other lawfully constituted armed forces.
- Can be awarded **posthumously**; the majority of recipients have received it after martyrdom.
- Comes with a monthly honorarium of ₹3,000, with an additional ₹3,000 for each bar awarded.

Criteria for award:

- Awarded only in wartime.
- Recognises exceptional courage, indomitable spirit, and self-sacrifice in the face of the enemy.

Winners so far:

- 21 awardees till date.
- 14 awarded posthumously.
- Conferred across four major wars fought by India.

About Aide-de-Camps (ADCs):

- An Aide-de-Camp is a personal military officer attached to high constitutional authorities such as the President, Governors, or Chiefs of Services.

Rank and background:

- Typically, a Major (Army), Lieutenant Commander (Navy), or Squadron Leader (Air Force).

Key functions:

- Managing the daily schedule and official engagements of the dignitary.
- Coordinating ceremonial duties, state visits, and protocol events.
- Acting as a liaison between Rashtrapati Bhavan and civil or military authorities.

- Assisting in protocol, coordination, and security arrangements.

China Wireless Freight Trains

- China became the first country to successfully operate seven heavy-haul freight trains as a single coordinated unit without physical coupling.
- **Wireless Control System:** A domestically developed system replaced mechanical couplers with virtual coupling using a two-dimensional control mode.
- **Two-Dimensional Control:** The system integrated relative speed control with absolute distance monitoring to maintain close, safe spacing.
- **Virtual Coupling:** It enabled separate freight units operated as one group train, accelerating and braking simultaneously to prevent collisions or separation.
- **Real-Time Communication:** Continuous train-to-train and train-to-ground data exchange enabled coordinated multi-train manoeuvres.

Significance

- **Capacity Gain:** The system can raise railway freight capacity by over 50% without laying new tracks.
- **Operational Efficiency:** It enables faster movement of larger cargo volumes, improving cost efficiency and reducing energy use in heavy-haul transport.
- **Global Leadership:** China positions its system as a scalable technical solution for heavy-haul railways in constrained or developing regions.

Chillai Kalan

- Kashmir has received its first snowfall of the season, marking the onset of Chillai Kalan and bringing an end to the prolonged dry spell.

About Chillai Kalan

- It is the harshest 40-day winter period in the Kashmir Valley, beginning on 21 December and lasting until 30/31 January; the term is Persian for "major cold."
- It is followed by **Chillai Khurd** (20 days, late January-mid February) and **Chillai Bachha** (10 days, late February), marking progressively weakening cold phases.
- During Chillai Kalan, temperatures remain sub-zero, snowfall probability is highest, and water

pipelines and water bodies such as the Dal Lake freeze.

- The heavy snowfall in this phase is hydrologically vital, as it recharges glaciers, snowfields and perennial water bodies.

National Farmers' Day

- National Farmers' Day (Kisan Diwas) is observed on December 23 since 2001 on the birth anniversary of **5th Prime Minister of India Chaudhary Charan Singh.**
- He was known for his avid advocacy for farmers' rights and agricultural reform initiatives, and was posthumously awarded Bharat Ratna in 2024.
- Nationwide Kisan Melas, **Krishi Vigyan Kendra** outreach programmes, and celebratory events are organised on this day to highlight the vital role played by the farmers.

National Mathematics Day

- National Mathematics Day has been observed on **22nd December** since 2012 to honour the birth anniversary of Indian mathematician Srinivasa Ramanujan (1887-1920).

About Srinivasa Ramanujan

- **Early Life:** Born in 1887 in Erode, Madras Presidency, he was largely self-taught and published his first paper in the journal of the Indian Mathematical Society in 1911.
- He went to Trinity College, Cambridge in 1913, became the 1st Indian to be elected a Fellow of Trinity College, and was elected Fellow of the Royal Society in 1918.
- He discovered the **Ramanujan tau function**, developed rapidly convergent series for π, introduced mock theta functions, results for partition numbers and paved the way for Game Theory.
- Legacy: His **mock theta functions** are critical for Black Hole physics, String Theory and modern cryptography. 1729 has been designated as the Ramanujan number in his honour.

Flower Lady of Manipur - Chokhone Krichena

- Prime Minister of India praised Chokhone Krichena, popularly known as the 'Flower Lady of Manipur', in Mann Ki Baat for transforming floriculture into a driver of self-reliance and inclusive

growth.

About Chokhone Krichena: Who she is?

- Chokhone Krichena is a woman entrepreneur from **Senapati district, Manipur**, who has successfully blended traditional agricultural knowledge with modern business practices to promote floriculture in the hill regions of the State.

Achievements:

- Founded Dianthe Private Limited (2021), a floriculture enterprise focused on decorative flower cultivation and marketing.
- Transitioned from traditional subsistence farming to commercial floriculture.
- Built a women-led farmer network in Senapati district.
- Enabled **inter-State market access**, with Manipur-grown flowers reaching multiple Indian States.
- Recognised nationally through Mann Ki Baat, bringing visibility to Northeast entrepreneurship.

Significance:

- Provides livelihood opportunities and leadership roles to rural women farmers.
- Promotes local production, value addition, and market linkage.
- Showcases the economic potential of hill agriculture and floriculture.

UN Chief Issues New Year Message in Hindi

- **Context (DD):** The United Nations (UN) Secretary-General Antonio Guterres released a New Year's message in Hindi, **a first in the history of the UN.**
- He warned about misplaced global priorities in his message, urging world leaders to prioritise development spending over military expenditure.
- Global military spending has risen to $2.7 trillion (10% more than last year), about 13 times the total global development aid and roughly equal to Africa's GDP.