FEBRUARY 2026

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INDIAN ECONOMY

Bureau of Port Security (BoPS)

- Government has decided to set up the Bureau to provide a **robust, unified port security framework** covering all major and non-major ports and maritime facilities.

The move responds to increasing maritime threats (terrorism, smuggling, cyber risks) and rising port trade & infrastructure expansion.

What is the Bureau of Port Security?

- A **dedicated statutory authority** being established to strengthen security governance for **ports, vessels and maritime infrastructure** in India.
- Constituted under **Section 13 of the Merchant Shipping Act, 2025**.

Regulatory & Legal Framework

- **Merchant Shipping Act, 2025**: Modern maritime law replacing the 1958 Act; BoPS is statutorily backed under this Act.
- Functions under the **Ministry of Ports, Shipping and Waterways (MoPSW)**.
- Complemented by existing maritime security laws and international codes (e.g., **ISPS Code** under SOLAS for ship & port facility security).
- **Central Industrial Security Force (CISF)** designated as a **Recognised Security Organisation (RSO)** to conduct security assessments & prepare security plans for ports.

Institutional Structure

- **Headed by** a Director General (Senior IPS officer, Pay Level-15).
- **Transition period**: For one year, the **Director General of Shipping (DGS/DGMA)** will act as DG, BoPS.
- Distributed oversight across maritime agencies is coordinated through BoPS, plugging fragmentation in maritime security governance.

Key Functions & Mandate

1. **Regulatory oversight** of security standards at ports, ships and port facilities.
2. **Enforcement & compliance** with international security norms (e.g., ISPS Code).
3. **Threat prevention & intelligence**: timely collection/exchange of security information.
4. **Cybersecurity division**: Protect port IT systems and critical digital infrastructure.
5. **Standardisation & training**: Work with CISF to develop security plans, audits, and training for port security personnel.
6. **Graded risk-based security measures**: Customize security levels based on threat, trade volume, location etc.

Need & Background

- India's **coastline (~7,500 km)** and growing maritime trade necessitate fortified port security architecture.
- Previously, security responsibilities were split among multiple agencies (Indian Navy, Coast Guard, CISF, state maritime police, port authorities), leading to gaps and overlap. BoPS aims to unify oversight and regulation.

Constitutional & Legislative Basis

- **Ports** fall under the **Concurrent List (List III)** of the Seventh Schedule of the Constitution, enabling both **Centre and States** to legislate.

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- **Security at ports**, especially those handling international cargo, is treated as a matter of **national security**, justifying a strong central regulatory role.

Primary Laws Governing Port Security

1. Indian Ports Act, 1908

- Provides the **statutory basis** for regulation and administration of ports.
- Empowers the Central Government to issue directions relating to **safety and security** of ports.
- BPS functions within this overarching legal framework.

2. Major Port Authorities Act, 2021

- Applies to **Major Ports** under the Centre.
- Mandates port authorities to:
  - Ensure **safety and security of port operations**
  - Comply with national and international security obligations
- BPS provides **security oversight and guidance** under this Act.

3. International Regulatory Framework

SOLAS Convention (1974)

- International Convention for the **Safety of Life at Sea**.
- India is a **signatory**.

International Ship and Port Facility Security (ISPS) Code

- Adopted under SOLAS after **9/11 attacks**.
- Mandatory for:
  - Ports handling **international maritime traffic**
  - Port facilities receiving foreign ships
- **BPS is the designated national authority** for:
  - Implementation
  - Monitoring
  - Compliance verification of ISPS Code in India

4. National Port Security Regulations

- **Port Facility Security Plans (PFSPs)**
  - Mandatory for all ISPS-compliant ports
  - Approved and periodically reviewed under BPS oversight
- **Port Security Committees**
  - Constituted at port level
  - Include port officials, police, Coast Guard, CISF (where deployed)
- **Security Levels**
  - Ports operate under **ISPS Security Levels 1, 2, and 3**
  - BPS coordinates escalation or de-escalation based on threat perception

5. Institutional Coordination Framework

BPS operates within India's broader **Maritime & Coastal Security Architecture**:

- **Indian Navy** – overall maritime security
- **Indian Coast Guard** – coastal and offshore security
- **State Marine Police** – territorial waters

- **Customs & Intelligence Agencies** – smuggling, narcotics, arms
- **Port Authorities & CISF** – on-ground port security

BPS acts as the **regulatory and coordinating link** among these agencies at ports.

6. Coverage under Regulatory Framework

- **Major Ports**
  → Direct central oversight via MoPSW and BPS
- **Non-Major (State) Ports**
  → Security standards framed by BPS
  → Implemented by States in coordination with Centre

7. Recent Regulatory Emphasis (Policy Direction)

- Uniform security norms across **major and non-major ports**
- Risk-based security audits instead of purely procedural compliance
- Integration of port security with:
  - Coastal surveillance systems
  - National logistics and trade security frameworks

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RBI Announces Fresh Liquidity Measures

RBI announced a set of measures to inject **₹2.90 lakh crore liquidity** into the Indian banking and financial system amid tight cash conditions. These are aimed at stabilising money markets, supporting credit flow, and managing volatility in the foreign exchange market.

A. Open Market Operations (OMO)

- RBI will conduct **Open Market Purchase auctions** for **Government of India securities worth ₹2 lakh crore** between **Dec 29, 2025 and Jan 22, 2026** in four tranches of ₹50,000 crore each.
  - In an OMO purchase, RBI buys government bonds from banks/markets → **increases rupee liquidity** in the system.

B. Dollar–Rupee Buy/Sell Swap Auction

- RBI will conduct a **$10 billion (approx.) 3-year buy/sell swap** on Jan 13, 2026.
  - In such swaps, RBI **buys dollars and commits to sell them later**, which:
    - **Injects rupee liquidity**
    - **Absorbs excess dollar liquidity**
    - Helps manage **forward premium pressures** in the FX market.

Why Are These Measures Important?

A. Ease Tight Liquidity Conditions

- **Short-term interest rates** had risen above RBI's target due to a **liquidity squeeze** toward year-end.
- Infusing durable liquidity helps ensure **adequate funds for banks to lend** for businesses and consumers.

B. Support Financial Markets

- Bond markets responded positively; **government bond yields fell** after the announcement—a sign of market confidence in liquidity support.

C. Manage Foreign Exchange Pressures

- **Excess dollar liquidity** and a high forward premium on the **USD/INR** had created volatility.
- The dollar-rupee swap is expected to absorb excess dollar liquidity and ease **FX market stress**.

D. Improve Monetary Policy Transmission

- Adequate liquidity helps ensure that policy rate changes (like changes in repo rate) pass through efficiently to money market and credit conditions.

Tools Used

Tool	What It Does	Relevance
Open Market Operations (OMO)	Purchase of govt securities increases rupee liquidity in banking system.	Core monetary policy instrument to manage liquidity.
Dollar–Rupee Buy/Sell Swap	Temporary injection of rupee funds while absorbing dollar liquidity.	Forex liquidity management & stability of rupee markets.
Repo/VRR/Repo Auctions	Short-term liquidity injection by lending funds to banks against securities.	Supports banks' immediate funding needs (e.g., ₹2 lakh crore short-term infusions recently).

Note: RBI employs various liquidity management operations such as OMO, repo, reverse repo, and swaps to maintain **orderly liquidity, interest rates, and financial stability**.

Context —

- **Tight year-end liquidity** conditions often arise due to:
  - Increased demand for cash and capital around quarter/year-end.
  - **Foreign exchange interventions** (e.g., net dollar sales to support the rupee).
  - Regulatory constraints limiting interbank placements.

  Altogether, these can push short-term rates above policy targets and tighten funds available for lending.

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Shipbuilding Assistance & Development Schemes

*The **Ministry of Ports, Shipping & Waterways (MoPSW)** has formally notified operational guidelines for two major shipbuilding support schemes — the **Shipbuilding Financial Assistance Scheme (SBFAS)** and the **Shipbuilding Development Scheme (SbDS)** —to boost India's domestic shipbuilding capacity and competitiveness.*

Background

- Shipbuilding is a **strategic industry** with links to maritime trade, defence, coastal economic development, and employment.
- Historically, India's commercial shipbuilding has lagged behind global peers in *capacity, technology, and scale*.
- The new schemes aim to strengthen the sector under **Make in India**, **Aatmanirbhar Bharat**, and the vision of **Viksit Bharat**.

Shipbuilding Financial Assistance Scheme (SBFAS)

Objective: To provide **financial support to shipbuilders** for the construction of various categories of vessels, enhancing domestic production and reducing dependence on imports.

Outlay & Coverage

- Total funds: **₹24,736 crore**
- Support ranges from **15–25% per vessel**, depending on vessel type and category.
- Assistance is **milestone-linked** and backed by required **security instruments** to ensure project completion.

Key Features

- **Graded Support:** Different assistance rates for **small, large, and specialised vessels**.
- **Series Orders Incentives:** Extra incentives for continuous orders to ensure steady production.
- **National Shipbuilding Mission:** A coordinating structure to enhance planning and implementation.
- **Shipbreaking Credit Note:** Operators scrapping vessels at Indian yards receive a credit worth **40% of the scrap value**, promoting circular economy principles by linking recycling to new construction.
- Independent valuation and milestone assessments strengthen accountability.

Expected Outcomes

- Over the next decade, support under SBFAS is expected to underpin shipbuilding projects worth about **₹96,000 crore** and generate employment across the maritime value chain.

Shipbuilding Development Scheme (SBDS)

Objective

To create **modern shipbuilding infrastructure and capabilities** through greenfield and brownfield investments, fostering long-term capacity building.

Outlay & Focus

- Total funds: **₹19,989 crore**
- Focuses on:
    - Development of **greenfield shipbuilding clusters**
    - Modernisation and expansion of existing **brownfield shipyards**
    - Establishing an **India Ship Technology Centre** for research, design, innovation, and skill development under the Indian Maritime University.

Scheme Features

- **Centre–State SPV Model:**
    - **Greenfield clusters** receive **100% capital support for common infrastructure** via a 50:50 Centre–State Special Purpose Vehicle (SPV).
- **Brownfield Support:**
    - Existing shipyards get **25% capital assistance** for critical infrastructure (dry docks, shiplifts, fabrication & automation).
- **Credit Risk Coverage Framework:**

- Government-backed insurance for **pre-shipment, post-shipment, and vendor default risks** to improve project bankability and reduce financing barriers.

- **Milestone-based Disbursements:**
  - Releases linked to verified progress through independent monitoring agencies.

Strategic Implications

A. Industrial & Economic Impact

- **Domestic Capacity Growth:** Aims to increase India's commercial shipbuilding capacity to around **4.5 million gross tonnes per annum by 2047**.
- **Manufacturing Linkages:** Boosts steel, heavy machinery, electronics, and allied sectors through forward and backward linkages.
- **Employment Generation:** Across shipyards, design, engineering, and ancillary service segments.

B. Maritime Security & Strategic Autonomy

- Enhances indigenous capability to build commercial and specialised vessels, potentially reducing strategic reliance on foreign yards.
- Supports India's goals under **SAGAR** (Security and Growth for All in the Region) and strengthening maritime operational logistics.

C. Skill & Technology Ecosystem

- India Ship Technology Centre will act as a hub for **R&D, design, skill development, and innovation**, addressing long-standing capability gaps.

Regulatory & Implementation Framework

- **Ministry of Ports, Shipping & Waterways (MoPSW):** Nodal authority for policy, approval, and supervision of both schemes.
- **Operational Guidelines:** Now officially notified and published on the **Shipmin.gov.in** portal, laying out eligibility, procedures, disbursement criteria, monitoring mechanisms, and accountability norms.
- **National Shipbuilding Mission:** To coordinate planning, execution, monitoring, and convergence across ministries/states.

*Both schemes are valid up to **31 March 2036**, with in-principle extensions envisaged up to **2047** to align with long-term capacity expansion goals.*

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UN System of National Accounts (SNA) 2025

The **System of National Accounts (SNA)** is the **internationally agreed statistical standard** for compiling national accounts, including GDP and related macro-economic indicators. It provides a **coherent, consistent, and integrated framework** for measuring economic activity.

- It is used worldwide as the basis for national accounts data, which* policymakers, businesses, and researchers rely on to analyse economic performance.

What is the *2025 SNA*?

- **System of National Accounts 2025 (2025 SNA)** is the **latest update** of the SNA, adopted by the **United Nations Statistical Commission in March 2025**.
- It replaces **SNA 2008**, the previous international standard used for national accounts and economic statistics.

- It is published jointly by the **Inter-secretariat Working Group on National Accounts (ISWGNA)** (UN, IMF, World Bank, OECD, Eurostat).

Why an Update Was Needed

The global economy has changed significantly since 2008 due to:

- **Digitalisation and digital markets**
- **Globalised value chains**
- **Emerging financial and non-market activities**
- **Growing policy focus on sustainability and wellbeing**

  These developments required updated accounting guidance and new frameworks for national economic measurement.

Key Features of the 2025 SNA

A. Retains Core Framework but Updates It

- The **conceptual basis** from SNA 2008 remains, ensuring continuity.
- It clarifies and extends guidance on issues that have gained importance in recent years.

B. Better Coverage of the Modern Economy

1. **Digitalisation**
   - More complete treatment of **digital activities, digital services, and intangible assets** (e.g., software, AI tools).

   Eg- Clearer Classification of Digital Products
   - Digital services are better classified into:
   - Software as a service (SaaS)
   - Cloud computing
   - Data hosting
   - AI-based services

   Methodological refinement:
   - These are **market services**, not intermediate blur categories.
   - **Economic Ownership over Physical Location**
   - Output is attributed to the **economic owner of IP**, not server location.

   Example (from UN SNA 2025 guidance)
   - A cloud service used in India but owned by a US firm →
     Value added is recorded in **producer economy**, while India records **import of services**.
   - Earlier, many countries wrongly attributed such value to domestic ICT output.
2. **Globalisation**
   - Improved guidance on **cross-border production and global value chains** to reflect economic integration.
3. **Emerging Financial Issues**
   - New or clarified treatments of **financial instruments and institutions** that have evolved since 2008.

     Better classification of:
     - Financial derivatives
     - Structured products
     - New non-bank intermediaries

- **Example**

  Risk-transfer instruments earlier treated inconsistently

  → Now uniformly classified under financial services output

C. Well-being and Sustainability Focus

- Introduces chapters and frameworks that connect national accounts with **well-being and sustainability metrics**, broadening focus **beyond GDP** to include:
  - **Natural capital** and natural resource accounting (e.g., treating natural resource depletion as a cost).
  - Resource depletion can be deducted to compute:
  - Adjusted NDP
  - Sustainable income

  Example - Extraction of coal contributes to GDP

  But depletion reduces net domestic product
    - GDP stays unchanged
    - Net measures reflect sustainability
  - **Human capital** and **social capital** concepts embedded more explicitly in the broader accounting ecosystem.

(This reflects demand from policymakers for indicators that link growth with environmental sustainability and societal wellbeing.)

D. Thematic and Extended Accounts

- The old idea of *satellite accounts* (e.g., environment, unpaid work) is replaced by **"thematic accounts"** and **"extended accounts"**:
  - **Thematic accounts** provide *more detailed breakdowns* of existing aggregates (e.g., digital economy, income distribution).
  - **Extended accounts** link SNA data with non-SNA variables such as demographic, environmental, and social data, offering a broader perspective for policy.

E. Natural Capital and Environment

- **Natural resources** are explicitly recognised as an **asset class** in the accounting framework (e.g., land, minerals, water).
- Depletion of natural resources can now be explicitly **treated as a production cost**, affecting measures like net domestic product (NDP).

Differences Between 2025 SNA and the Earlier SNA (2008)

Note: The last formal *edition* before 2025 was **SNA 2008** — widely in use through 2019 and beyond.

Category	SNA 2008	2025 SNA (Updated)
Core Base	Focus on GDP and macro aggregates of production, income, expenditure	Continues core but extends to digital, sustainability, wellbeing
Digital Economy	Limited explicit treatment	Expanded coverage of digital activities and intangible assets
Global Value Chains	Basic guidance	More detailed frameworks for globalised production

Natural Capital	Limited recognition	Treats natural resource depletion as production cost; expands asset definition
Well-being & Sustainable Development	GDP-centric	Integrates wellbeing/sustainability measures into larger accounts
Satellite Accounts	Used for environment and other themes	Replaced by thematic and extended accounts for deeper disaggregation
Integration With Other Manuals	Linked loosely	Coordinates with **BPM7** for balance of payments and external accounts

Why This Matters for Policy

- **GDP remains central**, but policymakers now get indicators more attuned to:
  - **ecosystem sustainability**
  - **inequality and distributional outcomes**
  - **digital economy performance**
  - **globalised production impacts**

  These enrich the interpretation of growth data for more informed policy design.

Implementation Timeline

- The **2025 SNA was adopted in 2025**, and countries are expected to **implement it progressively**, often aligned with national accounts base revisions (e.g., around 2029–30 for many economies).

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Design Linked Incentive (DLI) Scheme

Design Linked Incentive (DLI) Scheme is a **central government initiative** launched in **December 2021** under the **Semicon India Programme** to promote **indigenous semiconductor chip design** in India by offering *financial incentives* and *design infrastructure support* to domestic players — particularly **startups, MSMEs, and companies** engaged in semiconductor design including Integrated Circuits (ICs), Chipsets, System-on-Chips (SoCs), systems & IP cores.

Implementing Ministry: Ministry of Electronics and Information Technology (MeitY).

Nodal/Implementing Agency: Centre for Development of Advanced Computing (C-DAC).

Objectives of the DLI Scheme

- **Develop a self-reliant, globally competitive semiconductor design ecosystem** in India.
- **Reduce import dependence** for semiconductor designs and content, aiding *import substitution*.
- **Strengthen domestic IP creation** and technological capability.
- **Facilitate access to advanced design infrastructure** for innovators, especially startups and MSMEs.
- **Support the full lifecycle** of chip design: from conceptualisation to deployment in end products.

Why India Needs It

- **Semiconductors are strategic inputs** for sectors like defence, telecommunications, space, AI, and digital infrastructure.
- **Fabless design contributes high value addition** in the semiconductor value chain — often over 50% of total chip value — making domestic design capability critical for *technological autonomy*.

- Helps **enhance supply chain resilience** in the context of global shortages and geopolitical risks.
- Supports India's broader **Atmanirbhar Bharat and digital economy goals** by enabling indigenous intellectual property (IP) ownership.

Scope & Coverage

The DLI Scheme covers semiconductor design and related products including:

- **Integrated Circuits (ICs)**
- **Chipsets**
- **Systems-on-Chip (SoCs)**
- **Systems & IP cores**
- **Semiconductor-linked design components**

Support is provided across the **entire design lifecycle**, from prototype development to *commercial deployment*.

Eligible Entities

- **Domestic startups** – as per DPIIT definition.
- **MSMEs** – as per MSME definition (Gazette notification)
- **Domestic companies** – more than 50% beneficially owned by resident Indian citizens/Indian-controlled entities.

Three Major Components

A. Chip Design Infrastructure Support

C-DAC has set up the ChipIN Centre to provide end-to-end design infrastructure support to eligible firms. This includes

- remote access to a **National EDA Tool Grid**, enabling start-ups and MSMEs to use advanced chip-design software;
- access to an **IP Core repository** to support System-on-Chip (SoC) development;
- **financial assistance for Multi-Project Wafer (MPW) prototyping** at semiconductor foundries; and
- **post-silicon support**, including funding for testing, validation, and silicon bring-up of fabricated ASICs.

B. Product Design Linked Incentive (P-DLI)

- **Reimbursement of up to 50%** of eligible expenditure on design and prototyping.
- **Ceiling:** ₹15 crore per application.
- Covers expenses such as **design tools, manpower, prototype validation, IP registration** and related R&D costs.

C. Deployment Linked Incentive

- Incentive of **4%–6% of net sales** from products incorporating eligible designs over **5 years**.
- **Ceiling:** ₹30 crore per application.
- Encourages *actual commercial deployment* of chip designs, not just creation of prototypes.

Scheme Timeline & Duration

- Notified in **Dec 2021** and launched in **January 2022** as part of the **Semicon India Programme**.
- Implementation is over **5 years**, with potential extensions based on performance.

Linkage with Other National Initiatives

- Part of the **Semicon India Programme** (total outlay ₹76,000 crore) aimed at strengthening end-to-end semiconductor value chain. The **Semicon India Programme (SIM)** supports investments across **semiconductor and display manufacturing as well as chip design**. The DLI Scheme operates within this programme, ensuring **end-to-end support** from design to fabrication and commercialization.
- Complements
    - **Chips to Startup (C2S) Programme** – capacity building & EDA access to academic institutions. It focuses on **human resource development**, aiming to create **85,000 industry-ready professionals** at the B.Tech, M.Tech, and PhD levels in semiconductor chip design through academic institutions nationwide.
    - The **Microprocessor Development Programme**, led by **C-DAC**, **IIT Madras**, and **IIT Bombay**, has resulted in the development and fabrication of **open-source architecture–based indigenous microprocessors** such as **VEGA**, **SHAKTI**, and **AJIT**, advancing India's goal of technological self-reliance.
    - **Production Linked Incentives (PLI)** for semiconductor manufacturing.
    - **Digital India / Startup India** frameworks facilitating ecosystem growth.

Progress so far

- ChipIN Centre has enabled access to advanced EDA tools for about 1 lakh engineers and students across 400 organisations, making it the world's largest centrally accessed chip design facility.
- Support has been extended to 305 academic institutions under the C2S Programme and 95 start-ups under the DLI Scheme, significantly lowering entry barriers for chip design.
- The national EDA Grid has recorded over 54 lakh cumulative usage hours (as of 2 January 2026), reflecting strong adoption by start-ups, MSMEs, and researchers nationwide.
- Under the DLI Scheme, supported firms have achieved 10 patents, 16 tape-outs, and 6 successfully fabricated semiconductor chips, indicating progress from design to silicon.
- Over 1,000 specialised engineers have been trained or engaged, and 140+ reusable semiconductor IP cores have been developed, strengthening India's chip design ecosystem.

Strategic Importance

Positive Impacts

- **Indigenous IP creation** strengthens *technological sovereignty*.
- **Economic competitiveness** — design is high value-addition in semiconductor value chain.
- Promotes **startups & MSMEs** in deep tech sectors, enhancing innovation and high-skill jobs.

Challenges

- Semiconductor design requires **high R&D costs & skilled talent**, which can deter SMEs.
- Domestic ownership conditions and long commercialization timelines might restrict foreign participation & strategic partnerships.
- Volume manufacturing (fabs) remains largely global — design alone doesn't fully eliminate import dependence.

Way Forward

- Strengthen **talent pipelines** through focused skill development and academic-industry collaborations.

- Enhance **innovation financing** options for startups, including dedicated semiconductor R&D funds.
- Facilitate **global partnerships** to bring in expertise while balancing *ownership goals*.
- Integrate with *manufacturing incentives* to create a seamless design-to-fab ecosystem.

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Global unemployment remains unchanged with stalled progress — ILO warns of worsening job prospects for youth and women

*(Based on the **International Labour Organization (ILO)** Employment and Social Trends 2026 report)*

- **Global unemployment rate** is projected to remain largely **unchanged at ~4.9% in 2026**, reflecting a **stagnation in overall job creation** despite economic growth in some regions.
- The **progress toward decent and quality work** has stalled, masking deeper challenges in labour markets.
- The ILO warns that **youth and women's employment prospects** are especially at risk, with structural barriers and slow recovery from job losses.

Key Findings — ILO Employment and Social Trends 2026

1. Unemployment Stable but Job Quality Weak

- Global unemployment is expected to stay around **4.9%** in 2026 — roughly **186 million people without jobs** worldwide.
- Despite this stability, underlying labour market issues persist:
  - **Decent work deficits**: Many employed workers lack job security, social protection, or decent wages.
  - Around **300 million workers** remain in **extreme working poverty** (earning very low wages).
  - **2.1 billion workers** are in the **informal economy** with limited rights and protections.

2. Youth Employment Challenges

- **Youth unemployment** remains significantly higher than the overall rate, reflecting ongoing barriers to entry into productive work.
- Young people face **structural unemployment** due to:
  - Mismatch between skills and job requirements
  - Slow creation of **quality, formal sector jobs**
  - Technological disruption (e.g., AI/automation) affecting demand for certain roles
- Globally, a large share of young people are **NEET (Not in Education, Employment or Training)** — indicating disconnect from labour markets and skills training cycles.

3. Gender Inequality in Labour Markets

- Women's **labour force participation** remains lower than men's, with female participation roughly **24% below male levels** in some regions.
- Progress toward **gender equality at work** has stalled due to persistent social norms, childcare responsibilities, and unequal access to opportunities.
- Women are over-represented in **informal, low-paid sectors** with limited protection or career progression.

Drivers of Stalled Progress

1. **Informality & Low Job Quality**
    - High prevalence of informal jobs that lack security and social protection — especially in low-income countries.
2. **Technological Disruption**
    - Advances in AI and automation are reshaping labour demand; some low-skilled jobs disappear while new roles require higher digital skills.
3. **Trade & Global Economic Risks**
    - Trade uncertainty and disruptions affect **trade-linked employment**, affecting regions dependent on global value chains.
4. **Demographic Pressures**
    - Developed economies face ageing workforces, while developing countries grapple with large youth populations needing jobs.

Implications for Countries & Policy

India & Similar Economies

- India's youth constitute a significant share of the working population; failure to generate quality jobs risks **wasted demographic dividend**.
- Persistent gender gaps in participation rates require targeted policies.

Policy Levers Suggested by ILO

- **Invest in skills and education** to match evolving job requirements.
- Promote **decent jobs** with proper wages, security, and social protection.
- Expand **gender-responsive labour policies** (childcare, workplace equality).
- Strengthen **labour market institutions** for better matching of skills and jobs.

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NITI Aayog Roadmap for Green Transition of MSMEs — Key Financial Proposals

As part of India's **green industrial transition** under the vision of *Viksit Bharat by 2047* and **Net-Zero by 2070**, **NITI Aayog** released three decarbonisation roadmaps — for **cement**, **aluminium**, and particularly the **Micro, Small and Medium Enterprises (MSME) sector**. MSMEs are critical to India's economy — contributing nearly **30% of GDP**, about **46% of exports**, and employing over **250 million people**. ([turn0search2][turn0search0])

The **MSME decarbonisation roadmap** focuses on reducing emissions and energy intensity through **energy efficiency**, **green electricity**, and **alternative fuels**. It identifies **innovative financing mechanisms** to accelerate adoption of clean technologies

Financial Support Mechanisms Proposed

Viability Gap Funding (VGF) — ₹6,000 Crore

A **VGF fund of ~₹6,000 crore** is proposed to support **uptake of emerging and innovative energy-efficient technologies** by MSMEs, especially in **energy-intensive clusters**. The aim is to scale technologies that are **not yet commercially viable** at competitive prices, thus **bridging the gap** between economic value and financial feasibility. ([turn0search1])

How it works:

- Funds are to be provided through **competitive bidding to Original Equipment Manufacturers (OEMs)** producing high-impact energy-efficient solutions (>20% energy savings).
- Funds will help **mobilise domestic manufacturing** of these technologies and reduce cost barriers for MSMEs.
- These technologies go **beyond "Best Available Technology (BAT)"** and accelerate India's *net-zero progress*.
- Estimated impact: targeted energy-intensive sub-sectors and clusters could reduce specific energy consumption and emissions significantly. ([turn0search1])

Why VGF?

MSMEs often lack upfront capital and **face higher risk** in adopting new technology. VGF helps overcome **market failure** by making early-stage energy-efficient solutions viable.

This is akin to support mechanisms seen in other sectors (e.g., EV and battery acceleration programmes). ([turn0search1])

PM-Suryaghar-Style Capital Subsidy Scheme

A **capital subsidy scheme**, modelled on the success of **PM Surya Ghar: Muft Bijli Yojana** (for rooftop solar in households), tailored for **micro and small enterprises** to adopt **renewable energy systems** such as **rooftop solar (RTS)**. ([turn0search1][turn0search5])

Financial Outlay:

- The roadmap recommends an initial **~₹7,000 crore allocation** for Phase-1 implementation.
- Additional allocations may be envisaged over a decade to cover capital subsidies for solar systems (e.g., up to ~3 kW per unit) and to reduce dependency on grid fossil power. [turn0search6][turn0search1])

How it works:

- Capital subsidies reduce **upfront cost barriers** for MSMEs — a key deterrent to solar adoption.
- The programme could extend **Green Open Access** and **Renewable Energy Service Company (RESCO)** models for both cluster-level and individual MSME units.
- Financing instruments like **credit guarantee funds** may cover potential defaults, enhancing risk tolerance. ([turn0search1][turn0search5])

Impact Estimates:

- Adoption of green electricity and cleaner fuel solutions across clusters could reduce **~30-35 million tonnes CO_2e emissions** over the next decade (based on combined estimates).
- Promotes energy cost savings and enhances competitiveness in **carbon-aware global markets**. ([turn0search7])

Other Key Institutional Measures

National Project Management Agency (NPMA)

To coordinate implementation, NITI Aayog recommends a dedicated **NPMA** for MSME green transition, working with industry associations, state bodies and clusters. The NPMA would:

- Facilitate cluster selection, monitoring and verification
- Provide technical guidance and capacity building
- Coordinate with ministries and financial institutions for deployment of funds and technologies.

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India's Leadership in Global IPO Activity — SEBI Data

According to **Securities and Exchange Board of India (SEBI)** Chairman Tuhin Kanta Pandey, **India has emerged as the world leader in the number of Initial Public Offerings (IPOs)** and is **ranked third globally by the total value of IPOs** in the current financial year.

- **311 IPOs** were launched in the first **nine months of FY 2025-26**, raising **₹1.7 trillion in IPO proceeds** and **₹3.8 trillion in total equity mobilisation** (including Follow-on Public Offers, OFS).
- This places **India at the top in IPO count globally** and **third in IPO value** — a reflection of the **depth and dynamism of its capital markets**.

Key Capital Market Indicators (SEBI)

IPO Activity

- **First in number of IPOs globally** — indicates strong issuance momentum.
- **Third in IPO value globally** — shows significant capital mobilisation even compared with large developed markets.
- **Market capitalisation-to-GDP ratio** has risen from **~69% in FY16 to over ~130%**, indicating deeper capital markets and more investor participation.

Investor Base Expansion

- Number of **investors in equity markets** grew rapidly:
  - From ~43 million in FY20 → ~137 million recently
  - **Mutual fund investors** now exceed ~59 million, enhancing retail participation

Why India Is Leading in IPOs

Regulatory Reforms by SEBI

SEBI has introduced reforms that have:

- **Shortened listing timelines** (e.g., T+3 rolling settlement)
- **Eased compliance** and improved **disclosure standards**
- Encouraged **anchor investor participation** and secondary market-friendly disclosures

These reforms have boosted confidence among issuers and investors, strengthening the primary market.

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RBI Proposes Resumption of Licensing of Urban Cooperative Banks (UCBs)

After a **pause of over two decades**, the **Reserve Bank of India** has proposed to **resume licensing of Urban Cooperative Banks (UCBs)** — institutions that provide banking services at the urban and semi-urban level and support small borrowers, traders, and local credit needs. The RBI has issued a **discussion paper** and is seeking **public and stakeholder feedback** by **13 February 2026** on this proposal.

What is the Change Being Proposed?

Licensing Pause (Since 2004)

- **Licensing of new UCBs** was **halted in 2004** after many newly licensed banks became financially unsound.
- Over time, the RBI has focused on **consolidation**, **amalgamation**, and **closure of weak UCBs**.

Discussion Paper Released (January 2026)

The RBI released a **discussion paper titled "Licensing of Urban Co-operative Banks (UCBs)"** to examine:

1. **Whether to resume licensing of new UCBs**, and

2. **What eligibility criteria and regulatory standards should apply** if resumed.

Rationale for Resuming Licensing

Financial Inclusion & Local Credit

UCBs play an important role in **financial inclusion**, especially in **smaller towns and semi-urban areas**, by providing credit to local businesses, traders and households.

Strengthened Regulatory Framework

- Since the pause, the RBI's supervisory powers have been **strengthened (via the Banking Regulation Act and enhanced oversight)**, including a **tiered regulatory framework** for UCBs (introduced in 2022).
- An **Umbrella Organisation (National Urban Co-operative Finance and Development Corporation)** now supports smaller UCBs with **technology, liquidity and investment assistance**.

Sector Consolidation & Improved Health

- The number of UCBs has declined from **over 2,100 (2003)** to **about 1,457 (March 2025)** due to amalgamation and exit of weak entities, and **overall financial indicators have improved**.

Key Eligibility Criteria Proposed

The RBI paper proposes **stringent eligibility norms** for any new licensing:

- **Minimum capital requirement:** ₹300 crore as of the previous financial year.
- **Track record:** At least **10 years of active operations** and a **sound financial record over the last five years**.
- **Governance standards:** Robust governance, risk management systems, and compliance structures.
- **Capital adequacy:** Proposed minimum **Capital to Risk-Weighted Assets Ratio (CRAR) ≥ 12%** and **Net NPA ≤ 3%** at the time of licensing.
- **Geographical diversity:** Preference for entities with **wide geographic footprint** (e.g., multi-state).

Regulatory & Historical Context

UCB Regulation in India

- UCBs must be licensed to conduct banking business under **Section 22 of the Banking Regulation Act, 1949**.
- RBI regulates **banking functions** (licensing, prudential norms, CRR/SLR, supervision) while State Cooperative Acts govern **registration and internal governance**.

Historical Vulnerabilities

- Many UCBs licensed in the 1990s failed due to weak governance and risk management, prompting the 2004 pause.

Arguments in the RBI Paper

For Resumption

- Improved regulatory setup, enhanced supervisory tools, and institutional support.
- A fresh licensing policy may enable **new, financially strong cooperative banks** to serve local credit needs.

Against Resumption (Concerns Raised)

- **Capital-raising challenges:** Cooperative share structures make raising growth capital difficult.
- **Governance gaps and risk management issues** persist in the sector.
- **Technology adoption and professional management** capacity vary widely across societies.

Reserve Bank – INTEGRATED OMBUDSMAN Scheme (RB-IOS), 2026

The **Reserve Bank of India (RBI)** has issued the **Reserve Bank – Integrated Ombudsman Scheme (RB-IOS), 2026** — a revised framework for **consumer grievance redressal** in the financial sector, replacing the earlier **RB-IOS, 2021**. It is scheduled to **come into force on 1 July 2026**.

- The scheme is a **cost-free** and **non-adversarial** mechanism for resolving complaints against **RBI-regulated entities**.
- It embodies the **"One Nation, One Ombudsman"** approach — providing a **single, unified platform** for grievance handling across banks and other regulated financial entities.

What It Replaces

It supersedes the **RB-IOS, 2021**, which had already integrated the earlier multiple Ombudsman schemes:

- **Banking Ombudsman Scheme (2006)**
- **Ombudsman Scheme for NBFCs (2018)**
- **Ombudsman Scheme for Digital Transactions (2019)**

Key Features —

Who Can File Complaints?

Customers of RBI-regulated entities (banks, NBFCs, payment system operators, prepaid instrument issuers, credit information companies) can file complaints for **deficiency in service** after first approaching the entity.

Example of covered issues:

- ATM/debit/credit card problems
- Account operations & KYC issues
- Digital transaction failures
- Loan recovery/processing delays
- Wrongful charges or service lapses

Centralised Mechanism

- **Centralised Receipt and Processing Centre (CRPC)** handles complaints nationally.
- Complaints can be filed via:
  - **Online portal:** cms.rbi.org.in
  - **Email/physical submission** to CRPC.

No Upper Limit on Dispute Amount

Unlike some earlier frameworks, there is **no monetary cap** on the value of complaints that can be heard.

Compensation Powers

The Ombudsman can award:

- **Up to ₹30 lakh** for **consequential financial loss**
- **Up to ₹3 lakh** for **harassment/mental anguish**.

Appellate Process

Both complainants and regulated entities can appeal decisions to a **designated Appellate Authority** within a stipulated timeline (usually 30 days).

Principal Nodal Officer

Regulated entities must appoint a **Principal Nodal Officer** at headquarters to coordinate responses and information during complaint proceedings.

Why the Revision?

Fragmented Grievance Redressal

As India's financial ecosystem expanded (banks, NBFCs, fintechs, digital transactions), the old, segmented grievance frameworks created:

- Jurisdictional ambiguity
- Slow resolution timelines
- Diffused accountability

RB-IOS, 2026 addresses this by:

- **Consolidating grievance handling**
- Promoting **uniform standards**
- Enhancing **speed and transparency**

Current Context & RBI Priorities

The RBI has flagged a **surge in customer complaints**, particularly in digital and retail banking channels, as a concern for financial stability and consumer confidence. It has launched initiatives to expedite grievance resolution and improve internal ombudsman systems.

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India's trade with FTA partners shows widening trade deficit

Report: *Trade Watch Quarterly (April–June FY26)*

Publisher: NITI Aayog

Time period analysed: **Q1 FY26 (April–June 2025)**.

Key Findings on India–FTA Trade

A. Widening Trade Deficit with FTA Partners

- India's **trade deficit with countries having FTAs** widened sharply in Q1 FY26.
- **Trade deficit grew by ~59.2% year-on-year** between April–June 2025 compared with the same quarter in the previous year.
- This was driven by **higher import growth (+10%)** relative to **export contraction (-9%)** among FTA partners.
- Exports to FTA partners were approximately **USD 38.7 billion**, while imports were about **USD 65.3 billion**.

B. Exports to Key FTA Partners Contracted

- Exports to the **Association of Southeast Asian Nations (ASEAN)** — India's largest FTA export destination — **fell ~16.9%**.
- Major declines in exports were seen to:
  - **Malaysia:** -39.7%
  - **Singapore:** -13.2%
  - **Australia:** -10.9%
- Meanwhile, **modest gains** were reported in exports to:
  - South Korea (+15.6%)
  - Japan (+2.8%)
  - Thailand (+2.9%)
  - Bhutan (+10.2%)

- Exports to the **UAE** (India's second-largest FTA destination) also dipped (-2.1%).

Analysis Angle: A concentrated downturn in ASEAN exports disproportionately widened the overall FTA trade deficit.

Role of *Electronics Exports*

One of the **notable structural developments** in the report is the performance of **electronics exports**:

A. Strong Growth in Electronics

- India's **electronics exports grew by ~47% year-on-year** in Q1 FY26.
- This surge lifted electronics to **over 11% of total Indian exports** during the period.

B. Structural Export Diversification

- While overall exports to FTA partners declined, electronics stood out as a **"sunrise" sector**, showing rapid export growth and deeper integration into **global electronics supply chains**.

C. Contrast with Traditional Sectors

- The report noted a **sharp decline in petroleum exports**, highlighting structural divergence in export performance where technology-intensive sectors gain share while commodity exports wane.

Growing electronics exports reflect India's **shift toward technology and manufacturing integration**, even as overall trade balances with FTA partners may deteriorate.

Broader Trade Trends in Q1 FY26

From the same NITI Aayog report:

- India's **total goods and services exports** for Q1 FY26 were about **USD 209 billion**, while **imports were about USD 230 billion**, leading to a **trade deficit of USD 21 billion**.
- Exports and imports each grew roughly **3–4% year-on-year**.
- Services exports grew strongly (+10%), contributing to a **services trade surplus (~USD 48 billion)**.

Context: The overall trade deficit with FTA partners is part of a larger merchandise trade scenario where services and electronics exports are stabilising trends.

Structural and Policy Implications

A. Asymmetric Gains from FTAs

- The widening deficit suggests **asymmetric trade gains** with some FTA partners — where imports outpace exports — indicating structural competitiveness challenges in certain sectors.

B. Electronics as a Strategic Export Sector

- Strong electronics export growth may signal improved **competitiveness in technology-linked manufacturing** and a move up the **global value chain**. This aligns with India's emphasis on sectors like electronics manufacturing under **PLI (Production Linked Incentive)** schemes and **Make in India**.

C. Need for FTA Re-negotiations & Market Diversification

- India has **concluded FTAs** with **Oman, New Zealand, and the UK** and is negotiating with the **EU, US, Australia, GCC, EAEU, Canada, SACU**, and considering **PTAs with Brazil and Israel** — partly to tackle trade imbalances and open up export markets.

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Digital Transformation of India's Dairy Sector under the National Digital Livestock Mission (NDLM)

The **National Digital Livestock Mission (NDLM)** is a **central government initiative** under the **Department of Animal Husbandry and Dairying (DAHD)** aimed at **creating a unified, digital, livestock ecosystem** across India called **"Bharat Pashudhan."**

It focuses on **digitising livestock data and services** to support **breed improvement, disease surveillance, productivity enhancement, traceability, and farmer access to services** across the dairy and livestock value chain.

Core Components of NDLM

A. Bharat Pashudhan Platform

- A **digital database and ecosystem** linking livestock owners, field workers, and service providers.
- Includes **mobile and web applications** for recording animal data.

***B. Pashu Aadhaar* — Unique Digital Identity**

- Each livestock animal is given a **12-digit barcoded ear tag** called **Pashu Aadhaar**.
- This serves as a **primary key** to record and link **all digital records** related to that animal — breeding, vaccinations, health treatments, ownership changes, etc.

As of Dec 2025:

- **~35.96 crore animals** have been issued Pashu Aadhaar.
- Over **9.5 crore livestock owners** registered.
- **4 lakh field-worker user IDs** issued.
- **~146.6 crore vaccination records** logged.
- **~250 crore total livestock transactions** captured in the database.

C. Digital Recording of Livestock Services

Using the platform and mobile tools, field workers and veterinarians record:

- **Animal registration**
- **Artificial insemination & breeding**
- **Vaccinations**
- **Disease reporting**
- **Ownership changes**
- **Milk recording**
- **Ration balancing**
- **E-prescriptions and veterinary services**

<u>Digital Transformation in the Dairy Sector Specifically</u>

While NDLM covers livestock broadly, its **impacts on dairy** are substantial:

A. Traceability and Quality Assurance

Pashu Aadhaar enables **full traceability** of livestock — helping improve:

- **Animal health monitoring**
- **Genetic improvement**
- **Milk quality tracking** and safety.

This is important for **domestic consumer trust** and **export competitiveness** of dairy products.

B. Automatic Milk Collection System (AMCS)

- A **digital platform** for managing **daily milk collection** at cooperative dairy societies.
- It records **quantity, quality, and milk fat content** of milk — eliminating manual errors.
- Payments to farmers are **automated and transparent**, with real-time SMS alerts.

C. Dairy Enterprise Resource Planning (ERP)

- A **comprehensive digital ERP** (e.g., NDDB Dairy ERP / mINDERP) integrates:
  - Finance
  - Inventory
  - Sales & marketing
  - Manufacturing
  - HR/payroll
  - Mobile apps for real-time data access.
- This provides **end-to-end digital visibility** from cattle to consumer products.

D. Data-Driven Decision Support

Digital data enables:

- **Supply chain optimisation**
- **Milk route optimisation using GIS**
- **Evidence-based planning for procurement & processing**
- **Better animal health interventions**

Objectives of NDLM (Relevance to Dairy Sector)

1. **Enhance productivity and breed improvement** through data analytics and breeding records.
2. **Strengthen disease surveillance and control**, reducing morbidity/mortality in dairy animals.
3. **Enable traceability of livestock products**, strengthening quality assurance and brand building.
4. **Create a farmer-centric digital ecosystem** — easier access to services, schemes, and veterinary care.

Challenges & Considerations

- Implementing digital platforms across **rural, remote areas** with connectivity challenges.
- Ensuring **uptake by smallholder farmers** who may lack digital skills or access.
- Integrating fragmented **private and cooperative dairy sectors** with national digital infrastructure.

Strategic Importance

- Contributes to **agricultural digitalisation**, a key component of India's **Digital India** vision.
- Enhances India's position as the **world's largest milk producer** via **technology-led efficiency, quality, and traceability** improvements.
- Provides data for **evidence-based policymaking** and efficient public service delivery.

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A Decade of Startup India Initiative (2016–2026)
Impact on India's Entrepreneurial Ecosystem & Innovation-led Growth

Background & Evolution

- Launched in **January 2016**

ANURAG BACHAN'S DROANACHARYA IAS
SCO : 205-206-207, SECTOR : 36-D, CHANDIGARH – 160036
CONTACT : 8427009141, 8699010909

- Nodal Ministry: **Department for Promotion of Industry and Internal Trade (DPIIT)**
- Objective:
  - Promote **entrepreneurship**, **job creation**, and **innovation**
  - Shift India from *job-seeker* to *job-creator* economy

Core Pillars of Startup India (Static Foundation)

(a) Ease of Doing Business for Startups

- **Self-certification** under labour & environmental laws
- Faster incorporation via **single-window digital portal**
- Time-bound exit framework under **Insolvency and Bankruptcy Code**

(b) Financial Support & Incentives

- **Fund of Funds for Startups (FFS)**
  - ₹10,000 crore corpus
  - Implemented through **SIDBI**
- Tax incentives:
  - 3-year income tax exemption (within 10 years)
  - Capital gains tax exemptions
- Angel tax rationalisation (major reform post-2019)

(c) Industry–Academia & Innovation Push

- Atal Innovation Mission (AIM)
- Incubators, accelerators, research parks
- IPR support: fast-track patents, 80% fee rebate

Impact

- India is **3rd largest startup ecosystem** globally
- **1.2 lakh+ DPIIT-recognised startups** (as of 2025)
- **100+ unicorns** across fintech, SaaS, e-commerce, deep tech
- Startups spread across **700+ districts** → end of metro-only concentration
- Employment generation: **10+ million direct & indirect jobs**

Trap: Startup ≠ MSME; DPIIT recognition is mandatory for benefits.

Sectoral & Structural Transformation

(a) Diversification Beyond IT

- Early phase: E-commerce, fintech, aggregators
- Recent decade shift to:
  - **Deep Tech** (AI, semiconductors, space tech)
  - **Climate tech & green hydrogen**
  - **Agri-tech & food processing**
  - **Health-tech & bio-pharma**

(b) Manufacturing & Atmanirbhar Linkages

- Integration with:
  - **Make in India**
  - **Production Linked Incentive Scheme**
- Rise of hardware startups in electronics, drones, EVs

Innovation-led Growth: How Startups Changed the Growth Model

Traditional Model

- Capital-intensive, low innovation diffusion
- Jobless growth risk

Startup-led Model

- Knowledge-driven
- High productivity
- Rapid scaling via digital public infrastructure:
    - Aadhaar, UPI, Account Aggregator

Startups act as **innovation multipliers**, not just firms.

Current Relevance

(a) Policy Updates

- National Deep Tech Startup Policy (drafted)
- Simplification of angel tax regime
- Credit guarantee for startups
- Focus on **women & rural entrepreneurs**

(b) Global Context

- Venture capital slowdown post-COVID
- Geopolitical re-shoring → opportunity for Indian startups
- India positioning as **China+1 innovation hub**

Challenges & Structural Gaps (Critical Analysis)

Financial

- Overdependence on foreign venture capital
- Limited domestic risk capital

Innovation Quality

- Low patents-to-startups ratio
- R&D expenditure < 1% of GDP

Inclusivity

- Tier-2/3 startups still face funding & mentorship gaps
- Women founders underrepresented

Way Forward (Answer-Enrichment Points)

- Expand **domestic patient capital** (pension & insurance funds)
- University-startup-industry research clusters
- Outcome-based support instead of blanket incentives
- Stronger IPR-commercialisation ecosystem
- Global value chain integration via FTAs

Startup India — Key Steps & Initiatives (2016–2026)

1. Fund of Funds for Startups (FFS)

- **What it is:** A funding framework under DPIIT with a **corpus of ₹10,000 crore** managed by **Small Industries Development Bank of India**.
- **Function:** Funds SEBI-registered AIFs (Alternative Investment Funds) which invest in startups.
- **Impact:**

  - Commitments to **140+ AIFs**, investments of **₹25,500+ crore in 1,370+ startups**
  - Expands *domestic risk capital pool*, reducing dependence on foreign VC
- **Prelims keywords:** FFS, AIF, SIDBI
- **Mains angle:** Role of government in catalysing risk capital and addressing capital market gaps for early-stage firms.

2. Credit Guarantee Scheme for Startups (CGSS)

- **Purpose:** Collateral-free credit to startups through guarantees by **National Credit Guarantee Trustee Company (NCGTC)**.
- **Status:** 330+ loans worth over **₹800 crore** guaranteed.
- **Prelims focus:** NCGTC, collateral-free loans
- **Mains angle:** Helps *debt-based financing* where equity markets may be absent; reduces risk aversion among banks.

3. Startup India Seed Fund Scheme (SISFS)

- **Aim:** Early-stage support — proof of concept, prototype development, product trials, market entry.
- **Corpus: ₹945 crore**
- **Execution:** Through **215+ incubators** supporting early startups.
- **Prelims focus:** Seed funding & incubator linkages
- **Mains angle:** Filling the *pre-Series A funding gap* & enhancing innovation pipeline.

4. Startup India Online Hub

- **Role:** A digital platform connecting stakeholders — startups, investors, mentors, academia, govt.
- **Utility:** Centralised access to funding, mentorship, compliance info, and ecosystem support.
- **Prelims keywords:** Online Hub, digital platform
- **Mains angle:** Use of digital public infrastructure to lower information asymmetry in ecosystem.

5. States' Startup Ranking Framework (SRF)

- **Purpose:** Evaluate states/UTs on startup friendliness, policy implementation, and ecosystem strength.
- **Effect:** Promotes *competitive federalism* and tailored policies across states.
- **Prelims:** Ranking parameters, categories (Leaders, Top performers etc.)
- **Mains:** Federal governance in economic reforms & Centre-state role in ecosystem building.
- **Relevance:** Encourages decentralised growth beyond metro hubs.

6. National Mentorship Portal — MAARG

- **MAARG:** Mentorship, Advisory, Assistance, Resilience & Growth platform.
- **Function:** Matches startups with mentors for sector-specific guidance.

7. Startup India Investor Connect Portal

- **Objective:** Connect startups with investors, especially early-stage funds via one portal.

8. Atal Innovation Mission (AIM) ***(Linked but reinforces Startup India)***

- **Lead:** NITI Aayog
- **Focus:** Innovation culture — from schools to research labs
- **Components:**
  - **Atal Tinkering Labs** (10,000+ schools)
  - AIM 2.0 programmes (vernacular innovation, frontier states, human capital)

- **Prelims:** AIM, ATLs
- **Mains:** Innovation ecosystem from *grassroots to enterprise*.
- **Connection:** Strengthens pipeline feeding startups.

9. Technology & Incubation Schemes (MeitY & DST)

a) MeitY Startup Hub (MSH)

- Promotes tech startups, connects incubators and labs
- 6,148+ startups, 517 incubators (as of Dec 2025)

b) TIDE 2.0 Scheme

- For ICT-based innovation: AI, IoT, blockchain, robotics

c) NIDHI (DST umbrella programme):

- NIDHI-Prayas, EIR, TBI, SSS, COE → support idea-to-scale solutions

10. Rural & Inclusive Entrepreneurship Schemes

- **SVEP (Rural entrepreneurship)** under DAY-NRLM
- **ASPIRE** (MSME innovation & rural enterprise)
- **PMEGP** (employment generation via enterprise)

Current/Ecosystem Outcomes (Decade)

- **2 lakh+ DPIIT-recognised startups** (Dec 2025) — world's largest & most diverse ecosystem.
- ~50 % startups from **Tier-II/III cities** — indicates *democratisation*.
- Greater representation of **women directors** (~45 % in recognised startups).

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NITI Aayog report - "Achieving Efficiencies in MSME Sector through Convergence of Schemes", 2026

The report evaluates existing MSME schemes, highlights overlaps and inefficiencies, and makes recommendations for **scheme convergence** to improve outcomes for MSMEs.

1. Micro & Small Enterprises – Cluster Development Programme (MSE-CDP)

Objective: Promote cluster development to enhance competitiveness through common infrastructure, quality improvement, skills, and market access.

Support Provided:

- Common Facility Centres
- Market development support
- Quality and technology upgrades

Relevance in Report:

- Identified as one of the core cluster-level support schemes with overlaps with **SFURTI**.
- Convergence can reduce duplication and better align cluster financing & support.

Key Issue for Convergence:

- Both MSE-CDP and SFURTI provide infrastructure support; merging could streamline delivery.

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Scheme of Fund for Regeneration of Traditional Industries (SFURTI)

Objective:

Revive traditional industries (coir, khadi, village industries) by organizing artisans into clusters and improving market linkages.

Support Provided:

- Cluster development funds
- Capacity building
- Branding & marketing assistance

Overlap Noted:

- Similar to MSE-CDP in infrastructure & cluster support — a convergence opportunity.

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Procurement & Marketing Support (PMS)

Objective:

Enhance market access for MSME products through Government e-Marketplace (GeM), trade fairs, and marketing support.

Support Provided:

- Participation in exhibitions
- Buyer-seller meets
- Linkage with Government procurement

Report Insight:

- Overlaps with **International Cooperation** components — especially for export market access.
- Converging PMS with export-oriented schemes could improve international outreach.

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International Cooperation (IC) Schemes

Objective:

Link MSMEs with global markets, support participation in international fairs, and facilitate exports.

Overlap with PMS:

- Both aim to increase product uptake — domestic and global.
- Convergence can help avoid duplication of trade fair support.

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A Scheme for Promoting Innovation, Rural Industry & Entrepreneurship (ASPIRE)

Objective:

Encourage innovation and entrepreneurship in rural areas, with incubation and enterprise support.

Support Components:

- Incubation centres
- Entrepreneur development programs
- Funding & mentorship for innovation

Report Focus:

- ASPIRE has overlaps with other innovation components under MSME schemes.
- The report suggests aligning innovation support schemes to avoid fragmentation.

Prime Minister's Employment Generation Programme (PMEGP)

Objective:

Generate employment through setting up micro enterprises in rural & urban areas via credit linked subsidies.

Support Provided:

- Subsidy on bank loan for new enterprises
- Focus on self-employment

Relevance:

- One of the flagship schemes for enterprise creation.
- The report notes fragmentation of credit & subsidy schemes as a challenge.

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Credit Guarantee Fund Trust for Micro & Small Enterprises (CGTMSE)

Objective:

Facilitate **collateral-free credit** for MSMEs by providing credit guarantees to lenders.

Importance:

- Addresses the key constraint of **credit access** for MSMEs.
- Report highlights duplication where financial support is spread across schemes; better convergence can standardize credit assistance.

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Udyam Registration

Objective:

Provide a single, simplified registration platform for MSMEs to access benefits, credit, and compliance assistance.

Key Fact:

- A foundational administrative tool for MSME identity and scheme eligibility.
- Weak information convergence around registration was noted; hence the report suggests a **centralized portal**.

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Skill Development Programmes

Objective:

Build skilled manpower to meet MSME needs through training programs (often aligned with schemes like PMKVY under MSDE).

Report Suggestion:

- Skill initiatives are spread across ministries; a unified framework under MSME convergence can improve relevance and uptake.

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Zero Defect Zero Effect (ZED)

Objective:

Encourage MSMEs to adopt quality management and clean production practices to make products globally competitive.

Convergence Insight:

- Quality upgradation components often overlap with cluster or technology support schemes.

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52 Reforms in 52 Weeks- Indian Railways

A *systemic, phased reform agenda* for Indian Railways in 2026 aimed to:

- Enhance **operational safety**
- Improve **efficiency and service delivery**
- Integrate **technology (AI, digital systems)**
- Strengthen **workforce capabilities and customer experience**

Core Focus Areas

1. **Safety Reforms** — systematic improvements in signaling, ATP systems, procedures.
2. **AI & Digital Adoption** — AI-driven maintenance diagnostics, real-time monitoring.
3. **Passenger Services** — quality of catering, amenities, punctuality and new train introductions.
4. **Skill Development & Workforce** — upskilling staff; enhancing training programs.
5. **Infrastructure Modernisation** — continuing station modernisation, track upgrades, speed enhancement.

Ministry of Railways – Static Framework (Background)

Mandate & Structure

- The Ministry of Railways (MoR) oversees Indian Railways (IR), one of the world's largest rail networks, responsible for *transportation of passengers and freight*, infrastructure, safety, modernization, and technology adoption.
- Policy decisions are taken by MoR; implementation is through the **Railway Board** and zonal railways.

Strategic Role

- IR contributes significantly to India's *logistics ecosystem*, mobility for citizens, and national integration.
- Aligns with *national infrastructure plans* (e.g., Gati Shakti) to enhance capacity & connectivity.

Safety & Technology Focus

- IR uses *indigenous technologies* like **Kavach** — an automatic train protection system to prevent collisions — deployed across key corridors with plans for scalable rollout.

Major Scheme Examples

- **Amrit Bharat Station Scheme** — redevelopment of stations with passenger-centric facilities and multimodal integration.
- **Dedicated Freight Corridors (DFCs)** — promote efficient goods movement, decongesting conventional lines.

Indian Railways: Year-End Review 2025 – Highlights

A. Infrastructure & Modernisation

- **Track Works**: ~6,880 km of rails renewed + 7,051 km complete track renewal — part of ongoing infrastructure strengthening for safety and speed.
- **Sectional Speed**: Increased to *130 kmph* on 599 km and *110 kmph* on 4,069 km — supporting faster trains.

- **Electrification**: ~99.2% of broad gauge network electrified, a key milestone for sustainability.
- **Bridges & Connectivity**: New vertical-lift Pamban Bridge completed; all-weather connectivity in Kashmir (USBRL project) and new North East rail lines inaugurated.
- **Station Redevelopment**: 1,337 stations selected under modernisation; 155 fully modernised with enhanced passenger amenities and multimodal linkages.

B. Rolling Stock & Passenger Services

- **Vande Bharat Trains**: 164 services operational; introduction of *Vande Bharat Sleeper* to enhance long-distance comfort & speed.
- **Amrit Bharat Express**: 30 services operational, connecting various regions affordably.
- **Special Train Operations**: ~43,000 runs in 2025 to meet seasonal demand.

C. Freight & Logistics

- **Dedicated Freight Corridors (DFC)**: Operational expansion aiding decongestion of passenger lines and boosting freight throughput.
- **Gati Shakti Cargo Terminals**: Strengthening multimodal logistics, wagon production, and services to become *world's 2nd largest freight carrier*.

D. Safety & Technology

- **Safety Performance**: *Consequential train accidents* reduced significantly over recent years, reflecting improved systems and oversight.
- **Kavach ATP System**: Deployment of *Version 4.0* on priority routes with plans for widespread coverage.
- **Digital Tools**: Free Wi-Fi at >6,100 stations; **RailOne app** centralises passenger services (ticketing, tracking, grievances).

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India–EU Free Trade Agreement

India and the European Union together account for:

- ~25% of global GDP
- ~One-third of global trade

EU becomes India's 22nd FTA partner

India–EU FTA talks: Launched (2007) → Suspended (2013) → Relaunched (June 2022)

EU- one of India's largest trade partners- Bilateral trade growing steadily.

India–EU goods trade (2024–25): ~$136 billion

- Exports: ~$76 billion
- Imports: ~$60 billion

Services Trade- $83 billion

<u>Trade in Goods:</u>

- Over 99% of Indian exports to the EU to receive **preferential market access**
- Tariffs up to 10% eliminated from Day One on exports worth ~$33 billion
- Major beneficiary labour-intensive sectors
  - **Textiles & apparel-** EU is India's second-largest export destination for textiles and apparel, after the USA
  - Leather & footwear
  - Marine products

- Gems & jewellery
- Automobiles:Liberalisation through a calibrated, quota-based approach (sensitive sector protection)

Trade in Services:

- Certainty of market access and non-discriminatory treatment
- Strong push to digitally delivered services
- Ease of mobility to boost India's services exports
- India gains access to 144 EU service sub-sectors, including:
  - IT / ITeS
  - Professional services
  - Education services
- EU gains access to 102 service sub-sectors in India

Mobility & Professionals:

- **Facilitative and predictable mobility framework** for:
  - Short-term visits
  - Temporary stays
  - Business travel (both directions)
- **Mutual commitments** for:
  - Intra-Corporate Transferees (ICTs)
  - Business visitors
  - **Entry & work rights for dependents/family members of ICTs**

Social Security & Traditional Knowledge

- India secures a **framework for engagement on Social Security Agreements** over **5 years**
- **Practitioners of Indian traditional medicine** allowed to work under **home title** in EU countries where such practices are **not regulated**

Digital Trade & Innovation

- FTA promotes cooperation in:
  - **Innovation ecosystems**
  - **Cross-border electronic payments**
  - Digital trade facilitation

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National Household Income Survey (NHIS)

MoSPI's a new pan-India household survey to annually estimate **household income and related socioeconomic indicators**.

Aims to fill **long-standing data gaps** on income distribution and socio-economic conditions across regions.

- 1st edition in 2026

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Annual Survey of Incorporated Service Sector Enterprises (ASISSE)

MoSPI's a new pan-India survey will collect data on **service sector enterprises** with legal incorporation.

Helps in systematic tracking of **service sector performance**, contribution to GDP and employment.

- 1st edition in 2026
- Comparison with ASUSE – survey of non-agricultural, unincorporated enterprises.

POLITY AND GOVERNANCE

Pro-Active Governance and Timely Implementation (PRAGATI)

Why in News:

Land acquisition continues to be the most significant hurdle in infrastructure execution, contributing to nearly **35% of project delays**, as highlighted by the Cabinet Secretary following the **50th PRAGATI review meeting**.

About PRAGATI

What is PRAGATI?

PRAGATI is an **ICT-based, centralised governance mechanism** designed to facilitate grievance redressal, monitor programme execution, and oversee major development projects through **real-time, outcome-oriented reviews**.

Launch:

Initiated on **25 March 2015** by the **Government of India**.

Objectives

- Ensure **time-bound implementation** of infrastructure and development initiatives.
- Address **inter-ministerial and Centre–State coordination challenges**.
- Foster **transparency, accountability, and results-based governance**.

Key Features

- **Three-level institutional framework:** Connects the Prime Minister's Office, Union Secretaries, and State Chief Secretaries on a single digital platform, enabling swift decision-making and enhanced accountability.
- **Monthly reviews chaired by the Prime Minister:** High-level monitoring through video conferencing ensures prompt resolution of critical project bottlenecks.
- **GIS-enabled digital monitoring:** Incorporates real-time data, geo-spatial tools, and live imagery to track project progress and detect implementation-level constraints.
- **Integrated data ecosystem:** Consolidates inputs from **CPGRAMS, Project Monitoring Group (PMG), and MoSPI**, creating a unified dashboard and minimising administrative silos.

Significance

- More than **3,300 projects** valued at approximately **₹85 lakh crore** have been reviewed, with over **7,100 issues resolved**.
- Facilitated faster completion of long-pending projects dating back to the **1990s**.
- Enhances **cooperative federalism** by institutionalising structured coordination among the Centre, States, and local administrations.

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Increasing Privatisation in India's Healthcare Sector:

What Privatisation in Health Means:

Privatisation in the health sector refers to the expanding involvement of private entities — including corporate hospitals, insurers, and commercial medical education providers — in financing, delivering, and

shaping healthcare services, often supported directly or indirectly by public funds through insurance schemes and partnerships.

Concerning Trends in India's Healthcare Sector:

- India's public health expenditure remains low, at around **2.1% of GDP (2023–24)**, well below the target set in the National Health Policy 2017.
- More than **60% of total health spending is borne out of pocket**, pushing millions into poverty annually.
- Publicly financed schemes like **Ayushman Bharat PM-JAY** channel significant reimbursements to private hospitals, transferring public money into private provision.
- Private medical colleges impose very high fees (often ₹40–50 lakh or more), influencing healthcare priorities towards profit recovery.

Arguments in Favour of Privatisation:

- The private sector helps **plug gaps in tertiary-level care** where public capacity is limited, especially in specialised services such as oncology and cardiology.
- Private providers have played a major role in expanding **access to advanced diagnostics** and new medical technologies.
- In emergencies, private laboratories and facilities have been mobilised to supplement testing and treatment capacity. Eg. During the COVID-19 pandemic, nearly half of India's RT-PCR testing was carried out by private laboratories

Challenges and Concerns:

- **Profit incentives** can drive unnecessary procedures and overtreatment, raising costs for patients.
- **Regulatory oversight remains inconsistent** across states, resulting in variable pricing and quality standards.
- **Public funds are increasingly diverted** into private sector reimbursements rather than strengthening government hospitals.
- **High fees in private medical education** skew the health workforce toward lucrative specialisations, away from public service and primary care.

Government Measures to Strengthen the Health Sector

1. **Ayushman Bharat Initiative**
   - **PM-JAY** provides financial risk protection for secondary and tertiary hospitalisation.
   - **Health and Wellness Centres** focus on expanding access to comprehensive primary healthcare services.
2. **National Health Policy, 2017**
   - Sets a long-term goal of raising public health expenditure to **2.5% of GDP**, which remains a work in progress.
3. **Digital Health Reforms**
   - The **Ayushman Bharat Digital Mission** seeks to create interoperable digital health records and improve coordination across healthcare providers.
4. **Reforms in Medical Education**
   - Since 2014, the government has significantly expanded the number of **public medical colleges and MBBS/PG seats** to address workforce shortages.

Way Forward:

- Increase public health spending (e.g., to **at least 3% of GDP**) and prioritise investment in government health infrastructure.
- Strengthen **primary care and community health systems** so that early intervention reduces dependence on expensive tertiary services.
- Enforce **stronger regulatory and pricing frameworks** for private providers to ensure equity and quality.
- **Realign insurance programmes** like PM-JAY to support and build government capacity rather than act primarily as a passive purchaser of private services.
- **Reform medical education** to cap fees, mandate service in underserved areas, and orient training toward public health needs.

Conclusion: Privatisation may serve as a supplementary mechanism, but cannot be the cornerstone of India's health system. Without a strong public foundation, unchecked market dynamics risk deepening inequality and weakening health governance

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Bureau of Indian Standards (BIS)

Why in News?

The **79th Foundation Day of the Bureau of Indian Standards (BIS)** was recently commemorated.

Overview

The **Bureau of Indian Standards** is India's **national standards authority**, entrusted with standard formulation, product certification, hallmarking, and conformity assessment to protect consumers and enhance the global competitiveness of Indian goods and services.

Establishment and Legal Framework

- BIS began as the **Indian Standards Institution in January 1947**. It became the Bureau of Indian Standards in **April 1987**, and was strengthened by the BIS Act, 2016
- Functions under the **BIS Act, 2016**, which modernised its mandate and aligned it with global best practices
- **Headquarters:** New Delhi
- **Administrative control:** Operates under the **Department of Consumer Affairs, Ministry of Consumer Affairs, Food and Public Distribution**

Core Functions

- Development of over **23,300 Indian Standards** across traditional and emerging sectors
- Product certification, including **simplified and fast-track licensing**
- Implementation of **Compulsory Registration** and **Foreign Manufacturers Certification** schemes
- Hallmarking of precious metals
- Laboratory testing, accreditation, and quality infrastructure support
- Consumer awareness programmes, training, and dissemination of standards

Recent Initiatives

- **BIS Standardisation Portal:** End-to-end digital management of standards development with dashboards, role-based access, faster processing, and transparency

- **SHINE (Standards Help Inform & Nurture Empowered Women):** Capacity-building initiative empowering women through SHGs and NGOs as community-level quality advocates
- **BIS–SAKSHAM:** Annual institutional recognition scheme honouring excellence in knowledge, skills, and high-impact contributions

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National Intelligence Grid (NATGRID)

Why in News?

Recent reports show that the **National Intelligence Grid (NATGRID)** has been significantly expanded. It is now linked with the **National Population Register (NPR)** and can be accessed by State police. This has restarted debates on **privacy, oversight, and surveillance** in India.

About NATGRID

The **National Intelligence Grid (NATGRID)** is a **secure technology platform** created after the **26/11 Mumbai attacks** to improve information sharing among security agencies. Instead of storing data itself, it allows authorised agencies to **search multiple government databases in real time** through a protected system.

Main Features

- **Multiple database access:** Allows searches across 21 categories of datasets including travel records, bank data, telecom information, identity documents, and asset details.
- **Agency access:** Earlier limited to central agencies, it is now available to **State police officers up to SP rank**.
- **Data sensitivity levels:** Information requests are classified as non-sensitive, sensitive, or highly sensitive.
- **Use of AI tools:** Artificial intelligence helps link different records, including facial recognition and identity matching.

Achievements of NATGRID

- **NPR linkage:** Connecting NATGRID with NPR helps verify identities using family and household details for nearly **119 crore people**.
- **High usage:** About **45,000 searches every month**, making intelligence work faster and more continuous.
- **CCTNS integration:** Direct access to FIRs from over **14,000 police stations** improves coordination between the Centre and States.
- **AI tool (GANDIVA):** Helps match suspects across databases in minutes instead of days.
- **State-level access:** Allowing State police access has improved ground-level investigation and reduced information gaps.

Recent Expansion

- **Population-scale identity checks:** NPR integration enables large-scale identity verification.
- **Broader State access:** NATGRID is now a regular investigation tool, not limited only to counter-terrorism.
- **Greater use of AI:** While speeding up investigations, it also raises concerns about errors and misuse.

Concerns and Challenges

- **No clear law:** NATGRID works through executive orders and lacks a dedicated legal framework.

- **Privacy risks:** Accessing sensitive data without an FIR may violate Supreme Court guidelines on privacy.
- **AI errors:** Facial recognition systems have shown false matches, especially affecting vulnerable groups.
- **DPDP Act exemptions:** Citizens have limited rights to correct or challenge data misuse.
- **Function creep:** Expansion beyond terrorism cases increases the risk of mass surveillance.

Way Forward

- **Parliamentary oversight:** Regular review of NATGRID by a parliamentary committee.
- **Judicial approval:** Court permission for accessing highly sensitive data.
- **Data limits:** Automatic deletion of data once a person is cleared of suspicion.
- **AI safeguards:** Human checks and bias audits for AI-based systems.
- **Safe global cooperation:** Share intelligence with foreign agencies without exposing raw personal data.

Conclusion: NATGRID has improved intelligence sharing and investigation speed in India. However, its rapid expansion must be matched with **strong laws, safeguards, and oversight** to balance national security with citizens' privacy and democratic rights.

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Directorate General of Mines Safety (DGMS)

Why in News?

The **DGMS** recently observed its **125th Foundation Day (2026)**, highlighting its long-standing role in ensuring the safety and welfare of mine workers.

What is DGMS?

DGMS is a **statutory authority under the Ministry of Labour and Employment** responsible for protecting the **health, safety, and welfare of workers** employed in coal, metal, and oil mines.

Established:

- **1902**
- **Headquarters:** Dhanbad, Jharkhand

Objective:

To ensure **safe and hazard-free working conditions in mines**, following the principle of **"Safety First."**

Key Functions:

- Enforces mining safety laws, including the **Mines Act, 1952**
- Inspects mines and monitors safety standards
- Investigates mining accidents and suggests preventive measures
- Oversees occupational health of mine workers
- Promotes safety training and awareness

Importance:

- Safeguards workers in a **high-risk sector**
- Fulfils the Centre's responsibility for mine safety under the **Union List**
- Strengthens India's mining safety framework through specialised expertise

Centre issues notification for first phase of Census of India 2027:

What is it?

The **Census of India 2027** is the **16th national census** and the **8th after Independence**, conducted under the **Census Act, 1948**. It is India's most comprehensive source of population and socio-economic data.

Conducted by:

Ministry of Home Affairs, through the **Office of the Registrar General and Census Commissioner of India**.

Phases:

- **House Listing & Housing Census:** April–September 2026
- **Population Enumeration:** February 2027
  (Special timelines for snow-bound areas like Ladakh)

Background:

- First census: **1872**
- First synchronous census: **1881**
- First post-Independence census: **1951**
- Conducted every **10 years**, providing data up to **village and ward level**

Key New Features (2027):

- **First fully digital census** using mobile applications
- **Self-enumeration option** for citizens before field surveys
- **Real-time monitoring** through Census Management & Monitoring System (CMMS)
- **GIS-based mapping** for accurate house listing
- **Caste data collection** in digital form for the first time since 1931
- **Census-as-a-Service:** Machine-readable datasets for faster policymaking

Significance:

- Provides the basis for **welfare schemes, reservations, and delimitation**
- Improves **accuracy, transparency, and efficiency** in governance
- Supports **targeted social justice policies** through caste data

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Supreme Court and Green Governance

Why in News?

Recent debates have focused on the Supreme Court's expanding role in **environmental governance**.

What is the Supreme Court's "Green Governance"?

It refers to the Court's **proactive approach to environmental protection**, where it goes beyond interpreting laws and issues **continuous directions** to guide environmental policy and administration. This usually happens when regulatory authorities fail to act effectively.

Important Environmental Cases in 2025

- **Aravalli mining case:**
  A narrow interpretation of the Aravalli range opened areas for mining, but the order was later paused and sent to expert review.
- **Kancha Gachibowli forest case (Hyderabad):**

The Court, suo moto, stopped large-scale tree cutting for infrastructure projects, citing biodiversity loss and public interest.

- **Great Indian Bustard case:**
  Continued strong wildlife protection measures, linking conservation with responsibility towards future generations.
- **Delhi-NCR air pollution cases:**
  The Court pushed authorities for better coordination, planning, and enforcement to tackle pollution.
- **Stray Dog Case:**
  The Supreme Court initially allowed relocation of stray dogs to address public safety concerns but later modified its order to support sterilisation and vaccination under animal welfare laws

Role of Supreme Court in Environmental Conservation

- Made **environmental protection part of the right to life (Article 21)**
- Acted when governments and regulators failed to protect public health
- Prevented irreversible damage using the **precautionary principle**
- Strengthened the **public trust doctrine**, treating natural resources as common assets
- Brought environmental concerns into the mainstream of constitutional rights

Key Concerns and Limitations

- **Judicial overreach:** Courts sometimes enter technical policy areas better handled by experts
- **Policy uncertainty:** Frequent changes in rulings weaken long-term environmental planning
- **Over-dependence on courts:** Weak institutions increase reliance on judicial governance
- **Reduced public participation:** Direct Supreme Court cases can bypass local environmental forums

Way Forward

- Strengthen environmental regulators to reduce the need for judicial intervention
- Set clear principles to avoid frequent reversals in environmental rulings
- Improve coordination among pollution control bodies and monitoring agencies

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PANKHUDI Portal

What is it?

PANKHUDI is a **single online platform** that helps people and organisations work with the government on **women and child development** projects. It allows citizens, NGOs, companies, and NRIs to contribute through **CSR and voluntary partnerships** in a transparent and organised manner.

Ministry

The portal is managed by the **Ministry of Women and Child Development**.

Objective

To improve **coordination, transparency, and participation** in social welfare programmes, and to ensure better delivery of services for **women and children** across the country.

Key Features

- **Single-window system:** One common platform for individuals, NGOs, corporates, NRIs, and government bodies.

- **Focus areas:** Nutrition, health, early childhood education, child protection, and women's safety and empowerment.
- **Support to flagship schemes:** Strengthens implementation of **Mission Saksham Anganwadi & Poshan 2.0, Mission Vatsalya, and Mission Shakti** through digital workflows.
- **Transparent processes:** Online registration, proposal submission, approvals, and real-time tracking; only **non-cash contributions** are allowed to ensure accountability.
- **Wide coverage:** Supports improvement of services in Anganwadi centres, child care institutions, One Stop Centres, and women's shelters across India.

Significance

- Makes it easier for private and voluntary partners to work with the government.
- Improves monitoring and ensures measurable impact of social and CSR investments.

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Should the age of consent be lowered?

Why in news?

In **January 2026**, the Supreme Court in *State of Uttar Pradesh vs Anurudh & Anr.* expressed concern over the **misuse of the POCSO Act** in cases involving **consensual relationships between adolescents**. The Court asked the Union government to examine the need for **legal reform**.

What is the Age of Consent?

The **age of consent** is the minimum age at which a person can legally agree to sexual activity. In India, this age is **18 years** under the **POCSO Act, IPC**, and the **Bharatiya Nyaya Sanhita (BNS), 2023**. Any sexual activity involving a person below 18 is treated as a criminal offence, regardless of consent.

Emerging Trends

- Surveys show that many adolescents form relationships before 18.
- Studies have found that **a significant number of POCSO cases involve consensual teenage relationships**, not sexual abuse.
- In many cases, complaints are filed by parents due to social disapproval rather than exploitation.

Supreme Court's Position

- Under current law, **consent of a minor has no legal value**.
- However, in the 2026 judgment, the Supreme Court acknowledged that **POCSO is sometimes used against genuine adolescent relationships**.
- While the Court has softened outcomes in some cases, it has maintained that **any change must come through legislation**, not judicial interpretation.

Arguments for Reform

- **Criminalises teenage relationships:** Many cases involve mutual relationships where the girl later refuses to support prosecution.
- **Parental misuse:** The law is often used to punish elopement or inter-caste relationships.
- **Social reality mismatch:** Adolescent relationships exist, but the law treats them as serious crimes.
- **Global practice:** Several countries allow limited consent between teenagers with safeguards.
- **Judicial burden:** Courts are flooded with such cases, delaying justice for real victims of abuse.

Arguments Against Lowering the Age

- **Risk of coercion and grooming:** Many abusers are known to the child, making consent questionable.
- **Threat to child protection laws:** Lowering the age could weaken laws against trafficking and child marriage.
- **Clear protection line:** The 18-year rule avoids subjective judgments about maturity.
- **Risk of misuse by offenders:** Exploiters may disguise abuse as consent.

Way Forward

- **Close-in-age exemption:** Allow consensual relationships between adolescents aged **16–18** with a small age gap, while strictly punishing older offenders.
- **Judicial screening:** Courts should examine power imbalance, coercion, or grooming before proceeding.
- **Better sex education:** Schools should teach consent, boundaries, and healthy relationships.
- **Clear Supreme Court guidelines:** Uniform rules can prevent confusion and misuse across states.

Conclusion

Completely lowering the age of consent may weaken child protection, but the current law **unfairly criminalises adolescent relationships**. A **balanced, evidence-based reform**, such as close-in-age exemptions, can protect children while respecting adolescent autonomy.

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Lokpal of India

Why in News?

The **Lokpal of India** observed its **Foundation Day on 16 January 2026**, marking the date on which the institution formally came into effect in **2014**.

What is Lokpal?

The **Lokpal** is an **independent statutory body** at the national level created to **investigate corruption complaints** against public officials, including **senior political leaders and top bureaucrats**. It functions as India's central **anti-corruption ombudsman**.

Legal Basis

- Established under the **Lokpal and Lokayuktas Act, 2013**
- Became operational on **16 January 2014**

Background and Evolution

- The idea of an ombudsman was first discussed in **1963**
- The **First Administrative Reforms Commission (1966)** recommended a two-level system:
  - **Lokpal** at the Centre
  - **Lokayuktas** in the States
- Several Lokpal Bills failed between **1968 and 2011**
- The law was finally passed in **2013**, driven by strong public demand for an independent anti-corruption body. (India against corruption movement led by activist Anna Hazare)

Composition

- Consists of a **Chairperson** and up to **eight Members**

- Equal number of **Judicial and Non-Judicial Members**
- Appointed by the **President of India** on the recommendation of a **Selection Committee**
- **Tenure:** 5 years or till the age of 70, whichever is earlier

Eligibility

- **Chairperson:** Former Chief Justice of India or Supreme Court Judge
- **Judicial Members:** Former Supreme Court Judges or Chief Justices of High Courts
- **Non-Judicial Members:** Persons of high integrity with at least **25 years' experience** in fields like administration, law, vigilance, or finance

Jurisdiction

Lokpal can inquire into corruption complaints against:

- The **Prime Minister**, Union Ministers, and Members of Parliament
- All categories of **Central Government officials (Group A to D)**
- Officials of **PSUs, autonomous bodies, trusts, and societies** funded or controlled by the Union Government
- Certain organisations receiving **foreign contributions**

Powers and Functions

- Accepts complaints under the **Prevention of Corruption Act, 1988**
- Orders **preliminary inquiries** and full investigations
- Can refer cases to agencies like the **CBI**
- Exercises **limited supervision over the CBI** in Lokpal-referred cases
- Has powers similar to a **civil court** (summoning, examining witnesses, calling documents)
- Can approve **search, seizure, and attachment of assets**
- Grants **sanction for prosecution**, reducing delays
- May recommend **departmental action, prosecution, or case closure**
- Can act against **false or malicious complaints**

Conclusion

The Lokpal is a key institution for **strengthening accountability and fighting corruption** at the highest levels of government. While its design ensures independence and strong powers, its effectiveness ultimately depends on **timely appointments, adequate resources, and political will**.

******

Central Vigilance Commission (CVC)

Why in News?

Shri Praveen Vashista, IPS has been appointed as a **Vigilance Commissioner** in the **Central Vigilance Commission (CVC)** and assumed office on **16 January 2026**.

What is the Central Vigilance Commission?

The **Central Vigilance Commission** is the **highest vigilance and integrity body** of the Government of India. Its main role is to **prevent corruption** and promote **honesty, transparency, and accountability** in Central Government offices and public sector institutions.

Establishment and Legal Status

- Set up in **1964** through a government resolution

- Granted **statutory status** under the **Central Vigilance Commission Act, 2003**

Background

- The idea of CVC came from the **Santhanam Committee** (1962–64), which studied ways to fight corruption
- For many years, the Commission worked without a legal framework, limiting its powers
- In **2003**, it became a statutory and independent body, strengthening its authority over vigilance matters

Composition

- Headed by a **Central Vigilance Commissioner**
- Comprises upto **two Vigilance Commissioners**
- Appointed by the **President of India** based on the recommendation of a high-level selection committee
- **Tenure:** 4 years or up to **65 years of age**, whichever comes earlier

Jurisdiction

The CVC's authority extends to:

- **All India Services** and senior Central Government officers
- Officials of **Central PSUs, public sector banks, RBI, NABARD, SIDBI, LIC**, and general insurance companies
- Certain autonomous bodies and societies under Union Government control
- Exercises supervision over **CBI investigations** related to corruption cases
- Conducts inquiries into complaints forwarded by the **Lokpal**

Key Functions

- Coordinates and monitors vigilance work across Central Government organisations
- Orders or supervises inquiries into corruption complaints
- Gives vigilance advice to ministries, departments, and PSUs
- Oversees CBI investigations related to corruption offences
- Reviews delays in investigations and prosecution sanctions
- Recommends appointments to senior posts in the **CBI** and **Enforcement Directorate**
- Acts as the authority under the **Whistle Blower Protection framework**, ensuring protection to informers

Conclusion

The Central Vigilance Commission plays a **crucial role in maintaining integrity** in public administration. Its effectiveness lies in **independent functioning, strong coordination with investigative agencies, and timely vigilance action** against corruption.

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Special Intensive Revision

What is Special Intensive Revision (SIR)?

Special Intensive Revision (SIR) is a comprehensive and time-bound exercise carried out by the Election Commission of India to thoroughly update electoral rolls. Unlike routine annual revisions, SIR involves door-to-door verification and detailed scrutiny of voter records to ensure that the voter list is accurate, complete, and up to date.

SIR Verification Digitisation

Digitisation of **Special Intensive Revision (SIR) verification** means shifting the voter verification process from **paper-based field checks and physical hearings** to a **digital, technology-driven system**. Instead of voters appearing before officials, documents are uploaded online and verified through secure digital platforms.

This process uses **ECINet**, which allows backend verification of identity documents, online submission of forms, and real-time updates through SMS or email.

Key Features of Special Intensive Revision (SIR)

- **Cleaning electoral rolls:** Removes duplicate, deceased, and shifted voters to ensure fairness in elections.
- **Adding eligible voters:** Brings first-time voters and previously excluded residents into the rolls.
- **Correcting old errors:** Fixes mistakes carried forward from older voter lists, especially from early 2000s data.
- **Enumeration Forms:** Collects updated household and residency information digitally.
- **Digital tracking:** Each application can be tracked from submission to approval through an audit trail.

Why is Digital SIR Needed?

- **Improves accuracy:** Manual checks often lead to errors, while digital verification improves data reliability.
- **Reduces hardship:** Citizens no longer need to attend physical hearings or stand in long queues.
- **Fixes non-mapped voter issues:** Millions of voters wrongly marked as "non-mapped" can be verified quickly online.
- **Avoids legal problems:** Digitisation prevents voters from being forced to submit incorrect forms that may carry legal risks.
- **Ensures transparency:** Applicants receive instant updates and acknowledgements, reducing uncertainty and stress.

Challenges with SIR 2.0

- **Old data problems:** Current voter rolls still depend on outdated and manually prepared records.
- **Data mismatch:** Differences exist between various government records, creating confusion.
- **Digital divide:** Rural and vulnerable groups may struggle with online processes without help.
- **Resistance to change:** Some officials continue to rely on traditional manual methods.
- **Concerns over deletions:** Allegations of large-scale deletion of genuine voters without proper notice.

Way Forward

- **Instant communication:** Inform voters immediately about the status of their applications.
- **System integration:** Link ECINet with other government databases for faster document verification.
- **Assisted digital access:** Use Booth Level Officers to help citizens upload documents locally.
- **Process reform:** Ensure restored voters are not treated as first-time applicants.
- **Live updates:** Update draft electoral rolls in real time as verification is completed.

Conclusion:

Clean electoral rolls are essential for democracy, but they should not come at the cost of **citizen dignity**. A **transparent, digital, and citizen-friendly SIR process** can ensure accuracy while protecting trust in the electoral system. Technology must serve both **administrative efficiency and democratic fairness**.

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Digital Attendance System in Lok Sabha

Why in news?

From the **Budget Session 2026**, the **Lok Sabha** will introduce a **digital attendance system** to ensure that Members of Parliament (MPs) are **physically present inside the House** during sittings.

What is the Digital Attendance System?

It is a **seat-based biometric attendance system** where MPs record their attendance **electronically from their assigned seats** inside the Lok Sabha chamber. This replaces the earlier system of signing a register in the lobby.

Announced by:

Shri **Om Birla**, Speaker of the Lok Sabha

Objectives

- Ensure **actual participation** of MPs in House proceedings
- Improve **discipline, transparency, and efficiency** in Parliament
- Link **daily allowance strictly to physical presence** in the House

Key Features

- Ends the old practice of **signing attendance outside the chamber**
- Prevents **proxy attendance and misuse**
- Ensures attendance reflects **real participation**, not symbolic presence
- Discourages MPs from marking attendance and leaving immediately
- Supports India's move towards **digital and paperless parliamentary functioning**

Significance

- Strengthens **accountability of elected representatives**
- Encourages meaningful debate and continuity in proceedings
- Aligns Parliament with **modern e-governance practices**
- Enhances public trust by ensuring MPs attend sessions they are paid for

Conclusion

The digital attendance system marks an important step towards a **more disciplined, transparent, and accountable Parliament**, ensuring that attendance truly means participation in law-making.

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Loopholes in Judicial Removal

Why in news?

In **December 2025**, **107 Members of Parliament** from the **INDIA bloc** submitted a notice seeking the removal of **Justice G.R. Swaminathan of the Madras High Court**. The notice alleged bias and conduct contrary to secular values, once again drawing attention to how judges can be removed under India's Constitution.

What is Judicial Removal?

Judicial removal is the **constitutional method** for removing a judge of the **Supreme Court or a High Court** before retirement. Although it is often called "impeachment" in common usage, the Constitution does **not formally use this word for judges**. Instead, it provides a special parliamentary process to protect both **judicial independence and accountability**.

Constitutional Provisions Involved

- **Article 124(4):** Allows removal of a Supreme Court judge only on grounds of *proved misbehaviour or incapacity* and sets a very high voting requirement.
- **Article 124(5):** Authorises Parliament to make laws for investigating and proving such charges.
- **Article 217(1)(b):** States that High Court judges are removed using the same procedure as Supreme Court judges.
- **Article 218:** Extends Articles 124(4) and 124(5) to High Court judges.

Basic Conditions for Removal

- **Grounds:** A judge can be removed only for *proved misbehavior or incapacity*.
- **Minimum support:**
  - At least **100 Lok Sabha MPs**, or
  - At least **50 Rajya Sabha MPs** must sign the notice.
- **Meaning of misbehaviour:** Includes corruption, lack of integrity, or deliberate misuse of judicial power (as clarified in *M. Krishna Swamy v. Union of India*).
- **Inquiry committee:** A three-member panel (a Supreme Court judge, a High Court Chief Justice, and a legal expert) examines the allegations.
- **Special majority:** The motion must pass in **both Houses of Parliament** with:
  - a majority of total membership, and
  - two-thirds of members present and voting.

Step-by-Step Removal Process

1. **Notice submission:** MPs submit a signed motion to the Speaker (Lok Sabha) or Chairman (Rajya Sabha).
2. **Initial decision:** The Presiding Officer decides whether the motion should be admitted.
3. **Investigation:** If admitted, an inquiry committee examines the charges in detail.
4. **Parliamentary debate:** If guilt is established, Parliament debates and votes on the motion. A special majority of two thirds of those present and voting in each house is required for removal.
5. **Final removal:** If both Houses approve, the **President issues the removal order**.

Problems in the Current System

1. Excessive Discretion at the Entry Stage

The Speaker or Chairman can **reject a motion at the very beginning**, even if it is signed by the required number of MPs, without giving detailed reasons.

2. Political Influence

Since the Presiding Officer usually belongs to the ruling side, removal motions against judges seen as favourable to the government can be **blocked politically**.

3. No Clear Definition of "Misbehaviour"

The Constitution does not clearly explain what counts as misbehaviour, allowing **subjective interpretation**.

4. Lack of Transparency

The initial scrutiny by the Speaker happens **behind closed doors**, without public reasoning or judicial oversight.

5. The "Lapse" Problem

If the motion is rejected at the start, **the entire process collapses**, and allegations are never examined—no matter how serious the evidence

What Can Be Improved?

- **Clear admission rules:** Define when a motion must be accepted to prevent arbitrary rejection.
- **Time limits:** Set deadlines for the Presiding Officer to decide on admissibility.
- **Judicial review:** Allow courts to review rejection of motions to ensure fairness.
- **Independent scrutiny:** Shift the initial check from the Speaker's office to an independent authority.
- **Define misconduct:** Clearly separate judicial error (appealable) from serious misconduct (removal-worthy).

Conclusion

India's judicial removal process is designed to protect judges from political pressure, but too much rigidity in the removal process weakens accountability. **Reforming these loopholes is essential** to ensure that judicial independence is preserved without shielding misconduct.

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Governor's Address to the State Legislature

Why in News?

In recent times, several States have witnessed **fresh disputes between Governors and elected governments** over the wording and reading of the Governor's Address. These incidents have revived debates about **constitutional limits, propriety, and the Governor's role** in a parliamentary democracy.

What is the Governor's Address?

The **Governor's Address** is a **constitutionally mandated speech** delivered at the beginning of the first session of the State Legislature after elections and at the start of the first session every year. The speech presents the **policies, programmes, and priorities of the elected State government**, not the personal opinions of the Governor.

Constitutional Provisions Related to the Address

- **Article 163:** The Governor must act on the **aid and advice of the Council of Ministers**, except in a few constitutionally defined discretionary areas.
- **Article 174:** Gives the Governor the power to summon, prorogue, or dissolve the State Legislature, but **only on the advice of the Cabinet**.
- **Article 175:** Allows the Governor to address the House or send messages to it.
- **Article 176:**
    - Requires the Governor to address the Legislature at the start of the first session after elections and at the beginning of each year.
    - Mandates that the House's rules must provide time to discuss the issues mentioned in the Address.

Nature and Limits of the Governor's Power

- **Compulsory but ceremonial role:** The Governor is duty-bound to deliver the Address but **cannot change its content**, as it is drafted by the elected government.
- **No independent policy role:** The Address reflects government policy and reinforces the principle of **democratic accountability**.
- **Restricted discretion:** The Governor cannot delay or block legislative sessions against the Cabinet's advice.
- **Symbolic constitutional position:** The role is to communicate government priorities, not to question or veto them.
- **Legislative discussion ensured:** The Legislature is given time to debate the Address, ensuring accountability through elected representatives, not the Governor.

Important Judicial Pronouncements

- **Nabam Rebia v. Deputy Speaker (2016):** The Supreme Court ruled that the Governor has **no independent discretion** in summoning or advancing Assembly sessions.
- **Rajasthan High Court (1966):** Held that even if the Address is not fully read, it remains constitutionally valid and does not invalidate proceedings.
- **Syed Habibullah v. Speaker, West Bengal Assembly:** The Calcutta High Court clarified that defects in the delivery of the Address do not make legislative actions unconstitutional.

Significance of the Governor's Address

- **Maintains federal balance:** Confirms that Governors act as constitutional heads, not political actors.
- **Upholds democratic authority:** Ensures that elected governments control policy communication.
- **Promotes institutional harmony:** Prevents misuse or politicisation of the Governor's office.

Conclusion

The Governor's Address is a **constitutional obligation, not a discretionary privilege**. Respecting its limited and symbolic nature is essential to preserve **federalism, democratic governance, and institutional balance** between the Centre, States, and constitutional authorities.

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ENVIRONMENT AND ECOLOGY

Gas Hydrates

A natural gas reserve trapped within an ice-like structure has been discovered on the **ocean floor west of Greenland**. Scientists believe this may be the **deepest gas hydrate cold seep ever recorded**, and notably, it supports a rich and active marine ecosystem.

About Gas Hydrates

- Gas hydrates are **ice-like crystalline solids** formed when low-density gases such as **methane, ethane, or carbon dioxide** become physically trapped within a lattice of water molecules.
- Importantly, the gas does **not chemically bond** with water; instead, it is enclosed within the crystal structure under **low temperature and moderate pressure** conditions.
- Since **methane (CH_4)** is the most common gas involved, the terms *gas hydrates* and *methane hydrates* are often used interchangeably.
- Gas hydrates belong to a class of compounds called **clathrates**, where one molecule is enclosed within the cavities of another molecule's crystal framework.

Key Properties

- A defining feature of clathrates is the **absence of chemical bonding**, which allows the trapped gas to be released relatively easily.
- When methane hydrates are **heated or depressurised**, they break down into **water and natural gas**.

Occurrence

- On Earth, gas hydrates occur naturally in:
    - **Marine sediments**, especially along continental margins
    - **Within and beneath permafrost regions**
- Scientists also speculate that gas hydrates may exist on **other planetary bodies** with suitable temperature–pressure conditions.

Why Gas Hydrates Matter

- **Energy potential:** Gas hydrate deposits are estimated to contain **nearly twice the carbon** present in all known reserves of coal, oil, and conventional natural gas combined, making them a possible future energy source.
- **Climate implications:** Decomposition of gas hydrates can release large quantities of **methane**, a potent greenhouse gas, with serious implications for global climate stability.
- **Geological hazards:** Sudden release of pressurised methane may trigger **submarine landslides**, which can potentially generate **tsunamis**.
- **Biological significance:** Gas hydrate regions often support **unique biological communities**. These organisms rely on **chemosynthesis**, using hydrocarbons or hydrogen sulfide as sources of carbon and energy rather than sunlight.

In Essence

Gas hydrates lie at the intersection of **energy security, climate change, geological risk, and deep-sea ecology**. The recent discovery near Greenland not only pushes the known depth limits of gas hydrate

systems but also highlights their role in sustaining unusual and diverse marine life, making them a subject of growing scientific and strategic interest.

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Bomb Cyclone

A powerful **bomb cyclone** recently swept across the **United States**, causing severe winter conditions across the Midwest and the East Coast, including heavy snowfall, intense winds, and widespread disruption.

About Bomb Cyclone

- A bomb cyclone is a **large mid-latitude storm** that forms due to **explosive cyclogenesis** (also known as *bombogenesis*).
- Explosive cyclogenesis refers to the **very rapid intensification of an extratropical cyclone**, marked by a sharp fall in surface air pressure within a short period.
- Structurally, a bomb cyclone is similar to other intense mid-latitude storms, featuring a **central low-pressure system** that draws surrounding air inward, generating strong winds.
- What distinguishes a bomb cyclone is the **speed of its intensification**, not its basic structure.

Criteria for Bombogenesis

- The pressure-drop threshold required to classify a storm as a bomb cyclone **varies with latitude** due to differences in the Coriolis force.
    - At **60° latitude**, a pressure fall of **24 millibars in 24 hours** is required.
    - At **around 40° latitude**, a drop of approximately **17.8 millibars in 24 hours** is sufficient.

Formation Conditions

- Bomb cyclones generally develop during **winter months**.
- They form when **cold polar air masses collide with warm, moist air**, leading to rapid energy release.
- These storms are often linked with **atmospheric rivers**, which supply large amounts of moisture and intensify precipitation.

Global Hotspots of Explosive Cyclogenesis

The most active regions for extra-tropical explosive cyclogenesis include:

- Northwest Pacific
- North Atlantic
- Southwest Pacific
- South Atlantic

Weather Impacts

- Bomb cyclones produce **extreme weather conditions**, such as:
    - Torrential rainfall
    - Severe thunderstorms
    - Heavy snowfall and blizzards
    - Gale-force to storm-force winds
- The combination of intense precipitation and strong winds can lead to **flooding, power outages, transport disruption, and coastal hazards**.

In Essence

A bomb cyclone is not a distinct type of storm by structure, but by **how rapidly it strengthens**. Its association with sharp pressure falls, powerful winds, and intense precipitation makes it one of the **most destructive winter weather systems** affecting mid-latitude regions.

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Bio-Bitumen

Recently, the Union Minister of State for Science and Technology announced that India has ushered in an era of **"Clean, Green Highways"** following the successful transfer of the indigenous technology titled *"Bio-Bitumen via Pyrolysis: From Farm Residue to Roads"*.

About Bio-Bitumen

Bio-bitumen is a sustainable binding material produced from renewable organic resources such as plant-based oils, agricultural residues, and other forms of biomass. These raw materials are subjected to specialized processing techniques to generate a binder that closely resembles conventional petroleum-based bitumen in quality and performance.

As an alternative to fossil-fuel-derived bitumen, bio-bitumen significantly reduces carbon emissions while also lowering India's dependence on imported petroleum products. The production process of bio-bitumen varies according to the type of biomass used and involves multiple technological stages.

Significance of Bio-Bitumen

The manufacturing of bio-bitumen leads to substantially lower greenhouse gas emissions, making it particularly suitable for environmentally sustainable infrastructure and green highway projects.

Key Processes Involved in Bio-Bitumen Production

- **Biomass Collection and Processing:** Renewable feedstock such as plant oils, lignin, agricultural waste, or algae is collected and pre-processed.
- **Pyrolysis and Bio-Oil Extraction:** Biomass undergoes thermal decomposition at controlled temperatures, resulting in the formation of bio-oil, which acts as the primary precursor for bio-bitumen.
- **Refining and Modification:** The bio-oil is refined and chemically modified, often using polymers, to improve viscosity, thermal resistance, and adhesion properties.
- **Blending and Finalization:** In certain applications, bio-bitumen is blended with conventional bitumen to enhance road performance while retaining sustainability advantages.

Bio-Bitumen via Pyrolysis: Key Facts

The bio-bitumen via pyrolysis technology is an indigenous innovation jointly developed by **CSIR-Central Road Research Institute (CSIR-CRRI)** and **CSIR-Indian Institute of Petroleum (CSIR-IIP)**.

The process involves collecting post-harvest rice straw, converting it into pellets, and then producing bio-oil through pyrolysis. This bio-oil is subsequently blended with conventional bitumen for road construction. Extensive laboratory evaluations have demonstrated that nearly **20–30 per cent** of conventional bitumen can be safely substituted with bio-bitumen without any compromise in performance, durability, or quality.

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M-STrIPES

Forest personnel participating in the upcoming census of tigers and other wildlife at the **Anamalai Tiger Reserve** will deploy the advanced digital platform known as **Monitoring System for Tigers: Intensive Protection and Ecological Status (M-STrIPES)** to strengthen wildlife monitoring and protection efforts.

About M-STrIPES

M-STrIPES (Monitoring System for Tigers: Intensive Protection and Ecological Status) is a technology-driven, software-based system developed to support patrolling, surveillance, and conservation of tiger habitats. It was jointly launched in 2010 by the **National Tiger Conservation Authority (NTCA)** and the **Wildlife Institute of India**.

The system is designed to enhance wildlife protection, ecological monitoring, and scientific management of protected areas across the country. It has two major components:

- A central analytical engine comprising desktop software and an online analysis platform.
- An Android-based mobile application that enables field staff to record observations and patrol tracks using real-time GPS.

M-STrIPES integrates technologies such as Global Positioning System (GPS), General Packet Radio Service (GPRS), and remote sensing to:

- Collect real-time field data
- Build comprehensive databases using modern IT tools
- Analyse information through GIS and statistical techniques
- Generate actionable insights for effective management of tiger reserves

Under **M-STrIPES** protocols, forest guards are required to regularly patrol their assigned beats and log their movement using GPS devices, along with recording wildlife sightings, threats, and habitat conditions in site-specific data sheets. A *beat* represents the smallest administrative unit of forest management in India, traditionally overseen by a single forest guard.

Key Facts about Anamalai Tiger Reserve

Anamalai Tiger Reserve is located at an elevation of around 1,400 metres in the Anamalai Hills, spanning parts of Pollachi and Coimbatore districts of Tamil Nadu. It lies to the south of the Palakkad Gap within the Southern Western Ghats.

The reserve shares ecological connectivity with the Parambikulam Tiger Reserve to the east, and with Chinnar Wildlife Sanctuary and Eravikulam National Park towards the southwest. It is also home to six indigenous tribal communities—Kadar, Muduvar, Malasar, Malai Malasar, Eravalar, and Pulayar.

Ecologically, the reserve supports a wide variety of vegetation types, including wet evergreen, semi-evergreen, moist deciduous, dry deciduous, dry thorn, and shola forests. In addition, distinctive habitats such as montane grasslands, savannahs, and marshy grasslands are also present.

The flora of Anamalai is notable for hosting wild relatives of several cultivated plants such as mango, jackfruit, wild plantain, ginger (*Zingiber officinale*), turmeric, pepper (*Piper longum*), and cardamom.

Faunal diversity includes key species like the tiger, Asiatic elephant, sambar, spotted deer, barking deer, jackal, leopard, and jungle cat, making the reserve a crucial stronghold for biodiversity conservation in the Western Ghats landscape.

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Aerosols

A recent scientific study has highlighted that **water vapour contributes far more to atmospheric heating than aerosols**, underscoring the dominant role of greenhouse gases in global warming compared to particulate matter.

About Aerosols

Aerosols are tiny solid or liquid particles that remain suspended in the Earth's atmosphere. Typically, they persist in the air for a period ranging from a few days to several weeks before settling on the surface or being removed through precipitation such as rain or snow.

They originate from both **anthropogenic sources**, including the combustion of fossil fuels and biofuels, and **natural sources**, such as desert dust, sea spray, forest fires, and volcanic eruptions. Although aerosols are microscopic in size, they are present in vast numbers and consist of a complex mixture of inorganic and organic compounds.

Common visible manifestations of atmospheric aerosols include smoke, smog, haze, and dust clouds.

Role of Aerosols in Climate

Aerosols influence the Earth's climate system in multiple ways:

- **Cooling effect:** Certain aerosol particles reflect incoming solar radiation back into space, thereby reducing the amount of heat reaching the Earth's surface and contributing to atmospheric cooling.
- **Warming effect:** Some aerosols absorb solar radiation and heat the surrounding air. This effect is particularly strong in the case of **black carbon**, which, due to its dark colour, efficiently absorbs sunlight and enhances atmospheric warming.
- **Cloud interactions:** Aerosols act as cloud condensation nuclei, influencing cloud formation, cloud brightness, and cloud lifespan. These changes alter the way clouds reflect and trap heat, thereby affecting the Earth's radiative balance.

Impact on Human Health and Environment

At ground level, aerosols significantly degrade air quality and pose serious risks to human health. Fine particulate matter, especially particles with a median diameter of less than **2.5 micrometres (PM2.5)**, can penetrate deep into the lungs and enter the bloodstream. Exposure is linked to respiratory illnesses, cardiovascular diseases, and premature mortality.

Aerosols also disrupt transportation during events such as dust storms and volcanic eruptions and can reduce the solar radiation available for solar power generation, affecting renewable energy output.

Overall, while aerosols play a complex and sometimes contrasting role in climate regulation, they are a major contributor to air pollution and associated health hazards.

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National Environmental Standard Laboratory (NESL)

The **CSIR–National Physical Laboratory (NPL)** has recently set up the **National Environmental Standard Laboratory (NESL)** to strengthen India's environmental monitoring framework.

About National Environmental Standard Laboratory

- The NESL has been created to **evaluate, test, and recalibrate** instruments used in **air quality monitoring** and various **environmental sensors**, ensuring that they function accurately under **Indian climatic and environmental conditions**.

- It will generate **reliable and standardized data**, supporting initiatives like the **National Clean Air Programme (NCAP)**.
- **Location:** CSIR–NPL campus, **New Delhi**.

Key Features of NESL

- Enables **manufacturers, industrial units, municipalities**, and other agencies to **verify and validate** the performance of their pollution-monitoring devices within India, eliminating the need for foreign testing.
- Offers services such as:
  - **Industrial emission audits**
  - Validation for **smart-city air monitoring networks**
  - Supply of **certified reference gases**, testing protocols, and calibration support
- Aims to benefit **MSMEs, start-ups, and domestic manufacturers** by reducing testing costs and helping them comply with **increasingly strict environmental standards and transparency requirements**.

Council of Scientific and Industrial Research (CSIR) – Key Facts

- CSIR is one of India's premier **research and development organizations**, working across multiple branches of science, engineering, and technology.
- It is involved in the **design, innovation, and development** of scientific and industrial instruments and systems.
- Provides **testing, calibration, maintenance**, and related support for scientific equipment.
- Focuses on **human resource development** in the field of scientific instrumentation.
- Extends **technical assistance** to industries and contributes to innovation ecosystems.
- **Headquarters:** New Delhi.

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Miyawaki Method

The **Miyawaki method** has emerged as an effective approach for restoring greenery in **urban areas**, especially where natural green cover has steadily declined due to rapid urbanisation.

About the Miyawaki Method

- The technique was conceptualised in the **1970s** by the Japanese botanist **Akira Miyawaki**.
- It is an innovative **afforestation strategy** designed to create **dense, fast-growing forests** even in small and degraded land parcels.
- Often described as a **high-density planting technique**, it involves placing trees and shrubs very close to each other.
- Due to intense competition for sunlight, plants tend to grow **upwards rather than sideways**, resulting in rapid vertical growth.
- The method strictly focuses on planting **native species**, which helps recreate a **locally adapted and ecologically stable ecosystem**.
- Forests developed using this approach can grow **up to ten times faster** than conventional plantations.
- These forests are **highly compact and biodiversity-rich**, resembling natural old-growth forests.

Maintenance Requirements

- During the **initial two to three years**, the plantation needs **regular care**, including watering, removal of weeds, and close monitoring.
- Once established, the forest becomes **self-sustaining** and requires **little to no human intervention**.

Advantages of the Miyawaki Method

- Enhances **soil fertility** and restores degraded land.
- Promotes **rapid forest regeneration** and supports **greater biodiversity** than traditional plantation models.
- Trees grown through this technique absorb **higher amounts of carbon**, contributing to climate change mitigation.
- Particularly effective in **urban environments**, where it has converted polluted and barren spaces into thriving green zones.
- Helps manage **industrial waste**, reduces **dust levels and unpleasant odours**, and lowers **air and water pollution**.
- Plays a role in **preventing soil erosion** and maintaining overall **ecological balance**, making it a valuable tool for environmental restoration.

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Global Water Bankruptcy: Living Beyond Our Hydrological Means in the Post-Crisis Era Global Water Bankruptcy — UNU-INWEH Report (2026)

What is "Water Bankruptcy"?

- A **new scientific framing** of the global water crisis introduced by UNU-INWEH.
- Describes a condition where **long-term water use has exceeded nature's capacity to replenish** water resources and the damage is **effectively irreversible**.
- It goes beyond **water stress** or **water crisis** — indicating **chronic depletion and degradation of water systems** such that historical baselines cannot be restored.

Key Findings / Indicators

1. Post-Crisis Condition

- Many **river basins and aquifers** are losing the ability to return to normal conditions — water deficits are no longer temporary.
- The world is using more freshwater than can be naturally replaced, like overspending savings rather than living on interest.

2. Hydrological Debt

- **Surface water and groundwater depleted** beyond renewable thresholds.
- Critical natural water "capital" — aquifers, wetlands, soils, glaciers — are damaged or shrinking.
- This means future recovery is limited without transformative change.

3. Rising Scarcity & Insecurity

- **~75% of global population** lives in water-insecure regions.
- Billions experience **severe water scarcity** (e.g., lack of access for at least one month a year).
- Multiple major lakes, aquifers, and rivers show persistent decline.

4. Agriculture & Food Security

- **Agriculture uses ~70% of freshwater** globally.
- Many agricultural areas now operate with unstable or depleting water storage — affecting yields and food systems.
- Large irrigated croplands are under high water stress.

Causes of Water Bankruptcy

1. **Slow-onset Depletion**
   - Chronic overuse of groundwater and surface water beyond sustainable rates.
   - Unsustainable withdrawals slowly degrade storage and quality.
2. **Infrastructure-Driven Overshoot**
   - Large dams and water transfers enabled unsustainable expansion of use.
   - These systems enabled societies to overshoot natural limits.
3. **Ecological Degradation**
   - Wetlands, floodplains, rivers and soils have been degraded, reducing natural water storage capacity.
   - This "liquidation" erodes nature's buffering ability.
4. **Climate-Amplified Stress**
   - Climate change intensifies droughts, modifies precipitation, and reduces reliable water supply, making variability the new norm.

Why is This Important? (Exam Relevance)

1. Shift in Conceptual Framing

- Traditional terms like *water stress* or *water crisis* implied temporariness; *water bankruptcy* signals **chronic, structural depletion**.
- This reframing demands *systemic management* over short-term fixes.

2. Linkages to SDGs

- Water bankruptcy directly affects:
  - **SDG 6** (Clean Water and Sanitation)
  - **SDG 2** (Zero Hunger) via water-dependent agriculture
  - **SDG 13** (Climate Action)
  - **SDG 15** (Life on Land) through ecosystem degradation.

3. Social & Economic Effects

- Affects human health, livelihoods, and economies — especially in **agriculture, industry, and urban infrastructure** sectors.
- Displacement and migration risks rise where water fails.

4. Justice & Governance

- Vulnerable communities (rural poor, small farmers, women) are disproportionately affected.
- Calls for *equitable water rights*, *transparent water accounting*, and *just transitions* in policy design.

Policy Recommendations (as per Report)

1. Fundamental Reset of Global Water Agenda

- Move from emergency responses to **"bankruptcy management"** — confronting persistent overshoot.
- Use UN processes (e.g., *2026 & 2028 UN Water Conferences*) to reset priorities.

2. Transparent Water Accounting

- Track water supply, withdrawals, ecological losses, and natural capital depletion.

- Enforce limits based on science rather than short-term gains.

3. Protect Natural Water Capital

- Preserve and restore **aquifers, wetlands, soils, glaciers, and watersheds**.
- Maintain natural filtration, storage, and recharge systems.

4. Just & Adaptive Governance

- Shift governance to *adaptive, equitable systems* that protect vulnerable groups and secure water access.
- Integrate water policy with **climate, food, and ecosystem strategies**.

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India-Specific Findings & Relevance from the Global Water Bankruptcy Report

1. India Is Among Highly Vulnerable Regions

- The report identifies **Central–South Asia** (which includes India) as one of the global **hotspots of irreversible water stress and depletion** — regions where long-term over-withdrawal and degradation have surpassed natural replenishment capacity.

2. Groundwater Depletion & Aquifer Stress

- India is one of the **largest groundwater users in the world**, especially for agriculture — a pattern mirrored in the report's global data showing chronic depletion of aquifers.
- The report's indication that **~70% of major aquifers globally are in long-term decline** underscores risks for India's groundwater-dependent areas.

3. Urban Water Scarcity Patterns

- The report highlights the emergence of **"Day Zero" water crisis events** where urban supplies fail despite infrastructure — a trend observed in Indian cities such as **Chennai, Bengaluru, and parts of the National Capital Region**.

4. Agriculture's Water Footprint

- Globally, about **70% of freshwater withdrawals go to agriculture**, contributing to water bankruptcy; India, with a similarly high agricultural water demand, reflects this pattern.
- This directly links **farm sector water use** with risks to **food security and rural livelihoods** — critical for Indian policy and socio–economic stability.

Policy & Governance Implications for India

1. Shift from Short-Term Crisis Response

- The report argues that **short-term fixes** (tanker supply, deeper bore wells, inter-basin transfers) are **not sufficient**; such measures are commonly used in India but **do not address structural depletion**.

2. Need for Water Accounting & Limits

- India must adopt **transparent water accounting**, enforce **hydrological limits** on withdrawals, and integrate these into planning for agriculture, cities, and industry — as the report recommends globally.

3. Urban & Rural Water Governance

- Urban water systems need resilient frameworks to prevent **water stress from becoming permanent scarcity**, while rural groundwater governance must focus on sustainable extraction.

BIODIVERSITY

Lantana camara

A quiet but widespread invasion by *Lantana camara* is unfolding across many regions of the world. Rising global temperatures have further aided its expansion, enabling the plant to colonise new areas more rapidly and outcompete native vegetation.

About Lantana camara

Lantana camara is a small, woody, broad-leaved evergreen shrub that may grow as an annual or a perennial species. It belongs to the verbena family and is recognised globally as one of the most problematic **invasive alien plant species**.

Originally, the plant is native to the tropical and sub-tropical regions of **Central and South America**. Due to its colourful flowers, it was deliberately introduced to many countries as an ornamental species.

In India, Lantana camara was brought during the **early 18th century by the British** for decorative purposes. Over time, it escaped cultivation and spread extensively, invading forests, grasslands, agricultural fields, and wastelands across most tropical regions of the country. Today, it is considered one of India's most aggressive exotic weeds.

Ecological and Environmental Impacts

Lantana camara spreads rapidly and forms thick, impenetrable thickets that choke native plant species. It releases **allelopathic chemicals** into the soil, which inhibit the growth and regeneration of surrounding vegetation.

The plant poses serious risks to livestock, as its **leaves, flowers, and berries are toxic** when consumed, often leading to illness or even death in grazing animals.

Its root system penetrates deep into the soil and spreads laterally, allowing it to monopolise water and nutrients, thereby weakening native plants and altering natural ecosystems.

Utilisation and Management Aspects

Despite its invasive nature, Lantana camara has found limited economic uses. Its hard stems are sometimes used in **furniture making, fencing, and as fuelwood** in rural areas.

Additionally, the plant's biomass can be processed into **organic compost and vermicompost**, offering potential benefits for organic and sustainable farming practices when managed carefully.

In Essence

Lantana camara represents a classic case where an ornamental introduction has turned into an ecological threat. Climate change has further amplified its invasive potential, making its management and control a significant challenge for biodiversity conservation and land management, especially in tropical countries like India.

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Anopheles Stephensi

Urban malaria has emerged as a serious public health challenge in India, largely due to the rapid spread of the invasive mosquito *Anopheles stephensi* in major cities such as Delhi. This development has raised concerns about India's commitment to eliminate malaria by 2030, as highlighted in the **Malaria Elimination Technical Report, 2025**, recently released by the Ministry of Health.

About Anopheles stephensi

Anopheles stephensi is an invasive mosquito species that originated in regions of **Southeast Asia and the Arabian Peninsula**. It is recognised as one of the most efficient vectors of malaria and has gained global attention due to its expanding geographical footprint.

In recent years, the species has spread beyond its traditional range into several parts of **Africa**, where it is now considered a growing threat to public health systems.

Key Characteristics

Unlike most malaria-transmitting mosquitoes that are predominantly rural, *Anopheles stephensi* is exceptionally well adapted to **urban environments**. It can breed in very small collections of water, such as overhead tanks, construction sites, discarded containers, and household water storage units.

The mosquito is capable of **year-round breeding**, allowing it to persist continuously in cities. However, its population density peaks during the **summer months (June to August)**, which coincides with the period of highest malaria transmission in urban areas.

Role in Malaria Transmission

Across its natural and expanded range, *Anopheles stephensi* serves as an important vector for both **Plasmodium falciparum** and **Plasmodium vivax**, the two major parasites responsible for malaria in humans.

Its strong adaptation to city settings makes urban populations particularly vulnerable, complicating malaria control strategies that were traditionally focused on rural transmission.

In Essence

The spread of *Anopheles stephensi* has transformed malaria from a predominantly rural disease into an **urban public health challenge**. Its ability to thrive in cities and breed in minimal water sources poses a significant obstacle to India's malaria elimination target, underscoring the need for urban-focused surveillance and vector-control strategies.

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Eastern Imperial Eagle Spotted in Mudumalai Tiger Reserve

Wildlife observers have recently confirmed the sighting of the **Eastern Imperial Eagle**, a rare migratory raptor, at the **Mudumalai Tiger Reserve** during the winter migration period

About the Eastern Imperial Eagle

The Eastern Imperial Eagle is a **large bird of prey** belonging to the eagle group.

- **Scientific name:** *Aquila heliaca*
- **Family:** Accipitridae
- **Subfamily:** Aquilinae (identified by fully feathered legs)

Distribution and Migration

- The species breeds across **southeastern Europe**, **West Asia**, and **Central Asia**.
- Most populations are **migratory** and move southwards during winter to **northeastern Africa**, the **Middle East**, and **South and East Asia**.

Physical Characteristics

- It is the **second-largest eagle species found in Europe**.

- **Length:** Up to ~0.92 metres
- **Wingspan:** Can reach ~2.14 metres
- **Average weight:** Around 3.6 kg
- Displays **reverse sexual dimorphism**, with females being larger than males.
- Adults are **blackish-brown**, with a **pale golden crown and nape** and a greyish base extending towards the tail.
- Like other eagles, it possesses **powerful legs and feet** equipped with long, curved talons for capturing and carrying prey.

Lifespan and Conservation

- **Average lifespan:** About 56 years
- **IUCN Status:** *Vulnerable*, indicating a high risk of population decline if threats persist.

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Mudumalai Tiger Reserve (MTR)

The Mudumalai Tiger Reserve is a major wildlife protected area located in the **Nilgiris district of Tamil Nadu**.

Location and Significance

- Covers an area of **321 sq. km**
- Situated at the **tri-junction of Tamil Nadu, Karnataka, and Kerala**
- Lies on the **northeastern and northwestern slopes of the Nilgiri Hills**, part of the **Western Ghats**
- Forms a crucial component of the **Nilgiris Biosphere Reserve**, India's **first biosphere reserve**

Geological and Ecological Features

- The term *Mudumalai* means **"ancient hill range"**, reflecting its geological age of nearly **65 million years**, dating back to the formation of the Western Ghats.
- The **Moyar River** flows through the reserve, supporting diverse ecosystems.

Habitat Diversity

The reserve hosts a wide range of habitats, including:

- Tropical evergreen forests
- Moist and dry deciduous forests
- Moist and dry teak forests
- Secondary grasslands
- Swamps and marshy areas locally known as *Vayals*

Flora

- Dominated by tall **Elephant Grass** and giant bamboo species
- Rich in valuable timber such as **teak and rosewood**
- Supports wild relatives of cultivated plants like **wild rice, ginger, turmeric, and cinnamon**

Fauna

- Herbivores: elephant, gaur, sambar, spotted deer, barking deer, mouse deer, blackbuck, four-horned antelope, and wild pig
- Carnivores: tiger, leopard, and wild dog
- Nearly **8% of India's total bird species** are recorded from this region

ANURAG BACHAN'S DROANACHARYA IAS
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Cultural Note

- The Oscar-winning documentary **"The Elephant Whisperers"** was filmed at the **Theppakadu Elephant Camp**, located within the reserve.

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White-Bellied Heron

Recently, the expert appraisal committee of the Union Ministry of Environment, Forest and Climate Change has recommended **environmental clearance (EC)** for the **Kalai-II Hydroelectric Project** proposed on the **Lohit River**.

This stretch of the river is recognised as an important habitat of the **White-bellied Heron**, one of the rarest bird species in the world.

About the White-Bellied Heron

The **White-bellied Heron (*Ardea insignis*)** is a very large heron species and is considered the **second-largest living heron globally**.

It is also referred to as the **Imperial Heron** or **Great White-bellied Heron**.

Ecological Significance

- The presence of this bird is a **strong indicator of healthy river ecosystems**.
- Its survival reflects **good water quality, abundant fish populations, and minimal ecological disturbance**.

Habitat

- Found mainly in **wetlands and riverine ecosystems** within **tropical and subtropical forests**.
- It prefers the **foothills of the Eastern Himalayas**, especially areas with **free-flowing rivers**.

Distribution

- Its range is extremely limited and fragmented.
- It occurs in parts of **northeast India**, **Bhutan**, and **northern Myanmar**.

Feeding Behaviour

- The species primarily feeds on **fish**, particularly those found in **river rapids and fast-flowing waters**.
- It requires **undisturbed river channels** with natural flow conditions for successful foraging.

Threats

The White-bellied Heron faces multiple human-induced threats, including:

- **Loss and degradation of riverine habitats**
- **Hydropower development and river modification**
- **Conversion of wetlands for agriculture**
- **Expansion of human settlements and rising disturbance levels**

Conservation Status

- **IUCN Red List:** *Critically Endangered*
- **Wildlife Protection Act, 1972:** *Schedule I* (highest level of legal protection in India)

Why this matters for UPSC

This species is a **high-value prelims topic** due to its **critically endangered status**, **river-specific habitat**, and **linkage with hydropower and environmental clearance issues**—making it relevant for **Environment, Biodiversity, and Development vs Conservation debates**.

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Double-Humped Bactrian Camel

In a first-of-its-kind moment, **Ladakh's iconic double-humped Bactrian camels** are set to make a ceremonial appearance at the **77th Republic Day Parade**.
Their participation highlights the cultural heritage and ecological uniqueness of India's high-altitude cold deserts.

About the Double-Humped Bactrian Camel

Scientifically known as ***Camelus bactrianus***, the double-humped Bactrian camel is a large **even-toed ungulate**, often referred to as Ladakh's **"silent warriors"** due to its endurance, resilience, and long association with trans-Himalayan life and trade.

Distribution

- Native to the **extreme arid and semi-arid landscapes of Central Asia**.
- Naturally distributed from **Afghanistan to China**, with strongholds in the **Mongolian steppes** and the **Gobi Desert**.
- In India, a **small, isolated population** survives in the high-altitude cold desert of **Nubra Valley**.

Key Characteristics and Adaptations

- **Two humps** store fat, which can be metabolised into **energy and water** during prolonged food scarcity.
- Covered with a **thick, shaggy coat** that becomes denser in winter, enabling survival in temperatures dropping to **–40°C**.
- **Closable nostrils** protect against icy winds and dust storms, while **broad, padded feet** function like natural snowshoes on sand and snow.
- Among the rare terrestrial animals capable of **meeting hydration needs by consuming snow**.
- **Diet:** Primarily herbivorous, feeding on a wide variety of hardy desert plants, though technically omnivorous.

Conservation Status

- **IUCN Red List:** *Critically Endangered*

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Two New Frog Species

A research team led by renowned herpetologist **S. D. Biju**, popularly known as the *"Frogman of India"*, has recently identified two previously unknown frog species from the remote mountainous regions of **Arunachal Pradesh**. The newly described species are **Soman's Slender Arm Frog (*Leptobrachium somani*)** and **Mechuka Slender Arm Frog (*Leptobrachium mechuka*)**, both discovered in ecologically rich but understudied habitats.

Soman's Slender Arm Frog (*Leptobrachium somani*)

Soman's Slender Arm Frog is a newly identified member of the slender-armed frog group. The species was discovered near Tiwarigaon in Arunachal Pradesh and has been named in memory of the late journalist **E. Somanath**, in recognition of his long-standing contribution to environmental journalism.

This relatively small frog grows to about 55 millimetres in length. It is characterised by a greyish-brown body marked with irregular light-grey patterns and has distinctive eyes ranging from silver-grey to light blue. Ecologically, it is an evergreen forest species, with males commonly observed calling from the banks of both fast- and slow-flowing forest streams.

Mechuka Slender Arm Frog (*Leptobrachium mechuka*)

The Mechuka Slender Arm Frog is another newly described slender-armed frog species and derives its name from Mechuka town in Arunachal Pradesh, where it was first collected. Slightly larger than its counterpart, it measures around 60 millimetres in length.

This species inhabits evergreen forests as well as nearby grassland areas. It can be identified by its uniformly brown body with a subtle reddish hue and its striking silvery-white eyes, which set it apart from related species.

The discovery of these two frog species highlights the rich yet largely unexplored amphibian diversity of Arunachal Pradesh and underlines the ecological significance of its remote mountain and forest ecosystems.

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Grey Slender Loris

Recently, the states of Kerala and Tamil Nadu have initiated focused measures to restore suitable habitats and enhance monitoring mechanisms for the conservation of the grey slender loris, a unique nocturnal primate native to southern India.

About Grey Slender Loris

The grey slender loris (*Loris lydekkerianus*) is a small primate species belonging to the family Loridae. It is classified as a prosimian, indicating that it belongs to one of the earliest and most primitive lineages of primates.

The species occupies a wide range of habitats, including tropical primary and secondary rainforests, dry semi-deciduous forests, scrublands, swamps, acacia and bamboo forests, forest edges, as well as montane cloud forests. In terms of geographical distribution, the grey slender loris is primarily found in southern India—especially in Karnataka, Kerala, and Tamil Nadu—and also occurs in Sri Lanka.

Characteristics of the Grey Slender Loris

The grey slender loris is a nocturnal hunter, remaining active mainly during the night. It lacks a tail, and its flexible spine along with elongated limbs enables it to move deftly across forest canopies. The presence of opposable thumbs allows it to grip branches firmly and remain motionless for extended periods, a key survival adaptation.

It possesses large, forward-facing eyes that provide exceptional night vision, aiding in hunting and navigation in low-light conditions. Communication among grey slender lorises occurs through a combination of vocal calls and scent marking.

Dietarily, the species is predominantly insectivorous, with ants and termites constituting more than half of its food intake. However, the grey slender loris faces multiple threats, including illegal capture for the pet trade, hunting for body parts, and accidental roadside captures.

Conservation Status

According to the **IUCN Red List**, the grey slender loris is classified as *Near Threatened*. It is listed under *Appendix II* of **CITES**, which regulates its international trade. In India, it receives the highest level of legal protection, being included under *Schedule I* of the **Wildlife Protection Act, 1972**.

The recent conservation initiatives by Kerala and Tamil Nadu aim to mitigate these threats and ensure long-term survival of this ecologically important primate.

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Indian Giant Squirrel

During the ongoing **All India Tiger Estimation–2026**, the **Indian giant squirrel**, Maharashtra's state animal and popularly known as *Shekru*, was recently sighted in the Atwan region of the Pune Forest Division, highlighting the rich arboreal biodiversity of the area.

About the Indian Giant Squirrel

The Indian Giant Squirrel, also referred to as the Malabar Giant Squirrel, is a large rodent species endemic to India. It belongs to the group of tree squirrels and is counted among the largest squirrel species in the world. Its scientific name is **Ratufa indica**.

Distribution

The species is mainly distributed across the Western Ghats, Eastern Ghats, and the Satpura Range. Its geographical range spans several Indian states, including Karnataka, Andhra Pradesh, Madhya Pradesh, Gujarat, Chhattisgarh, Jharkhand, Maharashtra, Kerala, and Tamil Nadu. In Maharashtra, it holds special significance as the official state animal and is locally called *Shekru*.

Habitat and Behaviour

The Indian giant squirrel is strictly arboreal, spending most of its life high up in forest canopies. It constructs its shelters in tree hollows and rarely descends to the ground. The species is generally solitary and is seen in pairs only occasionally during the breeding season. It is also known for its remarkable agility, capable of leaping distances of up to 20 feet between trees.

Physical Characteristics

The total body length of the Indian giant squirrel ranges from about 254 mm to 457 mm, with the tail usually exceeding the length of the body. Adults typically weigh between 1.5 and 2 kilograms.

One of its most striking features is its vivid, multi-coloured fur. Colour patterns vary among individuals but commonly include two to three shades such as white or cream, brown, black, red, maroon, and occasionally dark fuchsia. Darker shades dominate the upper body, while lighter colours are seen on the underside and the long, bushy tail.

The species has short, rounded ears, broad hands with an expanded inner paw for gripping, and strong, sharp claws adapted for clinging to tree bark and branches. Females are usually slightly larger than males by around three centimetres and possess mammae for nursing their young.

Conservation Status

The Indian giant squirrel is currently classified as **Least Concern** on the **IUCN Red List**, indicating a relatively stable population at the global level. However, continued habitat protection remains essential for its long-term survival.

The recent sighting during the tiger estimation exercise underlines the ecological richness of forest landscapes and the importance of conservation efforts that benefit not just large carnivores, but also iconic arboreal species like the Indian giant squirrel.

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Gharial

A recent extensive survey conducted across the **Ganga River basin** has reported the presence of **3,037 gharials (Gavialis gangeticus)**—a critically endangered, fish-eating crocodilian—spread across **13 different rivers**, despite ongoing threats to their survival.

About Gharial

- The gharial is a **freshwater crocodilian**, classified under the **Order Crocodylia** and the **Family Crocodylidae**.
- **Scientific name:** *Gavialis gangeticus*
- The term *gharial* originates from the Hindi word **'ghara'**, meaning pot, referring to the **rounded, pot-like structure** on the snout of adult males.

Distribution

- Historically, gharials inhabited river systems of **India, Nepal, Bangladesh, Bhutan, Pakistan, and Myanmar**.
- Today, their strongest populations survive in **three Ganga tributaries**:
  - **Chambal River** (India)
  - **Girwa River** (India)
  - **Rapti–Naryani River** (Nepal)
- In India, designated gharial conservation reserves are located in:
  - **Uttar Pradesh**
  - **Madhya Pradesh**
  - **Rajasthan**

Key Features

- Among the world's crocodilians, the gharial ranks as one of the **largest species**, with males growing up to **16–20 feet (5–6 m)**; females generally reach **11.5–15 feet (3.5–4.5 m)**.
- Their skin is **thick** and covered with **smooth, non-overlapping scales**.
- They possess the **longest and narrowest snout** of any crocodilian species.
- Adult males develop a distinctive **bulbous nasal protuberance**, called the **ghara**, at the tip of their snout.
- Gharials are the **most aquatic** crocodilians, rarely venturing far from water. They typically come ashore only for **basking** or **nesting on sandbanks**.
- **Breeding cycle:**
  - Mating occurs between **November and January**
  - Egg-laying takes place between **March and May**

Conservation Status

- Listed as **Critically Endangered** on the **IUCN Red List**.

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Root Wilt Disease

Phytoplasma-driven root wilt disease has recently caused extensive damage across major coconut-growing belts of **Karnataka, Tamil Nadu, and Kerala**, severely affecting traditional plantations.

What is Root Wilt Disease?

- **Causal Agent:** The disease is triggered by **phytoplasma**, a bacterial pathogen known to inflict serious harm on coconut palms.
- **History:** First reported over **150 years ago** from **Erattupetta in Kerala**, it is categorised as a *non-lethal* disorder. Although it doesn't kill the palm, it drastically weakens its productive capacity.
- **Nature of Disease:** Even without causing mortality, the infection leads to progressive decline in vigour and output.

Mode of Transmission

- Spread primarily occurs through **insect vectors**, further aided by **wind movement** and the presence of **continuous coconut plantation belts**.
- While it can occur in virtually all soil varieties, the disease spreads **more aggressively in sandy, sandy-loam, and alluvial soils**.

Factors Enhancing the Spread

- Increasing climatic abnormalities—particularly **extreme temperature fluctuations**—have promoted faster transmission.
- The emergence and proliferation of **new sucking pests**, especially **whiteflies**, have significantly contributed to the surge in disease incidence.

Major Symptoms

- **Thinning or tapering** of the upper trunk region.
- Noticeable **reduction in leaf length and size**.
- **Flaccidity** — an abnormal drooping or bending of leaflets (a hallmark symptom).
- **Delayed flowering** and a **sharp decline in nut yield**.
- Overall, palms become **misshapen**, drop their nuts prematurely, and turn largely unproductive.

Impact

The disease severely impacts productivity, causing the palm to shed nuts early and lose its normal canopy structure, ultimately rendering it an unprofitable crop for farmers.

Management Measures

The most effective long-term strategy is the **development and dissemination of resistant or tolerant coconut varieties**. Breeding programmes continue to be the cornerstone of phytoplasma disease management.

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Gegeneophis Valmiki

Indian researchers have recently identified a rare underground amphibian in the **northern Western Ghats of Maharashtra** and named it **Gegeneophis valmiki**.

About Gegeneophis valmiki

- This newly discovered species is a **subterranean amphibian**, found hidden beneath the soil in the northern stretches of the Western Ghats.
- The species is named **Gegeneophis valmiki** to pay tribute to the historic **Maharshi Valmiki Temple**, located close to where the organism was discovered.
- It belongs to the **genus Gegeneophis**, a group commonly known as **blind caecilians**.

What Are Caecilians?

- Caecilians are often described as **"hidden amphibians"** because they spend almost their entire life beneath the ground.
- They are **limbless, elongated, and worm-like**, making their appearance and movement strikingly similar to earthworms.
- Unlike frogs, they **do not produce croaking sounds**, and their eyes are extremely reduced, placed below layers of skin and bone—making them difficult to spot or study in the wild.

Ecological Significance

- Although seldom seen, caecilians are **ecologically important**:
  - Their burrowing helps **aerate the soil** and enhances soil quality.
  - By feeding on soil invertebrates, they help maintain healthy **invertebrate populations**.
  - They serve as prey for **birds, reptiles, and small mammals**, contributing to the local food chain.
- They are also considered crucial from an evolutionary perspective, marking a **transition between aquatic and terrestrial vertebrates**.

Global & Indian Distribution

- Worldwide, caecilians make up only **231 of the 8,983 known amphibian species**, highlighting their rarity.
- India hosts **42 caecilian species** out of its 457 known amphibians.
- The **Western Ghats** are a major hotspot, home to **26 caecilian species found nowhere else**.
- Of these, **11 species** fall under the **Gegeneophis** genus.

Significance of the Discovery

- **Gegeneophis valmiki** is the **first new species added to its genus in over 10 years**, marking an important milestone for Indian herpetology and Western Ghats biodiversity research.

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Himachal Pradesh – Industrial Hemp

The Chief Minister of Himachal Pradesh has recently initiated a **policy push to legalise and regulate the cultivation of industrial hemp**, marking an important shift towards harnessing its economic and industrial potential under a controlled legal framework.

About Industrial Hemp

- **Industrial hemp (Cannabis sativa L.)** is botanically related to marijuana but differs significantly in its chemical composition and usage.
- Unlike marijuana, which contains high levels of **tetrahydrocannabinol (THC)**—the psychoactive compound responsible for intoxication—industrial hemp contains **negligible THC levels (less than 0.3%)**.
- It is an **herbaceous, dioecious plant**, meaning male and female flowers grow on separate plants.
- Taxonomically, it belongs to the **Cannabis genus** under the **Cannabaceae family**.
- The crop is characterised by **high fibre content and very low psychoactive properties**, making it suitable for industrial applications rather than recreational drug use.

Distinction Between Hemp and Marijuana

- Both hemp and marijuana belong to the same species but are cultivated for **entirely different purposes**.
- Marijuana varieties are grown mainly for **recreational and therapeutic uses** due to high THC content.
- Hemp varieties are cultivated for **industrial and commercial uses**, owing to their fibre-rich stalks and oil-rich seeds.

Applications of Industrial Hemp

- Industrial hemp is a **highly versatile crop** that can be processed into a wide range of products.
- **Stalks and fibres** are used in the manufacture of:
  - Biofuels
  - Automotive components
  - Paper and packaging materials
  - Upholstery and textiles
- **Stems** can be processed into:
  - Construction materials
  - Industrial composites
  - Various grades of paper
- **Seeds** are utilised for:
  - Animal feed and human food products
  - Extraction of oil, which is used in **cosmetics, lotions, and personal care products**

In Essence

Industrial hemp offers a unique opportunity to combine **agricultural diversification, sustainable industry, and rural income generation**. Himachal Pradesh's move to regulate its cultivation reflects a growing recognition of hemp as an **industrial crop rather than a narcotic**, provided it is cultivated within clearly defined legal and regulatory limits.

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HISTORY, ART & CULTURE

Granth Kutir

Recently, the President of India inaugurated Granth Kutir at Rashtrapati Bhavan, marking an important step towards preserving and promoting India's literary heritage.

About Granth Kutir

Granth Kutir houses a distinguished collection of manuscripts and books written in 11 classical Indian languages, namely Tamil, Sanskrit, Kannada, Telugu, Malayalam, Odia, Marathi, Pali, Prakrit, Assamese, and Bengali. The repository contains around 2,300 books spanning diverse disciplines such as epics, philosophy, linguistics, history, governance, science, devotional literature, and even the Constitution of India in these languages.

The primary objective of Granth Kutir is to strengthen public awareness of India's rich cultural, intellectual, and literary traditions. The initiative has been developed through collaborative efforts involving central and state governments, universities, research institutions, cultural organisations, and individual contributors from across the country. It also aligns with the broader vision of the Gyan Bharatam Mission, a flagship initiative under the Ministry of Culture aimed at documenting, conserving, and digitising India's vast manuscript heritage.

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Phulkari – Cultural Heritage in Focus

An exhibition showcasing more than 40 rare pre-Partition textiles has drawn attention to the social and cultural significance of Phulkari, particularly in the everyday lives of women.

About Phulkari

Phulkari, meaning "flower work," is a traditional embroidery style originating from undivided Punjab, covering regions of present-day Punjab, Pakistan, and Haryana. The term appeared in Punjabi literature during the 18th century and is believed to have connections with the Iranian craft of gulkari.

Historically, Phulkari chaddars formed an integral part of a girl's wedding trousseau, often embroidered by mothers and grandmothers over several years. The number and quality of Phulkaris symbolised family status and marked significant life events.

Key Features

Phulkari is a counted-thread embroidery known for its symmetrical geometric and floral motifs. It is embroidered on khaddar, a handspun and handwoven cotton fabric, traditionally dyed in earthy shades such as madder brown, rust red, indigo, and green. Vibrant silk threads are used to create patterns inspired by flowers like marigolds, jasmine, lotus, and the Tree of Life. Over time, contemporary motifs such as trains, trucks, and cars have also been incorporated. Phulkari products mainly include chaddars, dupattas, and stoles, often worn during weddings and ceremonial occasions.

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Lambadi Tribe – Legal and Cultural Context

The Supreme Court is once again examining the long-standing issue related to the Scheduled Tribe status of the Lambadi community in Telangana.

About the Lambadi Tribe

Also known as Sugali or Banjara, the Lambadi tribe is primarily found in Telangana, Andhra Pradesh, and Karnataka. They speak Gor Boli (Lambadi), an Indo-Aryan language that does not have a written script. Most members of the community follow Hinduism, though several traditional animistic beliefs continue to influence their cultural practices.

Cultural Practices

Lambadi people celebrate Teej during the month of Shravan, when young unmarried girls pray for suitable life partners. Fire dance and Chari are prominent traditional dance forms. Tattooing is widespread within the community. Lambadi women are known for their distinctive attire, consisting of vibrant red dresses decorated with mirror work, along with ivory bangles and heavy ornaments.

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Kaladi – Traditional Dairy Product

Recently, the Union Minister of State for Science and Technology emphasised the need to upscale Kaladi, a traditional dairy product, for broader culinary applications.

About Kaladi

Kaladi is a popular delicacy of the Dogra cuisine, originating from the Udhampur district of Jammu and Kashmir. It has been awarded the Geographical Indication (GI) tag.

Preparation Method

Kaladi is prepared using raw full-fat milk, with whey water serving as a natural coagulant. The milk is vigorously churned in an iron vessel using a wooden plunger. Sour milk or curd, locally known as mathar, is then added to separate the milk solids. The cheese is stretched, flattened, cooled on the iron pot, and subsequently sun-dried. Due to the cool climate of Udhampur, Kaladi dries on the surface while remaining moist inside.

GI Tag Facts

Geographical Indications identify products that possess unique qualities linked to their place of origin. In India, GI registration is governed by the Geographical Indications of Goods (Registration and Protection) Act, 1999, and remains valid for ten years, subject to renewal.

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Parbati Giri – Freedom Fighter Remembered

The Prime Minister recently paid tributes to freedom fighter Parbati Giri on the occasion of her birth centenary, acknowledging her contribution to India's independence struggle.

About Parbati Giri

Known as the "Mother Teresa of Western Odisha" and revered as Banhi-Kanya (daughter of fire), Parbati Giri was born on 19 January 1926 in Samleipadar village of present-day Bargarh district. Inspired by Gandhian ideals from a young age, she actively participated in the Quit India Movement in 1942 at the age of sixteen. She also led protests urging lawyers to boycott British courts. After independence, she devoted her life to social service, working tirelessly for the poor and marginalised sections of society.

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Bagurumba Dance – Cultural Showcase

The Prime Minister recently witnessed a grand performance of the Bagurumba dance in Assam, involving participation by over 10,000 artistes from the Bodo community.

About Bagurumba Dance

Bagurumba is a traditional folk dance of the Bodo people, deeply inspired by nature. It symbolises peace, fertility, joy, and communal harmony and is commonly performed during festivals such as Bwisagu, the Bodo New Year, and Domasi. The dance is characterised by gentle, flowing movements that imitate butterflies, birds, leaves, and flowers. While women perform the dance, men play traditional musical instruments such as the kham, sifung, and other wooden percussion instruments.

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Bhadrakali Inscription – Historical Evidence

The Bhadrakali inscription, dating back to the 12th century, serves as an important historical record confirming the development of the Somnath Temple under the patronage of the Solanki dynasty.

Key Details

Located at Prabhas Patan in Gujarat, the inscription was carved in 1169 CE and is currently protected by the State Department of Archaeology. It eulogises Param Pashupata Acharya Bhavabrihaspati, the spiritual preceptor of King Kumarapala of Anhilwad Patan.

The inscription documents the legendary reconstruction of the Somnath Temple across four yugas and highlights the devotion of Solanki rulers and contemporary scholars toward temple patronage.

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Hatti Tribe – Festival and Social Structure

Recently, Boda Tyohar, the largest annual festival of the Hatti tribe, commenced in Himachal Pradesh with widespread participation.

About the Hatti Tribe

The Hattis derive their name from their traditional practice of selling produce in small markets known as haats. They inhabit the Himachal Pradesh–Uttarakhand border region, particularly along the Giri and Tons river basins. The community is organised into two major clans—Trans-Giri in Himachal Pradesh and Jaunsar-Bawar in Uttarakhand.

A unique feature of Hatti society is Jodidara, a form of polyandrous marriage that is legally recognised under Himachal Pradesh revenue laws. In 2023, the Hatti community in Himachal Pradesh was granted Scheduled Tribe status.

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Kathputli – Folk Art Tradition

Around 250 families in Jaipur continue to preserve Kathputli, one of Rajasthan's oldest folk art traditions.

About Kathputli

Kathputli is a traditional string puppet theatre, with puppets made of wood, cloth, thread, and wire. The art form derives its name from kath (wood) and putli (doll). The puppets, known for their elongated skirts and expressive faces, are manipulated using multiple strings.

Historically, Kathputli performances narrated stories of Rajput kings, warriors, folk heroes, and moral tales, blending music, humour, and social commentary.

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Rani Velu Nachiyar – Warrior Queen

The Prime Minister recently paid tribute to Rani Velu Nachiyar on her birth anniversary.

About Rani Velu Nachiyar

Rani Velu Nachiyar (1730–1796) was the queen of Sivaganga in present-day Tamil Nadu and is regarded as the first Indian queen to wage war against British colonial forces. Trained in martial arts and weaponry, she was also a polyglot scholar.

She forged strategic alliances with leaders such as Hyder Ali and organised a powerful army, including an exclusive women's battalion named Udaiyaal. Her commander, Kuyili, is remembered as the first woman martyr in Indian history.

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Thadou Tribe – Linguistic Revival

Prasar Bharati recently sought inputs from All India Radio, Imphal, for recruiting staff to resume live broadcasts in the Thadou language.

About the Thadou Tribe

The Thadou are an indigenous tribal community residing in the hill regions surrounding the Imphal Valley in Manipur. They are the second-largest tribal group in the state and also inhabit parts of Nagaland, Assam, Tripura, Mizoram, Meghalaya, and Delhi.

They speak Thadou and Chin, belonging to the Tibeto-Burman language family. Traditionally animistic, most Thadou people have now embraced Christianity. Their annual cultural celebration, the Hun-Thadou Festival, marks the arrival of the New Year.

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INTERNATIONAL RELATIONS

Responsible Nations Index (RNI)

India has launched the **Responsible Nations Index (RNI)** as a *first-of-its-kind global evaluative framework* that measures how nations behave responsibly toward their citizens, the environment, and the world community — shifting focus from conventional *power-centred metrics* to *responsibility-centred evaluation* of nationhood.

Purpose & Rationale — Why RNI?

- **Redefining success:** Traditional measures of national performance (GDP, military power, economic clout) do not capture whether nations act ethically, sustainably, inclusively and responsibly.
- **Ethical governance:** RNI emphasises *responsible exercise of power*, humane development and stewardship of shared global goods.
- **Global perception:** It seeks to *reframe global leadership* based on values and responsibilities rather than dominance or strength

Development & Institutional Backing

- **Developed under:** The **World Intellectual Foundation (WIF)** — a global, non-partisan think tank.
- **Academic partners: Jawaharlal Nehru University (JNU)** and **Indian Institute of Management (IIM) Mumbai** were key contributors to framework design and methodological rigour.
- **Launch Event:** Unveiled at the **Dr Ambedkar International Centre, New Delhi**, with former President Ram Nath Kovind as chief guest.

Framework —

The **Responsible Nations Index (RNI)** evaluates countries across **three core dimensions**:

1. **Internal Responsibility**
    - How governments protect **citizen dignity, justice, equality, inclusion, health and education**
    - Human rights and well-being outcomes
2. **Environmental Responsibility**
    - **Sustainable use of natural resources**
    - Climate action performance
    - Environmental stewardship
3. **External Responsibility**
    - Contribution to **global peace**
    - Multilateral cooperation and international stability
    - Commitment to shared global public goods

The RNI is operationalised through **seven dimensions**, **15 aspects** and **58 indicators** using internationally recognised datasets.

Coverage & Methodology

- **Countries covered: 154 countries** worldwide
- **Data sources:** Transparent, globally comparable data drawn from institutions such as **the World Bank, UN specialised agencies (WHO, ILO, FAO)** and **World Justice Project**.

- **Indicators:** Rule of law, corruption perception, human development outcomes, environmental performance, climate action commitments, peace and cooperation metrics.

Ranking — RNI 2026

Rank	Country
1	Singapore
2	Switzerland
3	Denmark
4	Cyprus
5	Sweden
16	**India**
Last	Central African Republic

- **India's performance:** India secured **16th rank** among 154 countries in the inaugural RNI, ahead of major powers such as the **United States (around 66th)** and **China (around 68th)** — signalling strong performance on responsibility metrics

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Venezuela regime change by the US - 'Donroe doctrine'

The US military intervention in Venezuela marks a turning point in international relations and the sovereignty of states.

- On **January 3, 2026**, the United States launched **Operation Absolute Resolve**, a high-precision military strike in Caracas that resulted in the capture of Venezuelan President **Nicolás Maduro** and his wife, Cilia Flores.
- The US framed this not as a "war" but as a **law-enforcement action**. Maduro was extracted to New York City to face trial for a 2020 indictment involving narco-terrorism and drug trafficking.
- While Maduro is in US custody, his Vice President, **Delcy Rodríguez**, was sworn in as Acting President. Interestingly, the US has signaled a willingness to work with her for "stability," rather than immediately installing the 2025 Nobel Peace Prize winner and opposition leader, María Corina Machado.

Venezuela - key facts

- Venezuela is a country situated in the northern part of South America.
- Its capital city is Caracas.
- It shares land borders with Colombia, Brazil and Guyana. It also has maritime borders with the US (puerto rico and virgin islands), Kingdom of Netherlands (Aruba, Curacao and Bonaire), France (Martinique and Gaudelope), United Kingdom (Montserrat), Grenada, Trinidad and Tobago, Saint Kitts and Nevis, Dominica, Dominican Republic, Saint Lucia, and Saint Vincent and the Grenadines.
- Venezuela has the largest proven oil reserves in the world, primarily in the belt of the Orinoco river.

It also has vast tropical grasslands called the Llanos and an important lake, Lake Maraicabo, famous for the unique meteorological phenomenon of 'Catatumbo lightning'.

The rationale:

- **The 'Donroe Doctrine' -** A portmanteau of "Donald" and "Monroe," this is an updated version of the 1823 **Monroe Doctrine**. It asserts that the Western Hemisphere is a sphere of exclusive US influence.
- The goal is to purge non-hemispheric competitors—specifically **China, Russia, and Iran**—from establishing military or strategic footholds in Latin America.
- The administration linked Maduro's regime directly to the fentanyl crisis and illegal migration "invasion," classifying Venezuelan gangs (like *Tren de Aragua*) as foreign terro
- rist organizations.

Impact:

- **On International Law:** This sets a controversial precedent where a superpower can unilaterally seize a sitting head of state on criminal charges without a formal declaration of war. Critics call it the "Putinisation" of US foreign policy.
- **Geopolitical Realignment: China and Russia** both condemned the act as "hegemonic." China's $60 billion+ investment in Venezuela is now at risk.
- **On India:**
    - **Energy Security:** If Venezuelan oil flows freely again, it could lower India's import bill and reduce dependence on Middle Eastern or Russian oil. Indian refineries are also well suited to process the 'heavy' crude oil that Venezuela produces.
    - **Strategic Balancing:** India must navigate its "Strategic Autonomy"—balancing its growing partnership with the US while upholding the principle of national sovereignty at the UN.

Way Forward

- **Transition to Democracy: The UN and regional bodies (OAS) are pushing for a roadmap to free elections to prevent the Rodríguez administration from simply becoming "Chavismo 2.0."**
- **Diplomatic De-escalation:** To prevent a broader regional conflict, neutral powers (possibly including India or Brazil) may need to mediate a transition that protects the interests of all stakeholders, including the domestic opposition.

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Bangladesh - India ties

In **January 2026**, the relationship between India and Bangladesh reached a significant diplomatic low. The twin issues of Bangladesh's withdrawal from the **T20 World Cup** and the closure of **visa offices** highlight a shift from the "Golden Era" of cooperation to a period of "Strategic Friction."

- **T20 World Cup Boycott:** On January 22, 2026, the Bangladesh government announced its team would **not travel to India** for the T20 World Cup (scheduled for Feb-March 2026). They have requested the ICC to relocate their matches to a neutral venue like Sri Lanka.
- **Visa Office Closures:** Bangladesh's interim government has suspended visa services at its missions in **New Delhi, Kolkata, and Agartala**, citing "security concerns" for their staff following protests near their premises.

- This follows the 2024 ouster of Sheikh Hasina and the subsequent rise of an interim administration led by Muhammad Yunus, amid a backdrop of heightened anti-India sentiment.
- **Internal Politics:** With national elections scheduled for **February 12, 2026**, the interim government and parties like the BNP are utilizing "Anti-India" rhetoric to consolidate nationalist domestic support.

Impact:

- **People-to-People Ties:** The suspension of visas effectively freezes medical tourism and education exchanges. Bangladeshis are the largest source of foreign tourists to India; this move hurts the Indian healthcare and hospitality sectors.
- **Economic Disruption:** While the **Friendship Pipeline** and electricity trade continue for now, prolonged diplomatic coldness threatens the finalization of the **CEPA (Comprehensive Economic Partnership Agreement)**.
- **Geopolitical Vacuum:** As ties with India fray, Bangladesh is visibly pivoting toward **China and Pakistan** (e.g., talks about procuring JF-17 Thunder aircraft), challenging India's "Neighbourhood First" policy.
- **Connectivity:** Projects like the Agartala-Akhaura rail link and the use of Chittagong/Mongla ports by India's Northeast could face operational hurdles.

Way Forward:

- **Post-Election Reset:** Both sides are likely waiting for the **February 2026 elections**. India must engage with all political stakeholders (including the BNP) to ensure its security interests (insurgency in the NE) are protected regardless of who is in power.
- **Track-II Diplomacy:** Using non-governmental channels, former diplomats, and business leaders to restore trust and separate "cricket and visas" from core strategic cooperation.
- **Multilateral Safeguards:** Re-engaging through **BIMSTEC** to depoliticize regional connectivity and energy grids.

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Gaza Board of Peace

- **The Board of Peace is** an intergovernmental body established to oversee Gaza's post-war transition, reconstruction, and security. It was formally endorsed by **UNSC Resolution 2803 (2025)** but operates as a US-led, invitation-only organization.
- On **January 18, 2026**, President Trump invited Prime Minister Modi to join the Board, alongside leaders from approximately 60 other nations including Egypt, Saudi Arabia, and even Pakistan.
- **Structure:**
    - **Chair:** US President Donald Trump.
    - **Leadership:** Includes figures like Marco Rubio (US Secy of State), Tony Blair, and World Bank President Ajay Banga.
    - **Executive Arm:** The **National Committee for the Administration of Gaza (NCAG)**, a 15-member body of Palestinian technocrats responsible for day-to-day civil administration.

The rationale:

- **Beyond the UN:** The US administration is framing the Board as a "nimble and effective" alternative to the UN, which it views as bogged down by bureaucracy and anti-Israel bias.

- **Sustainable Reconstruction:** Gaza's rebuilding is estimated to cost **$70 billion**. The Board aims to mobilize private capital and billionaire-led investment rather than relying solely on state aid.
- **Security & Demilitarization:** Phase II demands the **full disarmament of Hamas** and the deployment of an International Stabilization Force (ISF) to replace the IDF in "buffer zones."

Key Changes & Notified Terms

- **The "Membership Fee":** A controversial draft charter proposes that while 3-year terms are free, permanent membership on the Board requires a **$1 billion contribution** to the Gaza reconstruction fund.
- **Strategic Portfolio:** Each member state will oversee a specific "portfolio" (e.g., healthcare, education, or high-tech infrastructure), moving away from the "donor-only" model to a "project-manager" model.
- **Veto Power:** The Chair (US President) retains significant authority over membership renewals and final approval of the Board's decisions.

Impact:

- **On India's Standing:** The invitation acknowledges India as a "stabilizing power" in the Global South. However, joining a non-UN body to govern a foreign territory is a departure from India's traditional foreign policy.
- **Geopolitical Rivalry:** Russia and China have reacted cautiously. While Putin expressed interest in joining (on the condition of unfreezing Russian assets), France and the UK have raised concerns about the Board undermining UN authority.
- **Internal Friction:** In India, political opposition (including Left parties) has warned that joining would be a "betrayal" of the Palestinian cause and India's commitment to a sovereign Two-State solution.

India's Dilemma & Way Forward

- **The "Abstention" (Current Status):** As of **January 29, 2026**, India has **abstained** from signing the charter at Davos. New Delhi is "mulling over" the invitation, prioritizing consultations with the **Arab League** (meeting on Jan 30-31) before making a final call.
- **Redline on Troops:** India has already made it clear that it will **not contribute ground troops** to the International Stabilization Force (ISF) unless it is under a direct UN mandate.
- **This issue** highlights the tension between India's **Strategic Autonomy** (staying independent of US-led blocs) and its **Global Ambitions** (wanting a seat at the table where the new world order is being written).

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The Iran Crisis, and impact on India's basmati sector

- Iran is currently gripped by its largest protests in decades, which began in late December 2025. Sparked by **economic grievances** (inflation near 60%), water/energy shortages, and political repression, the movement has faced a severe state clampdown.
- President Trump (re-elected 2024) has set "red lines" regarding the killing of protesters and mass executions. As of late January 2026, a U.S. naval "armada" is positioned in the Indian Ocean.

- In early January 2026, the U.S. announced a **25% secondary tariff** on any country doing business with Iran. This policy aims to isolate Iran completely by making trade with it a "liability" for nations that also value the U.S. market.

Reasons for the Crisis

1. **Economic Mismanagement:** Long-term neglect of infrastructure and a weakening rial (now ~1.4 million per USD) have destroyed purchasing power.
2. **Secondary Sanctions Diplomacy:** The U.S. is using the **International Emergency Economic Powers Act** to force third countries (like India, China, and Turkey) to choose between the Iranian and U.S. markets.
3. **Regime Survival:** The Iranian state views the protests as foreign-engineered "terrorism," leading to an internet shutdown and a militarized response to maintain control.

Implications

A. For Indian Basmati Exporters

- Iran is India's top Basmati destination (approx. 30% of exports), and the crisis is expected to hit these exports.
- With shipments halted, a domestic glut has caused prices for varieties like **1121 and 1509** to drop by 10–15% in Indian *mandis*.
- Indian rice already faces high duties in the U.S. (increased to 50% recently). The threat of an *additional* 25% tariff on all U.S.-bound Indian exports (due to Iran trade) creates a massive "compliance fear" among large corporate exporters.

B. Geopolitical & Strategic

- **Chabahar Port:** India's strategic gateway to Central Asia is under pressure. While it often enjoys "humanitarian carve-outs," the 25% tariff threat discourages private insurers and shippers from using the route.
- **Energy Diversification:** Continued instability in Iran forces India to lean further into the U.S.-led energy orbit or double down on Russian crude, further complicating its "Strategic Autonomy."

The Way Forward

- **Market Diversification:** The Indian Rice Exporters Federation (IREF) is advising an immediate shift toward **West Asia (Saudi/UAE), Africa, and the EU** to cushion the loss of the Iranian market.
- **Rupee-Rial Mechanism 2.0:** Exploring a more robust non-dollar trade settlement mechanism to bypass U.S. financial "toll booths," though this remains difficult under secondary tariffs.
- **Diplomatic Negotiation:** India must leverage its "Global South" leadership to negotiate specific waivers for essential agri-commodities (food security exceptions) under the U.S. tariff regime.
- **Domestic Support:** Providing credit guarantees or liquidity support to Basmati farmers and millers to prevent a total collapse of farm-gate prices during the 2026 harvest season.

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Trump's bid for Greenland and its impact on NATO

- Following his 2024 re-election, President Trump intensified his first-term proposal to purchase Greenland from the Kingdom of Denmark. He framed the acquisition as a "national security necessity" rather than a mere real estate deal.
- Greenland sits within the **GIUK Gap** (Greenland-Iceland-UK), a naval "choke point" vital for monitoring Russian submarine activity and controlling Arctic shipping lanes as polar ice melts.
- The U.S. seeks Greenland as a critical hub for its **"Golden Dome"**—a proposed multi-layered missile defense system designed to intercept hypersonic and ballistic threats from Russia and China.

Reasons for the Push

- **Resource Independence:** Greenland holds massive untapped deposits of **Rare Earth Elements (REEs)**, uranium, and zinc. Controlling these would break China's current monopoly on minerals essential for high-tech and defense industries.
- **Arctic Security Vacuum:** The U.S. administration argues that Denmark (with a small military) cannot adequately protect the island from Russian "hybrid warfare" or Chinese "Polar Silk Road" economic incursions.
- **Expansionist Policy:** Part of a broader shift in U.S. foreign policy (post-2024) toward "territorial expansion" and reasserting U.S. hegemony in the Western Hemisphere.

Implications

Impact on NATO & Europe

- **Existential Threat to NATO:** The crisis reached its peak in early **January 2026**, when the U.S. threatened a **25% tariff** on EU goods and refused to rule out military force. Allies argued that U.S. coercion against another NATO member (Denmark) fundamentally breaks **Article 5** (Collective Defense).
- **European Strategic Autonomy:** The threat galvanized European leaders (led by Germany and France) to accelerate plans for a "European Defense Union" independent of U.S. command.
- **Danish Resistance:** Denmark and Greenlandic leaders have repeatedly stated "Greenland is not for sale," emphasizing the right to **self-determination** for the 57,000 predominantly Inuit residents.

For India & the Global South

- **Normative Shift:** If a superpower successfully coerces a smaller nation into ceding territory, it sets a dangerous precedent for other disputed regions (e.g., South China Sea).
- **Arctic Council Stability:** The crisis risks paralyzing the Arctic Council, where India holds **Observer Status** and has interests in scientific research and sustainable resource extraction.

4. The Way Forward

- **The "Framework Deal" (Jan 21, 2026): At the Davos World Economic Forum, a temporary de-escalation was reached between Trump and NATO Secretary-General Mark Rutte.**
- **Cooperation over Ownership:** The U.S. shelved tariff threats in exchange for a "concept" of increased military access and joint mineral development, without a formal change in sovereignty.
- **Arctic Sentry Mission:** Proposed establishment of a permanent NATO mission in Greenland (modeled on the Baltic Sentry) to address U.S. security concerns while respecting Danish sovereignty.

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India germany ties - visit by German Chancellor and signing of key pacts

In January 2026, India and Germany deepened bilateral ties through a suite of strategic agreements signed during **German Chancellor Friedrich Merz's official visit to India** (12–13 January).

The two sides inked around **19 pacts and memoranda of understanding (MoUs) to strengthen collaboration across multiple sectors**, including defence industrial cooperation, trade facilitation, skills and mobility, and green energy initiatives.

Impacts:

1. **Defence and security:** The talks advanced a **$8 billion+ submarine production agreement** under **Project-75I**, involving construction of six advanced conventional submarines equipped with **Air-Independent Propulsion (AIP)** in India with German technology transfer — a milestone in defence industrial cooperation. This supports India's **naval modernisation and strategic autonomy** while reducing dependence on traditional suppliers.
2. **Economic and technological ties:** Agreements on **joint defence R&D, co-production, and advanced technologies** such as **green hydrogen, semiconductors, and AI** signify deepening industrial linkages. These pacts can boost India's participation in global value chains.
3. **People-to-people connectivity:** Visa facilitation and mobility initiatives aim to enhance **academic, research and skill exchanges** between the two countries.
4. **Geopolitical alignment:** Enhanced cooperation reinforces India's **Indo-Pacific strategic outreach** while offering Germany an Asian partnership balancing rising global tensions.

Way Forward:

- **Ratification and Implementation:** Ensure **timely ratification** and operationalisation of agreements, particularly defence and industrial pacts.
- **Technology Transfer:** Focus on **effective transfer of critical technologies** with intellectual property safeguards.
- **Diversified Supply Chains:** Use these partnerships to build **resilient supply chains** in defence and high tech, reducing over-dependence on single sources.
- **Multilateral Coordination:** Align bilateral deals with broader **EU-India cooperation**, including the recently concluded EU-India Free Trade Agreement, for synergistic economic outcomes.

Closer ties between Germany and India reflect a **pragmatic response amidst global turbulence** - as seen in erratic ties with the US, and a need to diversify away from Chinese supply chain dominance. It stands testament to India's evolving strategy of **multi-alignment and equi-closeness** as a hedge against geopolitical headwinds.

India - EU FTA signed

The **India-European Union Free Trade Agreement (FTA)**, often termed the **"mother of all deals,"** was concluded at the **India-EU Summit on 27 January 2026** after nearly **two decades of negotiations**.

It seeks to create a **comprehensive free trade zone** covering a market of around **2 billion people and about 25% of global GDP**, by progressively **reducing tariffs and non-tariff barriers** on goods and services between India and the EU.

The pact was formally announced by **Prime Minister Narendra Modi** and **EU leaders**, although it still requires **legal scrubbing and ratification** by the **European Parliament, EU member states and India's domestic procedures** before coming into force.

Benefits:

1. **Trade & Market Access:** India will gain **preferential access for over 99% of its exports by value** to the EU market; the EU will similarly receive broader access to India's market. Immediate duty cuts and phased tariff reduction will benefit sectors like **textiles, leather, spices, gems & jewellery, and marine products**.
2. **Tariff Reductions:** Tariffs on many EU products (e.g., cars, wines, spirits) will be significantly cut over time, with quota systems to protect sensitive Indian industries initially.
3. **Investment & Services:** The deal includes commitments on **services, investment, mobility for skilled professionals** and enhanced cooperation on **regulatory issues**.
4. **Strategic & Geopolitical:** It strengthens **India-EU economic ties**, diversifies India's trade partnerships beyond traditional partners, and comes amid **global trade tensions**. However, it has drawn **criticism from the US** citing competitive disadvantages

Way Forward:

1. **Ratification & Implementation:** Complete legislative and procedural approvals promptly in both India and the EU to enable entry into force, likely within **2026–27**.
2. **Domestic Adjustment:** Indian industries need **capacity upgrades, compliance frameworks and quality standards** to fully leverage market access, especially in manufacturing and services.
3. **Regulatory Alignment:** Harmonise standards (labour, environment, digital trade) to reduce non-tariff barriers and attract **EU investments**.
4. **Support for Vulnerable Sectors:** Formulate **transition assistance and safety nets** for sectors adversely affected by increased competition, especially SMEs and agriculture.

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India - UAE meet - key outcomes

In **January 2026**, India and the **UAE** strengthened their **comprehensive strategic partnership** during UAE President **Sheikh Mohamed bin Zayed Al Nahyan's visit** to New Delhi. Key agreements were signed to deepen **defence cooperation, energy ties, and trade relations**, including a **long-term LNG deal** and ambitious **bilateral trade targets**.

Key Outcomes & Impacts:

1. **Defence cooperation:** India and UAE formalised a **Strategic Defence Partnership** covering **joint exercises, technology sharing, cybersecurity, and special operations**, enhancing **Indo-Pacific and Gulf security linkages**.

2. **LNG deal:** A **$3 billion, 10-year LNG supply agreement** ensures India receives **0.5 million tonnes per year** starting 2028, strengthening **energy security** and supporting a **clean energy transition**.
3. **Trade targets:** Both nations aim to **double bilateral trade to USD 200 billion by 2032**, expanding collaboration in **goods, services, MSMEs, digital trade, and investments**, boosting economic integration

Way Forward:

1. Operationalise defence agreements through **joint exercises and tech partnerships**.
2. Promote **export growth** and address trade imbalances to meet the **$200 billion target**.
3. Leverage UAE relations to **diversify India's energy portfolio**, including **LNG, renewables, and hydrogen**.
4. Align efforts with **multilateral platforms** like **G20 and I2U2** for regional stability and strategic influence.

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US Exit from 66 Global Pacts/Organizations

In **January 2026**, the U.S. announced its withdrawal from **66 international organizations and treaties**, including **31 UN bodies** and **35 non-UN entities**, under the **"America First" policy**. The decision targets groups addressing **climate change, health, development, human rights, migration, and multilateral cooperation**, which Washington deemed **contrary to national interests**. The move follows an executive review initiated in **2025** evaluating U.S. participation in global institutions.

Impacts:

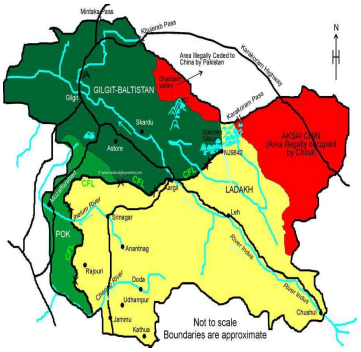
1. **Global governance:** Weakens U.S. influence in shaping international norms and responses to transnational challenges.
2. **Climate action:** Exits from climate bodies, including UNFCCC-linked institutions, undermine coordinated global climate efforts.
3. **Health and development:** Withdrawal from agencies like WHO threatens pandemic preparedness, disease surveillance, and aid coordination.
4. **Diplomatic influence:** Reduced U.S. engagement may create vacuums in trade standards, migration policy, and democracy promotion, allowing other powers like China to gain influence.

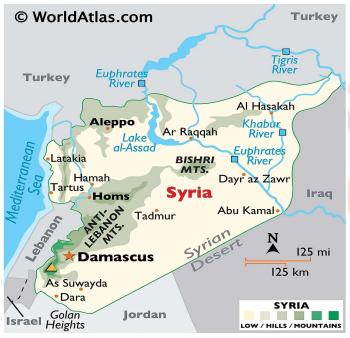
Way Forward for India:

1. Strengthen **multilateral engagement** in UN, WHO, and climate frameworks.
2. Take a **leadership role in Global South** to fill U.S. gaps.
3. Build **resilient coalitions** with EU, Japan, and Africa.
4. Promote **strategic autonomy** while advocating reforms in international institutions.

News in shorts

Issue	Details
India's assertion over Shaksgam valley	• Shaksgam Valley (also called Trans-Karakoram Tract) is part of the former princely state of Jammu & Kashmir and is **legally claimed by India**. • It lies **north of the Karakoram Range**, bordering Xinjiang

	(China) and Gilgit-Baltistan (Pakistan-occupied). • In **1963**, Pakistan illegally ceded about **5,180 sq km** of this territory to China under the **Sino-Pakistan Boundary Agreement**, which India rejects as **null and void**. • India maintains that Pakistan had **no locus standi** to transfer Indian territory, making Chinese presence there **illegal** under international law.
Pax Silica	• The **PAX Silica Initiative** is a **U.S.-led strategic partnership** launched in **December 2025** to secure resilient, trusted supply chains for **silicon, critical minerals, semiconductors, AI infrastructure, and advanced technologies**. It seeks to **reduce coercive dependencies** (especially on China) and promote cooperation across the technology value chain. • **Founding signatory members** include **United States** (lead), **Japan, Republic of Korea, Singapore, Israel, United Kingdom, Australia, Qatar, United Arab Emirates (UAE), Netherlands** (participating). The grouping is **non-treaty and voluntary** and focuses on collaboration rather than binding obligations.
China aggressive posturing on taiwan 	• In late December–early January, China conducted **large-scale military drills around Taiwan**, including simulated blockades and heightened PLA air/naval activity as part of its ongoing strategy to pressure Taipei. • China considers Taiwan a breakaway province under the One China Policy and has intensified military, diplomatic and economic pressure to assert its claim. • China opposes any **foreign engagement with Taiwan**, especially by the **US**, citing violation of sovereignty.
Myanmar elections scheduled	• Myanmar's **multi-phase general election** — the first since the **2021 military coup** — is being held between December 2025 and January 2026. • The polls are conducted under the **2008 military-drafted constitution** and organised by the **military-appointed Union Election Commission**.

	• Major opposition parties like the **National League for Democracy (NLD)** are **dissolved or boycotting**, and voting is excluded in many conflict-affected areas; critics label the elections a **sham aimed at legitimising military rule** amid ongoing civil war.
Somaliland dispute 	• **Somaliland** is a **self-declared republic** in the **Horn of Africa** that proclaimed independence from **Somalia in 1991**, following state collapse. • Though it has its **own government, currency and elections**, it lacks **international recognition** and is legally considered part of Somalia. • The dispute resurfaced after a **2024 MoU between Somaliland and Ethiopia**, granting Ethiopia **sea access** in return for possible recognition. • Somalia termed it a **violation of sovereignty**, escalating regional tensions.
Syria - fighting between Syrian government and Kurds 	• The Kurds are a stateless ethnic group spread across Turkey, Syria, Iraq and Iran, with a distinct language and identity. • In Syria, Kurds are mainly represented by the Syrian Democratic Forces (SDF) and YPG. The conflict centres on northeastern Syria (Rojava). • Syria borders **Turkey (north), Iraq (east), Jordan (south), Israel (south-west), Lebanon (west)** and the **Mediterranean Sea**. Key features include the **Euphrates River**, **Golan Heights**, **Anti-Lebanon Mountains**, **Syrian Desert**, and a narrow **Mediterranean coastal plain**.
Yemen conflict - cracks in the Saudi Arabia and UAE coalition	• The **Yemen conflict** began in **2014** when the **Iran-backed Houthi rebels** seized the capital **Sana'a**, ousting the internationally recognised government. • Saudi Arabia and the UAE intervened in **Yemen in 2015** against the **Houthi rebels**, but later developed **diverging interests**. • Saudi Arabia supports the **internationally recognised Yemeni government**, aiming to counter **Iranian influence**

	and secure its southern border. • The UAE backs **southern separatist forces**, especially the **Southern Transitional Council (STC)**, seeking control over **ports and strategic coastlines**. • This led to **intra-coalition clashes** despite a common anti-Houthi stance.
India pakistan exchange nuclear installations list	India and Pakistan annually exchange a **list of nuclear installations and facilities** on **1 January** under the **Agreement on the Prohibition of Attack against Nuclear Installations and Facilities (1988)**, in force since **1991**. The list includes **nuclear power plants, research reactors, fuel fabrication, enrichment and reprocessing facilities**. The pact prohibits attacks on these sites during peace or conflict and is a key **confidence-building measure (CBM)** aimed at reducing nuclear risks and enhancing **strategic stability** in South Asia.
Taliban diplomat to take charge of Afghan embassy	In **January 2026**, **Mufti Noor Ahmad Noor**, a senior Taliban foreign ministry official, **arrived in New Delhi to take charge as *Charge d'Affaires*** at the **Afghanistan Embassy**. This marks the **first Taliban-appointed diplomat** to lead the mission since the Taliban took power in 2021, though **India has not formally recognised the Taliban government**. India allowed the posting following talks with Afghan leaders, signalling **pragmatic engagement** despite non-recognition. The envoy has held meetings with Indian officials on **visa facilitation and bilateral ties**.

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SECURITY

MHAs' new SOP for cyber financial frauds

*The **Ministry of Home Affairs (MHA)** has approved a **Standard Operating Procedure (SOP)** under the **National Cybercrime Reporting Portal (NCRP)** to strengthen the response to **online financial fraud**, especially to **expedite refund of defrauded funds** — with special focus on cases below **₹50,000**.*

Key Features of the New SOP

1. Swift Refund Mechanism

- **Small-value cyber frauds (below ₹50,000)** can be **refunded directly** to victims **without a court order**.
- This removes procedural delays and court backlog issues in low-value cases.

2. Mandatory Unfreeze Rule

- If **no court/restoration order** exists, **banks must lift freeze** on funds within **90 days** of a cybercrime complaint.
- Prevents indefinite blocking of accounts and financial hardship for victims.

3. Uniform Process Across Financial Intermediaries

- The SOP prescribes a **standardised operational framework** for:
  - **Banks**, payment aggregators
  - **NBFCs**, stock trading apps
  - **E-commerce platforms**, mutual fund houses
- Ensures consistent action once a transaction is flagged as suspicious.

4. Grievance Redressal and Escalation Structure

- A **three-tier escalation mechanism** is prescribed to resolve disputes quickly and transparently.
- A **grievance redressal module** will be developed under the NCRP.

5. Money Restoration Module

- Under development within the National Cybercrime Reporting Portal to facilitate **rapid restitution** of defrauded funds.
- Cooperates with banks and law enforcement to operationalise refund flows.

National Cybercrime Reporting Portal (NCRP) Framework

- Launched to serve as a **central reporting platform** for **all cybercrime categories**, including financial fraud.
- Supports filing & tracking *online complaints* and works with the **Indian Cybercrime Coordination Centre (I4C)**.
- Integrated with toll-free helpline **1930** for complaint registration and assistance.

Current Relevance & Ecosystem Impact

Rising Online Financial Fraud

- Over the last six years, Indians have lost **₹50,000+ crore** to cyber frauds.
- Digital payment adoption & cybercrime sophistication have increased reporting and victimisation rates.

- **Victim-Centric Digital Governance**
  - The SOP shifts cybercrime response from a *procedural/formalistic model* to a **victim-centric, time-bound mechanism**.
  - Reduces reliance on judiciary for low-value disputes; aligns with **Ease of Living & Consumer Protection**.
- **Strengthening Digital Public Infrastructure (DPI)**
  - NCRP & its modules enhance the **digital safety net** essential in a rapidly digitising economy.
  - Improves institutional collaboration among **banks, law enforcement, tech intermediaries and regulators**.
- **Internal Security & Trust in Digital Finance**
  - Cyber financial frauds pose a threat to **internal security**, consumer confidence, and payment system integrity.
  - SOP strengthens the policy response by integrating **law enforcement coordination (I4C)** with **financial intermediaries**.
- **Challenges & Implementation Gaps**
  - Financial intermediaries' compliance capacity may vary, especially among **small NBFCs and fintechs**.
  - Clear evidence and dispute resolution standards will be required to avoid misuse or errors.
  - Monitoring whether **90-day unfreeze** is implemented uniformly will be critical.

Snapshot

Feature	**Detail**
Portal	**National Cybercrime Reporting Portal (NCRP)**
Helpline	**1930**
SOP Threshold for court-free refund	**₹50,000**
Unfreeze mandate	**90 days** if no court order
Managing body	**Indian Cybercrime Coordination Centre (I4C)** under MHA

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INS Vagsheer

President **Droupadi Murmu** recently undertook a submarine sortie onboard **INS Vagsheer**, becoming only the **second Indian President** to do so. The sortie was conducted from the **Karwar Naval Base**, highlighting India's growing underwater naval capabilities.

About INS Vagsheer

- INS Vagsheer is the **sixth and final submarine of the first batch** of **Kalvari-class (Scorpene-class)** submarines inducted under **Project-75**.
- The submarine derives its name from the **sandfish**, a formidable deep-sea predator found in the Indian Ocean.
- It was **commissioned into the Indian Navy on 15 January 2025**.
- With its induction, the complete first batch now includes:
  - INS Kalvari (Dec 2017)
  - INS Khanderi (Sep 2019)

- INS Karanj (Mar 2021)
- INS Vela (Nov 2021)
- INS Vagir (Jan 2023)
- INS Vagsheer (Jan 2025)

- All submarines of this class have been **constructed in India by Mazagon Dock Shipbuilders Limited** with **technology transfer from France**, marking a major milestone in defence indigenisation.

Key Features of INS Vagsheer

- Equipped with **advanced stealth capabilities**, including low radiated noise levels and an optimised hydrodynamic hull design, making it among the **quietest conventional submarines globally**.
- Measures **67.5 metres in length**, can achieve **20 knots speed while submerged**, and can dive to depths of **over 350 metres**.
- Designed for long deployments, it has an **endurance of up to 50 days at sea**.
- Armed with **torpedoes, anti-ship missiles, and mine-laying systems**, enabling it to perform:
  - Anti-surface warfare
  - Anti-submarine warfare
  - Intelligence gathering and surveillance missions
- Incorporates several **indigenously developed systems**, including:
  - Air-conditioning plant
  - Internal communication network
  - Ku-band SATCOM system
- Crew capacity includes **8 officers and 35 sailors**, and the submarine is fitted with an **anti-torpedo countermeasure system** for enhanced survivability.

In Essence

INS Vagsheer represents a significant leap in India's **underwater combat and deterrence capability**. Its commissioning completes the first phase of Project-75 and reinforces the Indian Navy's focus on **stealth, endurance, and indigenous defence manufacturing**, critical for securing India's maritime interests.

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Runway Upgrade at Car Nicobar Air Base

The **Chief of Defence Staff** recently inaugurated a **major runway upgradation** at the Indian Air Force air base located on **Car Nicobar Island**, significantly enhancing India's strategic and operational capabilities in the eastern Indian Ocean region.

About Car Nicobar Island

Car Nicobar Island is a strategically important island forming part of the **Nicobar district** in the **Andaman and Nicobar Islands**.

Location and Geographical Setting

- It is the **northernmost island of the Nicobar group**.
- Situated **south of Little Andaman** and **north of Nancowry Island**.
- The **Ten Degree Channel** lies to its north, separating the **Andaman Islands** from the **Nicobar Islands**.

Area and Population

- Covers an area of **less than 127 sq. km**.
- Despite its small size, it accommodates **nearly half of the Nicobar district's population** (around **17,800 as per the 2011 Census**).
- Serves as the **district headquarters of Nicobar**.

Physiography and Geology

- The island is **largely flat**, with **cliffs along the northern coast** and **low hillocks in the interior**.
- Surrounded by **silvery beaches** and flat terrain composed mainly of **coralline diluvium** deposits.

Climate

- Experiences a **tropical monsoon climate**, owing to its proximity (about **9° north**) to the equator.
- Receives an **average annual rainfall of around 400 mm**.

Vegetation and Land Use

- Unlike the central and southern Nicobar Islands, **evergreen forests are absent**.
- The landscape is dominated by **coconut plantations**.
- Natural vegetation is largely restricted to the **interior parts** of the island.

People and Culture

- Primarily inhabited by the **Nicobarese tribal community**, classified as a **Scheduled Tribe**.
- The indigenous population follows a distinct cultural and social system adapted to island ecology.

Biodiversity Significance

- Designated as an **Important Bird Area (IBA)** by **BirdLife International**, highlighting its avian diversity and conservation value.

Impact of the 2004 Tsunami

- Car Nicobar was **severely affected by the 2004 Indian Ocean earthquake and tsunami**.
- Located about **750 km from the earthquake epicentre**, the island still experienced **intense tsunami waves**, resulting in large-scale **loss of life and infrastructure damage**.

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SCIENCE AND TECHNOLOGY

President Attended SOAR Programme and Awarded AI Skill Certificates

The President of India recently graced the Skilling for AI Readiness (SOAR) programme, where certificates were conferred on students and educators trained in artificial intelligence.

About Skilling for AI Readiness (SOAR)

Skilling for AI Readiness (SOAR) is a nationwide capacity-building initiative launched in July 2025 under the Skill India Mission. It is implemented by the Ministry of Skill Development and Entrepreneurship (MSDE) with the objective of integrating artificial intelligence competencies into India's education and skilling ecosystem.

The programme focuses on equipping school students from Classes 6 to 12, along with teachers from both government and private institutions, with essential AI knowledge and digital skills to prepare them for future-ready careers.

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Battery Pack Aadhaar System — Draft Guidelines Released

The Government of India has issued draft guidelines for the Battery Pack Aadhaar System to strengthen battery lifecycle management.

The system is an indigenously developed digital identification and data storage framework.

It aims to ensure complete end-to-end traceability of batteries from manufacturing to final disposal.

Each battery pack will be assigned a unique identification number containing lifecycle data from raw material extraction to recycling.

The system will be mandatory for:

- Electric Vehicle (EV) batteries
- Industrial batteries with a capacity exceeding 2 kWh
- The digital record will be maintained as an electronic Battery Pack Aadhaar.

The initiative will facilitate:

- Second-life usage of batteries
- Improved regulatory compliance
- Efficient and environmentally responsible recycling

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India's Rise in WHO Pharmacovigilance Contributions

India climbed to the 8th position in 2025, a major improvement from its 123rd rank in 2014, in contributions to the World Health Organization's global pharmacovigilance database.

The ranking reflects India's participation under the WHO Programme for International Drug Monitoring (WHO PIDM).

This sharp rise has been attributed to the strengthened implementation of the Pharmacovigilance Programme of India (PvPI).

PvPI, launched in 2010, serves as the Government of India's flagship drug safety surveillance initiative.

The programme monitors adverse drug reactions, evaluates safety data, and forwards regulatory recommendations to the Central Drugs Standard Control Organisation (CDSCO) for necessary action.

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Centre Relaxes Eligibility Norms for Deep-Tech Startups under DSIR Scheme

The Central Government has eased eligibility conditions for deep-tech startups seeking financial support from the Department of Scientific and Industrial Research (DSIR).

The earlier requirement of a minimum three-year operational existence has been removed.

This move allows early-stage deep-tech startups to qualify for recognition and funding under DSIR's Industrial R&D Promotion Programme (IRDPP).

The decision aims to boost innovation and accelerate research-driven entrepreneurship in high-technology sectors.

Industrial R&D Promotion Programme (IRDPP)

The IRDPP is a flagship initiative of DSIR focused on strengthening research and development infrastructure in:

- Industrial enterprises
- Scientific and Industrial Research Organisations (SIROs)

Organisations recognised under the scheme become eligible for:

- Fiscal incentives
- Government support measures
- R&D facilitation benefits

What is Deep Tech?

Deep tech refers to advanced and disruptive technologies rooted in breakthrough scientific research and engineering innovation.

These technologies are typically research-intensive and require long-term development.

Key examples include:

- Artificial Intelligence (AI)
- Quantum computing
- Nanotechnology
- Blockchain
- Robotics
- Advanced material sciences

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OSIRIS-REx Mission and Asteroid Bennu Findings

Analysis of samples brought back by NASA's OSIRIS-REx mission from asteroid Bennu has revealed the presence of:

- Sugars

- Amino acids
- All five nucleobases essential for DNA and RNA

These findings indicate a complete molecular toolkit required for the origin of life, strengthening theories about extraterrestrial sources of life-building compounds.

About OSIRIS-REx Mission

OSIRIS-REx (Origins, Spectral Interpretation, Resource Identification and Security–Regolith Explorer) is the first U.S. mission to collect samples from an asteroid.

The mission successfully returned a capsule containing material from asteroid Bennu on 24 September 2023.

After completing its primary mission, the spacecraft was renamed OSIRIS-APEX.

It has been redirected to study asteroid Apophis during its close Earth flyby in 2029.

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HPCL Commissions Residue Upgradation Facility in Andhra Pradesh

Hindustan Petroleum Corporation Limited (HPCL) has commissioned a modern esidue Upgradation Facility (RUF) in Andhra Pradesh.

The facility has a processing capacity of 3.55 million metric tonnes per annum (MMTPA).

It uses advanced residue hydrocracking technology to upgrade heavy petroleum residues into valuable fuel products.

The project is being described as a landmark achievement in indigenous refinery engineering and technology development.

Hydrocracking Technology

Hydrocracking is a catalytic refining process widely used in petroleum refineries.

It converts heavy crude oil fractions into high-value, lighter petroleum products.

The main outputs include:

- Diesel
- Naphtha
- Liquefied Petroleum Gas (LPG)

The process works by breaking down large, complex hydrocarbon molecules into smaller and cleaner fuel compounds.

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Indian Scientists Simulate the Mpemba Effect Using Supercomputers

Indian researchers have developed the world's first supercomputer-driven simulation to successfully model the Mpemba effect.

The breakthrough provides a deeper scientific understanding of a long-standing thermodynamic puzzle.

About the Mpemba Effect

The Mpemba effect is a well-known physical paradox in which a hotter substance can freeze faster than a colder one under specific conditions.

It was most famously observed in water, but the phenomenon is not limited to water.

The effect has also been identified in other materials and physical systems.

Studying the Mpemba effect has important implications for:

- Heat engine efficiency
- Refrigeration technology
- Quantum computing research
- Advanced materials science

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Study on Stellar Twins Offers New Insights into Binary Star Evolution

A recent study examined a class of stellar twins known as W Ursae Majoris (W UMa) contact binaries.
These systems consist of two closely orbiting stars that share a common atmosphere.
Stellar twins are defined as pairs of stars having identical spectral characteristics.

Key Findings

- W UMa stars are short-period, dumbbell-shaped binary systems.
- The stars remain in physical contact and behave as natural laboratories for studying stellar properties.

The study revealed:

- Changes in orbital patterns
- Mass transfer between the two stars
- Evidence of surface activity such as star spots
- These observations provide valuable clues about the evolution and eventual fate of binary star systems.

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ISRO's Indigenous Dust Detector Spots Interplanetary Dust Impacts Near Earth

ISRO's first indigenously developed dust detection instrument has recorded interplanetary dust particles striking near Earth at intervals of roughly every 1,000 seconds.
The findings mark a significant milestone in India's space instrumentation and planetary science capabilities.

About Dust Experiment (DEX)

The Dust Experiment (DEX) is India's first home-grown instrument designed to detect and analyse high-velocity interplanetary dust particles.
Interplanetary dust particles (IDPs) are microscopic debris originating from:

- Comets
- Asteroids

The instrument was deployed aboard the PSLV Orbital Experimental Module (POEM) during the PSLV-C58 mission.
DEX has been developed by the Physical Research Laboratory (PRL), Ahmedabad.

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India Leads the World in Commercial Bio-Bitumen Production

India has achieved a global first by becoming the world's first country to commercially manufacture bio-bitumen for use in road construction, marking a major milestone in sustainable infrastructure development.

What is Bio-bitumen?

Bio-bitumen is an eco-friendly alternative to conventional bitumen, produced using organic materials such as agricultural residue, lignin, bio-char, and bio-oil. Traditional bitumen, on the other hand, is a black, sticky substance derived from the distillation of crude oil and is widely used for its strong binding properties in road construction.

Why is it important?

The adoption of bio-bitumen offers several advantages. It helps reduce India's dependence on crude oil imports, provides a productive solution to the problem of stubble burning, and strengthens the country's growing bio-economy. Bio-bitumen can either be blended with conventional bitumen or used to reduce the overall quantity of petroleum-based binder required.

Where is it used?

Bio-bitumen is primarily used in road paving and waterproofing applications, contributing to greener and more sustainable construction practices.

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India Set to Introduce Vehicle-to-Vehicle Communication Technology

India is preparing to roll out Vehicle-to-Vehicle (V2V) communication technology, as announced by the Union Minister for Road Transport and Highways. The move is expected to significantly enhance road safety and usher in a new era of intelligent transportation systems.

What is V2V Communication?

Vehicle-to-Vehicle communication is an advanced system that enables direct interaction between vehicles without relying on external networks such as cellular services. Through this technology, vehicles can exchange real-time information about their movement and surroundings.

Why does it matter?

V2V technology greatly improves road safety by allowing vehicles to communicate across all directions — front, rear, and sides — while also taking into account road conditions, curves, and terrain. It strengthens Advanced Driver Assistance Systems (ADAS) by enabling cars to share alerts about potential hazards, even when they are not visible to the driver.

By enabling smarter and more responsive driving environments, V2V technology is expected to reduce accidents and improve traffic efficiency across the country.

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DRDO Scramjet Engine Breakthrough

DRDO's Defence Research and Development Laboratory (DRDL) successfully conducted a ground test of a full-scale, actively cooled, long-duration scramjet engine.

The combustor operated continuously for over 12 minutes, demonstrating stable high-speed combustion.

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The achievement marks a major step forward for India's indigenous Hypersonic Cruise Missile Development Programme.

About Scramjet Engine

Scramjet stands for Supersonic Combustion Ramjet.

It is an advanced form of the ramjet engine and belongs to the class of air-breathing propulsion systems.

A ramjet compresses incoming air using the vehicle's forward speed, without any rotating compressor.

A scramjet allows combustion to occur while the airflow remains supersonic.

MeitY Launches 'Param Shakti' Supercomputer at IIT Madras

The Ministry of Electronics and Information Technology (MeitY) has launched the 'Param Shakti' supercomputing system at IIT Madras.

The project has been funded under the National Supercomputing Mission (NSM).

About Param Shakti

Param Shakti is an indigenously designed and manufactured supercomputer with a computing capacity of 3.1 petaflops.

It ranks among the most powerful computing systems available in Indian academic institutions.

The system is built using C-DAC's RUDRA series servers.

It operates on an open-source software ecosystem, including AlmaLinux.

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Low-Cost Flexible Sensor Using Pencil-Drawn Electrodes

Researchers have developed a low-cost and flexible sensor using pencil-drawn electrodes combined with graphene oxide (GO).

The innovation offers an eco-friendly and affordable alternative to conventional metal-based sensors.

The sensor demonstrates high sensitivity in detecting:

- Soil moisture levels
- Plant drought stress
- Human breathing patterns
- Graphene oxide is synthesized from graphite, an allotrope of carbon.

About Graphene (Wonder Material)

Structure: A single layer of carbon atoms arranged in a two-dimensional hexagonal lattice.

Key Properties:

- **Flexibility:** Highly elastic and can be stretched up to 20–25% of its original length.
- **Electrical conductivity:** Conducts electricity better than copper.
- **Thermal conductivity:** Transfers heat more efficiently than any known material.
- **Strength:** Has a tensile strength about 200 times greater than steel by weight.

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World's First 2 Tbit/s Free-Space Optical Communication Breakthrough

Scientists have successfully demonstrated the world's first 2 terabits-per-second (Tbit/s) Free-Space Optical (FSO) communication using compact optical terminals.

These small terminals can be mounted on satellites and High-Altitude Platform Stations (HAPS).
The achievement marks a major advance in next-generation space and aerial communication systems.

About Free-Space Optical (FSO) Communication

FSO is a wireless data transmission technology that uses modulated laser or light beams to transmit data through open space without optical fibres or cables.
It enables ultra-high-speed communication over long distances.

Advantages

Supports very high bandwidth and data rates
Offers enhanced security due to narrow beam transmission
Operates in unlicensed spectrum

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Chinese Nuclear Fusion Reactor Pushes Plasma Beyond Critical Limit

China's Experimental Advanced Superconducting Tokamak (EAST), also known as the Artificial Sun, has achieved a major breakthrough by maintaining plasma stability at extremely high densities.
The experiment crossed a long-standing barrier in fusion research known as the Greenwald limit.
Scientists had earlier believed that plasma could not exceed this density threshold without becoming unstable.
The achievement marks a significant advance in controlled nuclear fusion technology and brings practical fusion power a step closer to reality.

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YEAR AND REVIEW OF MINISTRIES

Department of Biotechnology

1. BioE3 policy

- India's first Policy in Biotechnology, the 'BioE3 (Biotechnology for Economy, Environment and Employment) Policy for '**Fostering High Performance Biomanufacturing'.**
- Six-thematic verticals of national importance have been identified for implementation under the initiative. These include (i) Bio-based Chemicals and Enzymes, (ii) Functional Food and Smart Proteins, (iii) Precision Biotherapeutics, (iv) Climate Resilient Agriculture, (iv) Biofuels and Carbon Capture and (vi) Futuristic Marine and Space Research.

2. Genome India project

- The primary objective of GenomeIndia is to build a **comprehensive catalogue of genetic variations** that reflect the unique diversity of the **Indian population**, with samples collected from **10,000 individuals.**
- This will provide a pathway towards affordable **genomics-based diagnostic tools** and **precision medicine** tailored to the Indian population.
- A genome is the **entire sequence of genes** which code for proteins which drive all actions in the human body.

3. Dare2eradTB

DBT program to create a **TB Genomic Surveillance Consortium** for **whole genome sequencing of Mycobacterum tuberculosi**s - to help understand the effect of mutations on transmission, treatment and disease severity.

4. RePORT india

The Regional Prospective Observational Research in Tuberculosis (RePORT) India initiative, a bilateral collaborative effort is being supported under the aegis of the **Indo-US Vaccine Action Programme (VAP), to advance tuberculosis (TB) research in India.**

5. IndCEPI mission

Department of biotech is supporting the implementation of the Ind-CEPI Mission, **"Epidemic preparedness through rapid vaccine development:** Support of Indian vaccine development aligned with the global initiative of the Coalition for Epidemic Preparedness Innovations (CEPI)", through a dedicated Program Management Unit (PMU) at Biotechnology Industry Research Assistance Council (BIRAC).

6. Garbh-Ini

DBT India Initiative GARBH-Ini program, have developed the **first India-specific Artificial Intelligence (AI) model to determine the age of a foetus** in a pregnant woman in the second and third trimesters precisely.

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Department of scientific and industrial research

1. Steel Slag Technology - world's first port road

- **World's first steel slag road** inside a private port at Hazira, Gujarat, has been developed based on CSIR-CRRI's steel slag road technology.

- This technology uses the **waste generated during steel production i.e steel slag** for making robust and durable roads.
- The processed steel slag has **high strength, hardness, abrasion resistance, skid resistance, and drainage capacity,** making it suitable for road construction.
- It is also **cheaper** compared to conventional paving methods.
- India is the **world's largest steel producer,** making this a viable raw material for road construction.

2. Pothole repair technology ECOFIX

- Pothole repair technology that uses **steel slag based cold mix** developed by CSIR-CRRI.

3. End of life plastic technical textiles based road

- The Central Road Research Institute has developed **geocells** - three-dimensional, block shaped modules using waste plastic.
- These modules can be filled with soil or construction debris and be used for **building roads**, particularly in challenging terrain.
- This will help to recycle plastic as well as improve road durability.

4. Rapid test kit for sickle cell anaemia

- The kit has been developed by CSIR and will use the **polymerase chair reaction (PCR)** technology to give test results in half an hour. The kit will cost less than Rs 100.
- Sickle cell anemia is caused due to a **mutation in the haemoglobin gene** and leads to chronic anemia. The disease causes **red blood cells to become rigid and sickle-shaped**, leading to blockages in blood flow and subsequent pain and organ damage.

5. BIRSA 101 - 1st CRISPR based gene therapy for treating sickle cell anaemia

- Sickle cell anemia is widely prevalent in tribal districts in India caused due to an individual carrying two copies of the SCD gene.
- Gene therapy offers a one time cure - uses CRISPR technology to **make precise cuts in the DNA of the individual and remove the faulty gene.**

6. SODAR for weather forecasting

- SODAR (Sound Detection and Ranging) is a **remote sensing technology that uses sound waves** to profile the lower atmosphere, measuring wind speed, direction, turbulence, and temperature structures, similar to how radar uses radio waves but with sound, crucial for **weather forecasting, air quality, and renewable energy.**
- The system analyzes the frequency shift (Doppler effect) of the returning echoes to calculate wind velocity (speed and direction) and turbulence at various heights.

7. First flowering of asafoetida at Himachal Pradesh

- Asafoetida is one of the top condiments and is a high value spice crop in India. India imports about 1200 tonnes of raw asafoetida annually from Afghanistan, Iran and Uzbekistan and spends approximately 100 million USD per year.
- Lack of planting material of Ferula assa-foetida plants in India was a major bottleneck in cultivation of this crop, making this a significant achievement.

- The plant prefers **cold and dry conditions** for its growth and takes approximately **five years for the production of oleo-gum resin** in its roots, therefore cold desert areas of Indian Himalayan region are suitable for cultivation of asafoetida.

8. First GM cotton resistant to pink bollworm

- GM cotton introduced in India in 2002 provides protection against certain bollworm species, but has not maintained defence against pinkbollworm, leading to large infestations and decline in crop yields in recent years.
- pink bollworm, called gulabi sundhi among farmers, burrows its larvae into the cotton balls making the lint unfit for use. It spreads primarily through the air.

9. Novel parasite vaccine for malaria

- This is a **whole parasite vaccine** that has been developed using the malaria-causing parasite and **deletion of two genes,** SCD and SCOT1.
- The weakened parasite can multiply in the liver to enable the body to develop immunity without symptoms of malaria.
- Malaria is caused by a **protozoan parasite** called plasmodium, spread by the **bite of infected female anopheles mosquitoes.**
- India accounts for about 70% of malaria incidence in the South Asia region, particularly affecting the tribal populations since they live in hard to reach, densely forested areas.

10. Targeted nanoparticle for breast cancer treatment

CSIR-CDRI is actively developing nanoparticles for breast cancer, focusing on improved drug delivery for chemotherapy agents like Docetaxel, creating safer, more effective nanocrystals that **reduce toxicity and target tumors better** by altering drug release and cellular uptake.

11. Silk-collagen hydrogel for accelerating wound healing

- A hydrogel is a **network of crosslinked polymer chains** that can **absorb and hold a large amount of water (or biological fluid) without dissolving,** making it soft, flexible, and similar to living tissue.
- They can be created from natural or synthetic materials.
- potential applications:
  - biomedical uses - drug delivery, tissue scaffolds, contact lenses, wound dressings
  - agriculture - superabsorbent polymers for soil - retains water, improves plant growth.
  - sensors for glucose monitoring
  - consumer products like toothpaste, diapers, shower gels

12. Atomic clocks to be installed to end reliance on foreign time source for 'one nation, one time'

- aims to sync all digital devices with indian standard time for uniformity.
- atomic clocks are known for their **exceptional accuracy and precision.** It operates by utilising the specific resonance frequency of atoms, usually c**esium or rubidium.**
- they are extremely precise, losing only one second every 100 million years.
- Working:
  - cesium atoms are very stable, with a very specific frequency at which its electrons vibrate.
  - This frequency is detected and used to adjust the clock's time.
- They are used in **GPS operations, telecom networks, and scientific resea**rch.

13. 1st lavender honey produced in kashmir

- In Pulwama (J&K), CSIR–IIIM (Council of Scientific & Industrial Research – Indian Institute of Integrative Medicine) has successfully produced India's first mono-floral lavender honey.
- Lavender honey refers to h**oney produced from bees who mainly feed on lavender pollen.** It is a highly sought after premium variety, priced 6 times higher than regularhoney.
- lavender cultivation in Kashmir has risen since 2014 under the **Aroma mission.**
- Benefits:
  - economic - high value product to boost farmer incomes, as well exports, with various consumer product applications in food and cosmetics.
  - ecological - lavender acts as a natural pest barrier and can be integrated into orchards.

14. mRNA based chikungunya vaccine

- mRNA based vaccines work on the **basic law of genetics** which says that DNA codes for messenger RNA which carries the information to create proteins for all biological functions.
- These vaccines use **only the mRNA of the chikungunya virus antigen,** instead of the whole organism, so that it gives the body the information to create proteins for the antigen and in turn generate antibodies, **without risk of infection.**
- So now, the body can recognise the virus and defend in case of actual infection, without the vaccine itself causing infection.
- mRNA vaccines face limitations due to their requirement of **ultra-cold storage** and high production costs.

15. Red seaweed farming push

- **Seaweed is a type of marine algae that grows in oceans and seas.** It is used in many products like **food, cosmetics, fertilizers (as a biostimulant) and even in medicine**. It grows in shallow waters and doesn't require land or freshwater, making it an eco-friendly crop.
- **key products:**
  - alginate - from brown seaweed, used as thickener.
  - agar - from red seaweeds, used in desserts, lab cultures.
  - carrageen - used in dairy products, ice cream, toothpaste.

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Department of Space

1. SpaDeX Mission

- India's future space missions involve an ambitious target to create its own space station known as **Bhartiya Antariksh Station** to enable us to carry out research in space indigenously.
- A **key technology required for this is docking technology i.e. ability to 'dock' a satellite to another satellite in space, and enable power transfer between them** to support the needs of a future space station.
- The SpaDeX (Space Docking Experiment) mission by ISRO is a landmark Indian technology demonstration to achieve autonomous rendezvous, docking, undocking, and power transfer between

two small satellites (SDX01 & SDX02) in orbit, proving crucial capabilities for future space station assembly.

2. Performance review of Aditya L1 Mission

- Aditya L1 is the first space based Indian mission to study the Sun.
- The spacecraft shall be placed in a **halo orbit around the Lagrange point 1 (L1) of the Sun-Earth system,** which is about 1.5 million km from the Earth. Lagrange points are **equilibrium points** where the Sun and Earth's gravity is balanced, allowing for the spacecraft to stay in orbit with less energy.
- A satellite placed in the **halo orbit around the L1 point** has the major advantage of **continuously viewing the Sun without any occultation/eclipses.**
- Objectives of the mission:
  - Study of the solar upper atmosphere to understand the nature of **coronal mass ejections and solar flares.**
  - Drivers of space weather and solar wind which causes **disruptions in satellites, telecom, energy grids.**

3. India took the lead role in the 'International Charter on 'Space and Major Disasters'

- The International Charter "Space and Major Disasters" is a global agreement among space agencies (including India's ISRO) to provide **free, rapid satellite data for disaster management (natural or man-made).**
- It supports **relief efforts with timely information** like imagery for floods, earthquakes, and oil spills, through a unified 24/7 system that prioritizes satellite tasking and data delivery to authorized users, making space technology a humanitarian tool for emergencies.

4. Semi-cryogenic engine designed and tested - 1st major breakthrough

- A semi-cryogenic engine (SCE) is a liquid rocket engine that uses **liquid oxygen (LOX) as an oxidizer and refined kerosene as fuel.**
- **Cryogenic engines use liquid hydrogen as fuel**, which is more expensive, less dense, and very difficult to store since it has to be compressed significantly.
- In a semi-cryogenic engine, it **replaces this with refined kerosene, offering benefits such as reduction in cost and easier storage** without much compromise on energy density required for thrust.
- Will replace the core liquid stage of LVM3 for payload enhancement.
- It will power the booster stage for future launches.
- Enhances payload capacity in Geosynchronous Transfer Orbit for future space missions.

5. NISAR mission - Indo-US collaboration

- The NASA-ISRO Synthetic Aperture Radar is a jointly launched satellite by the two agencies for enhanced earth surface monitoring.
- It has a dual frequency SAR - L band and S band.
- provides all weather day and night data every 12 days.
- Can detect **very minute changes** in the Earth's surface.

6. Himalayan outpost for planetary exploration in Tso Kar valley, ladakh

- Human analogue mission at Ladakh to simulate conditions for human spaceflight

7. SSLV launch complex at Kulasekarapattinam, tuticorin, TN

- This is a new launch complex for small satellite launch vehicles in Tamil Nadu.
- It will be beneficial for SSLV and serve the launch needs of private enterprises.

8. Restart of cryogenic engine CE-20 of Gaganyaan mission launch vehicle

- **For future missions, multiple in-flight restarts of the CE20 engine will be required for mission flexibility towards multi-orbit missions.**
- However, with the present configuration, each restart demands an additional start-up gas bottle and associated systems, leading to a reduction in vehicle payload capability.
- Hence, achieving boot-strap mode start - where the engine builds up to steady operation without external start-up assistance - is essential.
- This capability is crucial for Gaganyaan and BAS projects- which require multiple engine re-starts.

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Department of Science and Technology

1. Research Development and Innovation fund

- In line with the government's mission for promoting R&D in the country, a new fund called RDI has been created with an **outlay of 1 lakh crore for 5 years starting from 2025.**
- This fund will be **operated as a special purpose fund within the National Anusandhan Research Foundation (ANRF).**

2. India attains 38th position in global innovation index 2025

- This index is published by World Intellectual Property Organisation (WIPO)

3. National Quantum Mission

The Union Cabinet approved the National Quantum Mission (NQM) in 2023 from **2023-24 to 2030-31,** aiming to seed, nurture and scale up scientific and industrial R&D and create a **vibrant & innovative ecosystem in Quantum Technology (QT).**

Few areas where the mission aims to develop quantum technologies:

- Quantum Key Distribution
- Quantum Security-as a service platform
- quantum processor unit
- quantum diamond microscope for advanced magnetic imaging
- quantum communication and computing

4. BharatGEN - Generative AI model based on Indian languages

- It is India's first-of-its-kind, indigenously developed, Artificial Intelligence (AI) based, government-funded, Multimodal Large Language Model (LLM) for Indian languages.
- It aligns with the **Honorable Prime Minister's vision of an 'Indian Techade'** - which focuses on both inclusion and innovation.
- It involves a **consortium of top Indian academic institutions** to build an open-source ecosystem for AI development, empowering startups, researchers, and government with tools for national priorities like education, agriculture, and cultural preservation.

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5. National Supercomputing Mission

- The National Supercomputing Mission (NSM) is a flagship initiative by the Government of India to empower the country with **high-performance computing (HPC) capabilities.**
- The Mission envisages empowering our national academic and R&D institutions spread over the country by **installing supercomputers of various capacities**.
- Access to these supercomputers is provided through the **National Knowledge Network (NKN).**

6. Clean technologies under focus of DST

A. Coal gasification technology - it **converts coal into valuable synthetic gas (syngas)** by reacting it with controlled amounts of oxygen and steam at high pressures and temperatures. This process converts the coal into syngas - a mix of CO, H2, CO2 and CH4. This can be used as a **clean source of fuel as well as feedstock in fertilisers and chemicals.** The government has a target of producing 100 MT of coal gas by 2030.

B. Methanol - methanol is **primarily produced from syngas derived from natural gas, coal or biomass**, which is **then converted to methanol** using a **catalytic converter like copper, zinc oxide**. Methanol is an **efficient fuel which emits less NOx and Particulate matter (PM) than Petrol & Diesel** and produces **no SOx** as there is no sulphur in methanol. It can be blended or be completely substituted with Petrol & Diesel to use as a transport fuel along with other applications.

C. Dimethyl ether (DME) - DME is a clean synthetically produced fuel which can **substitute diesel for use in internal combustion engines.** It can also be used to produce other chemicals like solvents.

7. Achievements in nanotechnology

DST developed **nanotherapies for diseases like parkinson's, arthritis, and cancer.** The benefits of using nanoparticles is that due to their **unique properties** they can be used for **targeted and precise drug delivery** with minimal side effects.

8. Use of AI for personalised and precision medicine.

AI can be used to scale technologies which are tailored to an individual's unique genetic and medical history.

9. Neuromorphic Computing Research

Neuromorphic computing research focuses on building **brain-inspired hardware and algorithms for highly efficient, low-power AI**, mimicking the brain's structure with **spiking neural networks (SNNs)** and event-driven processing for tasks.

10. Sodium Ion battery technology

A research team at the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), an autonomous institute of the Department of Science and Technology (DST) has developed a **super-fast charging sodium-ion battery (SIB)**, that can charge up to 80% in just six minutes and last over 3000 charge cycles.

Sodium is **relatively abundant than lithium**, which has long been the primary storage system for electronics. Lithium's supply chain is concentrated and a geopolitical risk, making sodium-ion batteries an important alternative.

The benefits of sodium-ion battery is that it is **cost effective, safe, and can operate safely at varying temperatures.**

However it has **lower energy density and has shorter cycle life than lithium.**

11. Zinc-ion battery tech

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It uses **zinc ions as the charge carrier** instead of lithium and sodium ions.
Zinc is much more abundant relative to lithium making it **cheaper.** It is also considered **thermally safer at different temperatures.**

12. Unique genetic mutation driver of oral cancer in Indian women discovered

- This breakthrough was achieved via **whole exome sequencing**
- exome is the **collection of all protein encoding exons** in the genome - only 1-2% of total DNA but contains about 85% of all disease causing mutations. Exons are the code carrying nucleotides in a genome.
- The study identified the combination of **CASP8 and TP53 genes** to be correlated to oral cancer incidence.

13. Development of a Supercapacitor

- A supercapacitor is an **energy storage device** which can **rapidly charge/discharge with long lifespan (millions of cycles) but has lower energy density than batteries**
- Scientists have been looking for materials which can increase density and storage without sacrificing the supercapacitor's speed or longevity.
- A team of scientists have done so by **injecting lanthanum into silver niobate** and then shrinking the particles (nanoparticles) to create more surface area for energy storage.

14. Aerostatic drone developed

- These drones are silent as they do not require constant thrust to stay afloat, making them effective for persistent surveillance - for border/forest/wildlife/disaster management.
- It also has very few metal components making it virtually invisible to hostile radars.

15. National Initiative for Developing and Harnessing Innovations (NIDHI) Program

It is an umbrella programme conceived and developed by the Technology Translation and Innovation (TTI) Division, Department of Science & Technology, Government of India, for nurturing ideas and innovations (knowledge-based and technology-driven) into successful startups.

16. Hydrogen based fuel cell for uninterrupted power backup for telecom towers

- A **PEM (Proton Exchange Membrane) fuel cell** is an efficient and clean energy solution for powering telecom towers, particularly as a backup during grid outages. These fuel cells provide **reliable electricity with quick start-up times and operate at relatively low temperatures**, making them a viable alternative to diesel generators.
- The working principle involves an electrochemical reaction where hydrogen gas is fed into the anode, oxidized to release protons, which then travel through a polymer membrane to the cathode, where they react with oxygen to produce electricity and water.

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PLACES IN NEWS

Kanger Valley National Park

The Chhattisgarh government has intensified its conservation and documentation efforts to obtain **UNESCO World Heritage Site** recognition for the renowned Kanger Valley National Park, located in the Bastar region. The move reflects a growing emphasis on safeguarding the park's unique ecological, geological, and cultural significance at an international level.

About Kanger Valley National Park

Kanger Valley National Park is situated near **Jagdalpur** in the Bastar district of Chhattisgarh. The park takes its name from the **Kanger River**, which flows through its central part in a northwest–southeast direction. This river is a tributary of the Kolab River and ultimately contributes to the Godavari river system.

The national park covers an area of approximately **200 square kilometres**, making it one of the most prominent protected areas in central India.

Physical Features and Landscape

The park is known for its strikingly diverse topography. It includes low-lying plains, gently undulating slopes, steep escarpments, elevated plateaus, deep valleys, narrow gorges, and meandering stream channels, creating a visually rich and ecologically varied landscape.

One of its major attractions is **Tirathgarh Falls**, formed by the Kanger River. The waterfall plunges from a height of about **150 feet**, offering a spectacular natural sight, especially during the monsoon season.

Caves and Geological Significance

Kanger Valley National Park is also famous for its extensive network of **limestone caves**, with more than 15 identified so far. Among these, **Kotumsar Cave, Kailash Cave, and Dandak Cave** are the most well-known. These caves are important not only for tourism but also for geological and biological studies, as they host unique cave-dwelling species.

Flora

The vegetation of the park is dominated by **mixed moist deciduous forests**. Key tree species include **Sal, teak, and bamboo**, which together form dense forest cover and support a wide range of wildlife.

Fauna

The park supports rich faunal diversity. Major mammals found here include **tiger, leopard, mouse deer, sambar, chital, barking deer, wild cat, jackal, langur, rhesus macaque, and flying squirrel**, among others.

The avifauna is equally diverse, with bird species such as the **common hill myna, red jungle fowl, spotted owlet, racket-tailed drongo, and various parrots** commonly observed within the park.

In Essence

With its exceptional biodiversity, dramatic landscapes, limestone caves, and waterfalls, Kanger Valley National Park represents a rare ecological and geological treasure. The push for **UNESCO World Heritage status** aims to strengthen long-term conservation while bringing global recognition to one of India's most distinctive national parks.

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Kolleru Lake

Kolleru Lake, widely recognised for its ecological richness, has recently drawn attention for its **distinctive black dried fish**, which has gained popularity in both domestic and international markets. This development highlights the lake's growing economic as well as ecological significance.

About Kolleru Lake

- Kolleru Lake is **one of the largest freshwater lakes in India**, situated in **Andhra Pradesh**.
- It lies in the **inter-deltaic plain of the Krishna and Godavari rivers**, near the city of **Eluru**, and functions as a **natural flood-regulating reservoir** for both river systems.
- The lake covers an area of about **308 sq. km**, which can expand up to nearly **954 sq. km** during periods of peak flooding.
- It is the **largest freshwater lake in Andhra Pradesh** and is **shallow in nature**, a feature that supports high biological productivity.

Hydrology and Drainage

- The lake receives inflow from **four rivers — Budameru, Ramileru, Tammileru, and Errakalva — along with around 18 drainage channels**.
- Excess water from the lake drains into the **Bay of Bengal** through an outlet locally known as **'Upputera'**.

Ecological and Conservation Importance

- Kolleru Lake is popularly described as the **"Peerless Fisherman's Paradise"** and **"Bird Heaven"**, reflecting its importance for both fisheries and avifauna.
- It was declared a **Wildlife Sanctuary in November 1999**, recognising its ecological value.
- In **November 2002**, it was designated a **wetland of international importance** under the **Ramsar Convention**, underscoring its global significance.

Avifaunal Significance

- The lake supports **over 20 million migratory birds annually**.
- Key bird species include **grey pelicans, painted storks, and open-billed storks**.
- Migratory species arrive from distant regions such as **Siberia, Central Asia, and the Himalayan region**, making the lake one of **India's richest avian habitats**.

Livelihood Linkages

- Kolleru Lake is closely linked to the socio-economic life of surrounding communities.
- **Thousands of people depend on the lake** for livelihoods through **fishing, duck rearing, and paddy cultivation**.
- The growing demand for its traditional black dried fish has further strengthened the lake's role in supporting local economies.

In Essence

Kolleru Lake represents a unique convergence of **biodiversity conservation, wetland ecology, and livelihood security**. Its recent recognition for value-added fish products adds a new dimension to the importance of sustainably managing this vital freshwater ecosystem.

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Parvati-Arga Bird Sanctuary

The Government has notified the **Parvati-Arga Bird Sanctuary** in Uttar Pradesh as an **Eco-Sensitive Zone (ESZ)**, aiming to enhance ecological protection and regulate human activities in the surrounding landscape.

About Parvati-Arga Bird Sanctuary

- **Location:** Situated in **Gonda district of Uttar Pradesh**.
- **Wetland Type:** A **permanent freshwater ecosystem** comprising two oxbow lakes — **Parvati** and **Arga**.
- **International Status:** Designated as a **Ramsar Site** under the **Ramsar Convention**, recognising its global wetland importance.

Biodiversity Significance

Fauna

- The sanctuary provides habitat to several threatened vulture species, including:
  - **Critically Endangered:** White-rumped vulture (*Gyps bengalensis*), Indian vulture (*Gyps indicus*)
  - **Endangered:** Egyptian vulture (*Neophron percnopterus*)
- Presence of **invasive species** such as **water hyacinth (*Eichhornia crassipes*)**, posing ecological management challenges.

Flora

- Vegetation reflects characteristics of the **Indo-Gangetic ecosystem**, supporting wetland-dependent plant communities and associated fauna.

Eco-Sensitive Zone (ESZ): Key Points

- Also referred to as **Ecologically Fragile Areas (EFAs)**.
- ESZs are notified by the **Ministry of Environment, Forest and Climate Change** around **Protected Areas, National Parks, and Wildlife Sanctuaries**.

Objectives of Declaring ESZs

- To function as **"shock absorbers"** for protected areas by regulating development and human activities in surrounding regions.
- To serve as a **transition zone** between areas under strict protection and regions with relatively lower conservation restrictions.

Extent

- An ESZ may extend **up to 10 km** around the boundary of a protected area, subject to site-specific ecological considerations.

In Essence

The declaration of the Parvati-Arga Bird Sanctuary as an **Eco-Sensitive Zone** strengthens protection for a vital Ramsar wetland hosting endangered vulture species. It also underscores the role of ESZs in balancing **biodiversity conservation with sustainable development** in ecologically fragile landscapes.

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Pench Tiger Reserve

Recently, researchers released a **long-billed vulture (J132)** in the Pench Tiger Reserve in Maharashtra, highlighting ongoing conservation and species-reintroduction efforts.

About Pench Tiger Reserve

- Located in the **southern Satpura ranges**, spanning **Seoni and Chhindwara districts of Madhya Pradesh**, with its southern boundary touching **Maharashtra**.
- Declared a **National Park in 1983** and notified as a **Tiger Reserve in 1992**.
- Named after the **Pench River**, which flows **north to south** through the reserve.
- Comprises:
    - Indira Priyadarshini Pench National Park
    - Pench Mowgli Sanctuary
    - Surrounding buffer areas

Vegetation Types

- South Indian Tropical Moist Deciduous forests
- Southern Tropical Dry Deciduous Teak forests
- Southern Dry Mixed Deciduous forests

Flora and Fauna

- **Flora:** Teak, saag, mahua, grasses, shrubs
- **Fauna:** Chital, sambar, nilgai, gaur (Indian bison), wild boar

Associated Character: *Mowgli* from *The Jungle Book*

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Chilika Lake

The **Odisha government** is in the process of formulating a **new integrated action plan** aimed at conserving the rich biodiversity of **Chilika Lake**, while also promoting the **sustainable development of areas surrounding the lagoon**.

About Chilika Lake

Chilika Lake is a **brackish water lagoon** with distinct **estuarine characteristics**, extending across the districts of **Puri, Khurda, and Ganjam** in Odisha.

It is recognised as **Asia's largest brackish water lake** and one of the most ecologically significant wetlands in the world.

Located near the mouth of the **Daya River**, Chilika is the **second-largest brackish water lagoon globally**, surpassed only by the lagoon system associated with the **New Caledonian Barrier Reef** in **New Caledonia**.

- **Water-spread area:**
    - Around **900 sq km** during summer
    - Expands to nearly **1,165 sq km** during the monsoon season
- **Sea connection:**
    - Linked to the **Bay of Bengal** through a **32 km long and about 1.5 km wide channel**
    - This channel runs almost parallel to the coastline, separated from the sea by a **narrow sandy spit**

Islands in Chilika Lake

The lagoon hosts several islands of ecological, cultural, and tourism importance:

- **Nalabana Island** – Declared a **Bird Sanctuary in 1987**
- **Kalijai Island** – Famous for the **Kalijai Temple**

- Other notable islands include **Honeymoon Island, Breakfast Island, Beacon Island, and Satpada Island**

International Recognition

In **1981**, Chilika Lake became **India's first wetland** to be designated as a **Wetland of International Importance** under the **Ramsar Convention**.

Biodiversity Significance

Avifauna

- Chilika is the **largest wintering ground for migratory birds in the Indian subcontinent**.
- Birds migrate here from regions such as the **Caspian Sea**, **Lake Baikal**, **Aral Sea**, **Central and Southeast Asia**, the **Mongolian steppes**, **Ladakh**, and the **Himalayas**.
- Prominent species include **White-bellied Sea Eagles, Graylag Geese, Purple Moorhen, Jacana, Herons, and Flamingos**.
- The lake supports **one of the largest breeding populations of flamingos in the world**.

Terrestrial and Aquatic Fauna

- Surrounding landscapes are home to **Blackbucks, Golden Jackals, Spotted Deer, and Hyenas**.
- Chilika is also globally known for its population of **Irrawaddy Dolphins**, a flagship aquatic species of the lagoon.

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Melghat Tiger Reserve

Recently, the **Bombay Natural History Society (BNHS)** released 15 critically endangered Indian vultures into the wild at the **Melghat Tiger Reserve** in Maharashtra as part of a conservation initiative.

About Melghat Tiger Reserve

Melghat Tiger Reserve is located in the state of Maharashtra, on the southern extension of the Satpura Hill Range in central India, specifically in the Gavilgarh Hills. It holds the distinction of being the first tiger reserve established in Maharashtra.

The term *Melghat* literally refers to the meeting point of several *ghats* or valleys, which aptly reflects the undulating and rugged terrain of the reserve.

The vegetation of the reserve is predominantly tropical dry deciduous forest, with teak forming the dominant tree species. Ecologically, the reserve is significant as it serves as the catchment area for five important rivers—Khandu, Khapra, Sipna, Gadga, and Dolar—all of which ultimately flow into the Tapti River. The Tapti River itself, along with the Gawilgadh ridge of the Satpura Range, defines the natural boundaries of the reserve.

Melghat is also home to a diverse tribal population. The Korku tribe constitutes the largest tribal community in the region, along with the presence of the Gawli community and members of the Gond tribe.

In terms of flora, the reserve supports species such as teak, *Lagerstroemia parviflora*, *Terminalia tomentosa*, *Ougeinia oojeinensis*, *Emblica officinalis*, and bamboo. Its rich fauna includes sloth bear, Indian gaur, sambar deer, leopard, nilgai, dhole, hyena, jungle cat, and langur, among others.

Importantly, Melghat Tiger Reserve is recognized as a stronghold of the critically endangered forest owlet, highlighting its crucial role in biodiversity conservation.

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Tadoba Andhari Tiger Reserve

The **Tadoba Andhari Tiger Reserve (TATR)** has recently implemented a sterilisation and vaccination drive to address the increasing threat posed by stray dogs in and around the reserve area.

About Tadoba Andhari Tiger Reserve

Tadoba Andhari Tiger Reserve is situated in the Chandrapur district of Maharashtra. It is the largest as well as the oldest tiger reserve in the state, covering a total area of about 1,727 square kilometres.

Established in 1955, the reserve comprises two protected units—Tadoba National Park and Andhari Wildlife Sanctuary. The name *Tadoba* originates from the local deity "Tadoba" or "Taru," revered by the indigenous tribal communities of the region, while *Andhari* is derived from the Andhari River that flows through the landscape.

The reserve enjoys important wildlife corridor connectivity with the Nagzira–Navegaon and Pench Tiger Reserves within Maharashtra, enhancing genetic exchange and animal movement. Topographically, the terrain is undulating and hilly, with elevations generally ranging between 200 and 350 metres.

In terms of drainage, the reserve is nourished by key water bodies including Tadoba Lake, Kolsa Lake, and the Tadoba River. Biogeographically, it falls within the Central Plateau province of the Deccan Peninsula and is characterised by tropical dry deciduous forests supporting a typical Central Indian assemblage of wildlife.

The vegetation is dominated by dense teak forests, interspersed with species such as crocodile bark, salai, tendu, karaya gum, and mahua (*Madhuca indica*).

Faunal diversity in the reserve is remarkable. Besides the iconic tiger, Tadoba-Andhari supports Indian leopards, sloth bears, Indian gaur (bison), dholes (wild dogs), striped hyenas, marsh crocodiles, sambar deer, chital, barking deer, and the four-horned antelope or chousingha.

The reserve is also renowned for avifaunal richness, hosting more than 250 species of birds, making it a popular destination for birdwatchers. Notable species include crested serpent eagles, grey-headed fish eagles, paradise flycatchers, and hornbills.

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Thanthai Periyar Wildlife Sanctuary

Recently, the first phase of the **All-India Tiger Estimation–2026 (AITE-26)** was launched in the **Thanthai Periyar Wildlife Sanctuary**, marking the beginning of nationwide field assessments for tiger population monitoring.

About Thanthai Periyar Wildlife Sanctuary

Thanthai Periyar Wildlife Sanctuary is situated in the Bargur Hills of Erode district in Tamil Nadu. Strategically located, it lies between the **Sathyamangalam Tiger Reserve** of Tamil Nadu and Karnataka's **Male Mahadeshwara Wildlife Sanctuary** and **Cauvery Wildlife Sanctuary**, making it ecologically significant for landscape-level conservation.

The sanctuary has been identified as an important tiger corridor by the **National Tiger Conservation Authority**, facilitating the movement of tigers between protected areas. It also forms an integral part of the **Nilgiris Elephant Reserve**, underscoring its importance for elephant conservation.

Geographically, these forests occupy a crucial position in the Eastern Ghats, where they gradually merge with the Western Ghats near the Nilgiris, creating a unique ecological transition zone. Hydrologically, the

sanctuary serves as a catchment area for the Palar River, which ultimately drains into the Cauvery River system.

In terms of wildlife, the sanctuary supports a robust population of large herbivores, notably elephants and Indian gaur, providing a strong prey base for large carnivores and reinforcing its role in regional biodiversity conservation.

All-India Tiger Estimation: Key Facts

The All-India Tiger Estimation is carried out once every four years with the objective of evaluating the status, distribution, and trends of the tiger population across India. So far, five estimation cycles have been completed in the years 2006, 2010, 2014, 2018, and 2022, making AITE-26 the sixth cycle of this flagship conservation exercise.

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Ratapani Tiger Reserve

The Chief Minister of Madhya Pradesh has recently announced that the newly notified **Ratapani Tiger Reserve** will be named in honour of the eminent archaeologist and Padma Shri awardee **Dr Vishnu Shridhar Wakankar**, in recognition of his outstanding contributions to Indian archaeology.

About Ratapani Tiger Reserve

Ratapani Tiger Reserve is located across the Raisen and Sehore districts of Madhya Pradesh. The reserve extends over the undulating hills of the Vindhya mountain ranges and covers a total area of about 1,271 square kilometres.

Geographically, the reserve runs parallel to the northern bank of the Narmada River, while the Kolar River forms its western boundary. Several important water bodies are associated with the reserve, including the Barna Reservoir and the Ratapani Dam, also known as Barrusot Lake, which lie within or along its periphery.

The terrain of Ratapani is diverse, characterised by a mix of hills, plateaus, valleys, and plains, creating a mosaic of habitats. One of the most significant features of the reserve is the presence of the **Bhimbetka Rock Shelters**, a UNESCO-declared World Heritage Site renowned for its prehistoric rock shelters and paintings. In addition, the reserve area includes several other historical and religious sites such as Ginnourgarh Fort, a former POW camp, Keri Mahadeo, Ratapani Dam, and Jholiyapur Dam.

From a vegetation perspective, the forests of Ratapani are predominantly dry deciduous and moist deciduous in nature. Teak (*Tectona grandis*) is the dominant tree species, accounting for nearly 55 per cent of the forest cover.

Faunal diversity in the reserve is rich, with the tiger serving as the apex predator. Current estimates suggest that around 40 tigers inhabit these forests. The reserve also supports populations of the endangered chinkara. Other wildlife species found here include leopard (panther), hyena, jackal, Indian fox, wild dog, jungle cat, small Indian civet, blue bull (nilgai), blackbuck, chausingha (four-horned antelope), spotted deer, and barking deer.

Ratapani Tiger Reserve thus represents a unique landscape where ecological richness, riverine systems, and outstanding archaeological heritage coexist, enhancing its conservation as well as cultural significance.

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Dal Lake

Recently, several portions of **Dal Lake** in Srinagar froze after the city experienced its coldest night of the winter season. Temperatures across the Kashmir Valley dropped far below the freezing point, leading to partial freezing of this iconic water body.

About Dal Lake

Dal Lake is a mid-altitude, urban freshwater lake situated in Srinagar, in the Union Territory of Jammu and Kashmir. Encircled by the Pir Panjal mountain ranges, it occupies a central place in the cultural, ecological, and tourism landscape of Kashmir. Owing to its scenic beauty and importance, the lake is often referred to as the ***"Jewel in the Crown of Kashmir"*** **or** ***"Srinagar's Jewel."***

Spread over an area ranging between approximately 18 and 22 square kilometres, Dal Lake is among the largest natural lakes in the world and is also popularly known as the *Lake of Flowers*. The primary source of water for the lake is the Telbal stream, which originates from the Jhelum River system.

During peak winter, temperatures in the region can fall to around –11°C, causing the surface of the lake to freeze partially or completely. Hydrologically and structurally, the lake is divided by causeways into four distinct basins—Gagribal, Lokut Dal, Bod Dal, and Nagin, though Nagin is sometimes considered a separate lake. Lokut Dal and Bod Dal each contain a central island known as Rup Lank (also called Char Chinari) and Sona Lank, respectively.

One of the most distinctive features of Dal Lake is its floating gardens, locally called *Rad*. These are buoyant patches of land on which local farmers cultivate vegetables and flowers. The lake is also famous for its floating market, where vendors sell goods directly from their shikaras, or traditional wooden boats, offering a unique experience to visitors.

The shoreline of Dal Lake is bordered by a well-developed boulevard that hosts Mughal-era gardens, public parks, houseboats, and hotels. Prominent among the Mughal Gardens are Nishat Bagh, known as the ***Garden of Joy*** with its terraced layout and fountains; **Shalimar Bagh,** called the ***Abode of Love***, built by Emperor Jahangir; and Chashma Shahi, which is renowned for its natural freshwater spring.

Dal Lake thus represents a rare blend of natural beauty, cultural heritage, and human livelihood, making it one of the most iconic and ecologically significant landmarks of Kashmir.

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Aralam Butterfly Sanctuary

The Government of Kerala has officially renamed the **Aralam Wildlife Sanctuary** as the **Aralam Butterfly Sanctuary**, thereby establishing it as the first dedicated butterfly sanctuary in the state.

About Aralam Butterfly Sanctuary

Aralam Butterfly Sanctuary is located in the state of Kerala and occupies a strategically important ecological position. It shares its boundaries with the **Brahmagiri Wildlife Sanctuary** in Karnataka, the **Kottiyoor Wildlife Sanctuary**, and the North Wayanad Forest Division, forming a contiguous forest landscape.

The sanctuary is characterised by lush evergreen and semi-evergreen forests that support high biodiversity. The Cheenkanni River, which originates in the Brahmagiri ranges, flows through the thick forested tracts of Aralam and plays a vital role in sustaining its rich ecosystems.

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Aralam is especially renowned for large-scale butterfly migration and the phenomenon of mud-puddling, where butterflies congregate on moist soil to extract minerals. The area is also an important habitat for the Schedule I species, the slender loris.

In terms of faunal diversity, the sanctuary supports more than 266 species of butterflies, which constitute over 80 per cent of the total butterfly species recorded in Kerala. Several of these species are endemic to the region, while others fall under threatened or endangered categories.

Every year, during January or February, the sanctuary hosts a Butterfly Migration Study programme. This initiative focuses on observing and documenting the seasonal movement of butterflies and helps enhance scientific understanding of their ecological role as key pollinators.

Apart from butterflies, Aralam Butterfly Sanctuary also shelters a variety of wildlife, including elephants, giant squirrels, leopards, and numerous bird species, further underlining its ecological importance.

The renaming of Aralam as a butterfly sanctuary marks a significant step in species-specific conservation and highlights Kerala's commitment to protecting insect biodiversity and pollinator habitats.

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Nelapattu Bird Sanctuary.

The **Flamingo Festival** held recently drew large crowds, with numerous families visiting the **Nelapattu Bird Sanctuary** near Sullurpeta in Andhra Pradesh to witness the vibrant avian activity.

About Nelapattu Bird Sanctuary

Location:

- Situated in **Andhra Pradesh**, the sanctuary lies close to the **Pulicat Lake**, which is recognized as India's **second-largest saline lagoon**.

Ecological Importance:

- Nelapattu serves as one of the **major nesting habitats** for the **spot-billed pelican**, making it an essential site for waterbird conservation in South India.

Vegetation

The region supports distinctive plant ecosystems, particularly:

- **Barringtonia swamp forests**, which thrive in waterlogged conditions.
- **Southern dry evergreen scrub**, a characteristic vegetation type of the Coromandel region.

Flora

A wide range of plant species is present in the sanctuary, including:

- *Buchnania angustifolia*
- *Barringtonia actutangula*
- *Acacia arabica*
- *Albizzia amara*
- *Borassus flabellifer*
- *Euphorbia antiquorum*, among others.

Fauna

Apart from the spot-billed pelican, the sanctuary also provides crucial breeding grounds for several other bird species such as:

- Black-headed ibis

- Asian openbill stork
- Black-crowned night heron
- Little cormorant

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Bannerghatta National Park

The **Central Empowered Committee (CEC)** has recently advised that the **Ecologically Sensitive Zone (ESZ)** surrounding **Bannerghatta National Park (BNP)** in Bengaluru should be **reinstated to its original 2016 boundaries**, reversing the reductions made later.

About Bannerghatta National Park

Location:

- Situated in the **Anekal hill range** near **Bengaluru**, Karnataka.

History:

- Declared a **National Park in 1974**.
- In **2006**, the park became home to **India's first butterfly enclosure**, enhancing its ecological and educational value.

Hydrology:

- The **Suvarnamukhi stream** flows through the park and serves as the **primary water source** for its wildlife.

Vegetation

The park hosts a diverse mix of forest types, including:

- **Dry Deciduous Scrub Forests**
- **Southern Tropical Dry Deciduous Forests**
- **Southern Tropical Moist Mixed Forests**

Flora

Notable plant species found in the park include:

- *Narcissus latifolia*
- *Schleichera oleosa*
- Sandalwood
- Neem
- Tamarind
- Bamboo
- Eucalyptus

  and several other native and introduced species.

Fauna

Bannerghatta National Park is an important habitat for a wide array of wildlife, such as:

- **Asian Elephant (Endangered)**
- **Indian Gaur**
- **Tiger**
- **Sambar Deer**
- **Spotted Deer**

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- **Leopard**
- **Dhole (Wild Dog)**
- **Wild Pig**
- **Sloth Bear**

What is an Ecologically Sensitive Zone (ESZ)?

- ESZs act as **protective buffers** around **Protected Areas**, helping reduce external pressures on **fragile ecosystems**.
- They are designated by the **Ministry of Environment, Forest and Climate Change (MoEFCC)** under the **Environment (Protection) Act, 1986**.
- The zones restrict certain activities while allowing regulated development to maintain ecological balance.

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Valley of Flowers National Park

A forest fire has been burning for the past several days in the **Valley of Flowers**, a UNESCO World Heritage Site. Due to the intensity of the blaze, the **Uttarakhand Disaster Management Department** has requested assistance from the **Indian Air Force (IAF)** to help extinguish the flames.

About Valley of Flowers National Park

- Located in the **Chamoli district of Uttarakhand**, the park spans an area of **87 sq. km**.
- It gained global attention in **1931** when three British mountaineers, led by **Frank S. Smythe**, stumbled upon the valley after losing their way.
- The site is recognized as a **UNESCO World Heritage Site** and forms one of the two central zones of the **Nanda Devi Biosphere Reserve**, the other being the **Nanda Devi National Park**.
- The Valley of Flowers presents a **softer, more open landscape**, which contrasts with the harsh mountainous terrain of the adjacent Nanda Devi National Park.
- Together, they form an important **ecological transition area** between the **Zanskar Range** and the **Greater Himalayas**.
- The valley is renowned for its **lush alpine meadows**, exceptional biodiversity, and stunning natural beauty.
- It remains **snow-covered throughout the winter**, making it inaccessible for several months.

Flora

- The valley hosts over **600 species of flowering plants**, making it one of the richest alpine botanical zones in the Himalayas.
- Prominent flowers include **orchids, poppies, primulas, marigolds, daisies, and anemones**.
- The region also contains numerous **medicinal herbs and rare high-altitude plants**.
- Parts of the park are covered with **sub-alpine forests** dominated by **birch** and **rhododendron**.

Fauna

The national park supports a wide range of Himalayan wildlife, including:

- **Grey langur**
- **Flying squirrel**
- **Himalayan weasel**

- **Black bear**
- **Red fox**
- **Lime butterfly**
- **Snow leopard**

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Asola-Bhatti Wildlife Sanctuary

The **Delhi government** has recently informed that **more than 6,500 monkeys**, rescued by various civic agencies from residential and commercial localities across the capital, have been **relocated to Asola-Bhatti Wildlife Sanctuary** over the past five years.

About Asola-Bhatti Wildlife Sanctuary

- The sanctuary spans an area of **about 32.71 sq. km** and is located along the **Southern Delhi Ridge** of the **Aravalli hill range**.
- It lies on the **Delhi–Haryana border**, extending across **southern Delhi** and the **northern parts of Faridabad and Gurugram districts** of Haryana.
- The sanctuary forms an important segment of the **Northern Aravalli Leopard Wildlife Corridor**, aiding wildlife movement and genetic connectivity.
- Within Delhi, the sanctuary landscape intersects with several historically significant locations such as **Chattarpur Temple**, **Tughlakabad**, **Surajkund**, **Anangpur Dam**, and the **Adilabad ruins**.

Flora

- The region supports **semi-arid forest vegetation** typical of the Aravalli ecosystem.
- Dominant plant species include:
    - **Dhak (Flame of the Forest)**
    - **Babool (Acacia)**
    - **Khejri**
    - A variety of **xerophytic shrubs and grasses** adapted to dry climatic conditions.

Fauna

- The sanctuary provides habitat to a diverse range of mammals, including:
    - **Indian leopard**
    - **Jackal**
    - **Indian blue bull (Nilgai)**
    - **Sambar deer**
    - **Wild boar**
    - **Mongoose**
- It is also a major **avian hotspot**, with **over 200 bird species** recorded, such as:
    - **Indian peafowl**
    - **Crested serpent eagle**
    - **Indian roller**
- Reptilian diversity includes species like the:
    - **Monitor lizard**
    - **Indian cobra**
    - **Russell's viper**

Similipal National Park

According to the most recent crocodile census, **Similipal National Park in Odisha** has recorded a **rise in its crocodile population**, indicating improvement in habitat conditions and conservation efforts within the region.

About Similipal National Park

- Located in the **Mayurbhanj district of Odisha**, Similipal is one of India's largest forested landscapes, extending across **2750 sq. km**.
- The park derives its name from the **Simul (silk cotton) tree**, which is widely found across the area.
- It holds multiple conservation designations — it is a **National Park**, **Tiger Reserve**, **Wildlife Sanctuary**, **Biosphere Reserve**, and also forms a part of the **Mayurbhanj Elephant Reserve**.
- Positioned within the **Deccan Peninsular Biogeographic Zone**, the region exhibits a rare mix of biodiversity characteristic of the **Western Ghats**, **Eastern Ghats**, and even the **Eastern Himalayas**.
- The landscape features scenic waterfalls such as **Joranda** and **Barehipani**, the latter being one of the highest in India.
- The terrain is surrounded by highlands and plateaus, with its tallest elevation being the **twin peaks of Khairiburu and Meghashini**, rising about **1515 m above sea level**.
- The area is also home to several tribal communities, including the **Kolha, Santhala, Bhumija, Bhatudi, Gonda, Khadia, Mankadia**, and **Sahara** tribes.

Vegetation

- The forest cover is dominated by **moist mixed deciduous forests**, interspersed with patches of **tropical semi-evergreen forests** in areas with favourable microclimatic conditions.
- Small stretches of **dry deciduous woodland** and **natural grasslands** are also present, providing diverse habitats for wildlife.

Flora

- **Sal** is the most prevalent tree species in the region.
- Similipal supports nearly **7% of India's flowering plant species** and about **8% of the country's orchid diversity**.
- Its extensive grasslands serve as crucial grazing sites for numerous herbivore species.

Fauna

- The park is renowned for its populations of **tigers, elephants, and the hill mynah** (a key indicator species).
- It hosts the **largest tiger population in Odisha**, and uniquely, it is the **only tiger reserve in India with melanistic (black) tigers**.
- Other prominent mammals include the **leopard**, **sambar**, **barking deer**, **gaur**, **jungle cat**, **wild boar**, **four-horned antelope**, **giant squirrel**, and **common langur**.

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Kaziranga National Park.

The Prime Minister of India is set to inaugurate a **34.5 km-long elevated corridor** within **Kaziranga National Park, Assam**, aimed at improving connectivity while minimising disturbance to wildlife.

About Kaziranga National Park

Location & Landscape

- Positioned **between the Brahmaputra River and the Karbi (Mikir) Hills** in Assam, Kaziranga represents the **largest intact and natural stretch** of the Brahmaputra Valley floodplains.
- UNESCO recognised it as a **World Heritage Site in 1985**.
- The park's terrain consists of **dense forests, towering elephant grass, thick reed beds, marshy expanses, and shallow wetlands**, making it a rich mosaic of habitats.

River Systems

- The **Diffalu River**, a tributary of the Brahmaputra, cuts across the park.
- Another tributary, **Moradifalu**, forms part of its **southern boundary**, contributing to its wetland ecosystem.

Floral Diversity

- Kaziranga is well-known for its **extensive elephant grasslands**, interspersed with swamps.
- Aquatic vegetation is abundant, including **water lilies, lotus, and water hyacinths**.
- These vegetation types support a diverse range of herbivores and aquatic species.

Faunal Richness

- The park shelters key species such as:
  - **One-horned Rhinoceros (largest population globally)**
  - **Tiger**
  - **Eastern Swamp Deer**
  - **Elephant**
  - **Wild Buffalo**
  - **Hoolock Gibbon**
  - **Capped Langur**
- The **Gangetic River Dolphin** is frequently spotted in the riverine stretches.
- Numerous other mammals, birds and reptiles thrive here, making Kaziranga one of India's most biodiverse landscapes.

****

ANURAG BACHAN'S DROANACHARYA IAS
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IMPORTANT DAYS IN THE NEWS

National Girl Child Day, 24 January 2026

- **National Girl Child Day** is observed annually on **24 January** in India.
- It was first **introduced in 2008** by the **Ministry of Women and Child Development** to promote awareness about the rights, education, health and nutrition of girls.

Objectives of National Girl Child Day

- To highlight **gender discrimination** and challenges faced by girls such as:
  - **Female foeticide**
  - **Child marriage**
  - **Barriers to education and health** access.
- To promote **equal opportunities** and **holistic development** for girls.

Recent Progress & Developments (2024–25)

- **School infrastructure:**
  97.5% of schools in India now report girls' toilets.
- **Education participation:**
  The **Gross Enrolment Ratio (GER)** for girls at the **secondary level** reached **80.2%** in 2024–25 as per the **UDISE report**.

Government Initiatives & Schemes

Mission Shakti

- Launched (effective **1 April 2022**) by the **Ministry of Women and Child Development**.
- An umbrella programme combining safety, security, empowerment and welfare efforts for women and girls.
- **Budget allocation (2025–26): ₹3,150 crore.**

Samagra Shiksha

- Integrated scheme for school education (pre-school to Class XII).
- Aims to close **gender and social category gaps** in education.

Beti Bachao Beti Padhao (BBBP)

- Launched **2015**, now part of **Mission Shakti's Sambal sub-scheme**.
- Focuses on preventing **gender-biased sex selection**, improving **survival, protection and education** of girls.

UDAAN

- Initiative by **CBSE (2014)** to improve **girls' enrolment in engineering/competitive exams** by providing free study support.

NAVYA

- Launched **24 June 2025** (MWCD & MSDE).
- Targets adolescent girls **(16–18 yrs)** in aspirational districts for **vocational training** under **PMKVY 4.0**.

Vigyan Jyoti

- By **Department of Science & Technology** to promote girls (Classes IX–XII) in **STEM** fields. Supported ~80,000+ girls across India.

Scholarships & Financial Security

- **Central Sector Scholarships** for PG studies merged on the **National Scholarship Portal** (2023–24) to support higher education for girls.
- **Sukanya Samriddhi Yojana (SSY)** provides **long-term savings** for girls' education and marriage; 4.2+ crore accounts opened (by Nov 2024).

Significance & Impact

- National Girl Child Day reinforces **gender equity**, pushes for **education and empowerment**, **saves child marriages**, and strengthens **institutional mechanisms** for girls' rights.
- It aligns with India's **Viksit Bharat by 2047** vision and supports wider social inclusion goals.

****

Republic Day 2026

- **Republic Day** is observed annually on **26 January**.
- **26 January 1950**: The **Constitution of India came into force**, marking India's transition from a **Dominion** to a **Republic**.
- Republic Day 2026 marks the **76th anniversary** of the Constitution's enforcement.

Constitutional Importance

- On this day:
  - **The Constitution of India** became operational.
  - India adopted a **sovereign, democratic republic** form of government.
- **Dr B.R. Ambedkar** chaired the Drafting Committee of the Constitution.

Ceremonial & Institutional Aspects

- **National parade** held at **Kartavya Path, New Delhi**.
- Parade showcases:
  - **Military strength** (Army, Navy, Air Force)
  - **Indigenous defence capabilities**
  - **Cultural diversity** through state tableaux
- **President of India**:
  - Takes the salute
  - Is the **constitutional head of the Republic**
- **Gallantry awards** (Param Vir Chakra, Ashok Chakra etc.) and **Padma Awards** are formally acknowledged around Republic Day.

Theme

- The **theme for Republic Day 2026** is **"150 Years of Vande Mataram"**, commemorating the sesquicentennial (150th anniversary) of the **national song *Vande Mataram*** penned by **Bankim Chandra Chattopadhyay**.

Chief Guests (Republic Day Parade 2026)

- **President of the European Council — António Costa**
- **President of the European Commission — Ursula von der Leyen**

These distinguished guests underscored India's diplomatic engagement and strategic partnership with the **European Union.**

International Data Privacy Day, 28th January 2026

- **International Data Privacy Day** is observed **annually on 28 January** to **raise awareness about the importance of protecting personal data and privacy in the digital age**.

Origin & Global Context

- The day was initially designated by the **Council of Europe in 2006** as **Data Protection Day**, commemorating the **opening for signature of Convention 108** — the **world's first legally binding international treaty on data protection**.
- It is observed globally in many countries, including members of the Council of Europe, the United States, Canada, Israel, and others.

Purpose & Significance

- **Data Privacy Day highlights the shared responsibility** of governments, digital platforms, and citizens in building a **secure and trusted digital ecosystem**.
- It aims to:
  - Promote awareness of **data protection rights and privacy best practices**.
  - Encourage responsible handling of **personal and sensitive information**.
  - Foster trust in digital technologies by emphasising **ethical, secure, and inclusive digital adoption**.

India's Digital Landscape & Privacy Imperative

- India is among the **world's largest digitalised economies**, with digital platforms deeply integrated into daily life.
- Safeguarding personal data has become critical to:
  - **Sustain public trust** in e-governance and digital public infrastructure (like **Aadhaar, UPI, eSanjeevani, MyGov**).
  - Mitigate risks of **data misuse, cyber threats, and fraud**.

Legal & Institutional Framework in India

- **Digital Personal Data Protection (DPDP) Act, 2023**
  - Governs processing of personal data collected digitally.
  - Aims to balance **privacy protection with innovation and service delivery**.
- **DPDP Rules, 2025**
  - Notified on **13 November 2025** to operationalise the Act.
  - Establish a **citizen-centric data protection regime** with enforceable rights and accountability mechanisms.
- **Rights under the DPDP Act include:**
  - Right to **consent** or **refuse use of personal data**
  - Right to **access, correct, update, or erase** personal data
  - Right to **information** on data usage
  - Obligations on data handlers to respond within a specified time and inform citizens of breaches.
- India has also strengthened cybersecurity through institutions like **CERT-In** and coordinated measures like the **National Cyber Crime Reporting Portal**.

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AWARDS and PRIZES

Padma Awards 2026

- Padma Awards are among the highest civilian honours of India after the Bharat Ratna.
- They recognise distinguished and exceptional service in various fields, with an element of public service.

Categories

There are **three categories** of Padma Awards:

1. **Padma Vibhushan** – For **exceptional and distinguished service**
2. **Padma Bhushan** – For **distinguished service of a high order**
3. **Padma Shri** – For **distinguished service** in any field

These awards span multiple disciplines such as **arts, social work, public affairs, science & engineering, trade & industry, medicine, literature & education, sports, civil service**, etc.

Padma Awards 2026 — Key Facts

- **Year of announcement:** 2026
- **Occasion:** Announced on the **eve of Republic Day** (26 January) by the **President of India**.
- **President's approval:** Awards are approved by the **President on the recommendation of the Padma Awards Committee**.
- **Ceremonial conferment:** Awarded at a **civil investiture ceremony** at **Rashtrapati Bhavan** usually held in **March/April** following the announcement.

Padma Awards 2026 — Numbers

- **Total awards approved: 131** awards **(including 2 duo cases counted as one each)**.
- **Breakdown by category:**
  - Padma Vibhushan – **5**
  - Padma Bhushan – **13**
  - Padma Shri – **113**
- The list also includes:
  - **19 women awardees**
  - **Persons from the category of Foreigners / NRI / PIO / OCI**
  - **Posthumous awardees** (totaling **16**)
    (No names included as per your request.)

Eligibility & Selection (General Framework)

- **Eligibility:**
  - All persons **without distinction of race, occupation, position, or sex** are eligible for nomination, including **non-citizens**.
  - Government servants, including those in PSUs, are generally not eligible **except doctors and scientists**.
- **Selection process:**
  - Nominations are submitted (online now) by citizens, institutions, state/UT governments, ministries, previous awardees and others.

- A **Padma Awards Committee**, constituted by the **Prime Minister**, evaluates nominations and recommends names to the **President**.
- Shortlisted awardees are **notified** and names are **gazetted** before official conferment. (Standard process across years.)

Legal & Constitutional Aspects

- The **Supreme Court of India** has upheld that **Padma Awards and Bharat Ratna are civilian honours**, **not titles prohibited under Article 18** of the Constitution.

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Ashok Chakra 2026

The Ashok Chakra is India's highest peacetime gallantry award, conferred for most conspicuous bravery, or daring valour, or self-sacrifice in situations other than in the face of the enemy.

History & Position

- **Established:** 4 January 1952, originally as **Ashoka Chakra, Class I**, retroactive to **15 August 1947**.
- **Renamed:** In **1967** as **Ashok Chakra**, with Kirti Chakra and Shaurya Chakra as the other peacetime gallantry awards.
- It is the **peacetime equivalent of the Param Vir Chakra** in the wartime gallantry hierarchy.

Eligibility

- Awarded to all ranks of:
  - **Armed Forces**
  - **Police and Paramilitary Forces**
  - **Civilians**, including **foreign nationals** for acts of bravery within India.
- Can be awarded **posthumously** or multiple times (with bars for subsequent awards).

Criteria

- Awarded for **"most conspicuous bravery or some daring or pre-eminent valour or self-sacrifice"** during **peacetime activities** such as:
  - Anti-terror/anti-insurgency operations
  - Rescue missions
  - Life-saving acts involving extreme personal risk.

Relation With Other Gallantry Awards

- **Peacetime awards (Order):**
  1. **Ashok Chakra**
  2. **Kirti Chakra**
  3. **Shaurya Chakra**

  These are the **highest peacetime recognitions for courage** in non-war scenarios.

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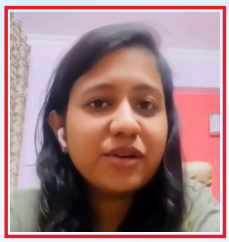
ANURAG BACHAN'S
DROANACHARYA-IAS

SOME OF SUCCESSFUL GEMS WITH ANURAG SIR

AASTHA SINGH
Rank 61st (IAS)



ANJALI GARG
Rank 79th (IAS)

ANKUR
Rank 37th (IAS)

SANYA
Rank 84th (IAS)

SAWAN
Rank 89th (IAS)

JYOTINDER BAJWA
Rank 256th (IAS) / 20th (PCS)

ASHOK
Rank 325th (IAS)

AFTAAB RASOOL
Rank 412nd (IAS)

MANISH YADAV
(IAS)

KHUSHDIL SANDHU
Rank 5th (PCS)

AMAN CHAWLA
Rank 6th (PCS)

HARPREET SINGH SIDHU
(PCS)

PRIYA KHERA
Rank 45th (DSP)

JASPREET
(INDUSTRY OFFICER)

SANKALP GAUTAM
Rank 2nd (HAS)

TEHSEEN
(IPS)

SAMAY SINGH
(IPS)

AREEBA
Rank 109th (IPS)

MAYANK MISHRA
Rank 228th (IPS)

DILMIL SINGH
(IRS)

RANVIR SINGH
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