NEXT IAS

THE CRUX

February Issue; 2026

Chief Editor

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Compilation of UPSC relevant news from 1st February to 28th February 2026

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INDIA AI IMPACT SUMMIT, 2026

The Summit highlighted India's expanding AI ecosystem, global partnerships, responsible AI governance frameworks, and major investments in compute infrastructure.

> *Artificial intelligence is going to be the defining technology of our times.*
>
> **Satya Nadella,** (CEO, Microsoft)

Background

- **Meaning of Artificial Intelligence:** Artificial Intelligence **(AI—computer systems that learn from data, recognise patterns and make decisions)** enables machines to perform intelligent tasks.
- India hosted the summit promoting **People, Planet and Progress principles** for inclusive global AI development.
- **Technological Origin and Development of AI:** AI emerged from **machine learning and big data computing**, supported by rapid growth in computing power and digital data. *(Source: Stanford AI Index 2025)*
- **Global Concern on Responsible AI Development:** As AI capabilities expanded, govts began discussing risks and governance at the **Bletchley Park AI Safety Summit 2023.** *(Source: UK Government)*
- **Expansion of International AI Cooperation:** Later summits in **Seoul 2024 and Paris 2025** expanded dialogue to innovation, inclusivity and collaborative AI research. *(Source: OECD 2025)*

Significance

- **Accelerating Economic Growth and Productivity:** AI adoption may contribute **$450–500 billion to India's GDP by 2025-30,** improving productivity in manufacturing, finance and logistics sectors. *(Source: NASSCOM 2025)*
- **Strengthening Digital Economy and Financial Systems:** AI secures India's **UPI network processing over 131 billion annual transactions**, detecting fraud patterns and protecting digital payments. *(Source: RBI 2025)*
- **Improving Agricultural Productivity and Climate Decisions:** AI crop advisory systems using **satellite and weather data increased crop yields by about 30% in pilot studies.**
- **Enhancing Healthcare Diagnosis and Medical Services:** AI systems analysing **X-rays and CT scans achieve about 90% diagnostic accuracy**, helping doctors detect diseases earlier. *(Source: WHO Digital Health Report 2025)*

Key Highlights of India AI Impact Summit 2026

Highlight	What Happened	Data (2026)	Significance
Global participation and dialogue	Governments, technology firms and researchers participated in large discussions	Over 5 lakh visitors and 500+ sessions	Shows strong global engagement on AI governance and innovation
Global South leadership in AI governance	India hosted the summit focusing on inclusive AI development	First major global AI summit hosted in the Global South	Expands representation of developing countries in AI policy discussions
Three Sutras framework for AI	Summit promoted principles of People, Planet and Progress	Framework guiding multilateral cooperation in AI	Encourages responsible and inclusive AI development

Key Outcomes of India AI Impact Summit 2026

Outcome	What Happened	Data (2026)	Significance
New Delhi Declaration on AI	Countries agreed on principles for responsible AI development	88 countries and international organisations supported declaration	Strengthens global cooperation on safe AI governance
Large investment commitments	Major funding announced for AI infrastructure and research	About $250 billion investments including $20 billion deep-tech research	Boosts AI ecosystem and technological innovation
Indigenous AI technology launch	Startup Sarvam AI launched domestically trained large language models	Multi-billion parameter AI model developed in India	Demonstrates India's growing AI research capability

- **Strengthening India's Indigenous Technology Capability:** Launch of **Sarvam AI large language model in 2026** demonstrates India's growing domestic AI research capacity.

Case Studies Showing the Significance of Artificial Intelligence				
Significance	**Case Study**	**Data (2025–2026)**	**impact**	**Source**
Economic productivity through AI	Siemens AI predictive maintenance system in manufacturing plants	AI monitoring reduces machine downtime by about 20–30% in factories	Higher productivity and lower production costs improve economic efficiency	McKinsey Industry 4.0 Report 2025
Healthcare improvement using AI	AI tuberculosis screening programme in India using chest X-ray analysis	AI tools can screen thousands of X-ray images daily in TB detection programmes	Faster disease detection strengthens public health services	Ministry of Health; WHO Digital Health Report 2025
Disaster prediction and climate management	DeepMind AI weather prediction model used globally	AI improves short-term weather forecasting accuracy by about 20%	Better forecasting supports agriculture planning and disaster preparedness	Nature Climate Research 2025

Challenges

- **High Cost of Building Advanced AI Systems:** Training powerful AI models can cost **over $100 million**, making development difficult for startups and universities. *(Source: Stanford AI Index 2025)*
- **Shortage of Skilled AI Professionals:** India has **about 416,000 AI professionals,** but demand may cross **one million specialists soon**.
- **Heavy Dependence on Imported Computer Chips:** India imports **more than 90% semiconductor chips**, which are essential for AI computers and data centres. *(Source: MeitY 2025)*
- **Large Electricity Demand for AI Data Centres:** Large AI data centres can consume **100–200 megawatts electricity each,** increasing pressure on power supply. *(Source: International Energy Agency 2025)*
- **Risks to Data Privacy and Cybersecurity:** India recorded **over 1.3 million cybersecurity incidents in 2024**, showing risks in digital data systems. *(Source: CERT-In 2025)*

AI Capability Comparison: India vs Global Leaders			
Capability Area	**India**	**Global Leaders (US / China / EU)**	**Source**
AI Research Publications	India ranked 3rd globally in AI research publications showing growing academic research activity.	US and China remain top two contributors to global AI research output.	Stanford AI Index 2025
AI Startup Ecosystem	India has over 500 AI startups working in health-tech, fintech, agriculture and language technologies.	Global leaders host thousands of AI startups with large venture capital investments.	NASSCOM AI Startup Report 2025
AI Data Centre Capacity	India expanding hyperscale data centres in Mumbai, Hyderabad and Chennai supporting AI computing.	US and China operate largest hyperscale AI cloud and computing infrastructure globally.	International Energy Agency 2025
AI Talent Availability	India is among the largest sources of software engineers and AI developers globally.	US and China lead in advanced AI research talent and frontier AI laboratories.	Stanford AI Index 2025
AI Use in Public Services	AI used in crop advisory, disease screening and digital governance services.	Global leaders use AI in autonomous vehicles, robotics and advanced defence systems.	OECD AI Policy Observatory 2025

Government and Institutional Efforts Tackling AI Challenges in India

- **IndiaAI Mission Building AI Ecosystem:** Government launched **IndiaAI Mission with ₹10,372 crore**, supporting AI research, startups, datasets and national AI computing infrastructure. *(Source: MeitY)*

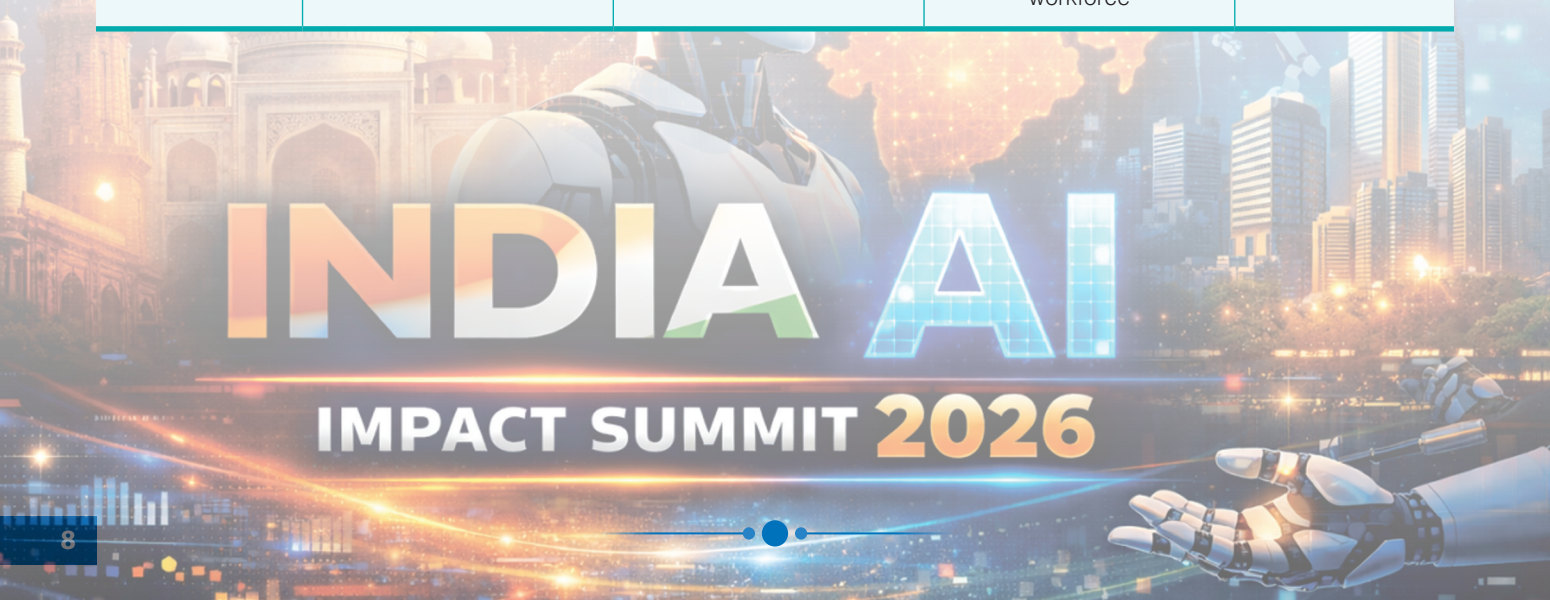
- **National AI Compute Infrastructure:** India is developing **34,000+ GPUs national computing platform**, helping universities and startups train advanced AI models domestically.*)*
- **India Semiconductor Mission:** Government launched **$10 billion semiconductor incentive programme** to manufacture computer chips used in AI computers. *(Source: MeitY 2025)*
- **Digital Personal Data Protection Act:** India enacted **Digital Personal Data Protection Act 2023** to protect citizens' data used in digital technologies and AI systems. *(Source: Govt of India)*
- **AI Research and Innovation Partnerships:** India AI Impact Summit 2026 promoted **global cooperation and $250 billion AI investment commitments** for research and technology development.

Way Forward

- **Increase AI Computing Infrastructure:** India should build larger AI computing centres so universities and startups can train advanced AI systems. *(Source: MeitY IndiaAI Mission 2025)*
- **Expand Semiconductor Manufacturing in India:** Speed up semiconductor factories so India can produce more chips needed for AI computers. *(MeitY Semiconductor Mission 2025)*
- **Improve Indian Language AI Technology:** Expand **BHASHINI platform** to create datasets for many Indian languages so AI tools work across the country. *(Source: MeitY 2025)*
- **Train More AI Professionals:** Universities and companies should train many more students in AI and data science skills.
- **Strengthen Data Protection and AI Rules:** Implement **Digital Personal Data Protection Act** to ensure safe and responsible use of data in AI systems. *(Source: Government of India 2025)*

Case Studies: Supporting above Recommnedations in Way Forward

Dimension	Case Study / Example	Clear Data (2025–2026)	How It Supports the Recommendation	Source
AI Computing Infrastructure Expansion	Microsoft–OpenAI AI supercomputing partnership building specialised AI data centres	Microsoft invested over $13 billion in OpenAI partnership and AI supercomputing infrastructure	Demonstrates that strong computing capacity is essential to develop advanced AI models	Stanford AI Index 2025
Domestic Semiconductor Manufacturing	Samsung semiconductor manufacturing ecosystem in South Korea	South Korea produces about 20% of global semiconductor memory chips	Shows how domestic chip production supports AI hardware and electronics industries	Semiconductor Industry Association 2025
AI Skill Development and Education	Finland national AI education programme "Elements of AI"	Programme trained over 1 million learners globally in AI fundamentals	Demonstrates how national education initiatives can build a large AI-skilled workforce	University of Helsinki AI Programme



16th FINANCE COMMISSION (2026-31)

The 16th Finance Commission, constituted in 2023 under the chairmanship of Dr. Arvind Panagariya has had its key recommendations accepted by the Government for implementation during 2026–27 to 2030–31.

Background

- The Finance Commission is a **constitutional body** *(an institution or authority that is established directly by the Constitution of India)* set up under article 280.
- **Article 280:** The President shall constitute a Finance Commission to recommend on:
  - Distribution of net proceeds of taxes between *Union and States* and *Among States*
  - Principles governing grants-in-aid of revenues of States out of the Consolidated Fund of India **(Article 275)**
  - Measures to augment State Consolidated Funds to supplement **Panchayats (Article 243H)** and **Municipalities (Article 243X).**
- **Article 280(2):** Parliament may by law determine the required qualifications for members of the Commission and manner of their selection.
  - In line with this, parliament passed the Finance Commission (Miscellaneous Provisions) Act, 1951.
  - As per the Act, the President appoints the Commission, which has a Chairman (usually an expert economist or former bureaucrat) and **four other members** (from judicial services, finance/accounting, public affairs and administrative services).
- Its recommendations are advisory (not legally binding, but the central government usually accepts most of them) and the report is placed before Parliament under **Article 281**.
  - **Article 281:** The President must place every recommendation made by the Finance Commission under the Constitution, along with a memorandum explaining the action taken on those recommendations, before both Houses of Parliament.

Need of Finance Commission

- India has a federal system (a system where power is divided between the central government and state governments).
- The Constitution assigns **elastic taxes** (taxes that grow fast with economy like income tax) to the Union List (taxes only Parliament can levy) and **inelastic taxes** like **stamp duty** to the State List (taxes only state legislatures can levy).
- This causes **vertical fiscal imbalance** wherein the Union collects more revenue but states spend more on infrastructure and development.
- **Horizontal fiscal imbalance** is too observed as money-making capacity among states is unequal. This is due to population and income differences.
- Article 280, in this regard, creates the Finance Commission (independent body recommending tax/grant sharing) that acts as a **neutral constitutional arbiter** for fiscal federalism.

Key Concepts and Trends

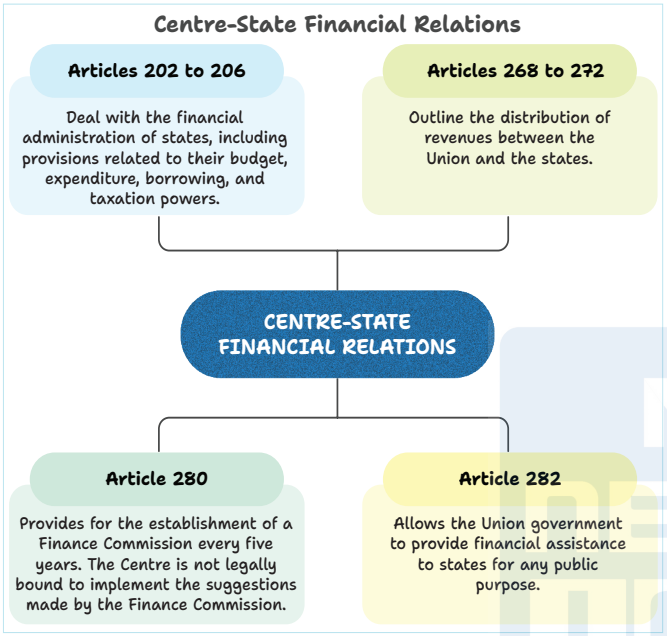
- **Tax Devolution:** Tax devolution refers to the **distribution of tax revenues** between the central government and the state governments. The Finance Commission decides what proportion of the Centre's net tax revenue goes to the **States overall *(vertical devolution)*** and how this share for the States is distributed among various **States *(horizontal devolution)*.**
- **Vertical Devolution (sharing between Centre and all states combined):** This arrangement decides what percentage of the Centre's divisible tax pool (taxes like income tax and GST that must be shared with states, excluding cesses) goes to states.
  - Currently, this is 41% as per the recommendations of the 16th FC.
  - Higher share = more money for states, but Centre makes a case for the requirement of more funds for defence and national schemes.
- **Horizontal Devolution (sharing among states):** Once states get their 41% pool, it's divided among 28 states using a formula with following criteria (weights given by 16th FC):

Criteria for Distribution of Central Taxes among States

Criteria	15th FC 2021-26)	16th FC (2026-31)
Income Distance	45%	42.5%
Population (2011)	15%	17.5%
Demographic Performance	12.5%	10%
Area	15%	10%
Forest	10%	10%
Tax and Fiscal Efforts	2.5%	-
Contribution to GDP	-	10%

- **Grants-in-Aid (extra money given for specific needs): Article 280(3)(b)** calls upon the Commission to recommend "the principles which should govern the *grants-in-aid* of the revenues of the States out of the Consolidated Fund of India."
  - **Under Article 275**, the President is to provide for "such sums" to be "charged on the ***Consolidated Fund of India*** in each year as *grants-in-aid* of the revenues of such States" as she may "determine to be in need of assistance", after considering the recommendations of the Finance Commission.
  - **Revenue Deficit Grants:** These are grants given in order to meet the gap in revenue accounts of the States post devolution. The 16th FC did not recommend any revenue deficit grants to States.
  - **Specific Grants:** The Commission ***did not recommend*** any sector-specific or State-specific grants as well.

- **Local Body Grants:** Grants for RLBs are classified into basic and performance components and those for ULBs into basic, performance, urban infrastructure and urbanisation premium components.
- **Disaster Grants:** The 16th finance commission continues the previous disaster risk financing approach, emphasizing relief-mitigation fund institutionalization, past expenditure analysis, and technology-led management to enhance state-level disaster resilience.



Evolution of Finance Commissions: From 1st to 16th

Since 1951, India has had 16 Finance Commissions, each covering five years. Here's how they evolved:

- **1st to 6th FC (1951–1980):** Focused on filling states' revenue gaps (shortfall between what states earn and spend). States' share was low (around 35–40%).
- **7th FC (1984–89):** Recommended 100% excise duties on electricity generation for collecting states and 40% excise duties on other commodities to be distributed among states.
- **10th FC (1995–2000):** The Tenth Commission further raised the share of the states to be 47.5 per cent.
- **14th FC (2015–20):** Boldly raised states' share to 42% and asked Centre to rationalise **Centrally Sponsored Schemes** (CSS – central schemes where Centre pays part and states implement).
- **15th FC (2021–26):** Slightly reduced to 41% (after Jammu & Kashmir became a Union Territory); it gave a big push for local bodies (panchayats and municipalities) and promoted the performance grants (money given only if states meet targets like timely audits). Each Commission reflects India's changing needs – from poverty reduction in the 1950s to urbanisation, disasters, and climate change today.

16th Finance Commission

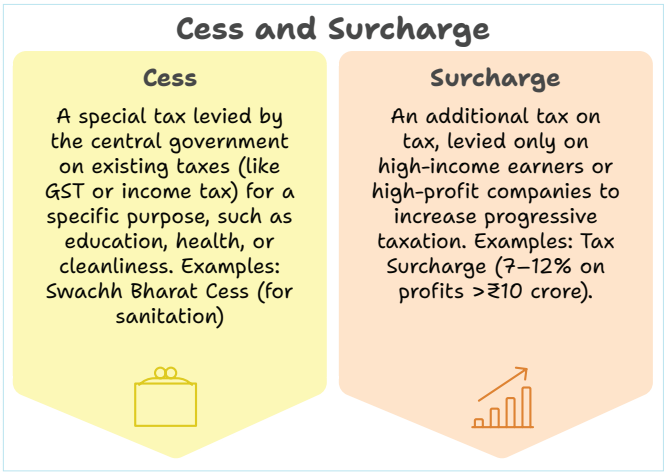
- The Sixteenth Finance Commission submitted its report in November 2025 (placed in Parliament February 2026).

Terms of Reference for the 16th Finance Commission:

- **Distribution of Tax Revenues:** The Commission recommends how divisible taxes are shared between the Union and the States, including the share of each State.
- **Guidelines for Grants-in-Aid:** It lays down principles for grants-in-aid from the Consolidated Fund of India, including amounts under Article 275.
- **Boosting Funds for Local Governments:** It suggests measures to strengthen State Consolidated Funds to support Panchayats and Municipalities based on State Finance Commission recommendations.
- **Review of Disaster Management Funding:** It may review disaster management financing under the Disaster Management Act, 2005, and suggest improvements.

Major Recommendations of 16th Finance Commission:

- **Grants for Local Bodies:** The 16th FC has recommended grants worth Rs 4.4 lakh crore and Rs 3.6 lakh crore for rural and urban local bodies, respectively. These grants are divided into basic (80%) and performance-based (20%) components.
  - All local body grants will be made available upon fulfilment of **three entry-level criteria:**
  - constitution of the local bodies as per the Constitution,
  - publication of provisional and audited accounts of the local bodies in the public domain, and
  - timely constitution of the State Finance Commission.
- **Basic Grants:** 50% of the basic grant will be untied and the rest 50% will be tied to sanitation and solid waste management, and/or water management.
- **Special Infrastructure Grants:** This component will be tied to the development of a comprehensive wastewater management system in cities with population between 10-40 lakh as per the 2011 census. Grants worth Rs 56,100 crore have been recommended over five years.
- **Urbanisation Premium Grant:** These will be released to states as a one-time grant for merger of *peri-urban villages* into adjoining urban local body areas and formulation of a Rural to Urban Transition Policy.
  - Rs 10,000 crore have been recommended under the urbanisation premium component.
- **Disaster Management Grants:** The Commission has recommended disaster management corpus of Rs 2,04,401 crore for **State Disaster Relief and Management Funds (SDRF and SDMF).**
  - The cost-sharing pattern between the centre and states is recommended to be:
    - 90:10 for north-eastern and Himalayan states, and
    - 75:25 for all other states.
  - Centre's share in total will be Rs 1,55,916 crore.



- **Fiscal Roadmap:**
  - The Commission has recommended that the Centre should bring down the fiscal deficit to 3.5% of GDP by 2030-31.
  - It recommended the annual fiscal deficit limit for states to be 3% of GSDP.
  - **Ban on Off-budget Borrowings:** 16th FC recommended strictly discontinuing the practice of off-budget borrowings for states and bringing all such borrowings onto their budgets.
  - The Commission has projected the combined debt of the central and state governments to decline from 77.3% in 2026-27 to 73.1% of the GDP in 2030-31.
- **Power-sector Reforms:**
  - The Commission recommended that states should actively pursue **privatisation of electricity distribution companies (DISCOMs).**
  - To shield the private investor from debt burden after discom takeover, a **special purpose vehicle may be created to warehouse the debt.**
- **Subsidy Expenditure:**
  - The 16th FC recommended states to review and rationalise their subsidy expenditure. The commission noted that schemes providing unconditional cash transfers tend to have large and untargeted beneficiaries.
  - **It recommended**
    - setting clear exclusion criteria and a rigorous review process to ensure effective targeting, and
    - discontinuing financing of subsidies through off budget borrowings.
  - The Commission also noted a lack of standardisation in defining and accounting of subsidies and transfers across states. It observed that subsidies and transfers across states are being misclassified as assistance, grants, or other expenditure.
    - The commission recommended adoption of a uniform approach for accounting and disclosure of subsidies and transfers.
- **Public Sector Enterprise Reforms:**
  - The Commission recommended a review and closure of 308 inactive State Public Sector Enterprises (SPSEs) and formulation of a state-level PSEs disinvestment policy to target inactive and underperforming SPSEs.
  - State or union PSEs, which incur losses for three out of four consecutive years, should be placed for the respective Cabinet's consideration. The Cabinet may decide closure, privatisation, or continuation depending on the strategic importance of the enterprise.

Challenges and Criticisms

- **Divisible Pool Erosion:** Cesses/surcharges mean states get ~34–35% effectively, not 41%. Southern states demand cess inclusion.
- **Horizontal Imbalance:** High-population poor states gain; high-performing states feel penalised.
- **Tight Deficit Caps:** States say the target of keeping fiscal deficit to 3% of GSDP limit squeezes welfare spending.
- **Conditional Grants:** Conditional grants are viewed as more strings being attached while reducing autonomy.
- **Irregular State Finance Commissions:** Many states fail to constitute SFCs on time, disrupting predictable fiscal devolution and this weakens local governance.
- **Challenges in Local Bodies Financing:**
  - **Low Revenue:** Local bodies' revenue constitutes only around **0.4% of GDP,** which is very low compared to global standards. Property tax collection remains inefficient and under-assessed.
  - **Heavy Dependence on Grants:** Most local bodies rely overwhelmingly on transfers from the Centre and states, **limiting fiscal autonomy** and long-term planning capacity.
  - **Capacity Constraints:** Limited administrative and technical expertise affects budgeting, financial management, and efficient utilisation of funds.

Way Ahead

- **Reforms Needed:** Constitutional cap on cesses (Article 270 amendment), GST Council to address revenue neutral rate and Empower SFCs with teeth.
- The 16th Finance Commission should **reassess the balance between shareable and non-shareable revenues** to address structural fiscal imbalances.
- **Greater transparency and rationalisation of cesses and surcharges** can strengthen trust and expand the effective divisible pool.
- **Institutional dialogue** through bodies like the Inter-State Council and GST Council should be deepened to promote cooperative **fiscal federalism** and coordinated fiscal planning.
- The 16th FC strengthens cooperative federalism (states and Centre working as partners) while pushing competitive federalism (rewarding better performers).

INDIA-FRANCE RELATIONS

Recently, French President Emmanuel Macron visited India, attended the AI Impact Summit 2026 and held extensive bilateral discussions focusing on implementing the long-term cooperation roadmap titled "Horizon 2047".

Key Outcomes of Recent Meet

- **Special Global Strategic Partnership:**
  - India and France elevated their relationship to a historic "Special Global Strategic Partnership," reflecting deep trust and long-term cooperation.
  - India-France **Special Global Strategic Partnership** upgrades from **Strategic Partnership (1998)** to a comprehensive alliance for global stability, emphasizing strategic autonomy, **global governance on climate/macroeconomics**, and co-development in AI, space, nuclear tech, and supply chains.
- **Defence and Strategic Cooperation:** India and France commended the contract for 26 Rafale-Marine fighter jets. The H125 helicopter Final Assembly Line (TATA-Airbus) was inaugurated, and a Joint Advanced Technology Development Group was formed for critical technologies.
- **Nuclear Energy Cooperation:**
  - Both countries strengthened cooperation on Small Modular Reactors (SMRs) and Advanced Modular Reactors (AMRs) under the 2025 Declaration of Intent.
  - France supported India's 100 GW nuclear power target by 2047 and progress in the Jaitapur Nuclear Power Project.
- **Space Cooperation:**
  - The third India-France Strategic Space Dialogue will be held in 2026.
  - India will also participate in the International Space Summit in France in July 2026.
- **Artificial Intelligence and Innovation:**
  - The India-France Innovation Network was launched along with joint centres for digital science and advanced materials.
  - Cooperation between the research institutions of both countries has been expanded.
- **Indo-Pacific Cooperation:** Both countries enhanced cooperation under the Indo-Pacific Oceans Initiative and the Indian Ocean Rim Association. They are also working together in trilateral formats with Australia and the UAE.
- **Climate Change and Environment:** Both nations welcomed the success of the UN Ocean Conference (Nice, 2025). They also supported the implementation of the Marine Biodiversity (BBNJ) Treaty.
- **Health Cooperation:**
  - Joint research initiatives in AI-based healthcare were launched involving AIIMS Delhi and French institutions.
  - Cooperation between health research organisations of both countries has increased.
- **Education and Cultural Cooperation:** France aims to host 30,000 Indian students by 2030. Cultural cooperation includes museum partnerships and the upcoming Namaste France 2028 programme.
- **Regional Issues:** Both countries supported a peaceful resolution of the Ukraine conflict based on UN principles. They also supported a two-state solution for Gaza and emphasised diplomacy regarding Iran.
- **Multilateral Cooperation:** France reiterated its support for India's permanent membership in the UN Security Council. The French President invited India to attend the 2026 G7 Summit and Africa Forward Summit.

Significance

- **Historical Background:**
  - India and France relation has depended and grown over the time.
  - France has consistently supported India's strategic autonomy and independent foreign policy.
  - Cooperation now covers defence, nuclear energy, space, climate change, and advanced technologies.
- **Geopolitical and Indo-Pacific Cooperation:**
  - India and France share strong convergence in the Indo-Pacific, where France is a resident power due to its overseas territories.
  - Both support freedom of navigation, international law, and a rules-based maritime order.
  - They also support a multipolar world order, and France backs India's permanent membership in the UNSC.
  - Cooperation is strengthened through joint naval exercises and trilateral partnerships with Australia and the UAE.
- **Defence Cooperation: Core Pillar:**
  - Defence is the backbone of India–France relations, supported by **regular defence dialogues, joint exercises, and technology cooperation**.
  - Major projects include **Rafale fighter aircraft, Scorpene submarines, and jet engine development**.
  - Both countries conduct exercises like **Varuna and Shakti**, enhancing interoperability.
  - The partnership is shifting from **procurement to joint development, co-production, and defence industrial cooperation**, strengthening India's defence indigenisation.
- **Geo-economic Cooperation:**
  - Bilateral trade has grown to over USD 15 billion, and France is a major investor in India.

- Cooperation is expanding in digital technology, artificial intelligence, fintech, and innovation.
- India's UPI has been launched in France, reflecting growing digital cooperation. Both countries are strengthening collaboration in emerging technologies and industrial partnerships.

- **Space, Climate, and Energy Cooperation:**
  - India and France cooperate closely in space research through the ISRO–CNES partnership, including satellite launches and climate monitoring.
  - Both co-founded the International Solar Alliance and cooperate in renewable energy and climate action.
  - Civil nuclear cooperation includes the Jaitapur Nuclear Power Project and collaboration on Small Modular Reactors, supporting clean energy goals.
- **People-to-People and Cultural Relations:** India and France share strong cultural and educational ties, supported by a growing Indian diaspora in France.
  - Educational exchanges, student mobility, and cultural programmes strengthen mutual understanding.
  - These people-to-people connections provide a strong foundation for long-term strategic partnership.

Challenges

- **Limited Depth of Economic and Trade Relations:** Bilateral trade (~$15–20 billion range, *Ref. MEA bilateral brief*) remains modest compared to India's trade with the US or EU.
  - Lack of an India–EU Free Trade Agreement, where France is influential, restricts full economic potential.
- **Constraints in Defence Technology Transfer and Co-development:** France is more open than many countries, but critical technologies (engine, avionics, propulsion) still face transfer limitations.
  - India's push for indigenisation under **Atmanirbhar Bharat** sometimes clashes with French commercial interests.
- **Differences in Approach toward Russia–Ukraine Conflict:** France strongly condemned Russia and aligned with EU sanctions, while India maintained strategic neutrality. This divergence reflects differing geopolitical compulsions and strategic autonomy priorities.
- **Slow Progress in Civil Nuclear Cooperation:** The Jaitapur Nuclear Power Project with **Électricité de France S.A. (EDF)** (France's state-owned electric utility company) has faced delays due to cost, liability laws, and regulatory concerns. This has slowed the realisation of a key pillar of India–France strategic partnership.
- **Bureaucratic, Regulatory, and Industrial Barriers:** Complex procedures, regulatory uncertainty, and industrial standards differences affect the smooth implementation of joint ventures. This discourages deeper French investment in India's manufacturing sector.
- **Lack of Strong People-to-People and Cultural Linkages:** Unlike India's relations with the US or UK, migration, student flows, and diaspora presence in France are relatively smaller.
  - This limits social, academic, and innovation ecosystem integration.

Way Forward

- **Effective Implementation of Horizon 2047 Roadmap:** Both countries must operationalise the Horizon 2047 roadmap with time-bound targets and institutional monitoring. This will ensure continuity and long-term strategic convergence across defence, technology, and economic sectors.
- **Deepening Defence Industrial Cooperation and Co-development:**
  - India and France should move from a buyer–seller model to joint design, co-production, and co-development of defence platforms.
  - This will strengthen India's defence indigenisation while ensuring France remains a trusted strategic partner.
- **Strengthening Technology Partnership in Emerging Sectors:**
  - Collaboration in artificial intelligence, semiconductors, cyber security, and space technology should be expanded.
  - Joint innovation, research centres, and private sector participation can enhance technological sovereignty for both nations.
- **Expanding Trade and Facilitating Investment and Mobility:**
  - Both countries should work toward increasing bilateral trade through easier market access and regulatory reforms.
  - Promoting business mobility, startups, and fast-track investment mechanisms will boost economic engagement.
- **Enhancing Maritime and Indo-Pacific Cooperation:**
  - India and France should expand joint naval exercises, maritime surveillance, and logistics cooperation in the Indo-Pacific.
  - France's overseas territories and India's strategic location provide opportunities for ensuring regional stability.
- **Fast-tracking Civil Nuclear and Clean Energy Cooperation:**
  - Early resolution of cost, liability, and regulatory issues in projects like Jaitapur is essential.
  - Greater collaboration in nuclear, renewable energy, and green hydrogen will support energy security and climate goals.

Conclusion

- India and France share one of India's most trusted partnerships, built on defence deals like Rafale jets and growing cooperation in AI, climate change, and Indo-Pacific security.
- President Macron's 2026 visit strengthened the Horizon 2047 plan for the next 25 years.

PRAHAAR

Amid rising tech-enabled terrorism, cross-border radicalisation and drone attacks, India launched PRAHAAR (Prevention, Response, Aggregation, Human-rights, Attenuation, Alignment, Recovery) national counter-terror policy.

> *Terrorism is a global menace that must be fought with unity, determination and full respect for human rights.*
>
> **Kofi Annan,** (Former UN Secretary-General)

Background

- India's counter-terror strategy historically relied on **separate intelligence, policing and military responses**, without a single national policy framework.
- Major attacks such as **Mumbai 2008, Uri 2016 and Pulwama 2019** exposed weaknesses in intelligence coordination, early threat detection and operational response.
- India responded by strengthening institutions including the **National Investigation Agency (NIA), National Security Guard (NSG) and Multi-Agency Centre (MAC)** to improve investigations and intelligence sharing.
- Terror networks simultaneously shifted toward technology-enabled methods including drone-based weapons smuggling, encrypted communication platforms and cryptocurrency financing.
- These structural security challenges led the Ministry of Home Affairs to formulate **PRAHAAR as India's first integrated national counter-terrorism policy framework.**

PRAHAAR	
Introduced By	Ministry of Home Affairs (MHA), Government of India, the central authority responsible for internal security and counter-terror coordination.
Core Objective	Establish an intelligence-led preventive security system that identifies terror threats early and disrupts attacks before they occur.
Security Model	Follows a whole-of-government approach, integrating intelligence agencies, central security forces and state police institutions.
Institutional Integration	Coordinates agencies such as the National Investigation Agency (NIA), Intelligence Bureau (IB), National Security Guard (NSG) and Multi-Agency Centre (MAC).
Intelligence Coordination System	Uses platforms such as MAC and the Joint Task Force on Intelligence (JTFI) to enable real-time intelligence sharing across security agencies.
Technology Integration	Emphasises cyber intelligence, anti-drone defence systems, digital surveillance and financial intelligence tracking of terror networks.
Threats Addressed	Targets cross-border terrorism, drone-based arms smuggling, online radicalisation, encrypted communications and terror financing networks.
Legal Framework Support	Operates alongside laws such as the Unlawful Activities (Prevention) Act (UAPA), the NIA Act, 2008 and the Prevention of Money Laundering Act (PMLA).

Challenges and Concerns of India's Counter-Terror Architecture

- **Slow digital evidence processing in terror investigations:** Indian courts and forensic labs face backlog in analysing digital evidence, delaying terror trials and prosecution outcomes. *(NCRB Crime Report 2025)*
- **Increasing use of artificial intelligence tools by terror groups:** Security agencies warn extremists increasingly use AI-generated propaganda and automated bot networks for radicalisation campaigns. *(Interpol Technology Assessment 2026)*
- **Expansion of dark-web based illegal marketplaces:** Dark-web platforms allow anonymous purchase of weapons, explosives and stolen data, complicating intelligence tracking. *(UNODC Cybercrime Report 2025)*
- **Security risks to critical transport infrastructure:** Airports, railways and seaports require stronger integrated surveillance to prevent coordinated terror attacks.
- **Limited specialised counter-terror training capacity:** Many police forces still lack advanced training in cyber intelligence, drone detection and digital surveillance technologies. *(MHA Police Modernisation Review 2026)*

India's Counter-Terror Architecture			
Institution	**Full Form**	**Core Function in Counter-Terrorism**	**Key Practical Role**
MAC	Multi-Agency Centre (under Intelligence Bureau)	National platform for real-time intelligence sharing among central and state security agencies.	Receives intelligence from 20+ agencies and all states, helping detect terror plots early. (MHA)
NIA	National Investigation Agency	India's central counter-terror investigation agency created under the NIA Act, 2008.	Investigates terror financing, ISIS modules, cross-border networks and interstate terror cases.
NATGRID	National Intelligence Grid	Integrated security database connecting travel, telecom, banking and immigration records.	Enables investigators to quickly trace suspects' movement, financial transactions and communication patterns. (MHA)
NSG	National Security Guard	India's elite federal counter-terror response force specialised in hostage rescue and urban combat.	Deployed during high-risk terror incidents and aircraft hijacking situations. (MHA)
NTRO	National Technical Research Organisation	India's technical intelligence agency focusing on satellite surveillance and cyber intelligence.	Provides signals intelligence, drone monitoring and satellite imagery for security operations. (National Security Architecture Reports)

Government and Institutional Efforts

- **National Intelligence Data Integration Systems:** Government operationalising NATGRID linking travel, banking, telecom and immigration records, enabling investigators to track terror suspects quickly.
- **Police Modernisation and Counter-Terror Training:** Union government allocated ₹3,375 crore under Police Modernisation Scheme to upgrade cyber forensics labs and counter-terror training facilities. *(Source: Union Budget 2025)*
- **Anti-Drone Security Deployment along Borders:** India deployed anti-drone radar and jamming systems along sensitive borders to stop weapon-smuggling drones.
- **Strengthening Counter-Terror Financial Monitoring:** Financial Intelligence Unit strengthened monitoring of suspicious financial flows under Prevention of Money Laundering Act enforcement. *(Source: FIU-IND 2025)*
- **Expansion of Global Counter-Terror Cooperation:** India collaborates through Financial Action Task Force mechanisms and extradition treaties to track international terror networks.

Way Forward

- **Complete integration of national intelligence databases:** Fully operationalising NATGRID with security databases will enable faster identification of suspicious travel, financial transactions and communication patterns. *(Source: MHA 2026)*
- **Expand specialised cyber-forensic laboratories across states:** Creating advanced digital forensic centres will help investigators analyse encrypted devices and online terror evidence quickly. *(Source: NCRB Cybercrime Review 2025)*
- **Develop national counter-drone security network:** Integrating radar sensors, satellite surveillance and anti-drone systems will strengthen border protection.
- **Strengthen international intelligence cooperation:** Deeper collaboration through **FATF and global intelligence partnerships** will help track cross-border terror financing networks.
- **Improve specialised counter-terror training capacity:** Expanding training programmes for police and security forces will improve investigation and rapid response capability. *(Source: MHA Police Modernisation Review 2026)*

Global Best Counter-Terror Models Compared with India's PRAHAAR			
Country / Model	**What the System Does**	**Practical Evidence (2025–26)**	**What India Can Learn**
United States – National Counterterrorism Center (NCTC)	A national centre that collects intelligence from many agencies and analyses it together to detect terror threats early.	The US runs Joint Terrorism Task Forces in all states where federal and local police jointly investigate terror cases. (US Homeland Security Report 2025)	Shows how strong intelligence data integration and joint investigations improve early detection of terror plots, which PRAHAAR aims to strengthen.
United Kingdom – CONTEST Counter-Terror Strategy	**UK uses four actions:** Prevent radicalisation, Pursue terrorists, Protect infrastructure, Prepare emergency response.	The Prevent programme identifies individuals at risk of radicalisation and provides counselling and monitoring. (UK Home Office 2025)	Shows the importance of community-level prevention and deradicalisation programmes, an area PRAHAAR can expand.

SPECIAL ADDRESS AND MOTION OF THANKS

For the first time since 2004, the Lok Sabha passed the Motion of Thanks on February 5, 2026, without the Prime Minister's customary closing response to the debate.

President's Address

- The Constitution provides for a "**Special Address**" by the President under Article 87(1). Unlike the ordinary right to address the House under Article 86, the right of the President to address the house under Article 87 is mandatory.
- The President is required to address both Houses of Parliament assembled together at:
  - The commencement of the first session after each general election to the Lok Sabha.
  - The commencement of the first session of each year (usually the **Budget Session**).
- **Purpose:**
  - The President's Address is the statement of policy of the Government and as such is drafted by the Government.
  - It outlines the government's achievements, its economic vision (such as fiscal targets and GDP outlook), and its legislative roadmap for the coming year.

Additional Information

- **Article 86 (1)** of the Constitution provides that the **President may address** either House of Parliament or both Houses assembled together, and for that purpose require the attendance of members.
- However, since the commencement of the Constitution, the **President has not so far addressed either House or both Houses assembled together under the provision of this article.**

Motion of Thanks

- **Article 87(2):**
  - Following the Address, Article 87(2) mandates that the Rules of Procedure of **each House** must provide time for a discussion on the matters contained within it.
  - This is operationalized through the **Motion of Thanks.**
- **The Debate:**
  - The debate typically spans three to four days. It is a unique parliamentary occasion where the 'scope of discussion is at its widest.'
  - Members can critique the government not just on what was said in the Address, but also on what was omitted.
- **Voting and Its Consequences:**
  - At the end of the debate, the Prime Minister replies to the points raised, and the Motion is put to a vote.
  - Amendments may refer to matters contained in the Address as well as to matters which, in the opinion of the member, the Address has failed to mention.
  - If an amendment to the Motion is passed, it represents a significant political setback for the government.
  - So far, the Rajya Sabha has passed the Motion of Thanks with amendments only a few times (1980, 1989, 2001, 2015 and 2016). In the Lok Sabha, no amendment has ever been passed.
  - **Accountability:** The Motion of Thanks ensures accountability by subjecting the government's agenda, as outlined in the President's Address, to parliamentary scrutiny and a confidence test.
  - **Defeat of Government:** If the Motion of Thanks is defeated in the Lok Sabha, it is viewed as a lack of confidence in the government and leads to the resignation of the Council of Ministers.

Aspect	President (Article 87)	Governor (Article 176)
Nature	Special Address (mandatory)	Special Address (mandatory)
Occasion	1st session post-Lok Sabha election + 1st session/year	1st session post-Assembly election + 1st session/year
Audience	Both Houses (Central Hall)	Assembly (+Council if bicameral)
Content	Union Cabinet-drafted	State Cabinet-drafted
Discussion	Motion of Thanks (both Houses)	Motion of Thanks (Assembly)

Judicial Interpretations and Constitutional Boundaries

The Supreme Court has repeatedly clarified the roles of these constitutional functionaries to prevent executive or gubernatorial overreach (when a Governor uses discretionary powers beyond constitutionally defined boundaries.

- **The "Aid and Advice" Doctrine:**
  - In **Shamsher Singh v. State of Punjab (1974)**, a seven-judge bench ruled that the President and Governor are the constitutional heads of the Union and States, respectively, and must exercise their formal powers only upon the advice of their Ministers.
  - The Court emphasized that "**the Governor has no functions of his own**" except where the Constitution specifically allows for discretion.
- **Limitations on Discretion:** In **Nabam Rebia v. Deputy Speaker (2016)**, the Supreme Court held that the Governor's discretionary powers under Article 163 are limited to those areas specifically mentioned in the Constitution.

- The Court noted that the Governor is not an "**elected representative**" and cannot use their office to override the will of the legislature or the Cabinet.

➲ **Article 361:**

- The "Address Walkouts" persist partly due to Article 361, which states that the President or Governor "shall not be answerable to any court for the exercise and performance of the powers and duties of his office."
- While their actions (like a bill dismissal) can be reviewed, their conduct (like walking out) is shielded, leading to a "moral hazard" in constitutional governance.

Way Forward

To protect the sanctity of the Parliament and State Legislatures, several reforms are suggested:

➲ **Clarifying the "Address" Convention:** It should be clarified that "Shall Address" under Articles 87 and 176 means reading the verbatim text provided by the Cabinet.

- Any deviation should be treated as a "Constitutional Impropriety" that allows for a presidential reference.

➲ **Implementing the Punchhi Commission Report:**

- The Punchhi Commission (2010) suggested that Governors should be removed through a process of "impeachment" by the State Legislature, similar to the President.
- This would make the Governor accountable to the state they serve, rather than being solely dependent on the "pleasure of the President" (Article 156).

➲ **Role of the Inter-State Council:** The Inter-State Council (Article 263) should be revitalized to serve as a forum where Governors and Chief Ministers can resolve conflicts regarding the "content of the address" before it is delivered, preventing public standoffs in the House.

Conclusion

➲ The Special Address and the Motion of Thanks are not merely ceremonial parliamentary practices; they are vital constitutional mechanisms that uphold executive accountability to the legislature.

➲ By enabling a wide-ranging debate on the government's policies and priorities, the Motion of Thanks reinforces the principle of responsible government at both the Union and State levels.

➲ Recent controversies surrounding truncated addresses and walkouts by Governors highlight the growing tensions in India's federal and parliamentary framework.

➲ Judicial pronouncements have clearly affirmed that constitutional heads must ordinarily act on the aid and advice of the Council of Ministers, leaving little scope for personal discretion in matters such as the Address.

➲ Therefore, preserving the sanctity of these constitutional conventions through clearer norms, institutional dialogue, and adherence to the spirit of cooperative federalism is essential to ensure that parliamentary democracy functions smoothly and constitutionally.

The Governor's Address and Issue of Walkouts

➲ **Article 176:**

- In the case of the states, Article 176(1) largely mirrors Article 87. The Governor is constitutionally required to address the Legislative Assembly (and Council, where applicable).
- The legal phrasing, "the Governor shall address", indicates a mandatory constitutional duty.

➲ **Address Walkouts and Selective Reading:**

- **Himachal Pradesh (February 2026):** Himachal Pradesh Governor read only first 2 paras out of 130-para speech. The Governor cited that certain paragraphs of the speech appear to comment on constitutional institutions.
- **Karnataka (January 2026):** Karnataka Governor read only the first two lines of the address and exited the House, citing "objectionable content" that criticized the Union government's fiscal policies toward the state.
- **Tamil Nadu and Kerala:** Governors have previously demanded that paragraphs regarding secularism or state-specific social justice models be deleted, leading to standoffs with the State Cabinets.

➲ **The Legal Impasse:**

- Constitution experts have argued that if a Governor refuses to read the Cabinet-approved speech, they are violating Article 163.
- **Article163:** There shall be a Council of Ministers with the Chief Minister at the head to aid and advise the Governor in the exercise of his functions.
- Since the Motion of Thanks can only happen after the Address, a walkout technically prevents the legislature from conducting its business, thereby obstructing the constitutional process.

MANAGING URBANIZATION IN INDIA

Accelerating urbanisation, rising climate risks, and recurring infrastructure failures highlight deep governance and planning challenges in managing India's expanding urban systems.

Constitutional Vision of Local Governance "Local governments are the most effective schools of democracy."

Dr. B.R. Ambedkar

Background

- **Meaning:** Urbanisation refers to the concentration of **population, economic activities and infrastructure in cities,** transforming settlement patterns, labour markets and economic structures. Cities increasingly act as centres of productivity and social change.
- **Origin and Post-1991 Urban Expansion:** Urban growth accelerated after **1991 economic liberalisation**, which expanded manufacturing, services and infrastructure investment.
  - Cities gradually became hubs for employment, finance and industrial activity.
- **Institutional Framework of Urban Governance:** The **74th Constitutional Amendment Act, 1992** created **Urban Local Bodies (ULBs)** and introduced the **Twelfth Schedule with 18 urban functions**, promoting decentralised urban governance.
- **Current Status and Scale of Urbanisation:** India has 4,800+ statutory towns and 3,900+ census towns, with about 36% urban population in 2025, projected to exceed 40% by 2036. *(MoHUA; UN)*
- **Emerging Governance and Infrastructure Challenges:** Rapid expansion into peri-urban areas and informal settlements strains infrastructure, while events such as Bengaluru floods and Greater Noida failures (2025–26) expose planning gaps.

Evolution of Urban Governance in India

Phase	Period	Key Development	Significance
Ancient Urban Administration	Ancient India (Mauryan–Gupta period)	Cities were administered by officials such as the Nagaraka mentioned in the Arthashastra, managing sanitation, markets and public order.	Demonstrates that organised urban administration existed in ancient Indian cities like Pataliputra.
Medieval Urban Governance	Delhi Sultanate–Mughal period	Urban administration was managed by officials like the Kotwal, responsible for policing, markets, public safety and city management.	Cities such as Delhi, Agra and Lahore had structured administrative systems for maintaining urban order.
Colonial Urban Administration	1687–1882	Establishment of Madras Municipal Corporation (1687) and later municipal bodies in Bombay and Calcutta.	Marked the institutional beginning of municipal governance under British administration.
Local Self-Government Reforms	1882	Lord Ripon's Resolution on Local Self-Government introduced elected municipal bodies and decentralised urban administration.	Considered the foundation of democratic local governance in India.
Post-Independence Urban Governance	1950–1990	Municipal governance remained a State subject with limited autonomy and financial powers.	Urban local bodies remained administratively weak and dependent on state governments.
Constitutionalisation of Urban Governance	1992	74th Constitutional Amendment Act granted constitutional status to municipalities and introduced the Twelfth Schedule.	Strengthened democratic decentralisation and institutional structure of urban governance.
Contemporary Urban Governance Reforms	2005–Present	Programmes such as JNNURM, AMRUT, Smart Cities Mission and Swachh Bharat Mission improved infrastructure and service delivery.	Focus on modern, technology-enabled and sustainable urban governance systems.

Significances of Managing Urbanisation

- **Cities Driving India's Economic Productivity:** Cities host 36% population yet produce about 63% GDP, demonstrating strong agglomeration economies (productivity gains from clustering industries and labour).
- **Improving Urban Water and Sanitation Services:** Under AMRUT and AMRUT 2.0, over 4,900 water supply and 2,700 sewerage projects improved urban service coverage across 500 cities.
- **Strengthening Disaster and Infrastructure Risk Governance:** Local urban planning enables flood mitigation; Surat's early warning system reduced major flood losses during recent monsoon seasons. *(NDMA Urban Flood Management Report 2026)*
- **Enhancing Climate Adaptation in Cities:** Urban heat action plans show measurable impact; Ahmedabad reduced heat-related mortality by more than 30% since implementation.
- **Promoting Inclusive Urban Housing and Livelihoods:** PMAY-Urban sanctioned about 1.2 crore houses, while DAY-NULM supports urban livelihoods through municipal-level implementation. *(Sources: MoHUA PMAY-U Dashboard 2025)*

Challenges and Concerns

- **Incomplete Institutional Decentralisation:** Although the 74th Constitutional Amendment created Urban Local Bodies, most states transferred fewer than ten of eighteen municipal functions. *(Sources: RBI State Finances Report 2025)*
- **Structural Fiscal Weakness of Urban Local Bodies:** Municipal revenues remain **around 0.7% of GDP in India**, far below the 4–6% typical in developed economies. *(Sources: RBI State Finances Report 2025)*
- **Unplanned Peri-Urban Expansion and Governance Gaps:** Over 3,900 census towns lack statutory municipal governance, creating planning gaps and infrastructure deficits. *(Sources: MoHUA Urban Statistics Handbook 2025)*
- **Major Urban Infrastructure Investment Deficit:** India requires about $840 billion urban infrastructure investment by 2036 to meet growing urban service demand.
- **Rising Urban Climate and Environmental Risks:** Nearly 70% of Indian cities face high climate vulnerability, including flooding, heatwaves and water stress. *(Sources: World Bank Urban Climate Risk Report 2025)*

Government and Institutional Efforts

- **Strengthening Urban Governance through Finance Commission Grants:** The 15th Finance Commission allocated about ₹1.2 lakh crore for Urban Local Bodies (2021–26) improving municipal finances. *(Sources: 15th Finance Commission Report; MoHUA 2025)*
- **Expanding Urban Infrastructure through Smart Cities Mission:** The Smart Cities Mission supports 100 cities implementing technology-driven urban infrastructure projects improving transport, water systems and governance efficiency.
- **Improving Water and Sanitation Infrastructure through AMRUT 2.0:** AMRUT 2.0 aims universal water supply and sewerage coverage in all statutory towns by 2026.
- **Strengthening Affordable Urban Housing through PMAY-Urban:** The PMAY-Urban programme supports affordable housing through subsidies, slum redevelopment and beneficiary-led construction for urban households.
- **Enhancing Urban Climate Resilience and Disaster Management:** NDMA and MoHUA promote urban flood management, heat action plans and climate-resilient infrastructure planning.

Way Forward

- **Strengthen Fiscal Autonomy of Urban Local Bodies:** Expand municipal revenue through property tax reforms, user charges and municipal bonds, increasing local infrastructure investment capacity. *(Sources: RBI State Finances Report 2025)*
- **Deepen Functional Devolution to Municipal Governments:** States should transfer all eighteen Twelfth Schedule functions enabling Urban Local Bodies to manage planning, water supply and local infrastructure.
- **Improve Integrated Urban Planning Systems:** Adopt GIS-based master planning and metropolitan governance institutions to manage rapidly expanding urban regions.
- **Expand Sustainable Urban Infrastructure Investment:** India must mobilise $840 billion infrastructure investment by 2036 through public-private partnerships and municipal finance reforms.
- **Integrate Climate Resilience into Urban Development:** Cities should implement urban flood management, heat action plans and green infrastructure strengthening climate resilience.

Case Studies of Effective Urban Management (Global and Indian)

City / Country	Key Urban Management Practice	Evidence	Key Lesson for India
Singapore	Integrated metropolitan planning by Urban Redevelopment Authority (URA) combining land-use planning, public housing and transport systems.	Over 80% residents live in planned public housing with efficient public transport coverage.	Demonstrates importance of strong metropolitan planning institutions and coordinated infrastructure investment.
Indore, India	Integrated solid waste management and municipal service delivery reforms through strong municipal governance.	Indore consistently ranked India's cleanest city under Swachh Survekshan rankings.	Demonstrates impact of effective municipal leadership and citizen participation in urban management.

MENSTRUAL HEALTH AS FUNDAMENTAL RIGHT

In Dr Jaya Thakur v. Union of India, the Supreme Court has ruled that the right to menstrual hygiene is an integral part of the right to life under Article 21 of the Constitution.

Key Highlights of Judicial Intervention

- **Fundamental Right:** Menstrual health is now legally recognised as an essential facet of the Right to Life (Art. 21) and the Right to Education (Art. 21A).
  - As per the SC, inaccessibility of menstrual hygiene measures **strips away the right to participate** on equal terms in schools **(Article 14).**
- **Free Bio-degradable Pads:** All government and private schools must provide free bio-degradable sanitary napkins to girl students (Classes 6–12).
- **Mandatory Infrastructure:** Schools must have functional, gender-segregated toilets with water connectivity. Non-compliance can lead to the derecognition of private schools.
- **Stigma Reduction:** The court mandated NCERT to incorporate gender-responsive curricula to educate both boys and girls, breaking the "hushed whispers" culture.

Supreme Court's Ruling on Menstrual Health

- **Right to Life with Dignity and Bodily Autonomy:** The Supreme Court held that lack of menstrual hygiene facilities exposes girls to stigma, discrimination, and humiliation, violating their right to live with dignity under Article 21.
  - It emphasised that menstrual health and hygiene (MHH) are essential for dignity, bodily autonomy, privacy, and reproductive health, not merely survival.
- **Substantive Equality:**
  - The Court highlighted that equality is not just about treating everyone the same (formal equality). Ignoring the biological needs of girls leads to structural exclusion.
  - Therefore, the State must address these specific disadvantages to ensure real equality between girls and boys.
  - **Substantive equality** prioritizes equal outcomes over formal equal treatment, addressing disadvantages through targeted measures like affirmative action.
- **Right to Education Act, 2009:**
  - The Court clarified that "free education" under the RTE Act also means removing financial barriers that prevent students from attending school, including the cost of sanitary products.
  - It further held that providing separate toilets for girls is not merely an infrastructural requirement but a substantive constitutional obligation.

Article 21 - Scope	Meaning / Scope	Important Case Law
Right to live with human dignity	Ensures that life means more than mere animal existence and includes dignity, respect, and basic human needs.	Maneka Gandhi v. Union of India (1978); Francis Coralie Mullin v. UT of Delhi (1981)
Right to privacy	Protects personal autonomy, bodily integrity, and informational privacy from unlawful intrusion.	K.S. Puttaswamy v. Union of India (2017)
Right to livelihood	Recognises that livelihood is essential for survival and cannot be taken away arbitrarily.	Olga Tellis v. Bombay Municipal Corporation (1985)
Right to health and medical care	Obliges the state to provide adequate medical facilities and emergency healthcare.	Paschim Banga Khet Mazdoor Samity v. State of West Bengal (1996)
Right to a clean environment	Ensures access to pollution-free air and water for healthy living.	Subhash Kumar v. State of Bihar (1991); MC Mehta v. Union of India (1987)
Right to legal aid and speedy trial	Guarantees free legal aid and ensures justice without unreasonable delay.	Hussainara Khatoon v. State of Bihar (1979)
Right to education	Recognised as essential for a dignified life; later made a Fundamental Right under Article 21A.	Mohini Jain v. State of Karnataka (1992); Unni Krishnan v. State of Andhra Pradesh (1993)
Right to sleep	Sleep is essential for health and dignity and cannot be disturbed arbitrarily.	Ramlila Maidan Incident v. Home Secretary, Union of India (2012)
Right to shelter	Includes access to adequate housing as part of a dignified life.	Chameli Singh v. State of Uttar Pradesh (1996)
Right to food	Access to basic nutrition and protection against hunger.	PUCL v. Union of India (Right to Food Case) (2001)

Directions Issued by the Supreme Court

- **Monitoring and Accountability:**
  - District Education Officers must conduct periodic inspections and collect anonymous feedback from students to assess the actual situation in schools.
  - The National Commission for Protection of Child Rights (NCPCR) and State CPCRs will monitor implementation of the Court's directions.
- **Provision of Sanitary Products:** All schools (government and private) must provide **free oxo-biodegradable sanitary napkins** through vending machines.
- **Menstrual Hygiene Management (MHM) Corners:** Schools should establish MHM corners with essential supplies such as spare innerwear, uniforms, and disposal bags for emergencies.
- **Sanitation Infrastructure:** Schools must ensure functional, gender-segregated toilets with water and soap at all times.
- **Waste Disposal:** Environmentally safe disposal mechanisms must be implemented according to Solid Waste Management Rules.
- **Gender Sensitisation:** NCERT and SCERT must include gender-sensitive curriculum to educate boys about menstruation and reduce stigma. All teachers should be trained to support menstruating students.

Significance

- **Emergence of "Biological Citizenship":** The judgment recognises that women face disadvantages due to biological processes like menstruation. The State has a responsibility to reduce this biological burden by providing necessary facilities and support.
- **From Negative to Positive Liberty:**
  - Earlier, the State only ensured that girls were not prevented from attending school.
  - The Court now emphasises positive obligations, requiring the State to provide sanitary products, toilets, and supportive infrastructure so that girls can actually attend school.
- **Redefining "Free Education" under RTE:** The Court recognised that lack of sanitary products, toilets, water, and disposal facilities leads to "menstrual poverty", which restricts girls' education and autonomy.
  - By mandating free sanitary products, the Court expanded the meaning of "free education" to include essential enabling conditions.
- **Law as a Tool for Social Change:** The Court emphasised gender sensitisation of students and teachers, recognising that stigma, harassment, and lack of awareness in schools often create a hostile environment that pushes girls out of education.

Menstrual Health Related Policy of the Government

- **Menstrual Hygiene Scheme (MHS):** Supported by National Health Mission (NHM). ASHAs distribute packs of 6 napkins (Freedays) at a subsidised rate of ₹6.
- **PM Bharatiya Janaushadhi Pariyojana:** Over 16,000 Kendras provide 'Suvidha' (Oxo-biodegradable pads) at ₹1 per pad.
- **Swachh Bharat Mission (Grameen) Phase 2:** Focuses on Menstrual Waste Management (MWM) using small-scale incinerators and deep burial pits to prevent environmental clogging.
- **Menstrual Hygiene Policy (2024-25):** Formulated by the Ministry of Health, it streamlines access to low-cost products, prioritises "Green" (biodegradable) initiatives, and integrates MHM into the formal school curriculum.
- **Standardisation of Products:** The Department of Health Research is studying sustainable alternatives like menstrual cups and recyclable pads to evaluate their safety and feasibility among rural women.

Challenges

- **Infrastructure Gaps:** Many schools lack functional toilets, running water, soap, disposal facilities, and proper maintenance of vending machines, especially in rural areas.
- **Financial and Supply Constraints:** Large-scale procurement of affordable biodegradable sanitary pads may strain state budgets without dedicated funding.
- **Waste Disposal Issues:** Limited technical capacity to manage menstrual waste and operate incinerators may lead to environmental and health risks.
- **Weak Feedback Mechanisms:** Students may hesitate to provide honest feedback due to social hierarchies and fear.
- **Social Stigma and Gender Bias:** Despite awareness efforts, menstruation is often treated as taboo, creating embarrassment and discrimination that discourages girls from attending school.

Way Forward

- **Inclusive Policies:** Policies should include trans-men and non-binary individuals who menstruate.
- **Local Production through SHGs:** Self-Help Groups can produce biodegradable sanitary pads locally, improving availability and generating livelihood opportunities.
- **Assured Water Supply:** School sanitation facilities should be linked with Jal Jeevan Mission to ensure continuous water supply.
- **Privacy-Friendly Infrastructure:** Toilets should include privacy features such as internal latches, screens, mirrors, and hooks.
- **Direct Benefit Transfer (DBT) Option:** Where supply chains are weak, governments may provide pad credits or DBT to girls for purchasing hygienic products.
- **Scientific Waste Management:** Menstrual waste collection and processing can be integrated with Swachh Bharat Mission through sanitation workers.
- **Standardised Procurement:** Centralised procurement systems should ensure sanitary pads meet biodegradability standards.

INDIA-MALAYSIA RELATIONS

Prime Minister Narendra Modi undertook an official visit to Malaysia from 7 to 8 February 2026 at the invitation of Prime Minister Dato' Seri Anwar Ibrahim of Malaysia.

Outcome of the Visit

- The visit reaffirmed the deep-rooted **civilizational links, democratic values, and vibrant people-to-people ties** that form the foundation of India–Malaysia relations.
- It also marked a significant step in consolidating the India–Malaysia **Comprehensive Strategic Partnership (CSP)**, which was formally elevated in August 2024. The CSP signifies elevated ties across defense, trade, tech, security, and regional stability.
- Since the establishment of diplomatic relations in 1957, both countries have built a relationship based on mutual respect, strategic trust, and shared regional and global interests. The 2026 visit expanded this partnership across political, defence, economic, digital, climate, educational, and multilateral domains.

Political and Institutional Cooperation

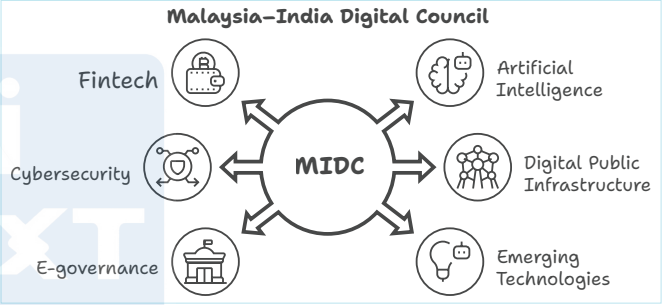
- **Sustained High-Level Engagement:** The two Prime Ministers held extensive bilateral discussions covering the full spectrum of cooperation, including defence, maritime security, trade, digital economy, semiconductors, energy, agriculture, education, health, and regional developments.
- Both leaders reaffirmed that Foreign Office Consultations (FOC) and Joint Commission Meetings (JCM) remain core institutional mechanisms underpinning bilateral engagement.
- **Parliamentary Diplomacy:** The visit built upon recent parliamentary exchanges, including:
  - Malaysia's participation in the **28th Conference of Speakers and Presiding Officers of the Commonwealth** (Jan. 2026).
  - India's participation in the **ASEAN Inter-Parliamentary Assembly (September 2025).**
- These engagements demonstrate growing institutional maturity in bilateral political relations.

Geo-Economic Cooperation

- **Trade Agreements:** Both nations are updating the **ASEAN-India Trade in Goods Agreement (AITIGA)** and better utilizing the **Malaysia-India Comprehensive Economic Cooperation Agreement (MICECA)**. The goal is to simplify trade rules and remove "non-tariff barriers" (hidden hurdles).
- **Strategic Sectors:** Leaders are pushing for investment in "future technologies" like **Semiconductors, Renewable Energy, Artificial Intelligence (AI), Fintech, and Green Technologies**, alongside **Healthcare and Infrastructure.**
- **Business & Finance:** The **10th India–Malaysia CEO Forum** (held 7 February 2026) ensured that private companies work closely with governments.
  - Crucially, the **Reserve Bank of India** and **Bank Negara Malaysia** are now allowing trade in **Indian Rupee** and **Malaysian Ringgit** to reduce dependence on foreign currencies like the Dollar.
- **Better Connectivity:** Recognizing that trade needs movement, both sides are working to expand **air and maritime links**. Malaysia has specifically proposed increasing air traffic rights to allow more frequent flights.

Digital and Financial Cooperation

- **Malaysia–India Digital Council (MIDC):** The formalisation of the MIDC represents a major institutional innovation. The MIDC aims to advance cooperation in:



- **Payment Linkages:** The collaboration between **NPCI International Limited (India)** and **PayNet Malaysia** will establish bilateral payment linkages. This integration will provide **seamless, low-cost remittance and payment solutions for tourists**, students, and small businesses. It represents a concrete example of Digital Public Infrastructure diplomacy.

Energy and Semiconductor Cooperation

- **Renewable Energy and Green Hydrogen:** Malaysia's PETRONAS and Gentari are active participants in India's renewable energy and green hydrogen sectors. Both leaders emphasized cooperation in large-scale solar projects and acknowledged India's leadership in establishing the **International Solar Alliance (ISA).**
  - This cooperation aligns with both countries' net-zero ambitions and sustainable development priorities.
- **Semiconductor Ecosystem Development:** Recognising the strategic importance of semiconductors, the leaders emphasized strengthening the semiconductor value chain through technological innovation and workforce development.
- **Ongoing cooperation includes: IIT Madras Global** partnership with **Advanced Semiconductor Academy of Malaysia.** Collaboration between **Indian Electronics and Semiconductor Association (IESA)** and Malaysia Semiconductor Industry Association (MSIA).

Defence and Security Cooperation

- **Institutional Mechanisms:** The defence relationship is guided by the Malaysia-India Defence Cooperation Committee (MIDCOM) and its subcommittees. The Terms of Reference for a Strategic Affairs Working Group (SAWG) and a Su-30 Forum have further institutionalised defence dialogue.
- **Joint Military Exercises:** The 5th edition of Exercise Harimau Shakti was conducted in Rajasthan in December 2025 between the Indian Army and the Royal Malaysian Army.
  - Naval cooperation includes participation in exercises such as: Samudra Laksamana, MILAN and ASEAN-India Maritime Exercise (AIME).
- **ADMM-Plus and Counter-Terrorism:** India and Malaysia are co-chairing the Counter-Terrorism Working Group under the ASEAN Defence Ministers' Meeting Plus (2024–2027 term). Malaysia will host the Expert Working Group Table-Top Exercise in 2026.
- **Terrorism:** Both leaders unequivocally condemned terrorism in all forms and committed to cooperation in combating radicalisation, terror financing, misuse of emerging technologies, and transnational organised crime, including coordination under the UN and FATF.

Education, Skill Development and Healthcare

- **Education and TVET:** Both leaders encouraged student and faculty exchanges under the ITEC and MTCP programmes. Cooperation in Technical and Vocational Education and Training (TVET) was identified as crucial for workforce alignment with evolving economic needs.
- **Healthcare and Traditional Medicine:** The leaders reaffirmed cooperation in healthcare and traditional medicine. Malaysia is working toward enabling deployment of **Traditional Indian Medicine (TIM)** experts under ITEC.
  - An MoU between India's **Central Council for Research in Homeopathy** and the **University of Cyberjaya** promotes research collaboration and academic exchange.

Culture, Tourism and People-to-People Relations

- Both nations celebrated the opening of the **Thiruvalluvar Chair** at the University of Malaya, which is a dedicated center for researching and teaching **Tamil language and literature.**
- The leaders highlighted the massive influence of **Tamil films** in Malaysia, specifically honoring the lasting impact and popularity of the legendary actor-politician **M.G. Ramachandran (MGR).**
- To help Malaysian students study in India, the government launched the **Thiruvalluvar Scholarships**, which strengthens the bond between students and teachers of both countries.

Sustainable Development and Disaster Cooperation

- Both leaders emphasized biodiversity conservation, including Malaysia's role in the **International Big Cat Alliance (IBCA).**
- They reaffirmed cooperation in disaster management under an **MoU between National Disaster Management Authorities** of both countries and highlighted the role of the **Coalition for Disaster Resilient Infrastructure (CDRI).**

Regional and Multilateral Cooperation

- Malaysia welcomed India's 2026 BRICS Chairmanship, and India supported Malaysia's aspiration for BRICS membership.
- **Both leaders reaffirmed commitment to:**
  - Reform of the United Nations Security Council
  - Respect for UNCLOS 1982
  - Freedom of navigation and overflight
  - ASEAN Centrality
  - Implementation of the **ASEAN Outlook on the Indo-Pacific (AOIP)** in synergy with **India's Indo-Pacific Oceans Initiative.**

Challenges

- **Trade Imbalance:** Despite bilateral trade nearing $20 billion in 2024–25, the trade balance remains heavily tilted in Malaysia's favour. India imports high-value commodities such as palm oil, electronics and crude oil, while its exports—mainly petroleum products, meat and aluminium—have relatively lower value addition, widening the deficit.
- **Palm Oil Dependency:** India's heavy reliance on Malaysian palm oil exposes the relationship to political and market vulnerabilities. Earlier tensions in 2019–20 led India to restrict imports.
- **Political Sensitivities:** Bilateral relations have occasionally faced strain due to comments by Malaysian leaders on India's internal issues, including Article 370 and the Citizenship Amendment Act.
- **The China Factor:** China remains Malaysia's largest trading partner and a major investor through the Belt and Road Initiative (BRI). While both India and Malaysia support stability in the South China Sea, Malaysia tends to pursue quiet diplomacy with China, whereas India advocates a firmer approach against expansionism.

Way Ahead

- **Strengthening Defence Cooperation:** India can position itself as a credible defence partner and exporter for Malaysia, enhancing strategic cooperation and balancing regional power dynamics.
- **Maritime Security Collaboration:** Integrating Malaysia more closely with the Information Fusion Centre–Indian Ocean Region (IFC-IOR) would improve intelligence sharing and safeguard critical sea lanes such as the Strait of Malacca.
- **Trade Reforms:** Accelerating the review of the ASEAN-India Trade in Goods Agreement (AITIGA) by 2026–27 can correct tariff imbalances and improve market access for Indian industries.
- **Stable Commodity Trade:** Long-term palm oil supply agreements can stabilise prices for India while ensuring consistent demand for Malaysia.

DELHI DECLARATION-2026

India hosted 22 members of the League of Arab States (AL) for the second India-Arab Foreign Ministers Meeting, 10 years after the first iteration in Bahrain.

About

- The **second India–Arab Foreign Ministers' Meeting** was held in **New Delhi on 31 January 2026**, bringing together India and the **22 member states of the League of Arab States**.
  - The meeting culminated in the **Delhi Declaration**, which outlined a broad roadmap for cooperation across political, economic, technological and security domains.
- The declaration reflects the **deep historical, civilizational and economic ties between India and the Arab world**, while also addressing pressing regional conflicts and global governance issues.
  - It also highlights India's attempt to pursue **strategic autonomy and balanced diplomacy in West Asia.**

Background: India–Arab League Engagement

- The **League of Arab States** was established in **1945 in Cairo** with the aim of strengthening political, economic and cultural cooperation among Arab countries. It currently comprises **22 member states** spanning **West Asia and North Africa.**
- India's engagement with the Arab League has evolved through several institutional mechanisms:
  - **2002:** A Memorandum of Understanding institutionalised the India–Arab dialogue process.
  - **2008:** A Memorandum of Cooperation led to the creation of the Arab–India Cooperation Forum (AICF).
  - **2013:** The cooperation framework was revised to improve coordination and effectiveness.
- India also holds **observer status in the Arab League,** enabling closer diplomatic engagement.
- The **India–Arab Foreign Ministers' Meeting** is the highest institutional mechanism guiding India–Arab relations. The 2026 meeting came **ten years after the first ministerial meeting held in Bahrain**, signalling renewed diplomatic momentum.

Key Aspects of the Delhi Declaration

Strategic and Economic Cooperation

- The declaration emphasised strengthening cooperation across multiple sectors such as:
  - Energy (including renewable energy)
  - Trade and investment
  - Digital technologies and artificial intelligence
  - Healthcare and pharmaceuticals
  - Agriculture and food security
  - Space cooperation
  - Education, research and innovation
  - Tourism and startups
- Trade between India and Arab states has **exceeded USD 240 billion**, making the Arab region one of India's most significant economic partners.
- Energy cooperation remains central, as several Arab countries are major suppliers of oil and gas to India. The declaration also emphasised cooperation in **green technologies and renewable energy**, reflecting the global energy transition.

Institutional Cooperation

- The declaration adopted an **Executive Programme for 2026–2028**, proposing multiple institutional engagements:

- These initiatives aim to transform India–Arab relations from **traditional energy trade to a multi-sectoral strategic partnership.**

Cooperation in Technology and Emerging Domains

- The declaration emphasised collaboration in **digital technologies and artificial intelligence (AI)**, including:
  - Exchange of expertise
  - Development of ethical and regulatory frameworks
  - Responsible use of AI technologies
  - Promotion of innovation and inclusive development
- India also encouraged Arab countries to participate in global initiatives such as:

Regional Political Issues Addressed in the Declaration

Palestine Question

- The declaration reiterated support for a **two-state solution** to the Israel-Palestine conflict, calling for:
  - A sovereign Palestinian state based on the 1967 borders

- Peaceful coexistence with Israel
- Protection of the rights of the Palestinian people

- The ministers also welcomed the ceasefire outcomes of the **2025 Sharm El-Sheikh Peace Summit** and emphasised humanitarian access to Gaza.

Support for Sovereignty of Regional States:

- **The Delhi Declaration reiterates support for** the sovereignty, unity and territorial integrity of Sudan, Libya and Somalia, rejecting external interference, indirectly reflecting fractures within the Arab world.
- **Sudan:** UAE is accused of backing the **Rapid Support Forces (RSF),** which has fought the Sudanese state since 2023 and formed a parallel government in 2025; the Declaration aligns with Sudan and condemns civilian atrocities.
- **Somalia:** Israel alone recognises Somaliland; the UAE's 2025 recognition of Somaliland passports diverges from the Arab League consensus. India firmly rejected recognition and backed Somalia's territorial integrity.
- **Yemen:** India and the Arab League explicitly condemned Houthi attacks in the Red Sea, marking a shift from India's earlier indirect language post-2023. Support for Yemen's unity aligns with Saudi actions against the UAE-backed Southern Transitional Council.

Maritime Security

- The declaration highlighted the importance of securing maritime routes such as the **Bab el-Mandeb Strait,** which is crucial for global trade.
- The ministers condemned attacks on shipping and stressed the need for **collective international responsibility in ensuring maritime security** in: Gulf of Aden, Arabian Sea, Red Sea and Indian Ocean.

Counter-Terrorism Cooperation

- Both sides reaffirmed **zero tolerance for terrorism,** emphasising:
  - dismantling terrorist infrastructure
  - countering terror financing
  - addressing misuse of emerging technologies by terrorist groups
  - tackling drone-based smuggling and attacks
- The declaration also stressed coordinated action against **terror entities listed under the UN sanctions regime,** particularly under the **United Nations Security Council** sanctions framework.

India's Strategic Approach in West Asia

The Delhi Declaration reveals several important features of India's evolving West Asia policy.

- **Primacy of Sovereignty and Territorial Integrity:** India emphasised the sovereignty of states such as Sudan, Libya, Somalia and Yemen.
  - This aligns with India's long-standing diplomatic principle of **non-interference and respect for territorial integrity**, which also reflects India's own concerns about separatism and externally supported non-state actors.
- **Strategic Balancing in Regional Rivalries:** The declaration subtly aligns with positions favoured by **Saudi Arabia** on several issues such as:
  - Yemen's unity
  - Stabilisation of Libya
  - Support for the Sudanese state
- **Maintaining Multi-Alignment:** Notably, the declaration avoided reference to **US military presence around Iran,** allowing India to maintain diplomatic space with: Iran, Arab states and the United States.

Engagement with the Global South

- The declaration emphasised cooperation among developing countries and praised India's **Voice of Global South Summits.**
- India and Arab states also supported reform of the **United Nations Security Council**, calling for expansion in both permanent and non-permanent membership to reflect contemporary global realities.
- This reflects India's effort to position itself as a **leading voice of the Global South in global governance reforms.**

Significance for India

The Delhi Declaration has several strategic implications for India:

- **Energy Security:** Strengthens cooperation with major oil-producing Arab states while promoting renewable energy collaboration.
- **Economic Partnership:** Expands trade and investment linkages across emerging sectors such as digital technology, AI and startups.
- **Diaspora Engagement:** The Arab world hosts over **nine million Indians**, making it one of the largest overseas Indian communities.
- **Maritime Security:** Enhances cooperation in protecting critical sea lanes connecting India with Europe and Africa.
- **Global South Leadership:** Reinforces India's role as a bridge between developing countries in Asia, Africa and the Middle East.

Conclusion

- The **Delhi Declaration of 2026** represents a significant milestone in India–Arab relations. By combining **economic cooperation, technological partnerships and coordinated positions on regional conflicts**, it deepens institutional engagement between India and the Arab world.
- For India, strengthening ties with the Arab League not only advances economic and energy interests but also reinforces its position as an influential actor in the **Global South and the evolving multipolar world order.**

INDIA'S ENERGY SECTOR

At India Energy Week 2026, India showcased its energy sector as a $500-billion investment opportunity, inviting global investors to support energy transition and infrastructure expansion.

> *Energy independence is the key to India's economic strength and national security.*
>
> **Dr. A.P.J. Abdul Kalam**

Background

- **Meaning and Structural Importance:**
  - India's energy sector refers to the system that produces, converts and distributes energy resources such as coal, oil, natural gas and renewables.
  - Reliable energy supply directly influences industrial production, transport systems, digital infrastructure and household welfare.
- **Historical Evolution of the Energy System:**
  - Historically, India's energy system evolved from biomass dependence (traditional fuels such as firewood and dung) to coal-dominated thermal power after Independence.
  - Reforms like the Electricity Act 2003 and National Solar Mission 2010 accelerated private participation and renewable expansion.
- **Present Structure and Capacity of the Energy System:**
  - India currently operates one of the world's largest power systems with about 466 GW installed capacity (Central Electricity Authority, 2025).
  - Renewable energy capacity exceeded 209 GW, while India targets 500 GW non-fossil fuel capacity by 2030.
- **Structural Vulnerabilities and Rising Demand:**
  - Despite rapid expansion, the sector faces high import dependence—about 85% crude oil and nearly 50% natural gas imports (IEA 2025).
  - Rising demand from industry (~40%), transport (~25%) and households (~20%) continues to strain energy systems.
- **Current Context: India Energy Week and Energy Transition:** Within this evolving landscape, India Energy Week 2026 highlighted India's transition from energy security (reliable supply) to energy independence (greater domestic production and diversified energy mix), showcasing $500-billion investment opportunities across exploration, LNG infrastructure and clean energy.

Significances

- **Strategic Energy Security and Geopolitical Autonomy:**
  - India's heavy crude oil import dependence (~85%) and gas imports (~50%) (IEA 2025) exposes the economy to geopolitical shocks.
  - India Energy Week highlighted initiatives like Strategic Petroleum Reserves, Samudra Manthan deep-sea exploration and ethanol blending (20% target) to strengthen long-term energy independence.
- **Foundation of Economic Growth and Industrial Transformation:**
  - Energy availability directly determines productivity in manufacturing, logistics, digital infrastructure and urban services.
  - India's installed power capacity reached ~466 GW (CEA 2025) supporting industrial growth under Make in India, PLI schemes and semiconductor missions, sustaining India's projected $5-trillion economic trajectory.
- **Global Energy Investment and Supply Chain Hub:**
  - India Energy Week projected $500-billion investment opportunities across the energy value chain, from upstream exploration to downstream petrochemicals.
  - India already exports petroleum products to 150+ countries, while refining capacity may exceed 300 MMTPA, strengthening India's position in global energy trade.
- **Driver of Clean Energy Transition and Climate Commitments:**
  - India has installed 209+ GW renewable capacity (MNRE 2025) and targets 500 GW non-fossil energy capacity by 2030.
  - Programs like the National Green Hydrogen Mission, PM Surya Ghar rooftop solar scheme and solar parks accelerate decarbonisation while meeting rising electricity demand.
- **Expanding Energy Infrastructure and Future Energy Markets:**
  - India Energy Week emphasised expanding LNG terminals, pipelines, city gas distribution networks and petrochemical complexes.
  - India aims to increase natural gas share in the energy mix from ~6% to 15%, diversifying energy sources and enabling cleaner industrial and urban energy consumption.

Challenges and Concerns

- **Structural Import Dependence and Strategic Vulnerability:**
  - India's energy system remains externally dependent: ≈85% crude oil, ~50% natural gas and ~20% coal imports (IEA & MoPNG 2025). This exposes India to energy geopolitics (political disruptions affecting energy trade).
  - The Russia–Ukraine war and Red Sea disruptions raised freight costs and widened India's energy import bill.
- **Demand Explosion from Urbanisation and Industrialisation:**
  - India's rapid economic growth is driving structural energy demand expansion. Total consumption reached ~1,800 Million Tonnes of Oil Equivalent in 2025, with

industry (~40%), transport (~25%) and residential (~20%) dominating demand (IEA 2025).
- India may account for 25% of global energy demand growth by 2040.

- **Renewable Expansion versus Grid Stability Constraints:**
  - India's renewable capacity crossed 209 GW (MNRE 2025), but integrating intermittent energy sources (solar/wind variability) stresses grid stability.
  - Without energy storage systems (batteries, pumped hydro) and flexible thermal backup, renewable penetration can create frequency imbalances and supply volatility.
- **Infrastructure and Financing Deficit in Energy Systems:**
  - Energy transition requires massive infrastructure—transmission corridors, LNG terminals, storage facilities, hydrogen infrastructure and smart grids.
  - NITI Aayog Energy Outlook (2025) estimates $200–250 billion investment needed by 2030, while bureaucratic delays and financing constraints slow project implementation.
- **Managing the Fossil–Clean Energy Transition:**
  - India's electricity system remains coal-dependent (~55% energy mix; ~70% power generation – CEA 2025).
  - Rapid decarbonisation risks energy affordability and industrial competitiveness, while slow transition threatens climate commitments under the Paris Agreement and net-zero target by 2070.

Government and Institutional Efforts

- **Upstream Energy Reforms for Reducing Import Dependence:**
  - India has introduced Hydrocarbon Exploration and Licensing Policy (HELP) and Open Acreage Licensing Policy (OALP – allowing firms to select exploration areas) to boost domestic oil and gas production.
  - Over 170 exploration blocks have been auctioned (MoPNG 2025) and exploration areas expanded to 1 million sq. km.
- **Strategic Petroleum Reserves and Supply Risk Management:**
  - India has built Strategic Petroleum Reserves (SPR – emergency crude storage during supply disruptions) at Visakhapatnam, Mangaluru and Padur, with Phase-II projects at Chandikhol and Padur expansion underway.
  - Current reserves cover ~9–10 days of imports (MoPNG 2025), improving resilience.
- **Accelerating Renewable Energy and Decarbonisation Transition:**
  - Policies like the National Solar Mission, National Green Hydrogen Mission (₹19,744 crore) and PM Surya Ghar Rooftop Solar Scheme are expanding clean energy.
  - Renewable capacity exceeded 209 GW (MNRE 2025) toward 500 GW non-fossil capacity by 2030, though grid storage and land constraints limit faster deployment.
- **Expanding Energy Infrastructure and Gas-Based Economy:** Government initiatives such as the National Gas Grid expansion, City Gas Distribution networks and LNG terminals aim to raise natural gas share from ~6% to 15% of India's energy mix.
- **Investment Mobilisation and Energy Market Reforms:** Reforms including Green Energy Open Access Rules (2022), Production Linked Incentive scheme for solar manufacturing, and electricity market reforms aim to attract private investment. India Energy Week 2026 highlighted $500-billion investment opportunities.

Issues Unresolved

- **Limited Domestic Hydrocarbon Discoveries:** Despite HELP and OALP reforms, over 170 exploration blocks auctioned, commercial oil discoveries remain limited due to complex geology (MoPNG 2025; KG Basin).
- **Inadequate Strategic Petroleum Reserves:** India's Strategic Petroleum Reserves cover only about 9–10 days of imports, far below the IEA 90-day benchmark for energy security.
- **Renewable Integration Constraints:** Although renewable capacity crossed 209 GW (MNRE 2025), lack of battery storage and grid flexibility causes intermittency challenges.
- **Uneven Gas Infrastructure Expansion:** National Gas Grid expansion continues, but pipeline connectivity gaps in eastern and northeastern regions limit gas-based economy targets.
- **Policy and Investment Uncertainty:** Despite Green Energy Open Access Rules and solar PLI, differing state regulations slow private energy investments (NITI Aayog Energy Outlook 2025).

Way Forward

- **Expand domestic renewable energy manufacturing capacity:** Strengthening solar, battery and electrolyser manufacturing reduces import dependence and supports clean energy transition. *(Source: MNRE Renewable Manufacturing Report 2026)*
- **Accelerate grid-scale energy storage systems deployment:** Develop large battery and pumped hydro storage to stabilise electricity supply during solar and wind fluctuations. *(Source: IEA Energy Storage Outlook 2025)*
- **Increase domestic exploration of oil and gas resources:** Expanding offshore exploration through **Open Acreage Licensing Policy** can improve domestic energy production. *(Source: MoPNG Exploration Policy 2025)*
- **Strengthen critical mineral supply chains:** Securing lithium, cobalt and rare earth minerals supports battery manufacturing and energy technologies. *(Source: International Energy Agency Critical Minerals Report 2025)*
- **Promote energy efficiency across industries and buildings:**
- Expanding energy efficiency programs can reduce electricity demand and improve energy security. *(Source: Bureau of Energy Efficiency Report 2026)*

SKILL SECTOR IN INDIA

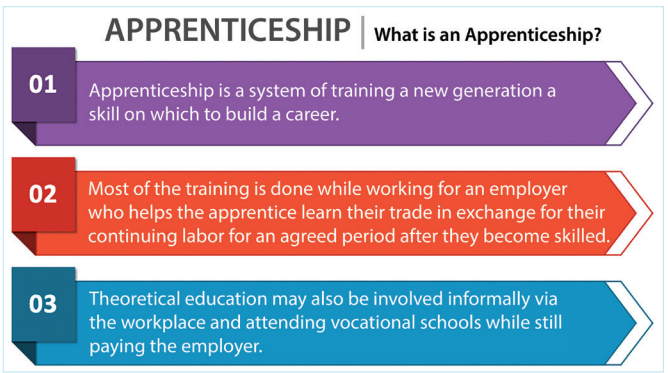
NITI Aayog launched a policy report titled "Revitalizing Apprenticeship Ecosystem: Insights, Challenges, Recommendations and Best Practices."

Introduction

- Skill development is a key pillar of India's strategy for economic growth, employment generation, and productivity improvement.
  - With a large and growing youth population, India must ensure that young people acquire market-relevant skills to participate effectively in the labour market.
- In this context, apprenticeship training has emerged as an important component of India's skilling ecosystem because it connects education with practical work experience.

Apprenticeship Training

- Apprenticeship training is a structured system of skill development in which individuals learn by working in an establishment under supervision while receiving formal training.
- Apprenticeships combine **practical workplace training with theoretical learning.**
- They act as a bridge between formal education and employment.
- Young people gain industry-relevant skills and work experience.
- Firms benefit from a trained workforce that matches their specific skill requirements.
- Therefore, apprenticeships improve both employability of youth and productivity of businesses.



Need for Strengthening Apprenticeships

- India's demographic structure highlights the importance of expanding apprenticeship opportunities.
- Youth aged 15–29 years constituted about 27.2% of the population in 2021.
- India is expected to have around **345 million youth by 2036**, which will be the largest youth population in the world.
- This large youth population can become a demographic dividend only if adequate skills and employment opportunities are created.
- **Apprenticeships are important in this context because they:**
  - provide practical and industry-oriented training,
  - reduce the gap between education and labour market requirements, and
  - improve employment prospects for young people.
- Strengthening the apprenticeship ecosystem is therefore essential for improving India's overall **skilling system and labour productivity.**

Current Landscape of Apprenticeships in India

- The NITI Aayog report highlights several trends and challenges in the current apprenticeship ecosystem.
- Gap between Registration, Engagement and Completion
- There is a large gap between the number of candidates who register for apprenticeships and those who complete their training.
  - In 2024–25, about 1.31 million people registered for apprenticeship programmes.
  - Out of them, 985,000 apprentices were actually engaged in training. However, only 251,000 apprentices successfully completed their training.
- This indicates significant drop-outs between the stages of registration, engagement, and completion.

Decline in Registrations

- The report also notes a **marginal decline in apprenticeship registrations in recent years**. This suggests the need for better monitoring of participation and dropout rates.
- Participation of Establishments
- Apprenticeship opportunities are uneven across different types of enterprises.
- Medium and large enterprises constitute less than 30% of active establishments, but they account for more than 70% of total apprenticeship engagement.
- Participation by MSMEs, start-ups, and informal sector enterprises remains limited.
- Since MSMEs form a major part of India's economy, their low participation restricts the expansion of apprenticeships.

Gender Gap

There is also a significant gender gap in apprenticeship participation.

- Male candidates have consistently higher shares of both registrations and engagement.

- Support systems for women and marginalized groups remain limited.
- Regional and Institutional Disparities
- Apprenticeship opportunities are concentrated in a few states.
- The top 10 states account for nearly 79–84% of apprenticeship engagement.
- North-Eastern states and Union Territories contribute very little.
- Even within states, participation varies widely across districts.
- These disparities highlight the need for more balanced regional development.

Key Recommendations of the NITI Aayog Report

The report suggests several measures to strengthen India's apprenticeship ecosystem.

- **Policy Reforms:**
  - The report recommends the creation of a **National Apprenticeship Mission** to improve coordination and governance. It also proposes the development of a **unified National Apprenticeship Portal** to simplify procedures and improve data management.
  - In addition, targeted incentives should be provided to promote apprenticeships in **aspirational districts, North-Eastern states, and among women apprentices.**
- **Regulatory Framework:**
  - The report suggests establishing an **Apprenticeship Engagement Index** to measure and compare the performance of states and union territories.
  - Such an index would help encourage competition among states and improve programme implementation.
  - The report also emphasizes the need for **strong monitoring and evaluation of apprenticeship programmes and apprentice competencies.**
- **State and District Level Interventions:**
  - States and districts should identify **high-potential but low-performing districts** and provide targeted policy support.
  - The report also recommends a **recognition and reward initiative for the top 25 districts** based on apprenticeship growth.
- **Increasing Participation of Establishments**
  - To expand the scale of apprenticeships, the report recommends stronger participation by **micro, small, and medium enterprises (MSMEs)**
  - Possible measures include:
    - adopting **cluster-based apprenticeship models,**
    - linking apprenticeships with the **start-up ecosystem**, and
    - aligning training with the **gig and platform economy.**
- **Stronger Support for Women and Marginalized Groups:** The report recommends additional support measures to improve inclusion. These include:
  - travel and accommodation assistance for disadvantaged apprentices,
  - expanded insurance coverage,
  - structured career counselling and guidance,
  - international mobility pathways, and
  - targeted initiatives to increase the participation of women.

Government Initiatives for Apprenticeship

- **National Apprenticeship Promotion Scheme (NAPS), 2016:** The **National Apprenticeship Promotion Scheme** was launched by the Ministry of Skill Development and Entrepreneurship to promote apprenticeship training across sectors.
- **Under this Scheme:**
  - Candidates aged **14–35 years** receive on-the-job training.
  - The government shares **up to 25% of the prescribed stipend (maximum ₹1,500 per month)** with employers.
  - Basic training costs for designated trades are reimbursed to encourage more establishments to participate.
- **National Apprenticeship Training Scheme (NATS):** The National Apprenticeship Training Scheme is administered by the Ministry of Education and mainly targets graduate and diploma holders.
  - It provides six months to one year of structured on-the-job training.
  - It helps technical graduates gain practical industry experience and improve employability.

Conclusion

- Apprenticeships play a crucial role in strengthening India's skill development ecosystem by linking education with industry requirements.
  - However, the current system faces challenges such as low participation of MSMEs, gender gaps, regional disparities, and high dropout rates.
- The recommendations of the NITI Aayog report highlight the need for stronger governance, better incentives, inclusive participation, and improved monitoring.
  - If these reforms are implemented effectively, apprenticeships can become a powerful tool for **improving employability, boosting industrial productivity, and realizing India's demographic dividend.**

GREAT NICOBAR ISLAND PROJECT

The National Green Tribunal's recent order on environmental clearances has renewed debate over ecological, tribal, and strategic implications of the Great Nicobar Project.

> *Economic growth and environmental protection are not incompatible. Sustainable development is the pathway to the future.*
>
> **Ban Ki-moon,** (Global sustainability governance)

Background

- **Meaning and Development Concept:** The Great Nicobar Island Project is a mega infrastructure initiative including trans-shipment port (cargo redistribution hub), airport, township, power plant, aimed strengthening India's maritime logistics and island economy.
- **Strategic Origin and Geopolitical Context:** The project emerged from India's Act East Policy (economic engagement with Southeast Asia) and Indo-Pacific strategy, leveraging proximity to Malacca Strait carrying nearly 30% global trade.
- **Evolution of Development Framework:** NITI Aayog's 2021 holistic island development master plan integrated Sagarmala port-led development (maritime logistics programme) with defence logistics and regional connectivity objectives. *(Sources: NITI Aayog 2021; MoPSW Sagarmala Report 2025)*
- **Infrastructure Scale and Economic Vision:** The **₹72,000-crore project covering 166 sq km** includes deep-water port handling **14 million TEUs (container cargo unit)** reducing dependence on foreign trans-shipment hubs. *(Sources: MoEFCC Environmental Clearance Documents 2025)*
- **Current Context and Policy Debate:** Recent National Green Tribunal scrutiny (2025–2026) raised concerns about 9.6 lakh tree felling, impacts on Shompen tribes, coral reefs and leatherback turtles. *(Sources: NGT Orders 2025; Wildlife Institute of India Reports)*

Key Ecological, Strategic and Governance Dimensions of Great Nicobar Island

Dimensions	Key Evidence & Data (2025–2026)	Why Important for GNIP Debate	Sources
Great Nicobar Biosphere Reserve	UNESCO Biosphere Reserve covering ~885 sq km, containing tropical evergreen forests with many endemic species such as Nicobar megapode.	Demonstrates high ecological sensitivity; large infrastructure requires strict biodiversity safeguards.	*UNESCO MAB Programme; MoEFCC Biosphere Reserve Report 2025*
Galathea Bay Ecological Zone	One of India's largest leatherback turtle nesting habitats with hundreds of nests recorded annually.	Port construction near the bay may affect globally vulnerable marine turtle populations.	*Wildlife Institute of India Marine Turtle Monitoring Report 2025*
Six Degree Channel Strategic Location	Major shipping corridor connecting Bay of Bengal with Malacca Strait used by thousands of international vessels annually.	Enhances India's maritime surveillance and trade monitoring in eastern Indian Ocean.	*Indian Navy Maritime Security Strategy 2025*
Shompen Tribal Community (PVTG)	Small indigenous population dependent on forest-based hunting and gathering livelihoods within Great Nicobar interior.	Infrastructure expansion raises concerns regarding tribal rights and cultural protection.	*Anthropological Survey of India Tribal Report 2025*
Seismic and Tsunami Risk Zone	Island lies near Sunda subduction zone, which generated the 2004 Indian Ocean tsunami.	Requires disaster-resilient infrastructure design and long-term climate adaptation planning.	*NDMA Tsunami Hazard Assessment 2026*

Significances of the Great Nicobar Island Project

- **Strengthening India's Maritime Domain Awareness:** Location enables advanced **maritime domain awareness (real-time monitoring of shipping activities)** improving surveillance against piracy, illegal fishing and maritime security threats. *(Sources: Indian Navy Maritime Security Strategy 2025)*
- **Reducing Logistics Cost in India's Trade System:** Developing domestic trans-shipment facilities can **reduce logistics costs by about 20–25%,** improving competitiveness of Indian exports globally. *(Sources: Ministry of Ports Shipping and Waterways Logistics Report 2025)*
- **Strengthening Supply Chain Resilience in Indo-Pacific:** The project can support **supply chain resilience (stable global production networks)** by diversifying maritime logistics infrastructure across the eastern Indian Ocean. *(Sources: OECD Global Supply Chain Report 2025)*

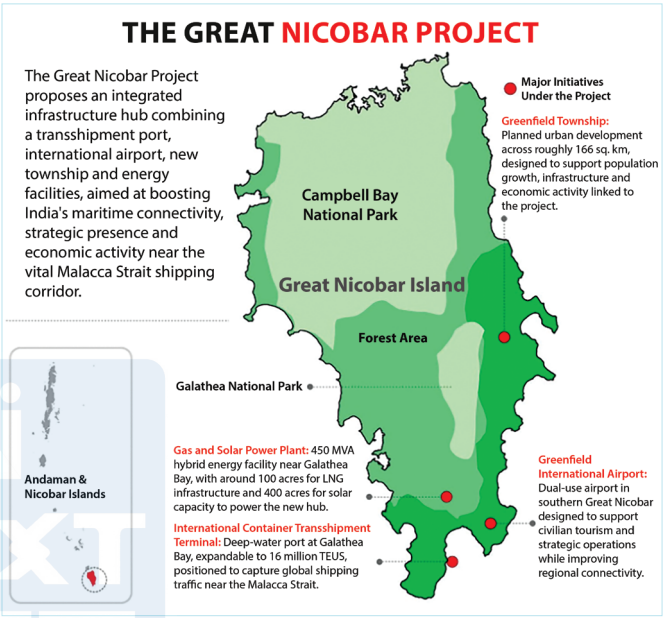
- **Expanding Ocean Science and Marine Monitoring Infrastructure:** Improved infrastructure can support **oceanographic research stations**, strengthening climate monitoring, biodiversity studies and disaster early-warning systems. *(Sources: National Centre for Coastal Research 2025)*
- **Supporting Humanitarian Assistance and Disaster Relief Operations:** Strategic island infrastructure enables rapid **HADR operations (Humanitarian Assistance and Disaster Relief)** during cyclones, earthquakes and maritime emergencies. *(Sources: NDMA Disaster Preparedness Review 2026)*

Challenges and Concerns

- **Massive Land Diversion from Protected Forest Areas:** About 130 sq km forest diversion under the Forest Conservation Act reduces protected habitats and threatens island ecological stability. *(MoEFCC Environmental Clearance Documents 2025)*
- **Disturbance to Globally Important Marine Corridors:** Great Nicobar waters host **migratory marine species routes**, and increased shipping noise can disrupt whales, dolphins and pelagic ecosystems. *(Sources: IUCN Marine Biodiversity Assessment 2025)*
- **Ecological Risk to Galathea Bay Ecosystem:** Galathea Bay hosts sensitive **coastal wetland ecosystems supporting rare species and fisheries**, potentially affected by port construction activities. *(Sources: Wildlife Institute of India Coastal Ecology Report 2025)*
- **High Financial and Economic Risk of Mega Infrastructure:** The **₹72,000-crore investment** faces uncertainties of shipping demand, global trade fluctuations and cost overruns. *(Sources: NITI Aayog Infrastructure Economic Analysis 2025)*
- **Climate Change and Sea Level Rise Vulnerability:** Low-lying island infrastructure faces projected sea-level rise of 0.3–0.6 metres by 2100 increasing long-term coastal risk. *(Sources: IPCC Climate Assessment 2025)*

Limitations in Government and Institutional Efforts: Great Nicobar Island Project

- **Limited Ecological Restoration Effectiveness:** Compensatory afforestation cannot replace **primary tropical rainforest ecosystems**, which take centuries to regenerate and sustain endemic biodiversity. *(Sources: MoEFCC Forest Advisory Committee Review 2025)*
- **Inadequate Long-Term Marine Monitoring Capacity:** Marine biodiversity monitoring programmes remain **short-term and project-based**, lacking continuous independent ecological assessment of coral and turtle habitats. *(Sources: Wildlife Institute of India Monitoring Assessment 2026)*
- **Weak Enforcement of Coastal Regulation Measures:** Implementation of **CRZ safeguards in remote islands remains administratively challenging**, reducing effective ecological protection. *(Sources: CAG Environmental Governance Audit 2025)*
- **Persistent Economic Uncertainty of Port Viability:** Shipping demand projections remain uncertain, as global container traffic growth slowed after post-pandemic trade fluctuations. *(Sources: UNCTAD Maritime Transport Review 2025)*
- **Limited Climate Adaptation Planning:** Current infrastructure plans only partially address long-term sea-level rise and coastal erosion projections affecting low-lying island infrastructure. *(Sources: IPCC Coastal Risk Assessment 2026)*



Way Forward

- **Establish Independent Ecological Monitoring Authority:** Create a multi-disciplinary **island ecological oversight authority** involving WII, NCCR and independent scientists ensuring transparent biodiversity monitoring. *(Sources: UNEP Island Governance Framework 2025)*
- **Strengthen Marine Ecosystem Protection Measures:** Adopt **seasonal dredging restrictions and marine protected zones** to protect leatherback turtle nesting and coral habitats. *(Sources: Wildlife Institute of India Marine Conservation Guidelines 2025)*
- **Ensure Sustainable Forest and Habitat Restoration:** Implement **native-species reforestation and wildlife corridors** to reduce habitat fragmentation caused by infrastructure development. *(Sources: MoEFCC Ecosystem Restoration Policy 2026)*
- **Strengthen Economic Viability and Port Demand Planning:** Adopt **phased infrastructure development linked with trade demand forecasts** reducing financial risks. *(Sources: UNCTAD Maritime Transport Review 2025)*
- **Integrate Climate-Resilient Infrastructure Planning:** Follow NDMA coastal resilience standards including elevated structures, mangrove buffers and tsunami evacuation systems improving long-term island safety. *(Sources: NDMA Coastal Disaster Guidelines 2026)*

INDIA'S EXPANDING AIR POWER

India's Defence Acquisition Council (DAC - top government committee that approves weapon purchases) has approved buying 114 Rafale F4 fighter jets worth in February, 2026.

Introduction

- India's air power forms a crucial part of its national defence strategy and enables the country to conduct precision strikes, maintain air superiority, and deter adversaries.
- The Indian Air Force (IAF) plays the central role in this capability through a combination of advanced fighter aircraft, long-range missiles, and network-centric warfare systems.
- India has strengthened its air strike capability through the acquisition of modern fighter jets, indigenous missile development programmes, and integration of advanced sensors and weapons.
- These developments help India address emerging threats from neighbouring countries such as China and Pakistan while maintaining credible deterrence.

Recent Rafale Fighter Jet Deal

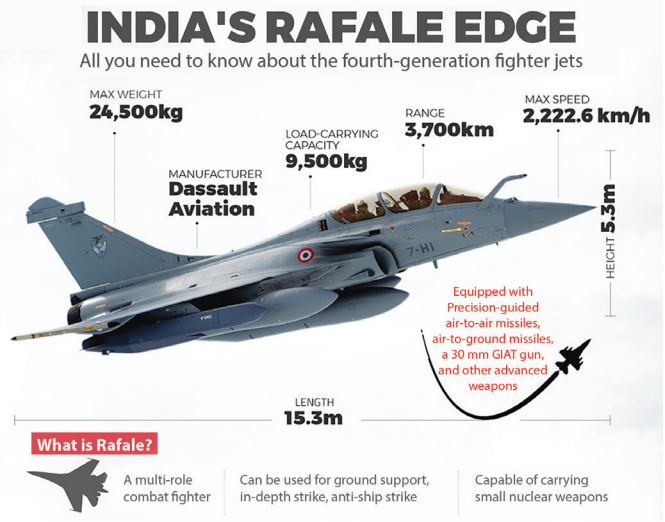
- **Approval of Rafale F4 Procurement:**
  - DAC approved the purchase of 114 Rafale F4 fighter aircraft in February 2026 to strengthen the combat capability of the Indian Air Force.
  - The **Defence Acquisition Council** is the highest government body responsible for approving major defence purchases and modernization programmes.
- **Domestic Manufacturing Component:** Dassault Aviation and Tata Advanced Systems Limited have signed four Production Transfer Agreements to manufacture the Rafale fighter aircraft fuselage in India, marking a significant step forward in strengthening the country's aerospace manufacturing capabilities and supporting global supply chains.
- **Contribution to Make in India:** The production arrangement supports the Make in India initiative, which aims to reduce dependence on imported defence equipment and develop India's domestic defence industry.

Operational Importance of Rafale F4

- **Addressing Squadron Shortage:**
  - The Indian Air Force requires 42 fighter squadrons to effectively manage a potential two-front war scenario involving China and Pakistan.
  - At present, the Indian Air Force operates only around 32 fighter squadrons, which creates a capability gap.
  - The induction of additional Rafale aircraft will help reduce this shortage and improve operational readiness.
- **Countering Chinese Air Power:**
  - China has deployed multiple J-20 stealth fighter aircraft near the India-China border.
  - The Rafale F4 fighter aircraft, with advanced radar systems and long-range missiles, will help India counter these stealth aircraft effectively.

Capabilities of the Rafale Fighter Aircraft

- **Omnirole Fighter Capability:** The Rafale is classified as an "omnirole fighter aircraft," which means it can perform multiple missions including air combat, ground attack, reconnaissance, and anti-ship operations within a single sortie.
- **Long Range Air Combat Weapons:**
  - The Rafale aircraft carries the Meteor air-to-air missile, which has a range of approximately 200 kilometres and provides powerful beyond-visual-range combat capability.
  - The missile significantly increases the ability of the Indian Air Force to destroy enemy aircraft before they come close enough to engage in dogfights.
- **Deep Strike Capability:**
  - The aircraft is equipped with the SCALP-EG cruise missile, which has a range exceeding 500 kilometres and flies at extremely low altitude to evade radar detection.
  - This missile is capable of striking strategic targets such as enemy headquarters, air bases, or military infrastructure located deep inside hostile territory.
- **Precision Strike Weapons:**
  - Rafale aircraft also carry HAMMER precision-guided bombs, which have a range of approximately 70 kilometres.
  - These bombs use **Global Positioning System (GPS)** and laser guidance systems to accurately strike targets such as terrorist camps or fortified military positions.
  - India Specific Technological Upgrades



Indigenous Radar Integration

- India is pushing to incorporate the Uttam Active Electronically Scanned Array (AESA) radar in Rafale aircraft which is an advanced radar system developed domestically.
- This radar allows the aircraft to detect and track multiple targets simultaneously even in environments where the enemy uses electronic jamming.

Network-Centric Warfare System

- The aircraft will also operate through the Air Force Network (AFNET), which is a secure digital communication network connecting fighter aircraft, ground radar systems, satellites, and command centres.
- This network enables real-time information sharing and coordinated operations across the battlefield.

Integrated Guided Missile Development Programme

- **Launch of the Programme:**
  - The Integrated Guided Missile Development Programme (IGMDP) was launched in 1983 under the leadership of Dr. A. P. J. Abdul Kalam and was implemented by the Defence Research and Development Organisation (DRDO).
  - The programme aimed to achieve self-reliance in advanced missile technologies and reduce dependence on foreign defence imports.
- **Strategic Motivation:**
  - India realised the need for indigenous missile capability after the 1962 war with China and the 1965 and 1971 wars with Pakistan, during which the country relied heavily on imported defence equipment.
- **Major Achievements of IGMDP:**
  - The programme successfully developed several important missile systems including Agni, Prithvi, Akash, Nag, and Trishul.
  - These missile systems strengthened India's conventional and nuclear deterrence capabilities.
- **Technological Contributions:** The programme also produced technological innovations such as advanced composite materials, ring laser gyroscopes, radome technologies, and long-range tracking systems.
  - After achieving its main objectives of developing indigenous missile capability, DRDO concluded the programme in 2008.

Indian Air Force Fighter Fleet

- **Su-30MKI Heavy Fighter Aircraft:**
  - The Su-30MKI forms the backbone of the Indian Air Force with around 260 aircraft organised into 14 squadrons.
  - These aircraft can carry up to eight tonnes of weapons, including the BrahMos air-launched cruise missile.
  - The aircraft played a major strike role in Operation Sindoor, where it launched BrahMos missiles against enemy targets.
- **Mirage-2000 Precision Strike Aircraft:**
  - India operates around 50 upgraded Mirage-2000 fighter aircraft across three squadrons.
  - These aircraft played a crucial role in the 2019 Balakot airstrike, where they dropped SPICE-2000 precision-guided bombs on terrorist training camps.
- **Tejas Indigenous Fighter Aircraft:**
  - India's indigenous Light Combat Aircraft Tejas programme represents an important step toward defence self-reliance.
  - Around 83 Tejas Mk1A aircraft have been ordered, while 40 earlier variants are already operational.
  - The aircraft is equipped with Uttam AESA radar and Astra air-to-air missiles, and the more advanced Tejas Mk2 variant is expected to enter service around 2029.
- **Complementary Fleet Structure:** The Rafale aircraft will operate alongside Su-30MKI heavy fighters, Mirage-2000 precision strike aircraft, and Tejas light fighters, creating a balanced and versatile combat fleet for the Indian Air Force.

Missiles

- A missile is a self-propelled guided weapon designed to deliver an explosive warhead accurately to a target.
- A typical missile consists of five key components: a guidance system, a seeker, an airframe, a propulsion system, and a warhead.
- **Classification Based on Speed:**
  - Missiles are classified as subsonic, supersonic, or hypersonic depending on their speed relative to the speed of sound.
  - For example, the Nirbhay cruise missile is a subsonic missile, while the BrahMos missile is a supersonic missile capable of travelling at around Mach 3.
- **Classification Based on Flight Path:**
  - Ballistic missiles, such as the Agni-V, follow a high-altitude trajectory before descending onto the target.
  - Cruise missiles, such as SCALP and BrahMos, fly throughout their journey using powered propulsion systems similar to aircraft.
- **Classification Based on Launch Platform:**
  - Air-to-air missiles, such as Astra and Meteor, are launched from aircraft to destroy enemy aircraft.
  - Air-to-surface missiles, such as BrahMos-A, are launched from aircraft to strike ground targets.
  - Surface-to-air missiles, such as Akash and S-400, are launched from ground platforms to intercept aircraft or missiles.
  - Submarine-launched ballistic missiles, such as K-15 Sagarika, are fired from nuclear submarines.

Stealth Technology

- **Meaning:** Stealth technology refers to a set of techniques used in military aircraft, missiles, and ships **to reduce detection by enemy radar, infrared sensors, and other surveillance systems.** It does not make platforms invisible but minimises their detectability, allowing them to operate inside hostile airspace.
- **Key Features:**
  - **Special Shape Design:** Angular surfaces scatter radar waves away from the radar source, reducing radar reflection.
  - **Radar-Absorbing Materials (RAM):** Special coatings absorb radar energy instead of reflecting it.
  - **Internal Weapon Bays:** Weapons are carried inside the aircraft to reduce radar signature.
  - **Reduced Heat Signature:** Engine exhaust systems lower infrared emissions to avoid heat-seeking detection.
- **Significance:** Enables deep-strike missions, intelligence gathering, and improved survivability in heavily defended airspace.

Challenges

- **Critical Squadron Depletion:** The IAF currently operates approximately 30–31 fighter squadrons, significantly below the government-authorized strength of 42 squadrons required to manage a "two-front" threat. The retirement of legacy MiG-21 and Jaguar aircraft is outpacing the induction of new platforms.
- **The "Stealth Gap" in Regional Airspace:** While regional adversaries have operationalized 5th-generation stealth fighters like the J-20, India's indigenous Advanced Medium Combat Aircraft (AMCA) is still in the developmental phase. This creates a temporary technological deficit in stealth-reliant combat scenarios.
- **Dependence on Foreign Original Equipment Manufacturers (OEMs):** Dependence on Russian OEMs persists for frontline fighters (Su-30MKI, MiG-29UPG) and air defense (S-400). Global supply chain disruptions and sanctions have historically affected the timely availability of spare parts and high-end sensors.
- **Critical Shortage of Force Multipliers:** The IAF faces a deficit in Airborne Early Warning and Control (AEW&C) systems and Mid-Air Refuellers. These "eyes in the sky" and "fuel tankers" are essential for extending the reach and endurance of fighter jets during deep-strike missions.
- **The Jet Engine Technology Barrier:** India currently lacks a domestic high-thrust jet engine. Despite the Kaveri engine project, the IAF remains dependent on foreign entities like GE (USA) and Safran (France) for the "heart" of its indigenous Tejas and future AMCA jets.
  - The **Kaveri Engine** is an indigenous **afterburning turbofan jet engine** under development in India by the Defence Research and Development Organisation to power combat aircraft and unmanned combat aerial vehicles as part of India's effort to achieve self-reliance in aero-engine technology. An **afterburner** burns extra fuel in exhaust to **generate higher thrust.**
- **Budgetary Imbalance (Capital vs. Revenue):**
  - A substantial portion of the defense budget is consumed by Revenue Expenditure (salaries and pensions).
  - This leaves limited Capital Outlay for the rapid procurement of modern 114 Multi-Role Fighter Aircraft (MRFA) and high-tech munitions.
- **Asymmetric Warfare and Drone Swarms:**
  - The rise of low-cost loitering munitions and drone swarms presents a new tactical challenge.
  - Retrofitting older airbases with New Generation Hardened Aircraft Shelters (NGHAS) and advanced Electronic Warfare (EW) suites is a massive, ongoing financial task.

Way Forward

- **Induction of next-generation fighter aircraft:** Accelerate development and induction of the **Advanced Medium Combat Aircraft (AMCA)** and **Tejas Mark-2 Light Combat Aircraft (LCA)** to strengthen India's deep-strike and multi-role air combat capabilities.
- **Expansion of stand-off precision weapons:** Increase the deployment of long-range cruise missiles, glide bombs, and **Precision-Guided Munitions (PGMs)** so that targets can be struck from safe distances without entering heavily defended airspace.
- **Development of hypersonic weapon systems:** Invest in hypersonic cruise missiles and hypersonic glide vehicles capable of travelling at speeds above Mach 5, enabling rapid and highly destructive strikes against strategic targets.
- **Strengthening surveillance and network-centric warfare:** Expand Airborne Warning and Control System (AWACS) aircraft, satellite-based surveillance, and secure communication networks to support real-time intelligence and coordinated air operations.
- **Deployment of unmanned combat systems:** Introduce **Unmanned Combat Aerial Vehicles (UCAVs)** and swarm drones for intelligence gathering, suppression of enemy air defences, and precision strike missions.
- **Enhancing aerial refuelling capability:** Increase the fleet of air-to-air refuelling tanker aircraft to extend the operational range and endurance of combat aircraft during long-distance missions.
- **Integrated joint strike capability:** Strengthen coordination between the Indian Air Force (IAF), Indian Navy, and Indian Army to enable integrated air-land-sea strike operations.

CAR T-CELL THERAPY

Researchers at IIT Bombay have developed improved methods to retrieve lab-grown T-cells, enhancing efficiency and reliability of CAR T-cell cancer immunotherapy.

> *We are entering a new era in which we can engineer biology to treat disease.*
>
> **Jennifer Doudna,** (Nobel Laureate, CRISPR Gene Editing)

Background

- **Meaning and Scientific Basis:** CAR T-cell therapy (Chimeric Antigen Receptor T-cell therapy) is an advanced immunotherapy (treatment using the body's immune system) where a patient's T-cells (infection-fighting white blood cells) are genetically engineered to recognise and destroy cancer cells. It represents precision medicine in oncology.
- **Origin and Global Evolution:** The concept emerged in the late 1980s–1990s with early gene-modified immune cells. The first FDA-approved CAR-T therapy Kymriah (2017) revolutionised treatment for blood cancers like leukaemia and lymphoma, demonstrating high remission rates in resistant cancers.
- **India's Emerging CAR-T Ecosystem:** India entered this field with NexCAR19, developed by ImmunoACT (IIT Bombay incubated start-up) and approved in 2023.
  - By 2025–26, Indian CAR-T therapy costs (~₹30–40 lakh) remain significantly lower than global therapies costing $350,000–$500,000.
- **Technological Advancements in T-Cell Engineering:** New techniques such as 3D fibrous scaffolds (biomaterial structures mimicking the body's cellular environment) help expand T-cells efficiently.
  - IIT Bombay researchers found Accutase enzyme recovery preserves cell viability (functional survival of immune cells) better than harsher enzyme treatments.
- **Current Context and Strategic Significance:** India's cancer burden exceeds 1.46 million new cases annually (ICMR 2025), making accessible immunotherapies crucial.
  - Indigenous CAR-T innovations may reduce costs, expand treatment access, and strengthen India's biotechnology and precision-medicine ecosystem.

Significances

- **Structural Transformation of Cancer Treatment Paradigm:** CAR-T therapy represents a shift from conventional cytotoxic oncology (chemotherapy damaging both cancerous and healthy cells) to precision immunotherapy (genetically engineered immune cells targeting tumour-specific antigens).
  - Clinical trials report 70–90% remission in B-cell leukemias and lymphomas (Lancet Oncology 2025), redefining cancer treatment strategies.
- **Critical Public Health Response to India's Cancer Burden:** India recorded ~1.46 million new cancer cases in 2025 (ICMR National Cancer Registry), with increasing hematological malignancies (blood cancers such as leukemia, lymphoma, myeloma). CAR-T therapy offers treatment for relapsed or refractory cancers (treatment-resistant malignancies), improving survival where chemotherapy or bone-marrow transplant fail.
- **Strategic Advancement in India's Biotechnology Sovereignty:** Development of NexCAR19 by ImmunoACT (IIT Bombay incubated biotech firm) represents India's entry into advanced cell-and-gene therapy innovation.
  - Supported by Biotechnology Industry Research Assistance Council (BIRAC) and National Biopharma Mission, it strengthens India's strategic capacity in high-end biologics and translational medicine.
- **Major Breakthrough in Treatment Affordability and Accessibility:** Globally approved CAR-T therapies cost $350,000–$500,000 (~₹3–4 crore), restricting access in developing economies.
  - India's NexCAR19 costs ~₹30–40 lakh (DBT 2025)—nearly 10 times cheaper—enabling wider clinical access while supporting Make-in-India biotechnology manufacturing ecosystems.
- **Foundational Platform for Future Precision and Regenerative Medicine:** CAR-T therapy functions as a platform biotechnology (adaptable cellular engineering framework) enabling therapies for solid tumours, autoimmune diseases and rare genetic disorders.
  - Integration with CRISPR gene editing, synthetic biology and AI-driven drug discovery is accelerating next-generation personalised medicine globally.

Challenges and Concerns

- **Severe Immune Toxicity and Systemic Inflammatory Response:**
  - CAR-T therapy can cause Cytokine Release Syndrome (CRS – excessive immune activation releasing inflammatory proteins) and ICANS (Immune Effector Cell-Associated Neurotoxicity Syndrome – inflammation affecting the brain).
  - According to Nature Medicine 2026, CRS occurs in 60–90% patients, with 20–30% severe cases, requiring advanced ICU-level immunotherapy monitoring.
- **Ultra-High Cost and Limited Treatment Ecosystem:**
  - CAR-T therapy requires GMP (Good Manufacturing Practice) gene-therapy facilities, viral vector engineering and cell-processing laboratories.

- Global CAR-T costs $350k–$500k, while India's NexCAR19 (~₹30–40 lakh) remains expensive for most patients. <30 specialised CAR-T centres exist in India (DBT 2026), limiting national accessibility.

- **Tumour Microenvironment Barrier in Solid Cancers:** CAR-T therapy is highly effective for hematological malignancies (blood cancers) but less effective in solid tumours because of tumour microenvironment (immunosuppressive biological environment protecting cancer cells). Nature Reviews Cancer 2026 reports CAR-T response rates remain limited in pancreatic, lung and brain cancers.
- **Antigen Escape and Cancer Evolution:** Cancer cells evolve through antigen escape (loss or mutation of target surface proteins recognised by CAR receptors), enabling tumour survival. Research in Blood Journal 2025 shows 30–50% relapse rates in some leukemia patients, indicating the need for multi-target CAR constructs.
- **Complex Personalised Manufacturing and Time Delay:**
  - CAR-T therapy uses autologous cell therapy (patient-derived immune cells genetically engineered in labs) requiring 2–4 weeks manufacturing time.
  - According to Nature Biotechnology 2026, treatment delays can worsen outcomes in aggressive cancers, driving research toward allogeneic "off-the-shelf" CAR-T therapies.

Government and Institutional Efforts

- **National Biopharma Mission (NBM) – Building Cell-Therapy Innovation Capacity:** The National Biopharma Mission (NBM) under the Department of Biotechnology (DBT) supports advanced biologics including cell and gene therapies (therapies using engineered living cells). With ₹1,500+ crore funding (DBT 2025) it supports translational research platforms.
- **BIRAC Innovation Ecosystem for Translational Biotech Start-ups:** Biotechnology Industry Research Assistance Council (BIRAC) funds start-ups through Biotechnology Ignition Grant (BIG) and BioNEST incubators supporting CAR-T developers such as ImmunoACT (NexCAR19). Over 70 immunotherapy projects supported (DBT 2025).
- **Regulatory Oversight through CDSCO and Gene-Therapy Guidelines:** India strengthened governance through ICMR National Gene Therapy Guidelines and Central Drugs Standard Control Organisation (CDSCO) approval pathways. These frameworks regulate gene-editing clinical trials and cellular therapies ensuring safety and ethical compliance.
- **Indigenous Biomanufacturing through BioE3 and Make-in-India Biotech:** The BioE3 Policy (Biotechnology for Economy, Environment and Employment) promotes domestic manufacturing of viral vectors, biologics and advanced therapeutics.
  - Indigenous CAR-T therapy NexCAR19 (~₹30–40 lakh) significantly reduces treatment cost versus global therapies costing ₹3–4 crore, improving treatment accessibility.
- **Expanding Clinical Ecosystems and Academic-Hospital Collaboration:** Institutions such as IIT Bombay, Tata Memorial Centre, AIIMS and IISc are building cell-therapy research and clinical infrastructure. By 2026 India hosts ~25 CAR-T capable hospitals (DBT).

Issues Unresolved

- **Limited Manufacturing Infrastructure:** Despite ₹1,500+ crore National Biopharma Mission funding, India lacks large GMP cell-therapy manufacturing facilities, restricting large-scale CAR-T production (DBT Annual Report 2025).
- **Expensive Research and Clinical Trials:** Although BIRAC supports 70+ immunotherapy projects, CAR-T development requires costly multi-phase clinical trials, delaying start-up commercialisation (BIRAC Innovation Report 2025).
- **Lengthy Regulatory Approval Processes:** ICMR gene-therapy guidelines and CDSCO approvals ensure safety, but complex regulatory reviews slow clinical deployment of advanced therapies (ICMR–CDSCO regulatory review 2026).
- **Limited Specialist Medical Workforce:** India has about 25 CAR-T capable hospitals, yet shortages of trained immunologists and oncologists restrict nationwide therapy access (DBT BioE3 progress report 2026).
- **Affordability and Treatment Access Barriers:** Indigenous NexCAR19 costs ₹30–40 lakh, cheaper than global CAR-T (~₹3–4 crore), but still unaffordable for many patients (Tata Memorial clinical data 2025).

Way Forward

- **Establish GMP Cell-Therapy Manufacturing Clusters:** Set up GMP-compliant CAR-T manufacturing clusters under BioE3 Policy and DBT, scaling viral-vector production to cut therapy cost 40–50% (DBT 2026).
- **Develop Universal Donor-Derived CAR-T Therapies:** Fund CRISPR-edited allogeneic CAR-T platforms enabling universal donor cells, reducing production time from 3–4 weeks to under 5 days (Nature Biotechnology 2026).
- **Expand National Cancer Grid Treatment Centres:** Increase CAR-T capable hospitals from ~25 to 80 within National Cancer Grid's 300+ hospitals improving access across tier-2 and tier-3 regions (DBT 2026).
- **Scale Translational Research and Clinical Trials:** Expand BIRAC-funded immunotherapy programmes and IIT-AIIMS-Tata Memorial collaborations to accelerate clinical trials and CAR-T commercialisation (DBT 2025).
- **Integrate CAR-T into National Health Insurance:** Include CAR-T under Ayushman Bharat-PMJAY coverage for eligible patients, improving treatment access for 1.46 million new cancer cases annually (ICMR 2025).

1 POLITY & GOVERNANCE

JOINT SITTING OF PARLIAMENT

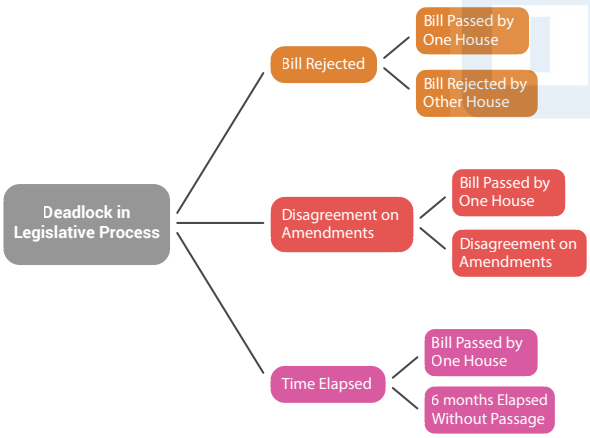
A protest by the Opposition during the President's Address to a joint sitting of Parliament on the first day of the Budget Session triggered sharp political exchanges.

Constitutional Position of the President's Address

- **Article 87** of the Constitution mandates the President to **address both Houses** of Parliament assembled at **the commencement** of the first session after a general election and at the first session of each year.
- The Address outlines the **policy priorities of the elected government,** approved by the Union Cabinet.
- It is a **constitutional and ceremonial exercise,** reflecting collective executive responsibility rather than the personal views of the President.

Legislative Deadlock

- **Article 108** of the Indian Constitution provides a constitutional mechanism for resolving legislative deadlocks between the Lok Sabha and the Rajya Sabha regarding ordinary bills.



- **The president can summon** both the Houses to meet in a joint sitting for the purpose of deliberating and voting on the bill. Voting is by simple majority of members present and voting.
- As per the Rules of Procedure and Conduct of Business in Lok Sabha, the joint sitting is presided over by the Speaker of the Lok Sabha.
- **Historical Instances of Joint Sitting:** Dowry Prohibition Bill, 1961; Banking Service Commission (Repeal) Bill, 1978 and Prevention of Terrorism Bill, 2002 (POTA).
- **Exceptions to Joint Sitting:** Money Bills (Article 110) and Constitution Amendment Bills (Article 368) are excluded from joint sitting under Article 108.

NATIONAL INTEGRATION COUNCIL

Recently, there was a demand for the revival of the National Integration Council during Zero Hour in the Rajya Sabha.

National Integration Council

- Prime Minister Jawaharlal Nehru convened the **National Integration Conference in 1961.**
- **Objective:** To promote national integration, communal harmony, and unity in diversity, and to address issues that threaten the country's social cohesion.

Zero Hour

- Zero Hour is an **Indian Parliamentary innovation** (not mentioned in constitution or parliamentary rules).
- It starts at 12 noon post-Question Hour and lasts about 30 minutes. During this period MPs raise urgent public issues without notice and the government responds.

Key Functions

Function	Description
Combating Divisiveness	Recommends measures against communalism, casteism, regionalism, separatism, and extremism
Strengthening Values	Advises on policies for constitutional values, secularism, and social harmony
Consensus Building	Acts as a forum for sensitive national issues

- **Composition:** Union Ministers, Chief Ministers of States and UTs, Leaders of major political parties, Eminent public figures, thinkers, and representatives of civil society.
- **Nature:** It is an advisory body ***(neither statutory, nor constitutional)***. Its recommendations are non-binding.
- **Meetings:** Not held regularly; convened as and when required, depending on national circumstances. The National Integration Council has not had a meeting since 2013.

SAMPOORNATA ABHIYAN 2.0

NITI Aayog launched the Sampoornata Abhiyan 2.0 campaign.

Introduction

- **About:** Sampoornata Abhiyan 2.0 was launched by NITI Aayog on 28 January 2026 as a nationwide campaign to accelerate development in backward regions through saturation of key indicators.

- **Implementation:** Districts and blocks prepare action plans, and progress is monitored regularly by NITI Aayog in coordination with central ministries and state governments.
- **Significance:** The campaign helps improve human development indicators, ensures effective implementation of government schemes, and promotes inclusive and balanced regional development.

Aspirational Districts Programme

- **It was launched in 2018** to quickly and effectively transform **112 districts** across the country.
- **Focuses on five themes:** Health & Nutrition, Education, Agriculture & Water Resources, Financial Inclusion & Skill Development and Infrastructure.

Aspirational Blocks Programme

- It was launched in **2023 and** aims for the saturation of essential government services in **513 Blocks** (329 Districts) across the country.
- **Focuses on five themes:** Health & Nutrition, Education, Agriculture and Allied Services, Basic Infrastructure and Social Development.

SEPARATE CENSUS ENUMERATION DNTs

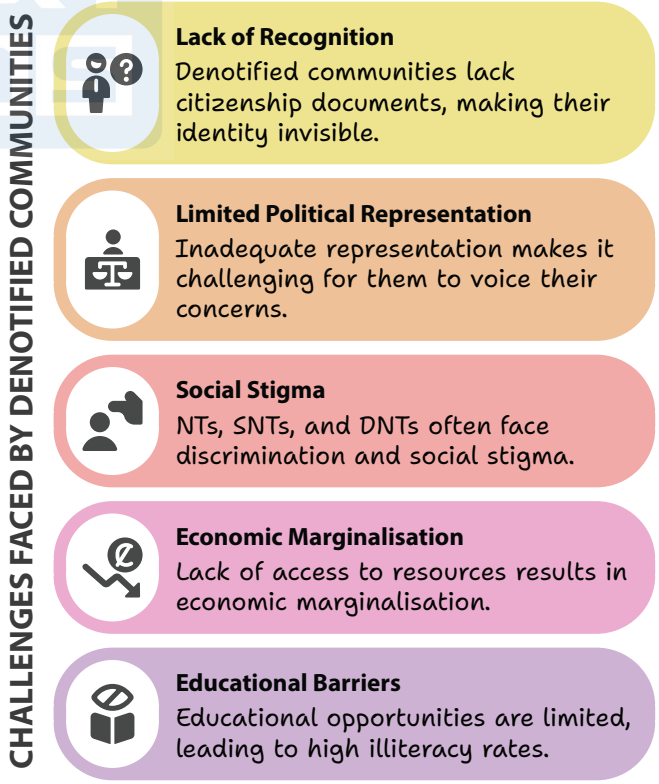
Denotified Tribes (DNTs), Nomadic Tribes (NTs), and Semi-Nomadic Tribes (SNTs) across India are demanding a separate column in the 2027 caste census and constitutional recognition through a distinct Schedule, citing long-standing political misclassification and exclusion from welfare benefits.

About

- **Nomadic and semi-nomadic communities** are defined as those that move from one place to another rather than living in one place all the time.
- The **term 'De-notified Tribes'** stands for all those communities which were once notified under the **Criminal Tribes Acts,** enforced by the **British Raj between 1871 and 1947.**
  - These Acts were repealed by the Government in **1952,** and these communities were **"De-Notified".** A few of these communities, which were listed as de-notified, were also nomadic.
- While most DNTs are spread across the Scheduled Castes (SC), Scheduled Tribes (ST) and Other Backwards Classes (OBC) categories, some **DNTs are not covered in any of the SC, ST or OBC categories.**
  - **Article 341** of the Constitution empowers the President to notify races, castes, tribes as Scheduled Caste in a state after consultation with the Governor of the state.
  - **Article 342** of the Constitution states that the President may notify the Scheduled Tribes in a state after consultation with the Governor of the state.

Status in India

- It has been estimated that South Asia has the **world's largest nomadic population.**



- In India, roughly **10 percent** of the population is Denotified and Nomadic *(Renke Commission (2005-2008))*.

- While the number of Denotified Tribes is about **150**, the population of Nomadic Tribes consists of about **500 different communities.**

- While the Denotified Tribes have almost settled in various States of the country, the Nomadic Communities continue to be largely nomadic in pursuit of their traditional professions.

Steps taken by the Government

- Based on the recommendations of the **Idate Commission (2015)** the Government of India constituted the **Development and Welfare Board for DNTs, SNTs &NTs (DWBDNCs)** in 2019.
- **Scheme for Economic Empowerment of DNTs (SEED):** The scheme was launched in **2022** for the welfare of Denotified, Nomadic and Semi-Nomadic Communities. The components of the Scheme for Economic Empowerment of DNTs are;
  - To provide **good quality coaching** for DNT candidates to enable them to appear in competitive examinations;
  - To provide **Health Insurance** to them;
  - To facilitate **livelihood initiatives** at the community level, and
  - To provide financial assistance for the **construction of houses** for members of these communities.

Idate Commission

- In **2015**, a National Commission for Denotified, Nomadic and Semi-Nomadic Tribes was constituted under the Chairmanship of **Bhiku Ramji Idate** for a period of three years.
- **The commission has given the following recommendations;**
  - There is a need to identify challenges faced by the NTs, SNTs, and DNTs owing to the stigma imposed by the enactment of the **Criminal Tribes Act, 1871** and later by the **Habitual Offenders Act, 1952** and figure out a way to modify discriminatory provisions of the latter.
  - It also suggested the non-inclusion of DNTs/NTs/SNTs under the SC/ST/OBC and formulation of specific policies for the former, among many others.
  - **Setting up a permanent commission** for Nomadic, Semi-Nomadic, and Denotified Tribes (NTs, SNTs, and DNTs) in India.
  - It stressed taking measures to discern hurdles endured by the communities in availing basic facilities such as education, employment, health care, and legal documents, among others.

PERSONALITY RIGHTS

The Delhi High Court issued notice to actor Salman Khan on a plea by a China-based AI voice platform to lift an interim injunction, bringing focus on personality rights, AI misuse, and digital privacy law in India.

About

- Personality rights refer to the right of an individual, especially celebrities, to protect their **name, image, voice, likeness, signature, and other personal attributes** from unauthorised use, particularly for commercial purposes.
- Many celebrities even register some aspects as trademarks to use them commercially. *For example*, **Usain Bolt's "bolting"** or lightning pose is a registered trademark.

Reasons for Providing these Rights

- The idea is that **only the owner** of these distinct features has the right to derive any commercial benefit from it.
- **Exclusivity** is a big factor in attracting commercial dividends for celebrities.
- Personality rights are not expressly mentioned in the laws in India but **fall under the right to privacy.**

Legality in India

- Personality rights are **not expressly mentioned in any specific statute**, but they are legally recognised and protected through judicial interpretation and related laws.
- **Constitutional Basis:** These rights are traced to the **Right to Privacy under Article 21 (Right to Life and Personal Liberty)** of the Constitution of India.
- **Important Judgment:** In **K.S. Puttaswamy v. Union of India (2017)**, the Supreme Court recognised the **Right to Privacy as a fundamental right under Article 21**, which forms the basis for the protection of personality rights.
- **Filing of Cases:** Personality rights claims are generally filed under the **Commercial Courts Act, 2015**, as celebrities usually do not have traditional intellectual property rights over their identity.
- **Legal Remedy:**
  - Celebrities can approach the Court and seek an **injunction and compensation** when an unauthorised third party uses their personality rights for commercial purposes.
  - An **injunction is a court order that directs a person or entity to stop doing a particular act**, such as using a celebrity's name, image, or voice without permission.
- **Use of Intellectual Property Principles:** Courts apply concepts from **trademark law**, such as **passing off (misrepresentation of association) and deception**, to determine whether a celebrity's personality rights have been violated.
- **Significance:** Personality rights help protect the **privacy, dignity, reputation, and commercial value of individuals**, especially celebrities, in advertisements, media, and digital platforms.

FORM 7 CONTROVERSY

The bulk submission of Form 7 applications by anonymous or fraudulent actors during the ongoing Special Intensive Revision (SIR) of electoral rolls has triggered controversy over possible misuse of the voter deletion process.

About Form 7

- Form 7 is used to **object to the inclusion of a name in the electoral roll**, including one's own name.
- **Grounds for objection include:** death of the voter, duplicate entry, shifting of residence, ineligibility due to age, citizenship, or misrepresentation.
- **Legal Basis:** Governed by Section 13(2) of the Registration of Electors Rules, 1960, framed under the Representation of the People Act, 1950. An objection must be filed by a person whose name is already included in the electoral roll.
  - **Booth Level Agents (BLAs)** are also permitted to file objections.
- **Recent Change:** In **2022**, the Election Commission amended Form 7 rules to allow **any voter within a constituency** to file objections, instead of restricting it to voters from the same polling booth, thereby widening its scope.
- **Verification Process:** After submission, Booth Level Officers (BLOs) conduct physical verification.
- **In case of death:** A death certificate and confirmation by three neighbours are required.
  - **If the voter is absent,** BLO must make three visits to verify the shifting of residence. The concerned voter is issued a notice and allowed a hearing.
  - Appeals against the Electoral Registration Officer's (ERO) decision can be filed before the District Magistrate within 15 days.

Additional Information

Filing a false declaration is punishable under **Section 32 of the Representation of the People Act, 1950**, with imprisonment for up to one year, a fine, or both.

AD HOC JUDGES

The Supreme Court Collegium has approved the appointment of five former judges as ad hoc judges in the Allahabad High Court.

About

Aspect	Details
Constitutional Provision	Article 224A of the Constitution provides for the appointment of retired High Court judges as ad hoc judges in High Courts.
Purpose	They are appointed to reduce case backlog, address judicial vacancies, and improve the disposal of pending cases.
Nature of Appointment	Ad hoc judges are appointed for a temporary period, generally ranging from 2 to 3 years.
Seniority	Their appointment does not affect the seniority of existing HC judges or their chances of elevation to Chief Justice or Supreme Court.
Appointment Process	The process is simpler than fresh appointments, as retired judges have already undergone background verification and judicial service.
Powers and Functions	Ad hoc judges exercise the same judicial powers and functions as permanent High Court judges.
Salary and Allowances	They receive pay and allowances similar to permanent High Court judges, but do not receive pension benefits for this tenure.
Frequency of Use	Although provided in the Constitution, Article 224A has been invoked rarely.

Supreme Court's Guidelines for the Appointment of Ad hoc Judges

- If a high court has vacancies that are **more than 20%** of its sanctioned strength;
- If over **10% of the high court's** cases are pending for more than five years;
- If the rate of disposal of cases is lower than the rate of institution of cases ('case clearance rate').

Additional Information

Article 127 of the Constitution deals with the appointment of ad hoc judges in the Supreme Court.

BHARAT-VISTAAR

The Union budget 2026-27 has proposed 'Bharat-VISTAAR' (Virtually Integrated System to Access Agricultural Resources).

About

Bharat VISTAAR Features

- **Multilingual AI Tool**
  Provides information to farmers in their own language.
- **Hindi and English Launch**
  First version will be launched in Hindi and English.
- **AgriStack Integration**
  Integrates AgriStack portals and ICAR package with AI systems.
- **Enhanced Farm Productivity**
  Enhances farm productivity and reduces risk.
- **Funds Allocation**
  Finance Minister allocated Rs 150 crore for Bharat-VISTAAR.

BHARAT TAXI

Union Minister for Home Affairs and Cooperation launched Bharat Taxi, India's first cooperative-based ride-hailing platform.

BHARAT TAXI FEATURES

Cooperative-Led
Registered under the Multi-State Cooperative Societies Act, 2002.

Driver Empowerment
Drivers are at the centre of ownership, operations, and value creation.

Flexible Operations
Drivers are free to operate on other platforms without exclusivity clauses.

Zero-Commission
Operates on a zero-commission and surge-free pricing model.

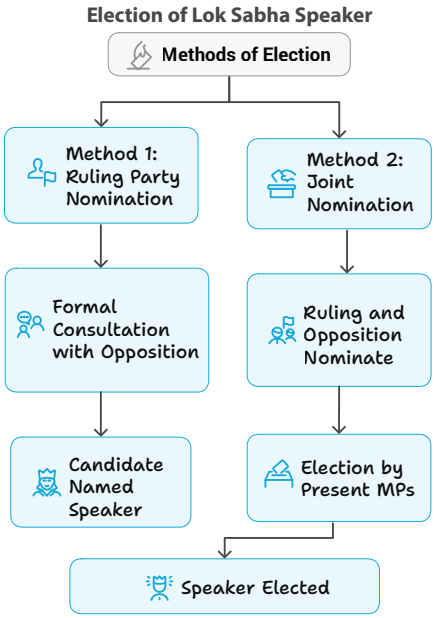
Driver Welfare
Prioritises driver welfare through social security measures.

RESOLUTION OF REMOVAL AGAINST SPEAKER OF LOK SABHA

A no-confidence motion (resolution for removal) has been submitted against the Lok Sabha Speaker under Article 94(c) of the Constitution of India.

About

- The presiding officer of **India's Lower House of Parliament,** the Lok Sabha Speaker, is the constitutional and ceremonial head of the House.
  - In the absence of the Speaker, the **Deputy Speaker discharges** his/her functions.
- **Article 93** of the Indian Constitution provides for the election of both the Speaker and the Deputy Speaker.
  - Generally, a member belonging to the **ruling party** is elected as Speaker.
- The salary and allowances of the Speaker of the Lok Sabha are charged to the Consolidated Fund of India and, therefore, are not subject to the annual vote of Parliament.



Removal of the Speaker

- **Article 94(c):** The Speaker may be removed by a **resolution of the Lok Sabha** passed by a **majority of all the then members** of the House.
  - This is known as an **effective majority** (majority of the total effective strength, excluding vacancies).
  - If the motion is passed, the **Speaker is removed immediately** but **continues as an MP.**
- **Notice Requirement:** At least **14 days'** written notice must be given before moving the resolution.
- **Minimum Support for Admission:** The motion must be supported by **at least 50** members to be admitted for discussion.
- **During the Pendency of Motion:**
  - The Speaker **cannot preside** over the House during the discussion of the motion.
  - The Deputy Speaker or another member presides.
  - The Speaker has the **right to participate and defend himself.**

Past Precedents

- **No Speaker of the Lok Sabha** has ever been successfully removed from office through a no-confidence or removal motion. Attempts have been made, but they continued holding office.
  - In 1954, members moved a motion against Speaker **GV Mavalankar.**
  - Speaker **Hukam Singh** faced a similar motion in 1966.
  - A motion was moved in 1987 against Speaker **Balram Jakhar.**
- **Neelam Sanjiva Reddy** resigned as Lok Sabha Speaker in 1969. He later became the President of the country.
- **GV Mavalankar,** the first Lok Sabha Speaker, died while serving in office. **GMC Balayogi** died in a helicopter crash in 2002 while serving as Speaker.

MINISTRY OF HOME AFFAIRS GUIDELINES ON VANDE MATARAM

The Ministry of Home Affairs (MHA) has issued guidelines directing that the national song Vande Mataram be sung/ played before the national anthem when both are played at official events.

Key Guidelines

- **Occasions for Playing or Singing:**
  - **Arrival and departure of the President** at formal State functions.
  - Before and after the presidential addresses to the nation.
  - Arrival and departure of Governors/Lieutenant Governors at State functions.
  - When the National Flag is brought on parade.
  - Other occasions specified by the Government of India.
- **Protocol:** The official version of approximately **3 minutes and 10 seconds** shall be used.
  - All six stanzas of Vande Mataram, including the four stanzas that were set aside by the Congress Working Committee in 1937, will be played.

Constitutional and Legal Framework

- **Status of National Symbols:** On **24 January 1950**, the first two stanzas of Vande Mataram were adopted as India's National Song.
  - While the Constitution does not explicitly define **the term "National Song," its recognition stems from discussions in the Constituent Assembly**and executive practice.
- **Article 51A(a) Fundamental Duties:** Mandates every citizen to abide by the Constitution and respect its ideals and institutions, the **National Flag and the National Anthem.**
  - Vande Mataram is not explicitly protected by any constitutional provision.

Vande Mataram

- Vande Mataram was composed by **Bankim Chandra Chatterjee** in Sanskrit and first appeared in the novel **Anandamath in 1882.** Anandamath is set against the backdrop of the 1769–73 **Bengal famine** and the **Sanyasi Rebellion.**
- First sung by Rabindranath Tagore at the 1896 Indian National Congress session gave it national exposure.
- During the **Swadeshi Movement of 1905,** Vande Mataram emerged as the anthem of civil resistance. Vande Mataram, as a political slogan, was first used on **7 August 1905.**

CORRUPTION PERCEPTIONS INDEX

Transparency International recently published the 2025 Corruption Perception Index (CPI).

About

- It measures perceived levels of public sector corruption using assessments from experts and business leaders.
- Scores range from zero, indicating very high levels of perceived corruption, to 100, which reflects a clean public sector.

Key Highlights of Data

- **Methodology:** The index evaluated 182 countries based on perceived public sector corruption, using a scale from zero (highly corrupt) to 100 (very clean).
- **Trend:** Corruption globally is worsening, even in advanced democracies, as the number of countries scoring above 80 has decreased from 12 a decade ago to just five this year.
  - It revealed a troubling downward trend, with the global average score falling to 42 out of 100—the lowest in over ten years.
  - It further pointed out that 122 countries, which are more than two-thirds of the total, scored under 50 in the 2025 CPI.
- **Best performing countries:** Denmark, maintaining its eight-year streak, tops the CPI 2025 with the highest score of 89, followed closely by Finland (88) and Singapore (84).
- **Worst Performing Countries:** The countries with the lowest scores suffer from severely repressed civil societies and high levels of instability. South Sudan and Somalia, both scoring 9, tied at rank 181.
- **India's Performance:** In 2025, **India ranked 91st** globally on the Corruption Perceptions Index (CPI), scoring 39 out of 100, which is a slight improvement from **2024 rank of 96th**.

SEVA TEERTH

The Prime Minister inaugurated the Seva Teerth complex in New Delhi, along with Kartavya Bhavan-1 and 2.

Seva Teerth and Kartavya Bhavan-1 and 2

- Seva Teerth houses the Prime Minister's Office, the National Security Council Secretariat, and the Cabinet Secretariat, all of which were previously located across different locations.
  - It consolidates administrative functions within modern, future-ready facilities.
- Kartavya Bhavan-1 and 2 accommodate several Key ministries, including the Ministry of Finance, the Ministry of Defence, the Ministry of Health and Family Welfare, Ministry of Education and the Ministry of Information and Broadcasting.
  - Both building complexes feature digitally integrated offices, structured public interface zones and centralised reception facilities.

Importance

- These features will foster collaboration, efficiency, seamless governance, improved citizen engagement and enhanced employee well-being.

BHU-AADHAAR

The Government of Delhi has initiated the assignment of a 14-digit Unique Land Parcel Identification Number (ULPIN), popularly termed 'Bhu-Aadhaar', to every land parcel in the Capital.

About ULPIN (Bhu-Aadhaar)

- Unique Land Parcel Identification Number (ULPIN) is part of the **Digital India Land Records Modernisation Programme (DILRMP).**
- It is a **14-digit identification number** accorded to a land parcel based on the **longitude and latitude coordinates** of the land parcel and depends on detailed surveys and geo-referenced cadastral maps.
  - The system integrates GIS mapping, drone surveys, and Ortho Rectified Images (ORI) for accuracy.
- It functions as a **digital land identity,** similar in concept to Aadhaar for individuals.

Significance

- The initiative aims to **enhance transparency, curb fraudulent transactions, and modernise land records** through geospatial technology.
- It complements the **SVAMITVA Scheme**, under which 48 villages in Delhi have already been covered.

MOTIONS OF PARLIAMENT

Recently, a Member of Parliament has submitted a notice to move a "substantive motion" against the Leader of the Opposition.

About

- A Motion is a formal proposal moved by a Member of Parliament (MP) to **initiate a debate or seek a decision of the House**.
  - No discussion on a matter of general public importance can take place except on a motion made with the **consent of the Presiding Officer.**
- Parliamentary motions are broadly classified into three categories: Substantive, Substitute, and Subsidiary.

Classification of Motions

- **Substantive Motion:**
  - A self-contained, independent proposal dealing with a very important matter.
  - Examples include the impeachment of the President or the removal of the Chief Election Commissioner.
- **Substitute Motion:**
  - Moved in substitution of an original motion to provide an alternative.
  - If adopted by the House, it supersedes the original motion.
- **Subsidiary Motion:** A motion that has no meaning on its own and refers to an original motion. These are further divided into:
  - **Ancillary:** Regular way of proceeding with business (e.g., "that the Bill be passed").
  - **Superseding:** Moved during a debate to supersede the current question.
  - **Amendments:** It attempts to modify only a part of the original motion.

Types of Parliamentary Motions

Motion Type	Purpose & Impact	Key Features
Closure Motion	To cut short the debate on a matter.	If passed, the debate stops, and the matter is put to vote. Includes "Guillotine" (undiscussed clauses put to a vote).
Privilege Motion	Raised when a Minister is believed to have committed a breach of privilege. **Article 105** grants Parliament freedom of speech and immunity to MPs from court proceedings for speeches/votes/publications in the Parliament.	Aimed at censuring the concerned Minister for withholding facts or giving wrong information.
Calling Attention	To draw a Minister's attention to an urgent matter.	An Indian innovation (since 1954); the Minister makes a brief statement on the issue.
Adjournment Motion	To discuss a definite matter of urgent public importance.	Disrupts the normal business of the House. Requires the support of 50 members. Not permitted in the Rajya Sabha.
Motion of Thanks	Discussed after the President's address.	Must be passed in both Houses; failure to pass it in the Lok Sabha is viewed as a defeat of the Government.

LAUNCH OF SAHI AND BODH INITIATIVES

The Union Health and Family Welfare Minister launched two digital health initiatives—SAHI (Secure AI for Health Initiative) and BODH (Benchmarking Open Data Platform for Health AI)—during the India AI Impact Summit 2026.

About

- **SAHI** is a **governance framework,** policy compass, and national roadmap for the responsible use of AI in healthcare, for leveraging AI in an ethical, transparent, accountable, and people-centric manner.
  - The platform will also serve as a **knowledge-sharing and governance hub,** promoting best practices in health AI development and implementation.
- BODH, developed by the IIT Kanpur in collaboration with the National Health Authority, will enable systematic evaluation of AI models using diverse, anonymised real-world health datasets.
  - It provides a **structured mechanism to test and validate AI solutions** before large-scale deployment.
- Together, **SAHI and BODH represent India's commitment to building a trustworthy, inclusive, and globally competitive health AI ecosystem** grounded in innovation, responsibility, and public trust.

CLOSURE OF FRA CELLS IN ODISHA

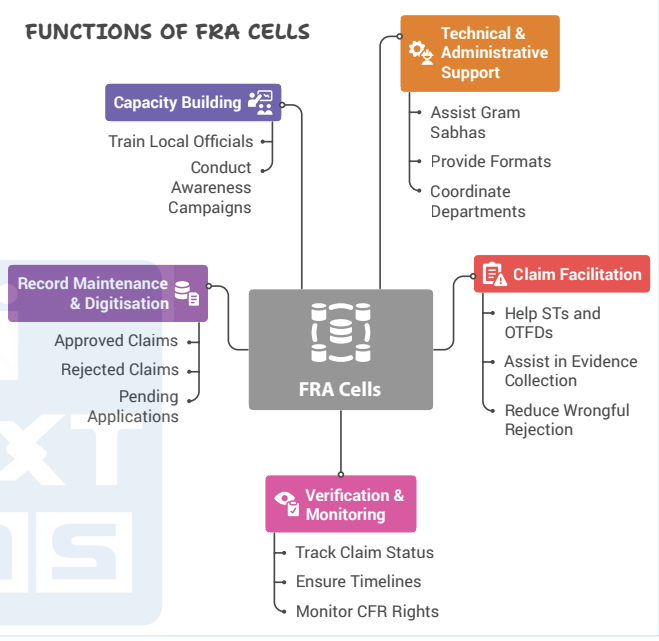
The Union Ministry of Tribal Affairs has initiated inquiries into the directives given by the State government of Odisha to shut down Forest Rights Act (FRA) Cells at multiple administrative levels.

About

- The Forest Rights Act (FRA), 2006, legally **recognises the rights of Scheduled Tribes and Other Traditional Forest Dwellers (OTFDs)** to manage, conserve, and use forest resources sustainably.
- It recognises and vests **individual and community forest rights (CFRs)** in Scheduled Tribes (STs) and other traditional forest dwellers (OTFDs) who have lived in forests for generations but whose rights were never formally recorded.
- **The Act also empowers Gram Sabhas to:**
  - Identify and verify claims over forest land and resources.
  - Manage and protect forest resources sustainably.
  - Regulate access to **Minor Forest Produce (MFP)** such as bamboo, tendu leaves, lac, honey, and wax.
- **Role of FRA Cells:**
  - These are special administrative units created to accelerate FRA implementation. Its functions include;
    - Assisting with claim filing and verification.
    - Maintaining records and digitisation of titles.
    - Providing technical and field support to local authorities.

Why FRA Cells Were Created

- FRA implementation is legally complex and involves coordination between tribal, revenue, and forest departments.
- Many forest-dwelling communities lack documentation and legal awareness.
- Large pendency of claims required dedicated institutional support.



VoicERA

The Digital India BHASHINI Division (DIBD), under the Digital India Corporation (DIC), Ministry of Electronics and Information Technology (MeitY) launched VoicERA.

VoicERA

- It is an open source, end-to-end Voice AI stack which is deployed on the BHASHINI National Language Infrastructure.
- It establishes a national execution layer for multilingual Voice and Language AI.
- It is designed to be open, pluggable, interoperable, cloud deployable, and on premise ready.
- It enables secure and scalable deployment of voice systems across government, research institutions, and innovation ecosystems.
- It reduces duplication of effort and eliminates vendor lock-in by modularising the voice stack.

Importance

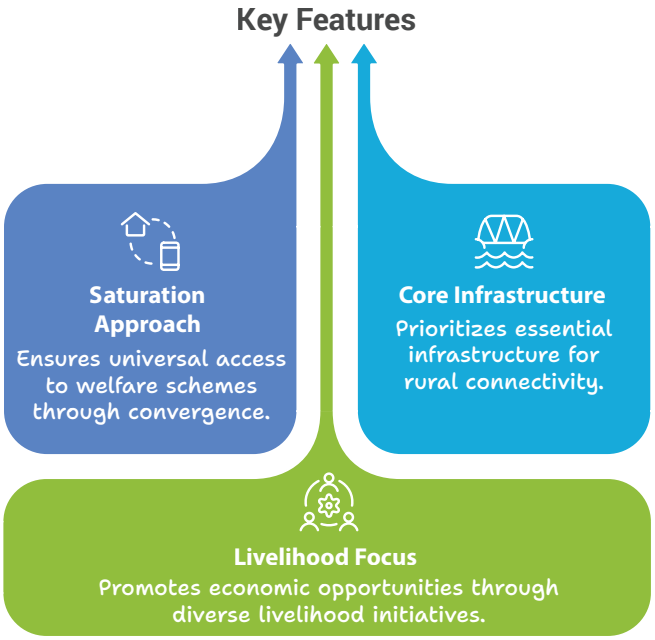
- The integration of **VoicERA with BHASHINI transforms India's national language infrastructure** into a voice-enabled Digital Public Infrastructure, supporting real-time speech, conversational AI, and multilingual telephony at population scale.
- It enables government departments to **quickly deploy voice-based citizen services across sectors** like agriculture, education, livelihoods, grievance redressal, and scheme discovery, promoting inclusive, secure, and interoperable public service delivery.

VIBRANT VILLAGES PROGRAMME–II (VVP-II)

The Vibrant Villages Programme–II (VVP-II) is a Central Sector Scheme (wholly funded and implemented by the central government through its ministries/departments) launched by the Union Home Minister at Nathanpur village in Assam's Cachar district.

About

- VVP-II aims to fill infrastructure gaps, reverse out-migration, and improve livelihoods in border areas, fostering secure communities aligned with **Viksit Bharat 2047.**
- It **builds on VVP-I by targeting comprehensive development** in border villages along India's international land borders (excluding northern borders covered earlier), spanning 17 states and 2 UTs with a ₹6,839 crore outlay until FY 2028-29.
- Evolved from the 1986-87 Border Area Development Programme (BADP), VVP-I (2023) targeted northern borders; VVP-II extends to Indo-Bangladesh, Indo-Nepal, Indo-Myanmar, Indo-Bhutan, and Indo-Pakistan frontiers with tailored strategies.

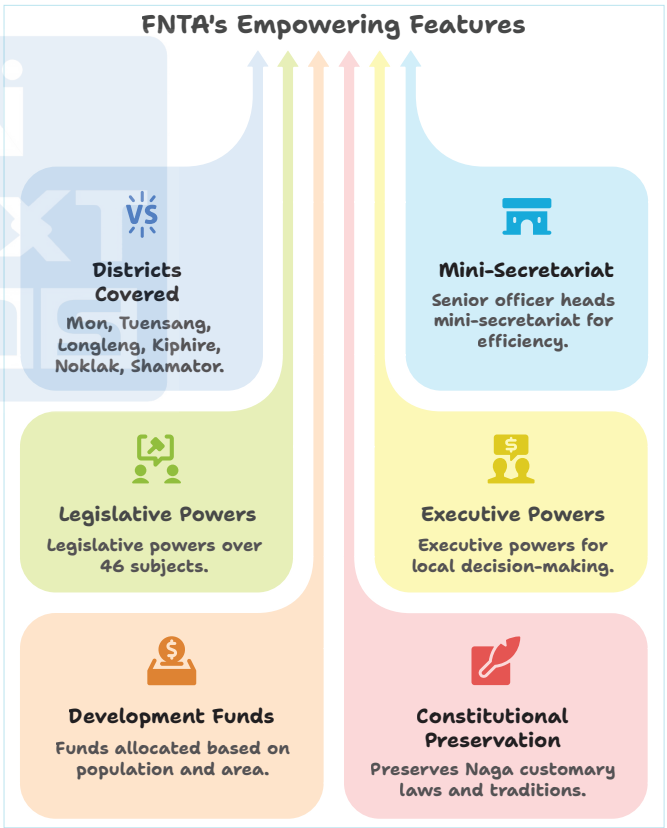


FRONTIER NAGALAND TERRITORIAL AUTHORITY (FNTA)

On February 5 2026, the Union Government signed a tripartite agreement with the Government of Nagaland and the Eastern Nagaland Peoples' Organisation (ENPO) to create the Frontier Nagaland Territorial Authority.

About

- The ENPO had demanded a separate State,**"Frontier Nagaland",** since **2010.**
- The demand stems from **colonial-era policies** that treated the **eastern hills as a minimally administered frontier.**
- After **Nagaland was carved out of Assam as a State in 1963,** eastern tribes felt politically and economically marginalised compared to western Nagaland. The eight tribes inhabiting the region argued that development gaps widened due to **limited infrastructure, poor connectivity, and weaker political representation.**



SANKALP SCHEME

The Public Accounts Committee (PAC) of Parliament criticised the government for the implementation of the Skill Acquisition and Knowledge Awareness for Livelihood Promotion (SANKALP) scheme. The panel was examining a Comptroller and Auditor General (CAG) report that highlighted significant delays and shortfalls in both financial and physical progress under the scheme.

About

- It is a flagship programme of the Ministry of Skill Development and Entrepreneurship.
- It was launched in 2018. SANKALP was originally scheduled for completion by 2023 but was later extended to 2024.
- It was designed to strengthen **short-term skill training** through better institutional frameworks, enhanced industry linkages, and targeted inclusion of marginalised communities.
- **Funding:** The scheme was slated to be financed through a World Bank loan of ₹3,300 crore, State leverage of ₹660 crore, and industry leverage of ₹495 crore.

Public Accounts Committee (PAC)

- **Establishment:** Public Accounts Committee (PAC) originated in 1921 following its mention in the Government of India Act, 1919 (Montford Reforms). It is reconstituted annually under Rule 308 of Lok Sabha's Rules of Procedure and Conduct of Business.
- **Appointment:** Lok Sabha Speaker appoints the Chairman. As a non-executive body, PAC's decisions remain advisory.
- **Members:** Comprises 22 members: 15 elected by Lok Sabha, 7 by Rajya Sabha Chairman. Term limited to one year.
- **Purpose:** Verifies if Parliament-granted funds were spent within the "scope of demand". Ministers cannot be members.
- **Functions:** PAC examines appropriation accounts, annual Finance Accounts, and other relevant accounts (excluding those under Committee on Public Undertakings).
  - Reviews CAG Reports on revenue, ministry expenditures, autonomous bodies. Treats procedural savings as critically as excesses.

Comptroller and Auditor General

- **About:** CAG of India (Article 148) is the head **Indian Audit and Accounts Department (IA-AD)**, protecting the public purse. He oversees central/state financial systems.
  - Upholds Constitution/parliamentary laws; pillar alongside Supreme Court, Election Commission, UPSC.
- **Appointment and Term:** President appoints CAG for a 6-year term or 65 years age, whichever is earlier. Oath for impartiality. Removal like Supreme Court judge (Parliament resolution for misbehaviour/incapacity). Resignation to President.
- **Independence:** Removal is in the same manner as for a Supreme Court Judge. Requires a **special majority resolution** in both Houses of Parliament for **proven misbehaviour or incapacity.**
  - Not eligible for further office under the Government of India or any State.
  - Salary is fixed by Parliament.
  - Service conditions for CAG's staff are prescribed by the President in consultation withCAG.
  - Expenses are **charged up on the Consolidated Fund of India** i.e not subject to vote (non-votable).
- **Duties and Powers:** Audits Consolidated Fund, state funds, PSUs/government corporations, substantially funded bodies.
  - Certifies tax proceeds, audits debt/advances/suspense.
  - Submits audit reports to the President.

PRASHAD SCHEME

Union Civil Aviation Minister announced plans to enhance pilgrimage tourism in Andhra Pradesh under the PRASHAD scheme.

Pilgrimage Rejuvenation and Spiritual Augmentation Drive (PRASAD) Scheme

- It is a **Central Sector Scheme launched in 2014–2015** by the Ministry of Tourism, Government of India.
  - A Central Sector Scheme (CS) is an initiative fully funded and implemented by the Union Government.
- It focuses on **developing and identifying pilgrimage sites across India** to enrich the religious tourism experience.
- It improved **infrastructure in tourism areas**—roads, transport, sanitation, and utilities—and enhanced both residents' quality of life and the overall experience for tourists.

Benefits

- **Increase Employment Opportunities & Tourism Revenues:** Tourism development under the PRASHAD Scheme generates local employment across hospitality, transport, guiding, handicrafts, and retail, boosting livelihoods and economic empowerment.
- **Income Generation:** Tourism boosts income for local artisans, vendors, homestays, and small businesses by increasing demand for their goods and services, improving livelihoods and living standards.
- **Preservation of Cultural Heritage:** PRASHAD-funded preservation of heritage sites helps communities maintain cultural identity while fostering education and cultural exchange with visitors.
- **Promotion of Local Culture and Traditions:** The PRASHAD Scheme promotes local culture through festivals, exhibitions, and traditional performances, enhancing community pride and cohesion.

- **Skill Development and Capacity Building:** The PRASHAD Scheme supports skill development and capacity-building programs for local communities, enabling them to engage in tourism and drive sustainable development.

BLOCKING OF OTT PLATFORMS FOR OBSCENE CONTENT

The Ministry of Information and Broadcasting (I&B) has ordered the blocking of five OTT platforms for streaming obscene and pornographic content.

Meaning of Obscene Content

- "Obscene content" refers to material that is lascivious, sexually explicit, or appeals to prurient interests, and tends to deprave or corrupt persons who are likely to read, see, or hear it.
- However, obscenity is not defined in absolute terms, it is shaped by law, judicial interpretation, and evolving societal standards.

Regulatory Evolution of OTT Platforms

- **Earlier Phase (Regulatory Vacuum):** OTT platforms initially operated without direct censorship like films under the CBFC.
- **IT Rules, 2021:** It brought digital news and OTT under a **three-tier grievance redressal mechanism.**
  - It mandated content classification (U, U/A 7+, U/A 13+, U/A 16+, A).
  - It required age-gating for adult content.
- **Proposed IT (Digital Code) Rules, 2026:** Draft rules propose stronger age-based classification, clearer norms on obscenity, incitement, and religious attacks.
  - Response to the Supreme Court directive to ensure balance between Article 19(1)(a) and 19(2).

Constitutional Dimensions

- **Article 19(1)(a) (Freedom of Speech and Expression):** Protects artistic and creative expression, including digital content.
- **Article 19(2) (Reasonable Restrictions):** Allows restrictions on grounds of decency or morality, public order, defamation, sovereignty and integrity.
  - The current action reflects the State's attempt to balance **free speech with reasonable restrictions**, especially concerning obscenity and protection of minors.
- The Supreme Court has repeatedly emphasised that while free speech is fundamental, it is **not absolute**, and must conform to constitutional limits.

Legal Framework Involved

- **IT Act, 2000:** Blocking orders follow due procedure under the Information Technology (Procedure and Safeguards for Blocking for Access of Information by Public) Rules, 2009.
  - **Section 69A:** Empowers the Central Government to **block public access to information** for reasons including sovereignty and integrity of India, public order, and decency or morality.
  - **Section 67:** Punishes publishing/transmitting obscene material electronically.
  - **Section 67A:** Specifically penalises sexually explicit content.
- **Indecent Representation of Women (Prohibition) Act, 1986:** It prohibits indecent depiction of women in any form, including on digital platforms.

Role of Institutions

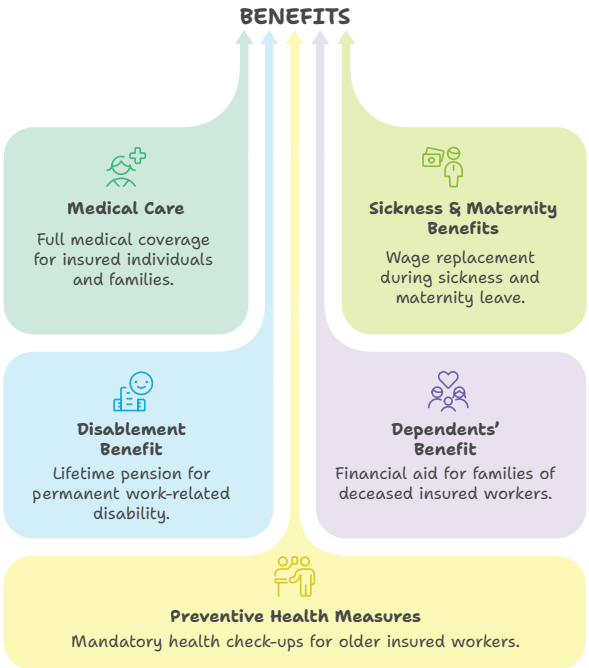
- **National Commission for Protection of Child Rights (NCPCR):** It flagged obscene content affecting children, and highlighted the child protection dimension in digital regulation.
- **Judiciary:** Directed formulation of safeguards ensuring protection of free speech, and enforcement of reasonable restrictions.

75 YEARS OF ESIC

The Employees' State Insurance Corporation (ESIC) is commemorating 75 years since its launch in 1952.

About ESIC

- ESIC operates under the Ministry of Labour & Employment as a **statutory body** administering the ESI Scheme.
- It stemmed from the **1944 Report on Health Insurance by Prof. B.P. Adarkar** ("Chhota Beveridge"), influencing India's post-independence welfare model.
- **Dr. C.L. Katial** served as the **first Director General of ESIC.**
- Contributions 0.75% from employees, 3.25% from employers (total 4%).



PRINCIPLE OF JUST DESERTS

The Supreme Court flagged the trend among high courts of reducing the sentences awarded to the accused persons. Considering the seriousness of the situation, the Supreme Court laid down guidelines to be followed by courts while dealing with imposition of sentences.

Guidelines for Courts

- Adherence to the principle of **"just deserts"** ought to be the primary duty of the courts.
  - Just Deserts is a theory of **punishment based on the idea that a person should be punished because they deserve it,** and the punishment should be **proportionate to the seriousness of the crime.**
  - It is also known as the **Retributive Theory of Punishment**
- Due consideration must be given to the **facts and circumstances of the case,** including the allegations, evidence and the findings of the trial court.
- The sentence should be **adequate to maintain the public trust in law and administration;** however, the court shall not be swayed by the outrage or emotions of the public and must decide the question **independently.**

Justice

Different theories of justice influence legal systems.

- **Distributive Justice:** It is associated with Aristotle and focuses on the fair distribution of resources and benefits in society.
- **Corrective Justice:** Corrective justice deals with correcting wrongs by providing compensation or restoring losses caused by another party.
- **Restorative Justice:** This emphasizes repairing harm through **dialogue, reconciliation, and involvement of victims, offenders, and the community** rather than relying only on punishment.

Types of Justice Systems:

There are mainly two models of Justice systems in the world namely, **adversarial and inquisitorial,** though many countries today use a hybrid approach combining elements of both.

- **Adversarial System:** In an adversarial system, a trial is conducted as a contest between the prosecution and the defence. Each side presents evidence, calls witnesses, and argues its case before a neutral judge.
  - The judge mainly ensures that proper legal procedures are followed and that the trial remains fair, though the judge may intervene when necessary.
  - The truth is expected to emerge through cross-examination and competing arguments.
  - This system is common in common-law countries such as the UK, USA, and Australia.
  - It strongly emphasizes procedural fairness, presumption of innocence, and protection of the accused's rights.
- **Inquisitorial System:** In an inquisitorial system, which is common in civil-law countries such as **France, Germany, and Italy,** judges play a more active role in investigating the case. They may direct inquiries, collect evidence, question witnesses, and organize evidence in written records before the trial.
  - Oral hearings still take place, but written documentation and judicial investigation carry greater importance than courtroom advocacy.
  - This approach aims to **discover the truth more directly**, though critics argue that a strong judicial role may risk bias.

India's Adversarial System:

- India largely follows an adversarial system, inherited from the British legal tradition. In criminal trials, the prosecution must prove the accused's guilt beyond reasonable doubt.
  - The accused enjoys important protections such as the right against self-incrimination under Article 20(3) and the right to life and fair trial under Article 21.
- The Indian system is not purely adversarial. Courts are allowed to intervene actively to ensure that justice is done. For example, courts can recall or summon witnesses under Section 311 of the Code of Criminal Procedure (Section 348 of the Bharatiya Nagarik Suraksha Sanhita, 2023) and ask questions to clarify facts. Thus, India's legal process is often described as a modified adversarial or hybrid system, combining adversarial procedure with certain inquisitorial features to help courts discover the truth.
- The Supreme Court in **Zahira Habibullah Sheikh v. State of Gujarat** emphasized that a criminal trial should not become a mere contest between parties; the court must actively ensure that the truth is discovered and justice is delivered.

KERALA TO BE NAMED 'KERALAM'

The Union Cabinet has approved the proposal to rename Kerala as Keralam.

Formation of the Modern State of Kerala

- **Pre-Independence Background:**
  - Malayalam-speaking people were historically divided among multiple kingdoms and princely states.
  - Major regions included Malabar (under British rule) and the princely states of **Travancore and Kochi.**
  - In the **1920s**, the **Aikya (Unified) Kerala Movement** demanded a single state for Malayalam speakers.
- **On 1 July 1949,** Travancore and Kochi merged to form the **Travancore–Cochin State.**
- **State Reorganisation Commission:**
  - The Union Government appointed the State Reorganisation Commission (SRC) under **Fazl Ali.**
  - It proposed the creation of a unified Kerala state.
- **The state of Kerala** was formally **created on 1 November 1956** under the States Reorganisation Act. It brought together:
  - Malabar district (from Madras State).
  - Travancore–Cochin State (excluding some Tamil-majority areas).

Process to Rename a State in India

- **Article 3 authorizes the Parliament to:**
  - form a new state by separation of territory from any state or by uniting two or more states or parts of states or by uniting any territory to a part of any state;
  - increase the area of any state;
  - diminish the area of any state;
  - alter the boundaries of any state; and
  - alter the name of any state.
- However, **Article 3** lays down two conditions in this regard: a bill contemplating the above changes can be introduced in the Parliament only with the prior recommendation of the President; and before recommending the bill, the President has to refer the same to the state legislature concerned for expressing its views within a specified period.
- The **President (or Parliament) is not bound** by the views of the state legislature and may either accept or reject them.
- Moreover, the **Indian Constitution (Article 4)** itself declares that laws made for alteration of names of existing states (under Articles 3) are not to be considered as amendments of the Constitution under **Article 368**.
  - Such laws can be passed by a simple majority and by the ordinary legislative process.

INTERNATIONAL DATA PRIVACY DAY

International Data Privacy Day is observed every year on 28 January to highlight the importance of protecting personal data in the digital age.

About

- International Data Privacy Day was designated in 2006 by the Council of Europe.
- The day commemorates the signing of Convention 108, the first legally binding international treaty on data protection.

India's Expanding Digital Ecosystem

- India is among the most digitalised economies, with the digital economy contributing over 10% of GDP, expected to reach about 20% by 2026–30.
- Growth is supported by Digital Public Infrastructure (DPI) such as Aadhaar, UPI, DigiLocker, and widespread broadband connectivity.
- India has over 101.7 crore broadband subscribers, enabling digital access in areas like payments, healthcare, education, and governance. However, increased digitalisation also raises privacy and cybersecurity risks due to the large volume of personal data generated.

Democratic and Rights-Based Concerns

- The right to privacy is recognised as a fundamental right under Article 21 by the Supreme Court in the Puttaswamy judgment (2017). Large digital databases in welfare and fintech systems may lead to profiling, surveillance, or exclusion without strong safeguards.
- Concerns remain regarding the **Digital Personal Data Protection (DPDP)** framework, including wide state exemptions, broad "legitimate use" provisions, and reliance on executive rules.
- Weak institutional capacity and concentration of data increase risks of data breaches and misuse.

2 INTERNATIONAL RELATIONS

FORGE INITIATIVE

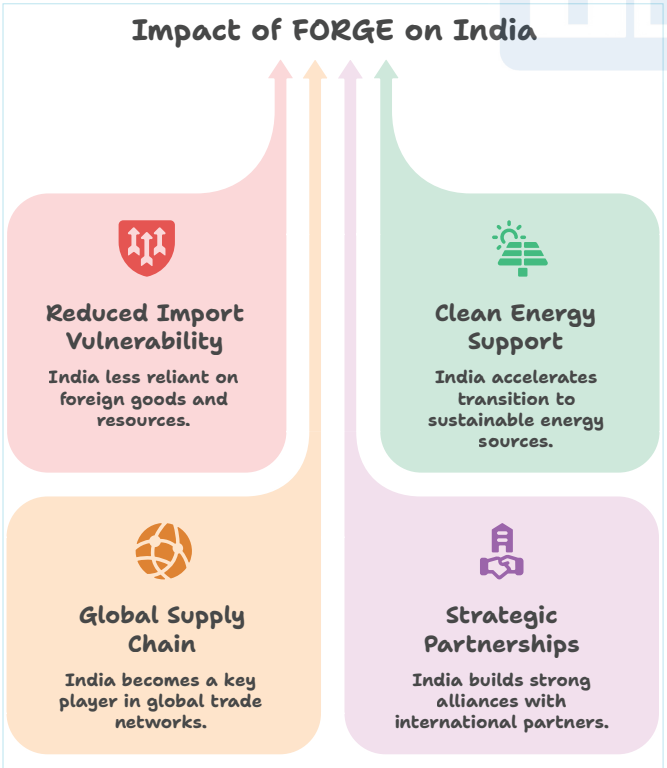
India has expressed support for the FORGE Initiative at the inaugural Critical Minerals Ministerial hosted by the United States in Washington DC.

About

- FORGE is a **multilateral international cooperation framework** designed to de-risk global critical mineral supply chains by bringing together like-minded countries.
  - It has been created as a successor to the **Minerals Security Partnership (MSP).**
- Core Idea is to reduce over-dependence on a few dominant suppliers, build trusted, transparent and resilient critical mineral ecosystems.

India's Alignment with the FORGE Initiative

- India sees FORGE as complementary to its domestic efforts such as:
  - National Critical Minerals Mission (NCMM)
  - Rare Earth Corridors
  - Focus on self-reliance with global cooperation



INDIA-GCC SIGN TERMS OF REFERENCE FOR FREE TRADE AGREEMENT

India and the Gulf Cooperation Council (GCC) have signed the Terms of Reference for a Free Trade Agreement (FTA) in New Delhi.

About

- **The terms of reference (ToR)** outline the scope and modalities of a proposed trade pact.
- **It defines the scope of the agreement**, including trade in goods, trade in services, investments, and other trade-related issues.
- Lay down the **structure and timelines** for negotiations;
- **Specify tariff reduction modalities** and dispute settlement mechanisms;
- **Provide clarity** on technical standards, rules of origin, customs cooperation, and trade facilitation measures.

Gulf Cooperation Council (GCC)

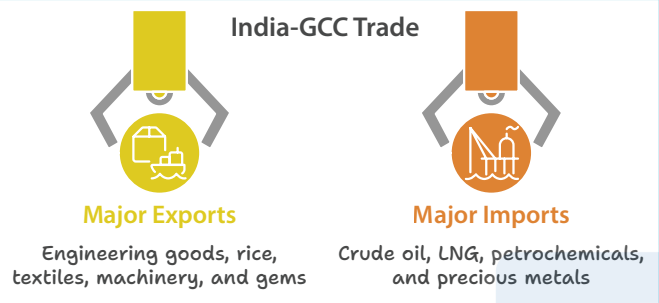
- GCC is a regional political and economic union established in 1981.
- It comprises six member countries: Saudi Arabia, Kuwait, the United Arab Emirates, Qatar, Bahrain, and Oman.
- It is headquartered at Riyadh, Saudi Arabia.
- **It aims** to achieve unity among its members based on their common objectives and similar political and cultural identities, rooted in Arab and Islamic cultures.

Significance of the Gulf Cooperation Council (GCC)

- The **GCC countries** together form a market of about 61.5 million people (2024) and have a combined GDP of about

USD 2.3 trillion at current prices, making them the 9th largest economic grouping in the world.

- The region is also home to a **large Indian diaspora of nearly 10 million people**, which acts as an important bridge between India and the GCC countries.
- A Free Trade Agreement (FTA) between India and the GCC is expected to strengthen cooperation in sectors such as food processing infrastructure, petrochemicals, and Information and Communication Technology (ICT).
  - This agreement could significantly deepen economic relations between India and the GCC region.



India–GCC Trade Cooperation

- India's trade with the GCC region reached USD 178.56 billion in FY 2024–25, including exports of USD 56.87 billion and imports of USD 121.68 billion.
  - This accounts for about 15.42% of India's total global trade.
- Over the past five years, India's trade with GCC countries has grown steadily at an average annual rate of around 15.3%.
- In addition, the GCC region is an important source of foreign direct investment (FDI) for India, with cumulative investments exceeding USD 31.14 billion as of September 2025.

INDIA–US TRADE AGREEMENT

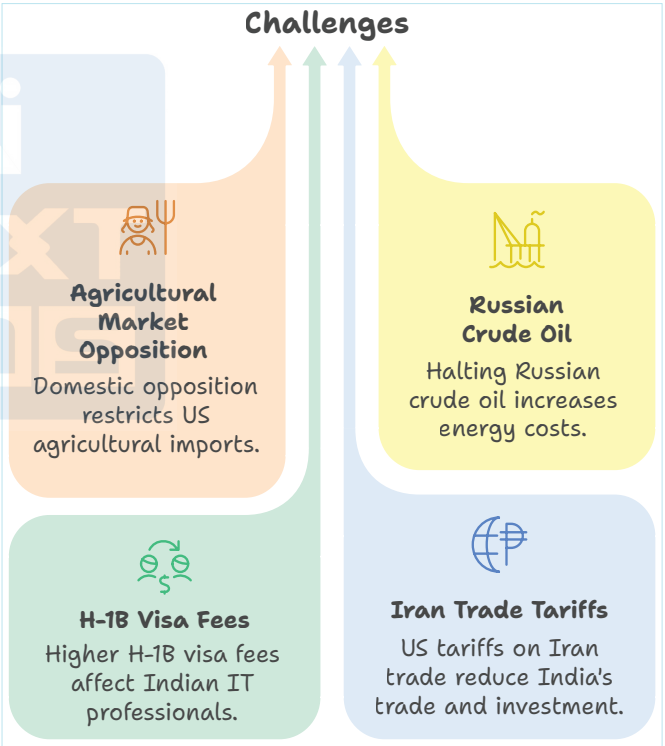
India and the United States have announced a new trade deal, lowering tariffs and setting ambitious targets for bilateral trade.

About

- **Tariff reduction:** US reciprocal tariffs on Indian goods reduced from 25% to 18%, effective immediately. Additional 25% duty was withdrawn, which had earlier been imposed.
- **US claims on broader commitments:** The US asserts the deal includes zero tariffs and non-tariff barriers for US goods and that India aims to buy over $500 Bn of US products across energy, tech, agriculture, coal, etc over five years. India will progressively reduce tariffs and non-tariff barriers against US goods.

Importance of the Deal

- It strengthens **India–US ties** amid global geopolitical shifts, especially regarding China. Helps counter **China's dominance** in global trade and manufacturing.
- Lower tariffs could improve competitiveness for Indian exporters (farmers, MSMEs, entrepreneurs) and attract investment. This would support Make, Design and Innovate in India for the world.
- Diversifying oil imports may reduce India's dependence on Russia, though at higher costs. It would help stabilize the **rupee amid global economic uncertainty.** It will position India as a key partner in **US-led trade and security frameworks.**



India–US Trade

- The US is among **India's largest trading partners**. India runs a trade surplus with the US, mainly due to services and high-value exports. India–US bilateral trade **rose from US$ 119.71 billion in FY24 to a record US$ 132.2 billion in FY25**, reflecting strengthening economic ties.
- The **US is the 3rd largest investor in India**. Cumulative FDI inflows (2000–2025) is US$ 70.65 billion. Key Indian Exports to the US are pharmaceuticals, engineering goods, electronics & gems and jewellery.

INDIA AND GREECE BILATERAL TIES

The Defence Minister held a bilateral meeting with his Greek counterpart in New Delhi. Both leaders reiterated that the India-Greece Strategic Partnership is based on shared values of peace, stability, freedom, and mutual respect.

Outcome

- A **Joint Declaration of Intent** was signed to strengthen defence industrial cooperation between the two countries. This will serve as the basis for preparing a five-year roadmap for defence collaboration.
- Both sides also exchanged a **Bilateral Military Cooperation Plan for 2026**, outlining future military engagements between their armed forces.

India-Greece Bilateral Relations

- **Political Relations:**
  - India and Greece have traditionally maintained friendly diplomatic ties, often supporting each other in international forums such as the United Nations.
  - The relationship was elevated to a Strategic Partnership in 2023 during the visit of Narendra Modi to Greece.
- **Defence Cooperation:** Both countries have strengthened defence ties through joint naval exercises in the Mediterranean Sea and participation in the multinational air force exercise **INIOCHOS (INIOCHOS-23, INIOCHOS-24 and INIOCHOS-25).**
  - Even after India's nuclear tests at Pokhran in 1998, when several European countries demanded sanctions, Greece signed a defence cooperation MoU with India the same year.
  - Both countries are also exploring co-production of defence equipment and technology sharing under the Make in India programme.
- **Economic Cooperation:**
  - India and Greece aim to double bilateral trade by 2030, which was about USD 2 billion in 2022–23.
  - Tourism contributes around 25% of Greece's revenue, and Greece is becoming a popular destination for Indian travellers.
- **Strategic Importance:** Located in the Eastern Mediterranean, Greece—being a member of the European Union and North Atlantic Treaty Organization—can act as an important gateway for India to access European markets.

INDIA TO CHAIR KIMBERLEY PROCESS

India has assumed the chairmanship of the Kimberley Process for the year 2026. As chair, India will supervise the implementation of the Kimberley Process Certification Scheme (KPCS) and coordinate the functioning of its working groups, committees, and administrative mechanisms.

Kimberley Process (KP)

- The Kimberley Process is a multinational initiative designed to regulate the global trade in conflict diamonds. Conflict diamonds are rough or unpolished diamonds used by rebel groups or insurgent organisations to finance conflicts and undermine legitimate governments.
- The initiative began in 2000, when countries in southern Africa started discussions to stop the trade of such diamonds. Negotiations among 37 participating parties eventually led to the establishment of the Kimberley Process Certification Scheme (KPCS) in 2003.
- Under this system, countries certify that **rough diamonds entering international markets are conflict-free**. Each participating country enforces these rules within its own jurisdiction to ensure compliance.
- Currently, the Kimberley Process has 60 participants representing 86 countries, accounting for about 99.8% of global rough diamond production.

Trade in Rough Diamonds

- Trade in rough diamonds is permitted only between certified Kimberley Process participants that comply with its standards. Member countries are also required to share accurate and timely data on diamond production and trade.

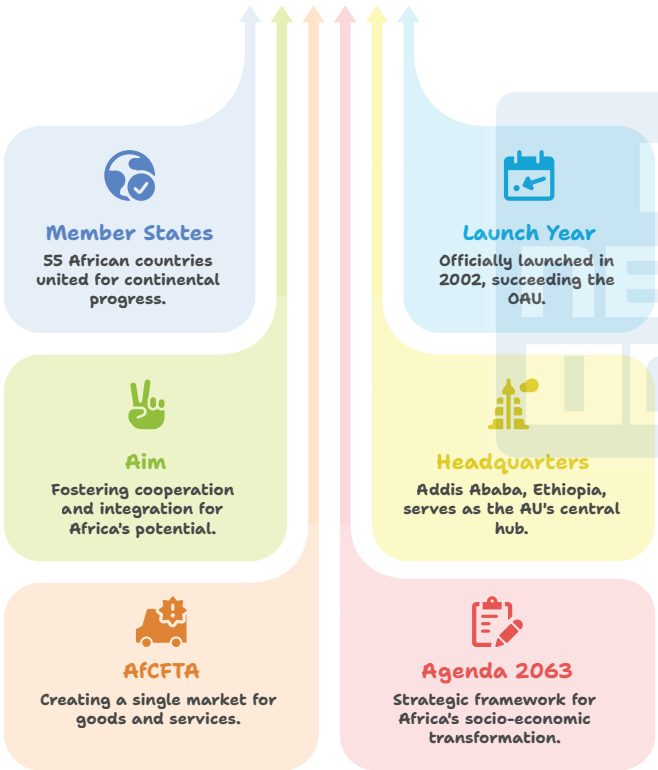
- Major producers include **Angola, Botswana, Canada, Congo, Namibia, and Russia**, which together account for over 85% of global rough diamond production.
- Although India is not a diamond producer, it is a **major importer of rough diamonds**, accounting for **around 40% of global imports**. India is also a leading **diamond cutting and polishing hub**, particularly in **Surat and Mumbai**, and exports polished diamonds to markets such as **China, Hong Kong, Israel, the United Arab Emirates, and the United States.**
- **India's Significance:** India's central role in the **global diamond value chain** gives it significant influence within the Kimberley Process and the ability to support reforms in global diamond governance.

Concerns

- **Narrow definition of conflict diamonds:** The current definition focuses mainly on diamonds used by rebel groups and does not adequately address issues such as human rights violations, environmental damage, or illicit trade linked to state actors.
- **Consensus-based decision-making:** Decisions require agreement from all participants, allowing any country to effectively veto proposals, which can weaken enforcement and the credibility of the Kimberley Process.

AFRICAN UNION

The African Union (AU) is hosting its annual summit in Ethiopia to discuss the future of the continent, as the organisation faces widespread discontent.



INDIA–IRELAND DIGITAL PARTNERSHIP

India and Ireland recently held a high-level bilateral meeting in New Delhi to enhance cooperation in telecommunications, digital infrastructure, and emerging technologies.

Key Highlights

- During the meeting, India highlighted the progress of its **digital transformation and ICT sector**. India currently has one of the world's largest digital ecosystems, with more than 1.23 billion telecom subscribers and nearly one billion internet users.
- India also noted that 5G services now cover about 99.9% of districts, supported by low data costs averaging around USD 0.10 per GB, making internet access widely affordable.
- India showcased its **Digital Public Infrastructure (DPI)** platforms that have gained global recognition. These include the **Unified Payments Interface, Direct Benefit Transfer, DigiLocker, Digi Yatra, and Sanchar Saathi**. These platforms demonstrate India's growing leadership in digital governance and public service delivery.

Ireland

- Ireland is an island nation located in Northwestern Europe, separated from the United Kingdom by the Irish Sea.

- The country's geography mainly consists of a central lowland limestone plain surrounded by coastal mountains, including ranges such as MacGillycuddy's Reeks.
- The **River Shannon** is the longest river in the country. Major lakes include **Lough Neagh** and **Lough Corrib.**
- The capital city of Ireland is **Dublin.**

BOARD OF PEACE

India participated as an observer in the recent inaugural meeting of US President Donald Trump's Board of Peace on Gaza, held in Washington DC and hosted at the Donald J Trump Institute of Peace.

About the Board

- Established in January 2026, in Davos, the Board stems from Trump's 20-point peace plan for Gaza, endorsed by UN Security Council Resolution 2803, which facilitated a ceasefire in the Israel-Hamas conflict.
- The Board aims to demilitarise Gaza, oversee reconstruction (estimated at $70 billion), and stabilise the region through aid, Hamas disarmament, and Israeli troop withdrawal.

INDIA–UK OFFSHORE WIND TASKFORCE

India and the United Kingdom launched the India–UK Offshore Wind Taskforce.

About

- The India–UK Offshore Wind Taskforce has been established under **Vision 2035** and the **fourth India–UK Energy Dialogue.**
  - Its purpose is to provide strategic leadership and coordination for developing India's offshore wind sector.
- The taskforce aims to strengthen cooperation between India and the United Kingdom in offshore wind energy development as part of their wider clean energy partnership under Vision 2035.
- Key areas of cooperation include ecosystem planning and market design, such as creating seabed leasing frameworks and mechanisms that ensure revenue certainty for investors. These measures are intended to support the growth of a strong offshore wind industry in India.

Importance

- Offshore wind energy can generate reliable and large-scale renewable power, particularly for coastal industrial regions and green hydrogen production hubs. This will help strengthen industrial competitiveness and energy security.
- The formation of the taskforce also reflects the **mutual trust and collaboration between India and the UK** in addressing the practical challenges of offshore wind development.
- The **United Kingdom** brings significant expertise in large-scale offshore wind deployment and well-developed supply chains. Meanwhile, India offers large market potential, long-term energy demand, and a rapidly expanding clean energy sector, making the partnership beneficial for both countries.

Additional Information

- India's installed non-fossil fuel capacity has crossed 272 GW, including over 141 GW of solar and 55 GW of wind capacity.
- During the current financial year, India has added more than 35 GW of solar and 4.61 GW of wind capacity.
- India is leading the Hydrogen Breakthrough Goal under the international Breakthrough Agenda and has achieved globally competitive benchmarks under the National Green Hydrogen Mission, with green hydrogen prices falling to a historic low of ₹279 per kg (approximately £2.65 per kg) and green ammonia prices reaching ₹49.75 per kg (approximately £0.47 per kg).

INTERNATIONAL ENERGY AGENCY (IEA)

The International Energy Agency (IEA) welcomed the progress being made on India's request for full membership of the organisation.

About

- The International Energy Agency (IEA) was established in 1974 following the global oil crisis, when major oil-exporting countries sharply reduced supplies, causing serious economic disruptions in industrialised nations.
- **Founding Members:** The founding members were Austria, Belgium, Canada, Denmark, Germany, Ireland, Italy, Japan, Luxembourg, the Netherlands, Norway, Spain, Sweden, Switzerland, Türkiye, the United Kingdom and the US.
- **Original Mandate:** The IEA was created to **ensure stable oil supplies and prevent disruptions** in global energy markets. It also introduced an emergency response mechanism requiring member countries to **maintain minimum strategic oil reserves** to handle future crises.
- **Membership:** IEA membership is open only to countries that belong to the **Organisation for Economic Co-operation and Development**. At present, the agency has **32 full members**, with **Colombia** becoming the most recent accession country (countries seeking membership).
- **Associate Members:** In 2015, the IEA expanded engagement by allowing non-OECD countries to join as associate members. These members participate in discussions and activities but do not have voting rights. ***India became an associate member in 2017***, and there are currently 13 associate members.

OECD

- The Organisation for Economic Co-operation and Development (OECD) is an intergovernmental organisation that promotes economic growth, policy coordination and global cooperation. Its motto is ***"Better Policies for Better Lives."***
- Established in **1961**, replacing the Organisation for European Economic Co-operation (OEEC).
- **Headquarters:** Paris
- **Membership:** 38 countries, mostly developed economies.
- India is **not a member.**

Changing Role of the IEA

Over time, the IEA's role has expanded beyond oil security:

- **Broader energy coverage:** Now includes gas, coal, nuclear power and renewable energy.
- **Climate and Energy Transition:** Focus on decarbonisation, clean energy technologies and net-zero pathways.
- **Critical Minerals:** A programme addresses supply chain risks for minerals required for renewable energy and electric vehicles.
- **Global Representation:** IEA members alone represented ~40% of global energy demand. **IEA + association countries** represent ~75–80% of **global energy demand.**

India's Quest for Full Membership

- India formally applied for full membership in 2023. Its main objective is to gain a decision-making role in the IEA, which plays an increasingly important role in shaping global energy policies, energy transition strategies and climate-related frameworks.

3 ECONOMY

REVISED CONSUMER PRICE INDEX

The Ministry of Statistics and Programme Implementation released a revised Consumer Price Index (CPI) series with base year 2024.

About

- CPI measures the average change in retail prices of a fixed basket of goods and services consumed by households.
- It is released monthly for rural, urban and combined sectors and serves as the primary indicator of retail inflation in India.
- CPI is computed using the Laspeyres Index method, which uses base-year prices, expenditure weights and current prices.

Key Changes in the Revised CPI Series

- **Base Year Update:** The base year shifted from 2012 to 2024 using data from the Household Consumption Expenditure Survey 2023–24, ensuring representation of current consumption behaviour.
- **Expanded Consumption Basket:** The number of items increased from 299 to 358, improving coverage of household expenditure patterns.
- **New Consumption Items Added:** Items reflecting modern lifestyles such as over-the-top streaming subscriptions, rural housing rent, value-added dairy products, pen drives, babysitting services and fitness equipment have been included.
- **Obsolete Items Removed:** Outdated goods such as video cassette recorders, digital video disc players and tape recorders have been excluded from the index.

Significance

- Provides more accurate measurement of consumer inflation aligned with evolving consumption patterns.
- Improves policy analysis, inflation targeting and economic planning through updated statistical standards.

FOREIGN PORTFOLIO INVESTMENT

Net selling by Foreign Portfolio Investors reached ₹35,962 crore in January 2026 in Indian equity markets. Foreign portfolio investors operate under regulations issued by the Securities and Exchange Board of India, while cross-border capital flows are monitored by the Reserve Bank of India.

Concept of Foreign Portfolio Investment

- Foreign Portfolio Investment refers to investment by non-resident investors in financial securities of another country without obtaining controlling ownership or management rights.
- It represents portfolio capital flows (cross-border investment in tradable securities providing financial returns without managerial control).

Major Financial Instruments Included in FPI

- **Equity Shares:** Market-traded ownership securities purchased by foreign investors that provide dividend income and capital appreciation without management control.
- **Government and Corporate Bonds:** Fixed-income debt securities purchased by foreign investors seeking predictable interest income and portfolio diversification.
- **Exchange Traded Funds:** Market-listed investment funds tracking indices or baskets of securities that foreign investors can easily trade.
- **Mutual Fund Units:** Collective investment instruments through which foreign investors hold diversified portfolios managed by professional fund managers.

Distinction between Foreign Portfolio Investment and Foreign Direct Investment

- **Foreign Portfolio Investment:** Passive financial investment without ownership control and characterised by high liquidity and short-term capital mobility.
- **Foreign Direct Investment:** Long-term investment involving significant ownership stake and managerial influence in foreign enterprises or productive assets.

Drivers of Foreign Portfolio Investor Outflows

- **Weak Corporate Earnings Momentum:** Slower profit growth among major listed companies reduced expected equity returns for global investors.
- **Depreciation of Indian Rupee:** Currency depreciation increases exchange-rate risk and reduces real returns when profits are repatriated.
- **Higher Global Interest Rates:** Rising yields in advanced economies attract global capital away from emerging markets such as India.
- **Global Risk Rebalancing:** International investors periodically rebalance portfolios to maintain risk-adjusted asset allocation across regions.

COKING COAL

Government notified coking coal as a Critical and Strategic Mineral under the Mines and Minerals (Development and Regulation) Act, 1957 based on recommendations of the High-Level Committee on Implementation of Viksit Bharat Goals.

Coking Coal

- Coking coal, also called metallurgical coal, is a specific grade of coal used for producing coke (carbon-rich porous fuel produced by heating coal without oxygen) required in blast furnace steelmaking.
- It acts as both fuel and reducing agent (substance that removes oxygen from iron ore during smelting). Suitable coking coal requires:
  - **High Carbon Content:** Ensures efficient combustion and effective reduction of iron ore during steel production.
  - **Low Sulphur and Phosphorus Content:** Prevents impurity contamination which can weaken mechanical strength of steel.
- **Strong Coking Properties:** Ability to soften, swell and re-solidify into strong porous coke during carbonisation.

Significance of Critical and Strategic Mineral Classification

- **Accelerated Mining Approvals:** Enables faster exploration and production of deep-seated deposits (mineral deposits located deep underground requiring advanced mining technologies).
- **Reduced Import Dependence:** Domestic production expansion can reduce metallurgical coal imports.
- **Steel Sector Supply Security:** Ensures stable raw material availability for expanding steel production capacity.
- **Alignment with National Steel Policy:** Supports India's target of 300 million tonnes crude steel capacity by 2030–31.

Resource Distribution in India

India possesses 37.37 billion tonnes of estimated coking coal resources. Major coalfield locations include:

- **Jharkhand:** Largest share of high-quality prime coking coal in the Jharia coalfield.
- **West Bengal:** Deposits mainly located in the Raniganj coalfield basin.
- **Chhattisgarh and Madhya Pradesh:** Contain medium-grade metallurgical coal deposits.
- **Import Dependence and Consumption Trends:**
  - Imports increased from 51.20 million tonnes in 2020–21 to 57.58 million tonnes in 2024–25.
  - Approximately 95 percent of the coking coal demand of the steel sector is currently met through imports, mainly from Australia.
  - This leads to significant foreign exchange expenditure and supply chain vulnerability.

Ministry of Coal / MMDR Act notification (2026).

COCONUT, COCOA, AND CASHEW

Union Budget 2026–2027 emphasises high-value plantation crops such as coconut, cocoa, cashew, and nut crops to boost farmer income and exports.

Coconut: Botanical and Agronomic Characteristics

Coconut is a perennial plantation crop (long-lived crop producing yield for several decades) belonging to the Arecaceae family (palm family consisting of monocotyledonous tropical plants).

- **Botanical Classification:** Coconut (Cocos nucifera) is a monocotyledonous palm (plant having one embryonic seed leaf and fibrous root system) widely adapted to tropical coastal ecosystems.
- **Geographical Origin:** The crop is believed to originate from the Indo-Pacific tropical region with strong genetic diversity across Southeast Asia and Pacific islands.
- **Climatic Requirement:** Optimal growth occurs between 25°C and 30°C temperature range with annual rainfall approximately 1,500–2,500 millimetres and high relative humidity.
- **Soil Requirement:** Coconut grows successfully in well-drained sandy loam, coastal alluvial soils, and lateritic soils with good aeration and moderate fertility.
- **Major Producing States:** Kerala, Tamil Nadu, Karnataka, Andhra Pradesh, Odisha, Goa, and West Bengal dominate coconut cultivation in India.
- **Economic Importance:** India is the largest coconut producer globally, supporting nearly 30 million livelihoods including about 10 million farming households.

Cocoa: Agronomic Features and Cultivation Pattern

Cocoa is an evergreen perennial tree crop belonging to the Malvaceae family, scientifically known as Theobroma cacao.

- **Geographical Origin:** Native to the Upper Amazon Basin of South America, later introduced globally through colonial trade networks.
- **Climatic Requirement:** Cocoa requires equatorial humid climate with temperatures between 21°C and 32°C and rainfall above 1,500 millimetres distributed throughout the year.
- **Soil Requirement:** Best suited to deep, fertile, well-drained loamy soils rich in organic matter and humus content.
- **Cultivation System in India**: Commonly grown as intercropping system under coconut and arecanut plantations, especially in Kerala, Karnataka, Tamil Nadu, and Andhra Pradesh.

Cashew: Botanical and Agricultural Characteristics

Cashew is an evergreen tropical plantation tree crop belonging to the Anacardiaceae family.

- **Scientific Identity:** Anacardium occidentale, originally native to coastal northeastern Brazil in South America.
- **Introduction to India:** Introduced during the 16th century by Portuguese traders for coastal soil conservation and later commercial cultivation.
- **Climatic Requirement:** Performs best at 20°C–35°C temperature range with moderate rainfall and a distinct dry season during flowering and fruiting stage.

- **Soil Adaptability:** Thrives in lateritic soils, red sandy soils, and coastal sandy soils and can tolerate degraded or marginal land conditions.
- **Major Producing States:** Maharashtra, Andhra Pradesh, Odisha, Kerala, Karnataka, Goa, and Tamil Nadu.

Policy and Economic Significance

- **High-Value Agriculture Promotion:** Plantation crops such as coconut, cocoa, and cashew provide significantly higher per-hectare income than staple cereals.
- **Export Competitiveness Enhancement:** Cashew kernels, coconut products, and cocoa derivatives contribute substantially to agricultural export earnings.
- **Crop Diversification Strategy:** Encourages farmers to shift from low-value crops toward horticulture and plantation crops with better market demand.
- **Rural Employment Generation:** Plantation crop sectors create substantial employment across coastal and tropical regions of India.

ORANGE ECONOMY

Union Budget 2026–2027 promotes creative industries as a services-sector growth engine through institutional support, talent development, and digital creative infrastructure.

Concept and Definition of Orange Economy

- The Orange Economy, also called Creative Economy (economic system where value is generated from creativity, culture, knowledge, and intellectual property rather than physical commodities), refers to industries producing goods and services whose value originates primarily from ideas, artistic expression, cultural heritage, and digital creativity.
- The concept was articulated by Iván Duque Márquez and Felipe Buitrago in the book The Orange Economy: An Infinite Opportunity. The colour orange symbolises culture, creativity, and identity in multiple civilizations.

Structural Components of the Orange Economy

- **Creative Industries:** Includes sectors such as film production, music, publishing, fashion design, architecture, performing arts, and digital media platforms.
- **Digital Creative Industries:** Encompasses Animation, Visual Effects, Gaming and Comics industries (digital content production sectors using advanced creative technologies).
- **Intellectual Property Economy:** Value creation occurs through copyrights, trademarks, patents, and design rights protecting original creative works.

Key Global Economic Indicators

- Creative industries generate more than 2 trillion United States dollars annually worldwide and support approximately 50 million jobs globally.
- These industries represent one of the fastest growing service sectors in the global knowledge economy.

Policy Measures Announced in Union Budget 2026–27

- **Creative Technology Education Infrastructure:** Establishment of Animation, Visual Effects, Gaming and Comics laboratories in 15,000 secondary schools and 500 colleges across India.
- **Institutional Development:** Implementation led by the Indian Institute of Creative Technologies, located in Mumbai and conceptualised as a specialised national creative technology institution.
- **Dedicated Financial Allocation:** Government allocated 250 crore for skill development and training in Animation, Visual Effects, Gaming and Comics industries.
- **Design Ecosystem Expansion:** Creation of a new National Institute of Design in eastern India through a competitive institutional selection mechanism.

Economic Importance for India

- According to the Economic Survey 2025–2026, India's media and entertainment industry reached approximately 2.5 trillion in 2024.
- Creative industries employ roughly 8 percent of India's working population, generating large employment opportunities for youth and women.
- Creative exports increased by about 20 percent during 2023–2024, generating more than 11 billion United States dollars in export earnings.
- Expansion of creative industries enhances India's global cultural influence through films, digital media, design products, and gaming content.

GRAIN AUTOMATED TELLER MACHINES

Bihar government approved installation of grain automated teller machines in Patna to modernise ration distribution under the Public Distribution System.

Concept and Definition

- Grain Automated Teller Machines, commonly called Annapurti machines (automated digital machines dispensing subsidised food grains to eligible beneficiaries), are electronic dispensing systems designed to distribute wheat and rice under the National Food Security framework.
- The technology was developed with support from the World Food Programme in collaboration with the Food Corporation of India.

Technical Architecture and Operational Mechanism

- **Automated Dispensing Technology:** Machine electronically releases predetermined quantity of wheat or rice after digital verification of beneficiary identity using ration card database.

- **Integration with Central Beneficiary Database:** Requires internet connectivity to access the digital database of Below Poverty Line households (families eligible for subsidised food under national food security programs).
- **Rapid Distribution Efficiency:** Each machine can dispense approximately 50 kilograms of grain within five minutes, significantly reducing distribution time compared with manual weighing processes.
- **Continuous Operational Capability:** System can operate 24 hours per day and seven days per week, enabling flexible access beyond traditional ration shop timings.
- **Renewable Energy Compatibility:** Machines can function using solar power systems, making them suitable for rural regions with unreliable electricity supply.

Governance and Administrative Advantages

- **Reduction of Distribution Delays:** Automation reduces beneficiary waiting time by approximately 70 percent compared with conventional ration shop procedures.
- **Transparency and Accountability Enhancement:** Digital authentication and automated measurement reduce risks of diversion of subsidised grains, under-weighing, and corruption.
- **Administrative Efficiency Improvement:** Eliminates manual processes such as weighing grains, maintaining physical registers, and repeated identity verification.
- **Strengthening Food Security Delivery:** Improves efficiency of national food distribution programs benefiting millions of economically vulnerable households.

BOND YIELD

After Union Budget 2026–2027 announced record government borrowing, yields on ten-year Government of India securities increased to one-year high.

Bond

- A bond (tradable fixed-income debt instrument issued by a government or corporation to borrow funds from investors) represents a contractual obligation where the issuer promises periodic coupon payments (fixed interest payments made at regular intervals) and repayment of principal amount (face value returned on maturity date).
- In India, sovereign bonds known as Government Securities are issued by the Government of India and managed operationally through the Reserve Bank of India.

Essential Components of a Bond

- **Face Value or Par Value:** Original principal amount borrowed by the issuer, usually ₹100 or multiples in Government Securities market.
- **Coupon Rate:** Fixed interest percentage paid annually or semi-annually on the bond's face value to investors.
- **Maturity Period:** Predetermined time duration after which the issuer repays the principal amount to the bondholder.
- **Market Price:** Current trading price of the bond in the secondary market determined by demand and supply conditions.

Bond Yield: Meaning and Measurement

- Bond yield (effective annual return earned by an investor from holding a bond) depends on coupon payments, market price fluctuations, and remaining maturity period.
- Bond yields and bond prices exhibit inverse relationship (when bond prices fall yields increase, and when prices rise yields decline).

Types of Bond Yield Indicators

- **Current Yield:** Ratio of annual coupon payment to the bond's current market price.
- **Yield to Maturity:** Comprehensive return calculation assuming the investor holds the bond until maturity and receives all coupon payments.

Reasons for Rising Bond Yields After Budget 2026

- **Record Government Borrowing Program:** Higher gross borrowing increases supply of Government Securities in financial markets.
- **Inflation Expectations:** Investors demand higher yields to compensate for anticipated erosion of purchasing power.
- **Monetary Policy Expectations:** Financial markets anticipate possible interest rate tightening by the Reserve Bank of India.

Economic Implications of Rising Bond Yields

- **Decline in Market Value of Existing Bonds:** Previously issued bonds with lower coupon rates become less attractive in secondary markets.
- **Higher Borrowing Costs for Government and Corporations:** New debt issuances must offer higher interest rates to attract investors.
- **Crowding Out Effect:** Large government borrowing may reduce credit availability for private sector investment.
- **Macroeconomic Signalling Role:** Bond yields reflect expectations about inflation trends, fiscal deficits, and future interest rate movements.

GOBARdhan SCHEME

The Galvanizing Organic Bio-Agro Resources Dhan (GOBARdhan) Scheme is strengthening rural income, bio-energy production, and organic waste management across Indian villages.

Concept and Institutional Background

- The GOBARdhan Scheme is a national waste-to-wealth rural development initiative converting biodegradable agricultural and cattle waste into energy and organic manure.

- The programme was launched in April 2018 under the Swachh Bharat Mission Gramin. It promotes scientific treatment of cattle dung and biodegradable organic waste (agricultural residue, animal waste, and food waste decomposed by microorganisms) to produce biogas, compressed biogas, and organic fertilisers.

Core Operational Mechanism

- **Biogas Generation Plants:** Rural bio-digesters process cattle dung through anaerobic digestion (biological decomposition of organic matter in oxygen-free conditions) to produce methane-rich biogas used as renewable energy.
- **Compressed Biogas Production:** Purified biogas is converted into compressed biogas (renewable gaseous fuel similar to compressed natural gas) which can be used for transport and industrial energy needs.
- **Organic Manure Production:** Digestate residue from biogas plants becomes bio-slurry (nutrient-rich organic fertiliser improving soil organic carbon and nutrient content).
- **Digital Market Linkage:** Organic fertiliser and compressed biogas can be integrated into national fertiliser and biofuel supply chains.

Institutional Integration

- Implementation is coordinated by the Department of Drinking Water and Sanitation under the Ministry of Jal Shakti.
- The scheme supports the Sustainable Alternative Towards Affordable Transportation programme for compressed biogas production.
- Bio-energy infrastructure complements national renewable energy targets monitored by the Ministry of New and Renewable Energy.

Economic and Environmental Significance

- **Rural Income Generation:** Farmers receive income by supplying cattle dung and agricultural waste to community biogas plants.
- **Circular Bioeconomy Development:** Organic waste is converted into energy and fertiliser, reducing environmental pollution and improving resource efficiency.
- **Soil Health Improvement:** Bio-slurry application increases soil organic carbon and reduces dependence on chemical fertilisers.
- **Climate Change Mitigation:** Proper treatment of cattle dung reduces methane emissions that would otherwise occur through open decomposition.

SUBORBITAL TOURISM

Blue Origin suspended the New Shepard suborbital tourism programme temporarily to prioritise development of the Artemis lunar lander mission.

Concept and Definition

- Suborbital tourism refers to commercial human spaceflight missions where spacecraft briefly cross outer space but do not complete a full orbital revolution around Earth. These flights cross the Kármán Line, which is widely recognised as the beginning of space.
- However, the spacecraft does not achieve the orbital velocity (minimum horizontal speed required for an object to remain continuously in orbit around Earth).

Kármán Line

- **Kármán Line:** Internationally accepted boundary between Earth's atmosphere and outer space at 100 kilometres above mean sea level.
- Proposed by aerospace scientist Theodore von Kármán.
- At this altitude, air density becomes too low for aircraft to generate aerodynamic lift, so vehicles must travel at orbital velocity (~7.8 kilometres per second) to remain in orbit.

Orbital Versus Suborbital Flight Dynamics

- **Suborbital Flight Trajectory:** Vehicle follows a parabolic trajectory (curved ballistic path where spacecraft ascends vertically, reaches peak altitude, then descends back to Earth).
- **Orbital Velocity Requirement:** Maintaining orbit requires horizontal speed of approximately 7.8 kilometres per second in low Earth orbit, which suborbital vehicles do not reach.
- **Flight Duration:** Typical suborbital missions last 10 to 15 minutes from launch to landing, significantly shorter than orbital missions lasting hours or days.
- **Microgravity Experience:** During the ballistic coasting phase passengers experience microgravity conditions (temporary weightlessness resulting from continuous free fall) lasting approximately 3 to 5 minutes.

Commercial Suborbital Tourism Systems

- **New Shepard Launch System:** Reusable suborbital rocket developed by Blue Origin designed for commercial space tourism flights.
- **SpaceShipTwo Spaceplane:** Suborbital passenger vehicle developed by Virgin Galactic using air-launch technology.
- **Reusable Rocket Technology:** Both systems demonstrate vertical landing reusable rockets (launch vehicles capable of returning safely to Earth for repeated use).

Economic and Technological Significance

- **Emerging Commercial Space Economy:** Suborbital tourism forms a key segment of the private space industry generating revenue from civilian space travel experiences.
- **Lower Technological Complexity Compared with Orbital Missions:** Lower propulsion requirements and shorter flight duration reduce operational costs.

- **Testing Platform for Space Technologies:** Suborbital flights allow testing of reusable rockets, life-support systems, and advanced spaceflight instrumentation.

AGRICULTURE INFRASTRUCTURE FUND

Agriculture Infrastructure Fund has sanctioned ₹80,224.15 crore loans for more than 1.5 lakh projects, mobilising investments worth ₹1.27 lakh crore since 2020.

Concept and Institutional Framework

- The Agriculture Infrastructure Fund is a central sector financing facility providing medium-term and long-term debt financing for agricultural infrastructure development.
- The scheme was launched in 2020 by the Government of India to strengthen post-harvest management infrastructure (facilities used for storage, processing, grading, and transportation of agricultural produce after harvesting) and improve agricultural supply chains.
  - The scheme is implemented by the Ministry of Agriculture and Farmers Welfare.

Core Objectives of the Scheme

- **Development of Post-Harvest Infrastructure:** Establishment of warehouses, cold storage units, grading centres, sorting facilities, and primary processing units near farm-gate locations.
- **Reduction of Post-Harvest Losses:** Modern storage infrastructure reduces quantitative and qualitative losses in perishable agricultural commodities.
- **Improvement of Agricultural Supply Chains:** Infrastructure investments enable efficient transportation, aggregation, and distribution of agricultural produce from farm to markets.
- **Promotion of Value Addition in Agriculture:** Processing units convert raw produce into higher-value products such as processed foods and packaged commodities.

Financing Structure and Credit Support

- **Interest Subvention Mechanism:** Government provides three percent annual interest subsidy on loans provided by banks and financial institutions to eligible borrowers.
- **Loan Tenure and Moratorium Period:** Loans are available for maximum period of seven years with moratorium period up to two years on repayment.
- **Credit Guarantee Protection:** Loans up to ₹2 crore are guaranteed under the Credit Guarantee Fund Trust for Micro and Small Enterprises, reducing lending risk for financial institutions.

Eligible Beneficiaries

- Eligible beneficiaries include farmers, farmer producer organisations, agricultural cooperatives, self-help groups, start-up enterprises, agri-entrepreneurs, and central or state government agencies involved in agricultural infrastructure development.

Convergence with Renewable Energy Programme

- The Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan were included as eligible infrastructure assets in September 2020, enabling financing for solarisation of grid-connected agricultural pumps and standalone solar irrigation systems.

Economic and Structural Significance

- **Strengthening Farm-Gate Infrastructure:** Improves price realisation for farmers by enabling storage and aggregation before market sale.
- **Boosting Rural Agro-Processing Industries:** Encourages establishment of small-scale processing units generating rural employment opportunities.
- **Reducing Supply Chain Inefficiencies:** Efficient logistics reduce transportation costs and price volatility in agricultural markets.

VEGETABLE OILS PRODUCTS

Government introduced stricter monitoring of edible oil supply chain through the Vegetable Oils Products Order, 2025 under the Essential Commodities Act, 1955.

Concept and Legal Basis

- The Vegetable Oils Products (Regulation of Production and Availability) Order, 2025 is a regulatory instrument issued under the Essential Commodities Act to strengthen monitoring of the edible oil sector.
- The order regulates activities of manufacturers, processors, blenders, and repackers of vegetable oils (entities involved in refining, mixing, packaging, and distributing edible oils). Its primary objective is to ensure transparent supply chains, prevent hoarding, stabilise prices, and protect consumer food security.

Institutional and Digital Monitoring Mechanism

- **Mandatory Digital Registration Requirement:** All edible oil manufacturers, processors, blenders, and repackers must register on the National Single Window System (central digital platform for regulatory approvals and business registration) and the Vegetable Oils Products Production and Availability portal (government monitoring platform tracking edible oil production and stock levels).
- **Monthly Data Submission Requirement:** Registered entities must provide detailed monthly returns covering production quantity, stock levels, imports, sales distribution, and consumption patterns.
- **Coverage of Edible Oil Products:** Reporting includes refined edible oils, vanaspati (hydrogenated vegetable oil used as cooking fat), and blended vegetable oils.

Economic Context of India's Edible Oil Sector

- India remains one of the largest global consumers of edible oils due to population size and dietary patterns. Approximately 60 percent of domestic edible oil consumption is met through imports, indicating significant external dependence.
- Major imported edible oils include palm oil from Indonesia and Malaysia, soybean oil from Argentina and Brazil, and sunflower oil from Ukraine and Russia.

Policy Significance

- **Market Transparency Enhancement:** Digital monitoring improves real-time visibility of supply chain information across production, stock levels, and distribution networks.
- **Prevention of Hoarding and Speculative Storage:** Mandatory reporting discourages artificial shortages created through excessive stock accumulation.
- **Price Stability for Essential Food Commodities:** Regulatory oversight helps moderate price volatility in cooking oils, which constitute a major share of household food expenditure.
- **Strengthening National Food Security:** Improved monitoring aligns with broader fiscal and food security objectives outlined in Union Budget 2026–2027.

DEBT–TO–GDP RATIO

Union Budget 2026–2027 shifts fiscal strategy towards debt sustainability, targeting a public debt–to–Gross Domestic Product ratio of 50 percent ±1 percent by 2030–2031.

Concept and Definition

- The Debt–to–Gross Domestic Product ratio (macroeconomic indicator measuring total public debt relative to the size of the national economy) expresses total outstanding government liabilities as a percentage of Gross Domestic Product.
- It measures the ability of a country to service its debt using income generated by the economy. Public debt generally includes internal debt (borrowings from domestic financial markets) and external debt (borrowings from foreign lenders and multilateral institutions).

Components of Public Debt in India

- **Internal Debt of Central Government:** Includes market borrowings such as Government Securities, treasury bills, and other domestic liabilities issued through the Reserve Bank of India.
- **External Debt Obligations:** Borrowings from multilateral development institutions and foreign governments used for infrastructure and development projects.
- **Other Liabilities:** Includes small savings schemes, provident funds, and special securities issued to public sector institutions.

Fiscal Policy Target

- The Government of India has set a medium-term fiscal anchor targeting a debt–to–Gross Domestic Product ratio of about 50 percent by financial year 2030–2031, with flexibility band of ±1 percent.
- This replaces excessive focus on annual fiscal deficit numbers and emphasises long-term fiscal sustainability.

Reasons for the Policy Shift

- **Post-Pandemic Fiscal Expansion:** Government borrowing increased significantly after pandemic-related welfare spending and economic stimulus measures.
- **Need for Long-Term Fiscal Discipline:** Debt targets provide a stable framework for gradual reduction of public debt burden.
- **Alignment with Global Fiscal Practices:** Many economies adopt debt anchors (long-term public debt targets guiding fiscal policy) rather than relying solely on short-term deficit limits.

Economic Significance

- **Indicator of Fiscal Sustainability:** Lower ratio indicates stronger ability of government to service debt obligations without excessive borrowing.
- **Investor Confidence and Sovereign Creditworthiness:** Stable debt ratios improve perception of macroeconomic stability among global investors.
- **Policy Flexibility During Economic Shocks:** Lower public debt allows government to undertake countercyclical spending during economic crises.

RENEWABLE ENERGY

A study titled Scenarios Towards Viksit Bharat and Net Zero by NITI Aayog projects renewable-dominated electricity generation by 2070.

Present Electricity Structure of India

- India's electricity sector currently relies heavily on coal despite rapid expansion of renewable capacity.
- **Installed Electricity Capacity Composition:** India's total installed electricity capacity is approximately 513 gigawatts, consisting of about 48 percent fossil fuel-based generation, 50 percent renewable energy capacity, and nearly 1.7 percent nuclear energy capacity.
- **Coal Dominance in Power Generation:** Coal-based thermal plants still generate approximately 74 percent of India's total electricity supply, providing dependable base-load power.
- **Global Renewable Energy Position:** According to International Renewable Energy Agency Renewable Energy Statistics 2025, India ranks third in solar installed capacity, fourth in wind capacity, and fourth in total renewable energy capacity globally.
- **Gap between Installed Capacity and Generation:** Renewable electricity generation increased from 19.6 percent in 2013–2014 to around 22 percent in 2024–2025, reflecting utilisation challenges.

Long-Term Energy Transition Projection

- **Renewable Electricity Share Expansion:** Renewable energy could increase from about 20 percent of electricity generation in 2024–2025 to more than 80 percent by 2070.
- **Declining Role of Coal:** Coal-based electricity generation is projected to decline sharply to around 6–10 percent of total electricity generation by 2070.

Structural Constraints Affecting Renewable Energy Expansion

- **Low Capacity Utilisation Factor:** Solar power plants operate at roughly 20 percent utilisation, wind energy plants around 25–30 percent, while coal plants operate around 60 percent utilisation and nuclear plants around 80 percent.
- **Dependence on Thermal Base Load Power:** Coal plants continue to supply round-the-clock electricity demand, particularly during night hours when solar generation stops.
- **Grid Storage Infrastructure Gap:** Limited availability of grid-scale battery storage systems (large energy storage facilities storing electricity for later use) restricts renewable energy utilisation.
- **Transmission Infrastructure Limitations:** Renewable energy generation sites often remain geographically distant from demand centres, creating evacuation bottlenecks.
- **Tariff Structure Constraints:** Absence of widespread time-of-day electricity pricing (tariff mechanism where electricity prices vary according to demand during different hours) reduces incentives to shift electricity consumption to solar peak hours.

Government Initiatives

- **Green Energy Corridor Programme:** Strengthens interstate transmission networks to evacuate renewable electricity efficiently.
- **Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan:** Promotes solar-powered irrigation pumps and decentralised renewable energy in rural areas.
- **National Green Hydrogen Mission:** Supports hydrogen production from renewable electricity for industrial decarbonisation.
- **Production Linked Incentive Scheme for Solar Manufacturing:** Encourages domestic manufacturing of high-efficiency photovoltaic modules and battery storage technologies.

LEAD BANK SCHEME

The Reserve Bank of India proposed revised operational guidelines to strengthen coordination, accountability, and credit planning under the Lead Bank Scheme.

Historical Origin and Policy Background

- The Lead Bank Scheme (district-level banking coordination mechanism designed to expand institutional credit access and financial inclusion) was introduced in December 1969 following recommendations of the Gadgil Study Group.
- The committee observed that commercial banks had limited rural outreach and inadequate orientation toward agricultural credit needs.
- It recommended an Area Approach (district-based banking responsibility system where a specific bank takes primary responsibility for credit planning and financial development).
- The proposal was subsequently endorsed by the Nariman Committee, which suggested assigning one public sector bank as Lead Bank in each district to coordinate financial institutions and development agencies.

Objectives of the Lead Bank Scheme

- **Expansion of Institutional Credit Availability:** Ensure formal banking services reach rural households, agricultural producers, micro enterprises, and weaker sections of society.
- **Priority Sector Lending Promotion:** Increase credit flow to agriculture, micro enterprises, education, housing, and other priority sectors identified by banking regulators.
- **District-Level Development Planning:** Facilitate coordination between banks, district administration, and government development programmes.
- **Financial Inclusion Enhancement:** Expand banking access through branch expansion, digital banking services, and targeted credit initiatives.

Institutional Structure of the Scheme

The Lead Bank Scheme functions through a three-tier institutional coordination framework:

- **Block Level Bankers Committee:** Platform where branch managers review credit flow, discuss operational issues, and coordinate development programmes at block level.
- **District Consultative Committee and District Level Review Committee:** Forums chaired by district administration to evaluate credit plans, financial inclusion progress, and implementation of government schemes.
- **State Level Bankers Committee or Union Territory Level Bankers Committee:** State-level forum coordinating banking policy implementation, chaired by the Chief Secretary and convened by designated banks.

Key Features of Revised Guidelines

- **Strengthening Lead District Manager Offices:** Enhanced staffing, analytical capacity, and digital monitoring systems for district-level banking coordination.
- **Clear Role Definition for Lead Banks:** Each district continues to have a designated commercial bank responsible for coordinating credit institutions and development agencies.
- **Improved Monitoring of Credit–Deposit Ratio:** Banks are required to aim for approximately 60 percent credit–deposit ratio (ratio of loans extended relative to deposits mobilised) in rural and semi-urban branches nationwide.

CHINCHA INDIANS AND SEABIRD GUANO-BASED AGRICULTURE

Recent archaeological research shows Chincha Indians used seabird guano fertiliser to enhance maize productivity in coastal Peru.

Chincha Civilization: Historical and Geographical Background

- The Chincha civilization was a prominent pre-Inca coastal civilisation located in the Chincha Valley along the southern coast of present-day Peru.
- Archaeological evidence suggests that the civilisation flourished approximately between 1000 Common Era and 1400 Common Era before being incorporated into the Inca Empire.
- At its demographic peak, the Chincha population is estimated to have reached nearly 100,000 inhabitants, indicating a highly organised society supported by agricultural surplus, irrigation systems, and maritime trade networks.

Environmental Conditions of Chincha Agriculture

- The Chincha Valley lies within a hyper-arid coastal desert ecosystem influenced by the cold Humboldt Ocean Current. Annual rainfall in this region is extremely limited, resulting in nutrient-poor soils with low organic matter content. Sustainable agriculture therefore required external nutrient supplementation and efficient irrigation practices.

Seabird Guano as a Natural Fertiliser

- Seabird guano refers to accumulated excrement, eggshell fragments, and decomposed carcasses of seabirds forming nutrient-rich organic deposits on coastal islands.
  - The fertiliser is exceptionally rich in plant nutrients because seabirds feed on marine fish and seafood.
- **Nitrogen Content:** Guano contains high concentrations of nitrogen compounds such as ammonium and nitrate essential for plant growth and chlorophyll formation.
- **Additional Macronutrients:** Guano also contains phosphorus and potassium, creating a natural equivalent of modern nitrogen–phosphorus–potassium fertiliser formulations.
- **Marine Nutrient Transfer:** Seabirds act as ecological vectors transferring nutrients from marine ecosystems to terrestrial agricultural fields.

Agricultural Application by the Chincha

- **Guano Extraction System:** Chincha farmers harvested guano deposits from the Chincha Islands located off the Peruvian coast.
- **Transport and Distribution:** The fertiliser was transported by boats to mainland agricultural fields and applied to maize cultivation areas.
- **Soil Fertility Restoration:** Application of guano replenished nitrogen-deficient desert soils, enabling sustained agricultural productivity despite harsh climatic conditions.

Economic and Political Significance

- **Agricultural Productivity Expansion:** Increased maize yields supported population growth and food security within the Chincha Kingdom.
- **Formation of Agricultural Surplus Economy:** Surplus agricultural production enabled development of extensive maritime trade networks along the Pacific coast.
- **Pre-Inca Agricultural Innovation:** Demonstrates early large-scale use of organic fertilisers in ancient agriculture.

FIRST ROAD–CUM–RAIL TUNNEL

Union Cabinet approved India's first underwater twin tube road–rail tunnel beneath the Brahmaputra River connecting Gohpur and Numaligarh.

Project Overview and Infrastructure Characteristics

- The project represents a strategic multimodal transport infrastructure corridor designed to improve connectivity across the Brahmaputra River in Assam.
- The estimated project cost is approximately ₹18,662 crore and the total length of the corridor will be about 34 kilometres.
- **Greenfield Connectivity Corridor:** The project is a Greenfield infrastructure project (transport corridor constructed on a completely new alignment rather than upgrading an existing route) ensuring high design efficiency.
- **Twin Tube Tunnel Engineering Design:** The tunnel system will consist of two parallel tubes allowing simultaneous movement of road traffic and railway transportation with separate safety systems.
- **Four-Lane Access Controlled Highway Component:** The road section will be designed as four-lane access-controlled highway (high-speed road where entry and exit points are regulated) enabling uninterrupted vehicle movement.
- **Distance Reduction Impact:** The infrastructure will reduce the travel distance between Gohpur on National Highway fifteen and Numaligarh on National Highway seven hundred fifteen from about two hundred forty kilometres to about thirty four kilometres.
- **Travel Time Reduction:** Estimated travel time will decrease from approximately six hours to about twenty minutes, significantly improving mobility across the river.

Strategic and Economic Importance

- **Regional Connectivity Enhancement:** The project will strengthen connectivity across Assam, Arunachal Pradesh, Nagaland and other northeastern states, improving integration of remote regions.

- **Logistics Cost Reduction:** Faster freight transport will reduce supply chain costs for agricultural commodities, industrial goods and defence logistics.
- **Economic Corridor Development:** Improved transport infrastructure will support trade expansion, tourism growth and industrial development across northeastern India.
- **Strategic Security Consideration:** Enhanced connectivity in the border region improves mobility for national security operations and disaster management.

Brahmaputra River: Geographical Characteristics

- The Brahmaputra River is one of **Asia's largest** river systems.
- **Source Location:** Originates from the Chemayungdung Glacier near Lake Manasarovar on the Tibetan Plateau.
- **Upper Course Name:** Known as Yarlung Tsangpo in Tibet, representing the longest upstream stretch of the river.
- **Indian Course Name:** Called Siang or Dihang in Arunachal Pradesh before becoming Brahmaputra in Assam.
- **Bangladesh Course Name:** Known as the Jamuna River before merging with the Ganges and Meghna river system.
- **Final Drainage Basin:** The combined river system eventually drains into the Bay of Bengal through the Ganges–Brahmaputra–Meghna delta, the world's largest deltaic system.

STARTUP INDIA FUND OF FUNDS 2.0

Union Cabinet approved Startup India Fund of Funds 2.0 with corpus ₹10,000 crore to expand venture capital availability in India.

Venture Capital: Concept and Economic Role

- Venture capital (long-term risk capital invested in early-stage companies with innovative technology or business models) is financing provided by specialised investors expecting high future returns.
- Venture capital funding is typically directed toward high-growth sectors such as artificial intelligence, biotechnology, financial technology, robotics, space technology and clean energy technologies.
- **Equity-Based Financing Structure:** Venture capital investors generally obtain equity ownership stakes in startup companies rather than fixed interest payments.
- **High-Risk High-Return Investment Model:** Early-stage companies may fail frequently, but successful startups generate significant capital appreciation.
- **Multiple Financing Instruments:** Venture capital funding may occur through equity shares, convertible debentures, or conditional loans convertible into equity.
- **Catalyst for Innovation and Startup Ecosystems:** Venture capital enables startups to scale technology, create jobs and commercialise innovation, strengthening entrepreneurial ecosystems and economic competitiveness.

Institutional Framework of Startup India Fund of Funds 2.0

The Startup India Fund of Funds 2.0 is a government-backed investment initiative launched under the Startup India Initiative. It aims to strengthen domestic venture capital investment in the Indian startup ecosystem.

- **Corpus Size:** Government has allocated ₹10,000 crore capital corpus for the second phase of the programme.
- It is managed by the Small Industries Development Bank of India (SIDBI)
- **Indirect Investment Mechanism:** Instead of directly investing in startups, the fund invests in Alternative Investment Funds (pooled investment vehicles regulated for high-risk investments in startups and emerging enterprises).
- **Catalytic Funding Strategy:** Government investment encourages additional private venture capital participation in the startup ecosystem.

Performance of Fund of Funds for Startups Phase One

The first phase of the programme launched in 2016 significantly strengthened startup financing.

- **Total Government Commitment:** Entire ₹10,000 crore corpus allocated to 145 Alternative Investment Funds.
- **Startup Investments Mobilised:** These funds collectively invested more than ₹25,500 crore in over 1,370 startups across multiple technology sectors.
- **Sectoral Coverage:** Investments supported industries including artificial intelligence, robotics, financial technology, biotechnology, healthcare, manufacturing, clean technology, and space technology.

Objectives of Fund of Funds 2.0

- **Geographical Expansion of Startup Financing:** Encourage venture capital investment in emerging startup ecosystems beyond major metropolitan cities.
- **Promotion of Innovation-Led Economic Growth:** Support startups developing globally competitive technologies, digital platforms, and manufacturing solutions.
- **Mobilisation of Domestic Investment Capital:** Reduce dependence on foreign venture capital funding sources.
- **Contribution to National Development Vision:** Align with the government's economic vision of Viksit Bharat 2047 through innovation-driven entrepreneurship and employment creation.

Growth of India's Startup Ecosystem

- India's startup ecosystem has expanded rapidly.
- Number of startups recognised by the Department for Promotion of Industry and Internal Trade increased from fewer than 500 in 2016 to more than 200,000 recognised startups by 2025.
- The year 2025 recorded the highest annual startup registrations in India's history.

MUNICIPAL BONDS

The Ministry of Housing and Urban Affairs conducted consultations to deepen India's municipal bond market for urban infrastructure financing.

Concept and Definition

- Municipal bonds are marketable debt securities issued by Urban Local Bodies (local self-governments such as municipal corporations and municipalities) to raise capital from investors.
- These instruments allow cities to finance urban infrastructure projects such as water supply systems, sewerage networks, public transport corridors, storm-water drainage systems, solid waste management plants, and urban roads.

Historical Evolution in India

- **First Municipal Bond Issuance:** The first municipal bond in India was issued in 1997 by Bengaluru Municipal Corporation, marking the introduction of market-based urban infrastructure financing.
- **Subsequent Issuances by Indian Cities:** Cities including Pune, Ahmedabad, Hyderabad, Indore, and Lucknow later issued municipal bonds to fund urban infrastructure development projects.
- **Policy Support through Urban Development Missions:** Municipal bond financing gained momentum with urban reforms introduced under Atal Mission for Rejuvenation and Urban Transformation which incentivised creditworthy cities to access capital markets.

Regulatory Framework

- Municipal bonds are regulated by the Securities and Exchange Board of India through the Issue and Listing of Municipal Debt Securities Regulations, 2015.
- **Credit Rating Requirement:** Urban Local Bodies must obtain investment-grade credit ratings from recognised rating agencies before issuing bonds.
- **Disclosure and Transparency Norms:** Municipal issuers must maintain audited financial statements and periodic disclosures to investors.
- **Stock Exchange Listing Requirement:** Bonds must be listed on recognised stock exchanges to ensure transparency and investor protection.

Types of Municipal Bonds

- **General Obligation Bonds:** Debt instruments backed by the overall revenue sources of the municipality such as property taxes and municipal service fees.
- **Revenue Bonds:** Bonds serviced through revenue generated by specific infrastructure projects such as water supply systems or urban transport networks.

Economic Significance

- **Urban Infrastructure Financing Mechanism:** Municipal bonds provide long-term capital for cities facing rapidly expanding infrastructure demand.
- **Fiscal Decentralisation Enhancement:** Urban Local Bodies can mobilise resources independently rather than relying entirely on central or state government transfers.
- **Capital Market Development:** Municipal bonds diversify India's domestic bond market and provide new investment avenues for institutional investors.

INTERNATIONAL EMERGENCY ECONOMIC POWERS ACT, 1977

The Supreme Court of the United States ruled that the International Emergency Economic Powers Act cannot be used for broad tariffs.

Legal Origin and Legislative Purpose

- The International Emergency Economic Powers Act, 1977 is a United States federal statute enacted to provide the President with authority to regulate international economic transactions during national emergencies.
- The law was enacted after termination of the earlier Trading with the Enemy Act emergency powers framework to ensure greater congressional oversight of presidential economic powers.
- The Act allows the President to act when *"unusual and extraordinary threats originating outside the United States threaten national security, foreign policy, or the national economy."*

Conditions for Invocation

- **National Emergency Declaration Requirement:** Presidential powers under the law can be exercised only after a formal national emergency declaration under the National Emergencies Act.
- **Foreign-Origin Threat Requirement:** The threat must originate substantially outside the United States.
- **Congressional Notification Requirement:** The executive branch must inform the United States Congress about actions taken under the Act.

Major Economic Powers Granted by the Act

- **Regulation of International Financial Transactions:** The President may restrict cross-border banking transactions, foreign exchange transfers, and international payments.
- **Freezing of Foreign Assets:** Government authorities can block property and assets belonging to foreign states, companies, or individuals located within United States jurisdiction.
- **Prohibition of Economic Dealings:** Trade, investment, or financial interactions with designated countries, companies, or individuals can be prohibited.
- **Sanctions Implementation Mechanism:** The law serves as the legal basis for many United States economic sanctions programmes targeting foreign governments or organisations.

Judicial Interpretation in the Recent Case

The Supreme Court of the United States clarified that the Act does not authorise the President to impose broad import tariffs. The ruling relied on two constitutional doctrines:

- **Congressional Taxing Power Principle:** The United States Constitution grants Congress exclusive authority to impose tariffs and taxation measures.
- **Major Questions Doctrine:** Courts require explicit congressional authorisation before the executive branch exercises powers with large economic or political consequences.

Alternative Legal Instrument Used

- After the ruling, the President invoked Trade Act of 1974 Section 122, which allows temporary trade measures to address balance-of-payments imbalances.
- A ten percent temporary tariff on imports from all countries was announced under this provision.

DELHI–MEERUT REGIONAL RAPID TRANSIT SYSTEM CORRIDOR (NAMO BHARAT)

The Prime Minister inaugurated the complete 82 kilometre Delhi–Meerut Namo Bharat Regional Rapid Transit System corridor, India's first high-speed regional rail system.

Regional Rapid Transit System: Concept

- The Regional Rapid Transit System (high-speed regional rail network designed to connect major metropolitan cities with surrounding satellite towns using dedicated rail corridors) is intended to provide fast, high-frequency and high-capacity commuter transport across the National Capital Region.
- It aims to reduce congestion, shorten commuting time, and promote integrated regional development.

Namo Bharat: Technical and Operational Features

- **High Speed Regional Rail Technology:** The trains operate with design speed of approximately 180 kilometres per hour and operational average speed around 100 kilometres per hour, making them significantly faster than conventional suburban rail systems.
- **Dedicated High Capacity Infrastructure:** The system uses segregated rail tracks, modern signalling technology, platform screen systems, and advanced electric multiple unit trainsets designed for rapid acceleration and deceleration.
- **High Frequency Commuter Operations:** Trains are designed to operate at intervals of approximately five to ten minutes during peak hours, ensuring efficient passenger movement.

- **Energy Efficient Electric Traction System:** The corridor operates on electrified rail technology reducing fossil fuel dependence and lowering carbon emissions.

Project Structure and Alignment

- **Total Corridor Length:** Approximately 82 kilometres connecting Delhi, Ghaziabad, and Meerut across the National Capital Region.
- **Number of Stations:** The corridor includes around 24 stations consisting of elevated, underground, and at-grade stations.
- **Travel Time Reduction Impact:** Travel time between Delhi and Meerut is reduced to around 55 minutes compared with nearly two to three hours by road during peak traffic conditions.
- **Implementing Agency:** The project is executed by the National Capital Region Transport Corporation, a joint venture of the central government and participating state governments.

Economic and Urban Development Significance

- **Regional Economic Integration Enhancement:** High-speed connectivity improves labour mobility between residential towns and employment centres in the National Capital Region.
- **Reduction in Road Traffic Congestion and Pollution:** Increased public transport usage reduces private vehicle dependence and urban air pollution levels.
- **Transit Oriented Urban Development Promotion:** High-capacity stations encourage development of commercial, residential and service infrastructure around transit hubs.
- **Strategic Infrastructure for Urbanisation Management:** Supports sustainable urban expansion by connecting satellite cities with the national capital.

ACCESS PASS FOR FISHING IN INDIA'S EEZ

Government launched nationwide Access Pass system enabling mechanised fishing vessels to legally operate within India's Exclusive Economic Zone (EEZ).

Exclusive Economic Zone: Legal Maritime Framework

- The Exclusive Economic Zone (maritime zone extending up to two hundred nautical miles from a coastal state's baseline where the state enjoys sovereign rights for exploration and exploitation of marine resources) is defined under the United Nations Convention on the Law of the Sea.
- **Territorial Sea Limit Definition:** Coastal states exercise full sovereignty over waters extending twelve nautical miles from the baseline measured from the coast.
- **Contiguous Zone Jurisdiction:** The contiguous zone extends up to twenty four nautical miles from the baseline, where the state can enforce customs, immigration and sanitary regulations.
- **Exclusive Economic Zone Jurisdiction:** The EEZ extends up to two hundred nautical miles, granting sovereign rights for fishing, marine resource extraction, seabed mining, hydrocarbon exploration and marine scientific research.
- **Extended Continental Shelf Provision:** Countries may claim seabed resources beyond two hundred nautical miles if scientifically validated by the Commission on the Limits of the Continental Shelf.
- **India's Maritime Jurisdiction Area:** India's EEZ covers approximately 2.37 million square kilometres, making it among the largest maritime zones globally.

Access Pass for Fishing: Policy Design

The Access Pass for Fishing (official authorisation allowing mechanised and large motorised fishing vessels to operate legally in the Exclusive Economic Zone) has been introduced to regulate deep sea fishing activities.

- **Mandatory Authorization Requirement:** Mechanised fishing vessels and large motorised vessels operating beyond territorial waters must obtain an Access Pass under EEZ fishing regulations.
- **Digital Application Platform:** Access passes are issued through the ReALCRaft Portal, which enables transparent licensing procedures.
- **Deep Sea Fishing Promotion Objective:** The policy encourages fishers to move from overexploited coastal waters toward deep sea fisheries containing high value species such as tuna, squid and pelagic fish.

ReALCRaft Portal

The ReALCRaft portal is a national digital governance platform developed by the National Informatics Centre and the Department of Fisheries to manage registration and licensing of fishing vessels.

- **Comprehensive Vessel Registration System:** Provides web-based services for registration of marine fishing vessels, transfer of vessel ownership, and licensing approvals.
- **Integration with Export Certification Systems:** The platform is integrated with the Marine Products Export Development Authority and the Export Inspection Council of India.
- **Traceability and Export Compliance:** The digital system supports issuance of Fish Catch Certificates and Health Certificates required for exporting seafood to international markets.

Economic and Strategic Significance

- **Sustainable Marine Resource Management:** Regulated fishing reduces pressure on near-shore marine ecosystems.
- **Income Enhancement for Marine Fishers:** Deep sea fisheries provide access to high value export oriented marine species.
- **Global Seafood Trade Competitiveness:** Digital traceability systems improve compliance with international sanitary and sustainability standards.

4 ENVIRONMENT

SOLID WASTE MANAGEMENT RULES, 2026

India notified the Solid Waste Management (SWM) Rules, 2026, replacing the Solid Waste Management Rules, 2016, effective 1 April 2026.

About

- The **SWM Rules, 2026** strengthen the framework for municipal solid waste management by embedding circular economy principles (an economic model that minimises waste through reuse, recycling, and resource recovery) and **Extended Producer Responsibility (EPR)** (a policy approach that makes producers responsible for managing post-consumer waste generated from their products).
- India generates **over 62 million tonnes of municipal solid waste annually**, and improving segregation, recycling, and recovery is essential to reduce landfill dependence and environmental pollution.

Key Provisions

- **Four-stream segregation at source:** Mandatory segregation into wet waste (biodegradable waste), dry waste (recyclable materials), sanitary waste (hygiene waste), and special-care waste (domestic hazardous waste).
- **Definition of Bulk Waste Generators (BWGs):** Entities with built-up area ≥20,000 sq m, water consumption ≥40,000 litres per day, or waste generation ≥100 kg per day.
- **Extended Bulk Waste Generator Responsibility (EBWGR):** BWGs must ensure segregation, processing, and environmentally safe disposal of waste generated on their premises.
- **Centralised digital portal:** Real-time monitoring of waste generation, collection, transportation, processing, and disposal.
- **Promotion of Refuse Derived Fuel (RDF):** Industries such as cement plants must utilise RDF (fuel produced from high-calorific non-recyclable municipal waste).
- **Restrictions on landfilling:** Landfills permitted only for non-recyclable and inert waste.

Comparison with SWM Rules, 2016

- The 2016 rules mandated three-way segregation (wet, dry, and domestic hazardous waste) and assigned waste management responsibility primarily to urban local bodies and waste generators.
- The 2026 rules introduce four-stream segregation, clearer definitions of bulk waste generators, stronger accountability through EBWGR, mandatory RDF utilisation, and digital monitoring systems, thereby strengthening enforcement and promoting resource recovery within a circular economy framework.

CARBON CAPTURE PUSH

The Union Budget 2026–27 announced a ₹20,000 crore allocation for Carbon Capture, Utilisation and Storage (CCUS) to support India's decarbonisation efforts.

Carbon Capture, Utilisation and Storage (CCUS)

- Carbon Capture, Utilisation and Storage (CCUS) refers to technologies that capture carbon dioxide (CO_2) emissions from large stationary sources such as coal-based power plants, cement plants, and steel factories before the gas is released into the atmosphere
- **After capture, the CO_2 may either be:**
  - Stored in deep geological formations such as depleted oil and gas reservoirs or deep saline aquifers, or
  - Utilised in industrial applications, including the production of synthetic fuels, chemicals, or construction materials such as carbonated concrete.
- CCUS is considered a **transitional decarbonisation technology** (technology that reduces emissions in sectors where immediate zero-carbon alternatives are not yet commercially viable).

Importance for India

- India's emissions profile is strongly influenced by **coal-based electricity generation and energy-intensive industries**. CCUS can reduce emissions from **hard-to-abate sectors** such as **steel, cement, aluminium, and fertiliser manufacturing**, where direct electrification is currently difficult.
- Reducing industrial emissions may also help Indian exporters avoid additional costs under mechanisms such as the **Carbon Border Adjustment Mechanism (CBAM)** *(a European Union policy imposing a carbon price on certain imported goods based on their embedded emissions).*

India's Climate Commitments

Under its updated Nationally Determined Contributions (NDCs) submitted in 2022 under the Paris Agreement, India has committed to:

- Reduce the emissions intensity of GDP by 45% by 2030 compared with 2005 levels.
- Ensure 50% of installed electricity capacity comes from non-fossil fuel sources by 2030.
- Create an additional carbon sink of 2.5–3 billion tonnes of CO_2 equivalent through increased forest and tree cover.

BLUE CATEGORY OF INDUSTRIES

The Central Pollution Control Board (CPCB) has introduced a Blue Category to classify Common Effluent Treatment Plants (CETPs) as Essential Environmental Services (ESS).

About

- The **Blue Category** covers facilities designated as **Essential Environmental Services (ESS)** *(infrastructure created specifically to prevent, control, or reduce environmental pollution)*.
- These facilities primarily **treat or manage pollutants generated from domestic or industrial activities** rather than producing pollution themselves.
- The classification is intended to **recognise and promote pollution-control infrastructure**, ensuring that such facilities receive regulatory clarity and support.

Central Pollution Control Board (CPCB)

- The CPCB *(India's national pollution control authority)* was established in 1974 under the Water (Prevention and Control of Pollution) Act, 1974, and also performs functions under the Air (Prevention and Control of Pollution) Act, 1981.
- It operates under the Ministry of Environment, Forest and Climate Change **(MoEFCC)** and is responsible for setting environmental standards, monitoring pollution levels, and coordinating pollution-control activities with State Pollution Control Boards **(SPCBs)**.

Pollution Index (PI) Framework

- The Pollution Index (a quantitative methodology developed by CPCB to classify industries based on pollution potential) assigns equal weight to air emissions, water effluents, and hazardous waste generation, following the Precautionary Principle (preventive action should be taken when environmental harm is possible).
- **Industries are Classified as**
  - **Red Category:** PI ≥ 80 (high pollution potential)
  - **Orange Category:** PI 55–79 (moderate pollution potential)
  - **Green Category:** PI 25–54 (low pollution potential)
  - **White Category:** PI < 25 (minimal pollution potential)
- The **Blue Category** operates alongside this framework to recognise **facilities dedicated to pollution control and environmental management.**

INDIA'S AGROFORESTRY AMBITIONS

Experts highlighted financing, policy, and awareness barriers to agroforestry at the South Asian Agroforestry & Trees Outside Forests (AF-TOF) Congress 2026.

AF-TOF Congress

- The AF-TOF Congress, also referred to as "Treescapes 2026," was the first regional platform dedicated to advancing agroforestry and Trees Outside Forests across South Asia.
- It was organised by the Centre for International Forestry Research and World Agroforestry (CIFOR-ICRAF) in collaboration with the Indian Council of Agricultural Research (ICAR).

Agroforestry

- Agroforestry is a land-use system that integrates trees with crops and/or livestock on the same landholding. Such systems improve soil fertility, biodiversity, and climate resilience, while enabling carbon sequestration (long-term storage of carbon in vegetation and soils) and diversified farm income.

Status in India

- India currently has about 28 million hectares under agroforestry, and policy discussions aim to expand this to around 50 million hectares by 2050.
- Tree-based systems are estimated to account for roughly one-fifth of India's terrestrial carbon stock.

Key Challenges

- **Limited access to finance:** Although India's annual institutional agricultural credit exceeds ₹20 lakh crore, less than 5% supports agroforestry due to long gestation periods (often 5–30 years), collateral constraints, and land-tenure complexities.
- **Low policy awareness:** Many farmers remain unfamiliar with provisions under the National Agroforestry Policy, 2014, including tree harvesting rights and transit regulations.
- **Underdeveloped value chains:** India imports over $7 billion worth of timber annually, indicating underutilised domestic tree-based production.

Way Forward

- Strengthening credit access for tree-based farming, simplifying harvesting and transit regulations, improving farmer awareness, and linking agroforestry with carbon markets and domestic timber value chains can enhance rural incomes, climate mitigation, and ecosystem restoration.

MANGROVE CLAM (GELOINA EROSA)

Scientists at the ICAR–Central Marine Fisheries Research Institute (CMFRI) have achieved the first successful captive breeding of the mangrove clam (Geloina erosa), offering a potential method to restore declining populations in Indian mangrove ecosystems.

About Mangrove Clam

- The **mangrove clam (*Geloina erosa*)**, also known in scientific literature as **Polymesoda erosa**, is a **large bivalve mollusc** *(aquatic invertebrate with two hinged shells)* belonging to the **family Cyrenidae**. Adult individuals typically reach **up to about 10 cm in shell width.**

Distribution and Habitat

- The species inhabits organic-rich muddy substrates in intertidal zones of mangrove forests and estuaries across South and Southeast Asia, including India, Sri Lanka, Thailand, Malaysia, Indonesia, and the Philippines.
- In India, it is commonly found in mangrove ecosystems along the west coast, particularly in Kerala, where it is locally known as "Kandal Kakka."

Ecological Importance

- ***Geloina erosa*** is an efficient filter feeder, consuming suspended organic matter, plankton, and detritus, which helps improve estuarine water quality through nutrient recycling.
- Its burrowing activity stabilises sediments, enhances aeration and nutrient cycling, and supports the structural stability and ecological resilience of mangrove ecosystems.

Significance of Captive Breeding

- The successful hatchery breeding by ICAR-CMFRI is significant because wild populations have declined due to overharvesting and habitat degradation.
- Controlled breeding can enable stock enhancement, sustainable aquaculture, and conservation of mangrove biodiversity.

BLACK CARBON IN THE ARCTIC

Increasing geopolitical competition in the Arctic region, including strategic interest in Greenland, has drawn attention away from the growing climate threat posed by black carbon emissions.

What is Black Carbon?

- **Black carbon** is a **short-lived climate pollutant (SLCP)** and a major component of **fine particulate matter (PM2.5)** *(airborne particles with a diameter of 2.5 micrometres or less)*. It is generated through the **incomplete combustion of fossil fuels, biofuels, and biomass**, particularly from **diesel engines, coal burning, residential biomass stoves, and marine heavy fuel oil used by ships.**
- Although black carbon remains in the atmosphere for only **about 4–12 days**, it has a **very high warming potential** because it strongly absorbs solar radiation. Over a **20-year time horizon**, its warming effect per unit mass is estimated to be **around 1,500–1,600 times greater than carbon dioxide.**

Why it is Critical in the Arctic

- When black carbon particles deposit on snow and sea ice, they reduce albedo (the ability of a surface to reflect sunlight). Lower albedo increases solar heat absorption, accelerating glacier melting and sea-ice loss.
- This process intensifies Arctic amplification, the phenomenon in which the Arctic warms approximately two to four times faster than the global average. Rapid Arctic warming can disrupt global atmospheric circulation, influencing jet streams and large-scale climate patterns such as monsoon systems.

Strategic Importance of the Arctic

- The Arctic region has rising geopolitical significance due to emerging shipping routes, substantial oil and mineral resources, and expanding military presence, which increasingly shapes international competition in the region.

RAJAJI NATIONAL PARK

The Supreme Court of India permitted the metalling of the 11.5-km Laldhang–Chillarkhal road passing through Rajaji National Park in Uttarakhand.

About

- **Rajaji National Park** is located in the **Shivalik foothills of the Himalayas in Uttarakhand**, near **Haridwar, Rishikesh, and Dehradun**. It was established in **1983** by merging three wildlife sanctuaries: **Rajaji Wildlife Sanctuary, Motichur Wildlife Sanctuary, and Chilla Wildlife Sanctuary.**
- The park is named after **C. Rajagopalachari (Rajaji)**, a freedom fighter and the **first and only Indian Governor-General of independent India.**

Ecological Features

- Rajaji forms part of the **Shivalik–Terai landscape**, characterised by **sal-dominated forests, riverine vegetation, grasslands, and scrub forests**. Important rivers flowing through the park include the **Ganga and Song**, which support diverse aquatic and terrestrial ecosystems.
- In **2015**, Rajaji National Park was notified as part of the **Rajaji Tiger Reserve under Project Tiger**, enhancing its conservation status.

Biodiversity

- The park supports a rich diversity of fauna and flora and serves as an important habitat for the **north-western population of the Asian elephant (*Elephas maximus*)**. Key mammals include:
  - Bengal tiger *(Panthera tigris tigris)*
  - Leopard *(Panthera pardus)*
  - Sambar *(Rusa unicolor)* and spotted deer *(Axis axis)*
  - Himalayan goral *(Naemorhedus goral)*
- Rajaji is also recognised for its **significant bird diversity**, with **over 300 recorded species**, making it an important site for **avian conservation and ecological tourism.**

JAPAN'S "MIWATARI" (GOD'S CROSSING)

The Miwatari phenomenon at Lake Suwa in Nagano Prefecture, Japan, has not appeared for several recent winters, indicating the effects of rising temperatures linked to climate change.

What is Miwatari?

- **Miwatari** (meaning **"God's Crossing"**) is a natural ice ridge that forms when the entire surface of Lake Suwa freezes during extremely cold winters. The phenomenon typically occurs after several consecutive days of temperatures falling below approximately –10°C.
- When the lake freezes, thermal expansion and contraction of the ice sheet create fractures in the frozen surface. As the ice shifts, newly formed ice slabs are forced upward along the cracks, forming a distinct raised ridge that stretches across the frozen lake.

Cultural and Historical Significance

- The phenomenon has strong links to **Shinto traditions**, Japan's indigenous religion. According to local belief, the ridge represents the **path taken by the deity Takeminakata-no-Kami crossing the frozen lake to visit the goddess Yasakatome-no-Kami.**
- The **Yatsurugi Shrine in Suwa** has officially recorded Miwatari events since the **15th century**, making it one of the **longest continuous climate-related observational records in the world.**

Evidence of Climate Change

- Historical records show that Lake Suwa froze almost every winter until the late 20th century. However, the frequency of complete freezing has declined sharply since the 1980s, and no full Miwatari ridge has been observed since 2018.
- Scientists attribute this change to increasing winter temperatures associated with global climate change, which prevent the lake surface from freezing completely.

ANUPAM' MODEL OF WASTE MANAGEMENT

The New Delhi Municipal Council (NDMC) implemented the 'Anupam' model of decentralised waste management, enabling residential colonies to segregate and process household waste within their premises and thereby reduce the need to transport waste to municipal processing facilities.

About the Anupam Model

- The Anupam model is a community-based decentralised solid waste management system in which waste generated within a residential colony is segregated, processed, and recycled locally.
- This approach reduces transportation of municipal waste, lowers pressure on landfills, and promotes citizen participation in waste management, consistent with the Solid Waste Management Rules, 2016.

Key Features

- **Segregation at source:** Waste is separated into wet waste (biodegradable waste), dry waste (recyclable materials), and sanitary waste (hygiene waste) at the household level.
- **Further segregation of dry waste:** Dry waste is sorted into categories such as paper, metal, glass, e-waste, and non-recyclable materials to facilitate recycling.
- **On-site composting:** Wet waste and horticultural waste are composted within the colony using wire-mesh composting bins placed in parks and green areas, eliminating the need for transportation to NDMC treatment plants.
- **E-waste management:** Electronic waste is sent to Central Pollution Control Board (CPCB)-authorised recyclers for safe disposal.

Operational Details

- Each Anupam Colony has dedicated sanitation inspectors and NDMC staff responsible for composting and mechanical sweeping operations.
- The colonies generate about 300 kg of wet waste daily.
- Thirteen wire-mesh composters and ten horticulture pits have been installed, producing approximately 800 kg of compost, which is distributed to residents and used by the NDMC horticulture department.

FUNCTIONAL DIVERSITY

A recent ecological study reported that land-use change and elevation gradients are altering spider communities in the north-western Indian Himalayas, thereby affecting functional diversity in these ecosystems.

What is Functional Diversity?

- Functional diversity refers to the variety and distribution of functional traits of species within an ecosystem. Functional traits are biological characteristics—such as body size, feeding behaviour, reproductive strategy, habitat use, or morphology—that determine how organisms interact with the environment and perform ecological roles.
- Unlike species diversity (number of species present), functional diversity focuses on the ecological roles species perform, including predation, pollination, seed dispersal, nutrient cycling, and decomposition.

Ecological Significance

- Higher functional diversity increases ecosystem stability, productivity, and resilience.
- When multiple species perform similar ecological functions, functional redundancy occurs, meaning that if one species declines or becomes locally extinct, another species with similar traits can maintain the ecosystem process.
- For *example*, predatory spiders regulate insect populations, contributing to natural pest control in forests and agricultural landscapes.

Threats in the Himalayan Region

- The north-western Himalayas, part of the Himalayan biodiversity hotspot, are experiencing land-use change due to agricultural expansion, infrastructure development, and human settlement.
- These changes simplify complex habitats, reduce the range of functional traits present, and may shift ecosystems toward lower functional diversity and reduced ecological resilience.

Policy and Conservation Context

- India's biodiversity conservation is guided by the Biological Diversity Act, 2002, which aims to conserve biological diversity, promote sustainable use of biological resources, and ensure equitable sharing of benefits arising from their use.
- Maintaining functional diversity is essential for achieving the Act's objective of long-term ecosystem sustainability.

INDIA'S FIRST NET-ZERO PANCHAYAT

Bela Gram Panchayat in Bhandara district, Maharashtra, was recognised as India's first net-zero panchayat during Mumbai Climate Week 2026 for implementing community-driven climate mitigation initiatives.

What is Net Zero?

- Net zero refers to a condition in which the amount of Greenhouse Gases (GHGs) emitted into the atmosphere is balanced by an equivalent amount removed through natural or technological carbon sinks, resulting in no net increase in atmospheric emissions.
- Achieving net zero requires systematic reduction of emissions across energy, transport, agriculture, and waste sectors, along with enhancement of carbon sinks such as forests.
- The energy sector contributes nearly three-quarters of global greenhouse gas emissions, making the transition from fossil fuels (coal, oil, and natural gas) to renewable energy sources such as solar and wind essential for climate mitigation.

Bela Gram Initiatives

- Bela Gram Panchayat, located in the Vidarbha region of Maharashtra, implemented several measures to reduce its carbon footprint:
  - Plantation of more than 90,000 trees, enhancing carbon sequestration.
  - Replacement of traditional biomass chulhas with LPG, reducing emissions and indoor air pollution.
  - Installation of solar panels to promote renewable energy use.
  - Household waste segregation and elimination of single-use plastics.
- The village received the Rashtriya Panchayat Puraskar 2024, an award instituted by the Ministry of Panchayati Raj to recognise outstanding performance of Panchayati Raj Institutions established under the 73rd Constitutional Amendment Act, 1992, which constitutionally empowered rural local self-government in India.

BEE CORRIDOR

The National Highways Authority of India (NHAI) has proposed the creation of "bee corridors" along national highways to support pollinator populations and improve ecological sustainability.

What is a Bee Corridor?

- A bee corridor is a continuous stretch of vegetation planted with pollinator-friendly flowering species that provide nectar and pollen throughout the year. Such corridors are designed to support pollinators such as honeybees, butterflies, and other insects, which play a critical role in plant reproduction and agricultural productivity.
- Unlike conventional roadside plantations that mainly provide shade or aesthetic value, bee corridors prioritise plant species that sustain pollinators across seasons, thereby creating linear habitats that connect fragmented ecosystems.

Implementation by NHAI

- The National Highways Authority of India (NHAI) is a statutory authority established under the National Highways Authority of India Act, 1988, functioning under the Ministry of Road Transport and Highways.
- It is responsible for the development, maintenance, and management of national highways in India.

Under this initiative

- Around 40 lakh trees will be planted along national highways during 2026–27.
- Approximately 60% of these plantations will form bee corridors, consisting of flowering tree and shrub species that provide year-round nectar and pollen.

Significance

- Pollinators are essential for the pollination of many agricultural and horticultural crops, directly influencing food production and ecosystem health. However, pollinator populations are declining globally due to habitat loss, pesticide exposure, and climate change.
- Bee corridors can restore pollinator habitats, enhance biodiversity along highways, strengthen ecosystem connectivity, and support agricultural productivity through improved pollination services.

SPECIES IN NEWS						
Species	**Type**	**Key Features**	**Habitat / Distribution**	**IUCN Status**	**Wildlife Protection Act, 1972**	**CITES Appendix**
Sarus Crane	Bird	Tallest flying bird (152–156 cm), wingspan ~240 cm; monogamous; breeds during monsoon	Wetlands, marshes, fallow land and agricultural fields; mainly Uttar Pradesh, also Bihar, Rajasthan, Gujarat, Madhya Pradesh, Assam	Vulnerable	Schedule IV	Appendix II
Greater Flamingo	Bird	Largest flamingo species; height 110–150 cm; feeds on small aquatic organisms	Africa, Mediterranean, Middle East, Indian subcontinent; migrates to India from Israel, Afghanistan, Pakistan	Least Concern	Schedule IV	Appendix II
Mountain Gorilla	Mammal (Great Ape)	Shares ~98% DNA with humans; thick fur for cold mountain climate; herbivorous diet	High-altitude forests (8,000–13,000 ft) in Rwanda, Uganda, Democratic Republic of the Congo	Endangered	Not applicable (not in India)	Appendix I
Reticulated Python	Reptile (Snake)	Longest snake species; distinctive net-like scale pattern; kills prey by constriction	South and Southeast Asia including Indonesia, Philippines, Malaysia, Thailand and parts of India	Least Concern	Schedule I (as Python species in India)	Appendix II
Cheer Pheasant	Bird	Ground-nesting pheasant; strong natal philopatry; associated with Chir Pine grasslands	Western Himalayas: Pakistan, Kashmir, Himachal Pradesh, Uttarakhand, Nepal (1,200–3,350 m)	Vulnerable	Schedule I	Appendix I
Pangolin (Indian)	Mammal	Only mammal with keratin scales; feeds on ants and termites; defensive volvation behaviour	South Asia including India, Pakistan, Sri Lanka, Nepal	Endangered	Schedule I	Appendix I
Mangrove Clam	Mollusc (Bivalve)	Filter feeder; burrowing stabilises sediments; improves water quality	Mangrove and estuarine intertidal zones across South and Southeast Asia	Not Evaluated / Not globally threatened	Not listed	Not listed

5 GEOGRAPHY

CONTINENTAL MANTLE EARTHQUAKES

Researchers from Stanford University have produced the first global map of continental mantle earthquakes, identifying a rare class of earthquakes that occur deep within the Earth's mantle rather than the crust.

Continental Mantle Earthquakes

- Most earthquakes occur within the **Earth's crust**, generally at depths of **10–29 km**, where tectonic plates interact and accumulate stress.
  - However, **continental mantle earthquakes** originate much deeper—typically **more than 80 km below the Earth's surface**—beneath the **Mohorovičić discontinuity (Moho)**, the boundary that separates the **Earth's crust from the mantle.**
- The **upper mantle** consists of **semi-solid rock that can deform slowly under pressure and temperature**, yet tectonic stress can still generate earthquakes in this region.
  - These deep earthquakes often occur in areas experiencing intense **tectonic compression**, particularly in **continental collision zones** such as the **Himalayan region**, where the **Indian Plate collides with the Eurasian Plate.**

Key Geographical Concepts

- **Mohorovičić Discontinuity (Moho):** A major seismic boundary discovered in 1909 by Andrija *Mohorovičić*, identified by a sudden increase in the velocity of seismic waves traveling from the crust into the denser mantle.
- **Seismic Waves:** Scientists distinguish mantle earthquakes using Sn waves (mantle-travelling seismic waves) and Lg waves (crustal seismic waves).
- A recent analysis of about 46,000 earthquakes recorded since 1990 identified 459 mantle earthquakes, improving scientific understanding of Earth's internal structure, deep tectonic stress, and crust–mantle interactions.

BOMB CYCLONE

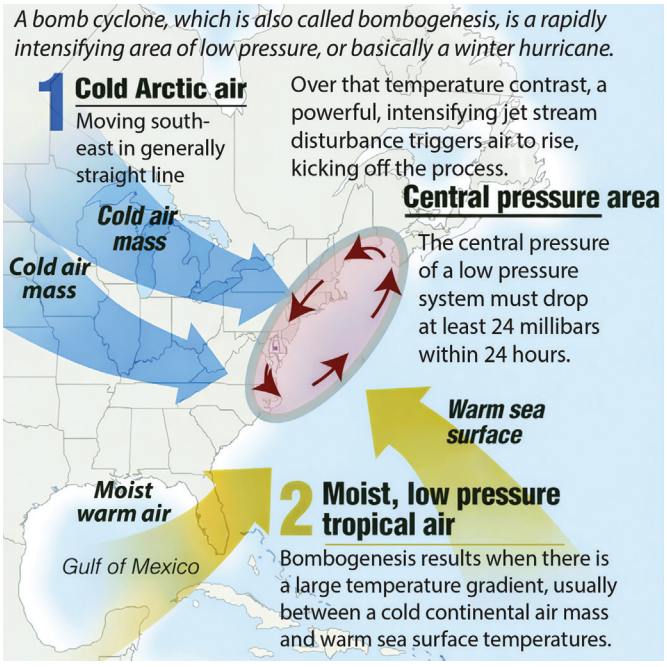
A powerful bomb cyclone is expected to bring heavy snowfall and severe winter weather to the eastern United States, drawing attention to the phenomenon of rapidly intensifying mid-latitude storms.

Bomb Cyclone (Explosive Cyclogenesis)

- A bomb cyclone is a rapidly intensifying extratropical cyclone (mid-latitude low-pressure storm) in which the central atmospheric pressure falls by at least 24 millibars within 24 hours. This rapid pressure drop is known as bombogenesis (explosive cyclogenesis).
- The sharp decline in pressure strengthens the pressure gradient (difference between high- and low-pressure regions), resulting in powerful winds and severe weather conditions.
- Bomb cyclones usually form in mid-latitudes (30°–60°) where cold polar air masses meet warm, moist subtropical air masses.
  - This interaction creates baroclinic instability (instability caused by strong horizontal temperature contrasts), which provides energy for storm intensification.

Key Geographical Concepts

- **Extratropical Cyclones:** Bomb cyclones belong to this category of storms that form outside the tropics and derive energy mainly from **temperature contrasts between air masses.**
- **Jet Stream Interaction:** Strong **jet streams (fast-moving air currents in the upper troposphere)** remove air from the storm centre, allowing surface pressure to fall rapidly and intensify the cyclone.
- **Warm Ocean Currents:** Warm currents such as the **Gulf Stream** provide heat and moisture that strengthen storm systems.
- Bomb cyclones can produce **blizzards, intense snowfall, heavy rainfall, coastal flooding, and hurricane-force winds**, making them among the most destructive winter storms in mid-latitude regions.



SNOWBALL EARTH

Recent geological studies on Cryogenian glacial rocks from the Garvellach Islands provide new evidence on global ice cover during Snowball Earth.

Concept and Definition

- Snowball Earth refers to geological intervals when Earth's oceans and continents were almost completely covered by ice sheets from poles to near-equatorial latitudes.
- These events occurred mainly during the Cryogenian Period of the Neoproterozoic Era.
- During this phase, sea ice may have reached thickness of several hundred metres, and global mean surface temperatures are estimated to have fallen below –40 degrees Celsius in some climate models.

Major Cryogenian Glaciation Events

- **Sturtian Glaciation (720–660 million years ago):** Longest known global glaciation lasting nearly 60 million years, with glaciers extending to tropical latitudes.
- **Marinoan Glaciation (650–635 million years ago):** Second major Snowball Earth episode that ended with rapid deglaciation and atmospheric carbon dioxide accumulation.

Climatic Mechanisms

- **Ice–Albedo Positive Feedback:** Expanding ice increased planetary albedo (surface reflectivity of solar radiation), reducing heat absorption and accelerating global cooling.
- **Ocean Freezing Feedback:** Ice cover reduced ocean–atmosphere heat exchange and slowed the hydrological cycle, reinforcing planetary freezing.

Causes of Global Glaciation

- **Equatorial Continental Positioning:** Continents near the equator enhanced silicate weathering (chemical process removing carbon dioxide from the atmosphere), reducing greenhouse warming.
- **Decline in Atmospheric Carbon Dioxide:** Lower greenhouse gas concentrations weakened Earth's heat-trapping capacity.
- **Plate Tectonics and Volcanic Activity:** Variations in volcanic carbon dioxide emissions altered long-term atmospheric composition.

Geological Evidence

- **Low-Latitude Glacial Deposits:** Glacial sediments found in present-day tropical regions indicate ice sheets reached equatorial zones.
- **Cap Carbonates:** Thick carbonate rock layers deposited immediately above glacial sediments indicate rapid warming after ice melting.
- **Paleomagnetic Signatures:** Magnetic orientation in rocks confirms glaciation occurred near the equator.

Biological Significance

- Deglaciation increased nutrient influx, ocean oxygenation, and biological productivity, possibly contributing to the emergence of complex multicellular organisms before the Cambrian biological diversification.

STRAIT OF HORMUZ

Iran recently restricted navigation in parts of the Strait of Hormuz during military exercises amid geopolitical tensions.

Geographical Location and Morphology

- **Strategic Maritime Passage Connecting Major Water Bodies:** The strait forms the only maritime outlet connecting the Persian Gulf with the Gulf of Oman and the Arabian Sea, enabling global maritime access for Gulf oil exporting states.
- **Bordering States and Political Geography:** The northern coastline of the strait belongs to Iran, while the southern shores are shared by Oman and the United Arab Emirates.
- **Physical Dimensions and Navigation Corridor:** The strait is about 167 kilometres long, and at its narrowest point measures approximately 33 kilometres wide between Iran and Oman.
- **Shipping Lane Structure Under International Maritime Rules:** Two navigation lanes of roughly 3 kilometres width each operate for inbound and outbound vessels, separated by a buffer safety zone.

Global Energy Transit Importance

- **Largest Petroleum Transport Chokepoint in the World:** According to the United States Energy Information Administration 2025, about 20 to 21 million barrels of petroleum liquids per day, nearly 20 percent of global oil consumption, move through this passage.
- **Liquefied Natural Gas Export Corridor:** The majority of Qatar's liquefied natural gas exports, representing about one fifth of global liquefied natural gas trade, transit through the strait.
- **Key Exporting Countries Dependent on the Strait:** Oil shipments from Saudi Arabia, Iraq, Kuwait, Iran, Qatar and the United Arab Emirates depend heavily on this maritime corridor.

Importance for India's Energy Security

- **Crude Oil Import Dependence:** Approximately 45 percent of India's crude oil imports originate from Persian Gulf countries and pass through the Strait of Hormuz.
- **Natural Gas Supply Chain:** Nearly 60 percent of India's liquefied natural gas imports from Qatar also transit through this route, making it strategically critical.

Strategic and Geopolitical Significance

- **Historic Conflict Zone in Global Energy Geopolitics:** The strait witnessed attacks on oil tankers during the Iran–Iraq Tanker War.
- **Strategic Leverage in International Relations:** Iran periodically threatens closure of the strait in response to sanctions or military tensions, though a complete blockade has never occurred.

Alternative Export Routes

- **Pipeline Bypass Infrastructure Developed by Gulf States:** The Saudi East–West pipeline to the Red Sea and the Abu Dhabi–Fujairah pipeline enable partial bypass of the strait but together carry only a limited share of Gulf oil exports.

PLACES IN NEWS

Place	Country/ Region	Precise Location	Physical Geography	Strategic / Environmental Importance	Key Bodies / Agreements
Lake Urmia	**Iran**	Northwestern Iran between East Azerbaijan and West Azerbaijan provinces	Endorheic salt lake (no outlet to sea); extremely high salinity due to high evaporation; surrounded by semi-arid plateau	One of the largest hypersaline lakes in the world; severe shrinkage due to dams, irrigation diversion, climate change; ecological crisis affecting migratory birds and regional climate	Ramsar Convention on Wetlands (1971); UNESCO Biosphere Reserve Programme (Man and Biosphere – MAB)
Rafah Border Crossing	**Gaza Strip – Egypt**	Southern Gaza connecting Gaza Strip with Egypt's Sinai Peninsula	Located near the Mediterranean coast in the southern Gaza region	Only border crossing between Gaza and Egypt not directly controlled by Israel; vital for humanitarian aid, civilian evacuation, and trade	Border arrangement recognized under the 1979 Egypt–Israel Peace Treaty (Camp David Accords)
Thwaites Glacier	**Antarctica**	Western Antarctica flowing into the Amundsen Sea	One of the largest outflow glaciers of the West Antarctic Ice Sheet (WAIS); rests partly on marine bedrock below sea level	Called "Doomsday Glacier" because collapse could trigger marine ice sheet instability; potential global sea-level rise of ~0.5 m directly and over 3 m indirectly if WAIS destabilizes	Studied under the International Thwaites Glacier Collaboration (ITGC) by US and UK scientists
Eritrea	**Horn of Africa**	Northeast Africa along the Red Sea coast, north of Ethiopia	Coastal plains along Red Sea, central highlands plateau, and western lowlands	Controls part of the Bab el-Mandeb Strait, a global maritime chokepoint linking the Red Sea and Gulf of Aden; important for global oil and trade routes	Member of African Union (AU) and COMESA (Common Market for Eastern and Southern Africa)
Sardinia Island	**Italy**	Western Mediterranean Sea between Italian Peninsula and North Africa, south of Corsica	Large mountainous island with granite and schist formations; highest peak Mount La Marmora (Gennargentu range)	Strategically located in Mediterranean trade routes; historically important for naval and military positioning; also known for high-security prisons and anti-mafia detention under 41bis regime	Governed under Italian Penal Code Article 41bis (anti-mafia isolation regime)

6 INTERNAL SECURITY

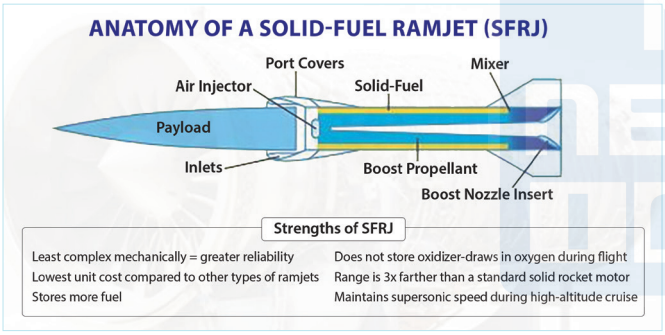
SFDR TECHNOLOGY

The Defence Research and Development Organization (DRDO) successfully demonstrated Solid Fuel Ducted Ramjet (SFDR) technology at the Integrated Test Range in Chandipur, Odisha.

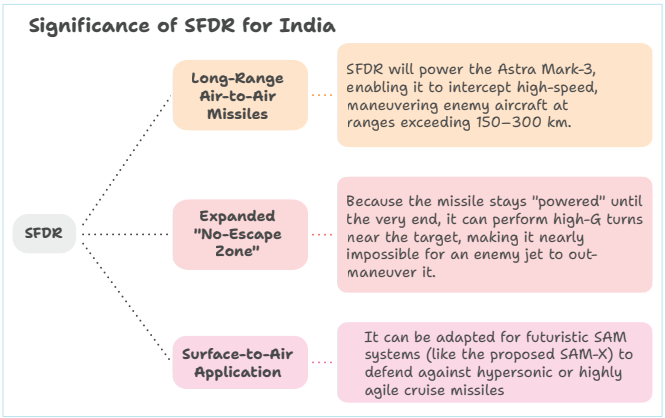
About

- **Solid Fuel Ducted Ramjet (SFDR)** is an advanced missile propulsion technology that uses a ramjet engine to generate sustained thrust.
- Unlike conventional rockets, which carry both fuel and oxidizer onboard, SFDR **uses oxygen from the atmosphere for combustion**, making the system more efficient and suitable for long-range engagements.

Requirement of Initial Booster



- Since **ramjet engines operate effectively only at very high speeds**, the missile must first be accelerated using a solid booster.
  - The booster propels the missile to supersonic speeds, generally above Mach 2, after which the ramjet engine takes over and continues to provide thrust throughout the flight.



Ramjet Engine

- A Ramjet is an air-breathing propulsion engine that operates on the principle of supersonic airflow and combustion.
  - It uses the high speed of the vehicle itself to compress incoming air, instead of using rotating components such as compressors or turbines.
- A key feature of a ramjet engine is the absence of rotating parts. The engine relies entirely on its forward motion at very high speeds to compress the incoming air.
  - As the vehicle moves rapidly through the atmosphere, air enters the engine inlet, gets compressed due to the high velocity, mixes with fuel, and then burns to produce thrust.

AGNI-3 MISSILE

India successfully test-fired the nuclear-capable Agni-3 ballistic missile from Chandipur, Odisha, with a strike range exceeding 3,000 km.

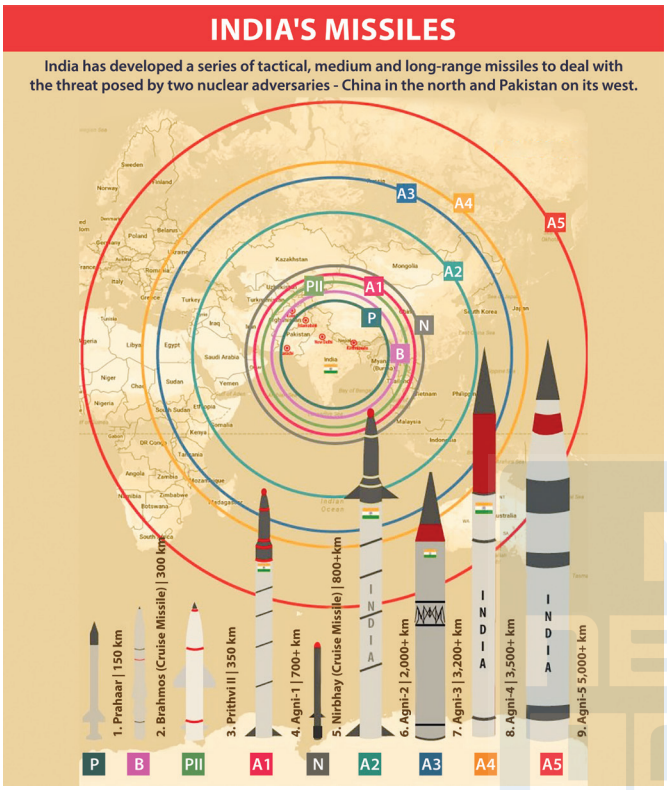
What are Ballistic Missiles?

- Ballistic missiles are a type of **rocket-propelled missile** that follows **a ballistic trajectory** i.e. similar to how a ball thrown into the air arcs up and then falls back down under gravity.
- These are powered only during a short initial **boost phase (by rocket engines),** after which most of the flight is unpowered, coasting along a predictable parabolic path before re-entering the atmosphere (if it leaves it) and descending to the target.
- Ballistic missiles are distinct from **cruise missiles (like BrahMos)**, which fly like low-flying aircraft with **continuous propulsion** and can maneuver throughout their flight.

About Agni-3 Ballistic Missile

- It is Developed by the Defence Research and Development Organization.
- It is a **two-stage, solid-fuelled ballistic missile** with a strike range exceeding three thousand kilometres.
  - A **solid-fuelled ballistic missile** (also called solid-propellant ballistic missile) is a type of ballistic missile that **uses solid propellant as its rocket fuel.**
  - A **liquid-fuelled ballistic missile**, where separate liquid fuel and oxidizer are stored in tanks and pumped into a combustion chamber only just before or during launch.
- It is capable of carrying both conventional and nuclear warheads.

- The Agni-III has been inducted into the **Strategic Forces Command** since 2011.
- The successful test underscores India's continued focus on strengthening its strategic deterrence and maintaining high levels of operational readiness.



EMERGENCY LANDING FACILITY

Prime Minister Narendra Modi inaugurated a 4.2-kilometre Emergency Landing Facility on the Moran Bypass in Assam, the first such facility in Northeast India.

About

- An Emergency Landing Facility or ELF is a reinforced highway stretch designed to act as an alternative runway for the Indian Air Force.

Moran Bypass

- It is located in **Dibrugarh district, Assam**, India, along National Highway 37 (NH-37).
- It connects areas near **Demow** (around km 534.8) to the end of the bypass (around km 561.7), improving.

- The concept of ELF emerged during the Cold War, when countries developed highway runways to reduce the vulnerability of fixed airbases. Nations such as **Finland, Sweden, and Switzerland** continue to use such dual-use infrastructure.
- Located about 300 kilometres from the **Line of Actual Control**, the Moran ELF provides critical backup during conflict situations and strengthens disaster response in remote regions.
  - It can handle fighter aircraft up to 40 tonnes and transport aircraft up to 74 tonnes.
- With around 15 such facilities now operational, this strategic grid stretches from the deserts of Rajasthan to the expressways of Uttar Pradesh and now to the strategic borders of the Northeast.

BIO-WEAPONS THREAT

In 2025, the Gujarat ATS uncovered an alleged ricin-based bioterror plot, marking India's first suspected ricin-linked bioterror case with possible international links.

Meaning of Biological Weapons

- Biological weapons use **pathogens (bacteria, viruses, fungi) or toxins (like ricin, botulinum toxin)** to cause disease or death in humans, animals, or crops.
  - They are classified as **Weapons of Mass Destruction (WMDs)** due to their potential for large-scale harm.
- Biological agents are **attractive to non-state actors** due to their relatively low production cost and high psychological impact.

Biological Safety Regulations

Department of Biotechnology
Oversees research governance and safety frameworks for labs.

Plant Quarantine Organization
Regulates agricultural imports and exports.

National Disaster Management Authority
Issued guidelines for managing biological disasters.

Environment (Protection) Act
Governs hazardous microorganisms and genetically modified organisms.

The Weapons of Mass Destruction and their Delivery Systems (Prohibition of Unlawful Activities) Act, 2005
Criminalizes biological weapons.

The Biosafety Rules, 1989
Guidelines for recombinant DNA research and biocontainment.

Importance of Biosecurity for India

- India's **large population and high population density** increase the potential impact of any biological incident.

- Heavy dependence on agriculture and livestock makes the country vulnerable to **agro-terrorism and transboundary animal diseases.**
- Rapid growth in biotechnology research increases the challenge of regulating **dual-use research** with civilian and military applications. The interest of **non-state actors in low-cost, high-impact biological agents** further compounds security risks.

International Measures

- **Biological Weapons Convention (BMC):** It prohibits the development, production, acquisition, transfer, stockpiling and use of biological and toxin weapons.
  - While BWC opened for signature in **1972**, it entered into force in **1975** and was the **first multilateral disarmament treaty** banning an entire category of **Weapons of Mass Destruction (WMD).**
- **Chemical Weapons Convention (CWC):** It is a multilateral treaty that bans chemical weapons and requires their destruction within a specified period of time. CWC is implemented by the Organization for the Prohibition of Chemical Weapons (OPCW).
- **Australia Group:** The Australia Group is an informal forum of countries that seeks to prevent the proliferation of chemical and biological weapons. It does so by harmonizing export controls on dual-use materials, equipment, and technologies.

Global Best Practices

- The U.S. anchors its biosecurity framework under the **National Biodefense Strategy (2022-2028),** which integrates health, defence, and biotech oversight.
- **China's Biosecurity Law (2021)** treats biotechnology and genetic data as matters of **national security**, mandating centralized control over research and material transfers.
- **The United Kingdom's Biological Security Strategy (2023)** focuses on biosurveillance and rapid response.

Ricin

- Ricin is a highly **toxic carbohydrate-binding protein** extracted from the castor bean plant (Ricinus communis).
- It **blocks protein synthesis in cells**, causing multiple organ failure and death within hours of exposure. Even a few milligrams can be fatal.
- It is listed under **Schedule-1** of the **Chemical Weapons Convention (CWC),** supervised by the Organization for the Prohibition of Chemical Weapons (OPCW).
- There is **no known antidote** for Ricin poisoning.

TEJAS FIGHTER AIRCRAFT FLEET

The Indian Air Force's (IAF) Tejas fighter aircraft fleet is undergoing a "maintenance check" to determine the reason for the recent incident that occurred while one of the fighters was taking off from a base.

About the Tejas Fighter Aircraft

- Light Combat Aircraft (LCA) Tejas is a **4.5 generation**, **all-weather** aircraft. The aircraft is designed to be a **multi-role aircraft** capable of taking up offensive air support, close combat and ground attack roles at ease.
- It is also designed to undertake Ground Maritime Operations.

Light Combat Aircraft (LCA)

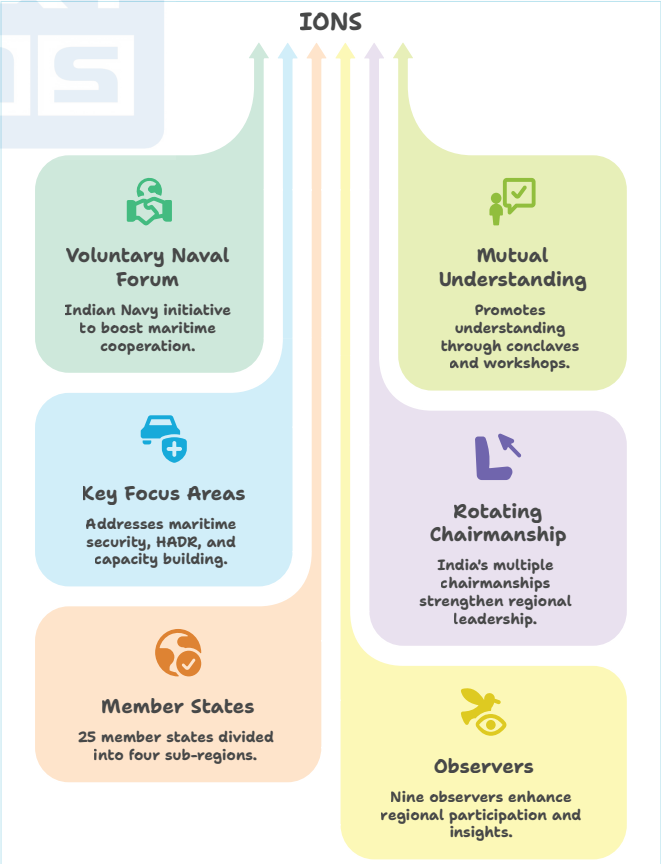
Light Combat Aircraft or LCA or light fighters, is a fighter aircraft that is on the lower side of weight, cost, and other features. The aircraft provides cost-effective design and performance by selecting specific features according to requirements.

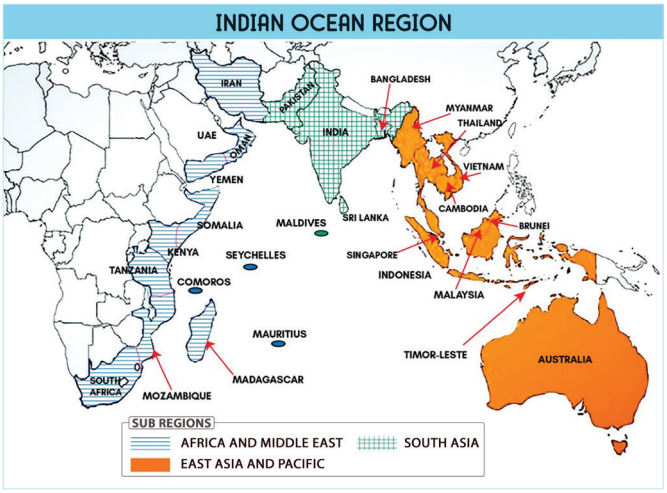
- **LCA Mk1A:** It is the most advanced version of the LCA Tejas. It is equipped with AESA Radar, an EW suite consisting of radar warning and self-protection jamming, Digital Map Generator (DMG), Smart Multi-function Displays (SMFD), Combined Interrogator and Transponder (CIT), Advanced Radio Altimeter and other advanced features.

INDIAN OCEAN NAVAL SYMPOSIUM (IONS)

India assumed the chairmanship of the IONS from Thailand.

About





DRAFT DEFENCE ACQUISITION PROCEDURE (DAP) – 2026

The Department of Defence has prepared the draft Defence Acquisition Procedure (DAP) 2026 to promote jointness, self-reliance (Atmanirbharta), force modernisation, and expansion of the defence manufacturing ecosystem. Once approved, it will replace DAP 2020.

About

- The Defence Acquisition Procedure (DAP) is India's standardized framework for procuring military equipment, platforms, and systems by the Ministry of Defence (MoD).
- It aims to ensure timely acquisitions that meet the Armed Forces' performance and capability needs while promoting self-reliance (Atmanirbharta).

Aim

- To align India's defence procurement with the changing geo-strategic environment, economic growth, expansion of the private defence industry, and technological demands of modern warfare.

Key Provisions of Draft DAP-2026

- **Ease of Participation:** Relaxation of financial and experience criteria to enable wider participation and faster procurement through greater delegation of decision-making powers.
- **Digitisation and Automation:** Greater use of digital platforms and automated systems in defence acquisition processes.
- **Atmanirbharta Focus:** Institutionalised preference for the Buy (Indian-IDDM – Indigenously Designed, Developed and Manufactured) procurement category.
- **Categorisation of Projects:** Defence acquisition projects classified based on technology availability and manufacturing readiness to promote innovation and indigenous capability.
- **Support to Start-ups and MSMEs:** Provision for advance payments against intellectual property rights or bank guarantees to encourage participation of smaller firms.
- **Revamped Trials and Quality Assurance:** Streamlined trials and QA procedures to match shorter technological cycles and manufacturing readiness.

Key Provisions of DAP-2020

- **Import Embargo:** Ministry of Defence notified a list of 101 weapons and platforms banned for import to encourage domestic manufacturing.
- **New Procurement Category:** Introduction of Buy (Global – Manufacture in India) replacing the earlier Buy and Make category.
- **Indian Vendor Definition:** A firm is considered Indian-owned if more than 50% of its capital is held by resident Indian citizen.

EXERCISE DHARMA GUARDIAN

The 7th edition of the annual India–Japan joint military exercise *Dharma Guardian* commenced at the Foreign Training Node in Chaubattia, Uttarakhand.

About

- Exercise *Dharma Guardian* was initiated in **2018**. It is conducted annually and held alternately in India and Japan.
- The primary objective of the exercise is to strengthen military collaboration and enhance the combined operational capabilities of both forces to undertake joint operations in a **semi-urban environment.**

Exercise JIMEX

It is a bilateral naval exercise conducted between the Indian Navy and the Japan Maritime Self-Defence Force (JMSDF).

Military Exercises

Exercise (Edition)	Participants	Frequency & Nature	Focus
KHANJAR (13th)	India, Kyrgyzstan	Annual, Military	Joint operations in urban warfare and counter-terrorism scenarios under the United Nations mandate

7 SCIENCE & TECHNOLOGY

SICKLE CELL DISEASE (SCD)

The United States Food and Drug Administration (U.S. FDA) has granted Orphan Drug Designation (ODD) to Desidustat for the treatment of Sickle Cell Disease (SCD).

Orphan Drug Designation

- Orphan Drug Designation (ODD) *(a regulatory status granted by the U.S. FDA to medicines intended for rare diseases affecting fewer than 200,000 people in the United States)* provides incentives to encourage pharmaceutical research. These include seven years of market exclusivity after approval, tax credits for clinical research costs, and waiver of certain regulatory fees.

Sickle Cell Disease

- Sickle Cell Disease (SCD) is a hereditary blood disorder caused by a mutation in the HBB gene *(gene encoding the beta-globin component of haemoglobin).*
- **Haemoglobin** *(the oxygen-carrying protein in red blood cells)* becomes abnormal, producing haemoglobin S (HbS). This causes red blood cells to become rigid and crescent-shaped (sickle-shaped) instead of flexible and round. These abnormal cells have a shorter lifespan and can obstruct small blood vessels.

Health Effects

Blockage of blood vessels leads to:

- Vaso-occlusive crises *(severe pain episodes due to restricted blood flow)*
- Chronic haemolytic anaemia *(destruction of red blood cells)*
- Organ damage affecting the spleen, kidneys, and lungs

Prevalence

- SCD occurs most frequently in populations of African, Mediterranean, Middle Eastern, and South Asian origin.
- In India, it is prevalent in the tribal belt covering Odisha, Jharkhand, Chhattisgarh, Madhya Pradesh, and Maharashtra.

Treatment

- Current management includes hydroxyurea therapy, blood transfusions, and infection prevention. Hematopoietic stem cell transplantation (HSCT) *(bone marrow transplantation replacing defective blood-forming cells)* remains the only established curative treatment.
- India has launched the National Sickle Cell Anaemia Elimination Mission, aiming to eliminate the disease as a public health problem by 2047.

STEM CELLS TO TREAT AUTISM

The Supreme Court of India held that offering Stem Cell Therapy (SCT) as routine treatment for Autism Spectrum Disorder (ASD) is unethical and amounts to medical malpractice.

Autism Spectrum Disorder

- Autism Spectrum Disorder (ASD) *(a neurodevelopmental disorder affecting brain development)* is characterised by persistent difficulties in social interaction, communication, and restricted or repetitive behaviours. Symptoms typically appear in early childhood and vary in severity.

Reasons for the Court's Ruling

- **Lack of scientific evidence:**
  - There is no conclusive clinical evidence demonstrating that stem cell therapy improves or cures autism.
  - Without a recognised standard of care *(an evidence-based treatment accepted by the medical community)*, physicians cannot reliably explain the risks and benefits of the therapy.
- **Violation of medical ethics:** Offering unproven treatment violates the ethical principle of non-maleficence *(the duty of medical practitioners to avoid causing harm)* and undermines informed consent.
- **Therapeutic misconception:** Some clinics present experimental procedures as established cures, misleading families of children with ASD.
- **Regulatory non-compliance:** The Indian Council of Medical Research (ICMR) and the National Guidelines for Stem Cell Research (2017, updated periodically) allow stem cell use mainly in approved clinical trials, not as routine therapy for autism.

Stem Cells and Therapy

- Stem cells are undifferentiated cells capable of developing into specialised cell types. Major types include embryonic stem cells (pluripotent), adult stem cells (multipotent), induced pluripotent stem cells—iPSCs (reprogrammed cells), and umbilical cord stem cells.
- Stem Cell Therapy *(use of stem cells to repair or regenerate damaged tissues)* is currently recognised in India as standard treatment primarily for certain hematological disorders, particularly blood cancers such as leukemia through hematopoietic stem cell transplantation.

ETHYLENE GLYCOL

The Tamil Nadu government banned a batch of Almond Kit cough syrup after tests detected ethylene glycol contamination.

About Ethylene Glycol

- Ethylene glycol (EG) *(a toxic organic chemical belonging to the diol or two-alcohol group)* is a colourless, odourless, sweet-tasting, water-soluble liquid widely used in industrial applications. Its chemical formula is $C_2H_6O_2$.
- It is commonly used as the main component of automotive antifreeze and engine coolants *(fluids that prevent freezing and overheating in engines)* because of its low freezing point and high boiling point. Ethylene glycol is also used in hydraulic fluids, industrial solvents, printing inks, and in the manufacture of polyesters and Polyethylene Terephthalate (PET) *(plastics used in textile fibres and beverage bottles).*

Toxicity and Health Effects

- Ethylene glycol is highly toxic if ingested. Inside the body it is metabolised into glycolic acid and oxalic acid, which can cause metabolic acidosis *(dangerous increase in blood acidity)* and kidney damage due to calcium oxalate crystal formation.
- Common symptoms include vomiting, dizziness, breathing difficulty, and kidney failure. Even small quantities can be fatal if untreated.

BHARAT GenAI

Under the Bharat GenAI initiative, a government-supported AI model will be available in all 22 constitutionally recognised Indian languages.

What is Bharat GenAI?

- Bharat GenAI is India's proposed sovereign Large Language Model (LLM) *(an advanced Artificial Intelligence model trained on vast text data to understand and generate human-like language)*. It is being developed as part of the IndiaAI Mission, launched by the Government of India in March 2024.
- The initiative aims to create an indigenous AI model tailored to India's linguistic diversity, cultural context, and governance needs, unlike many global AI systems that are primarily trained on Western-centric datasets.

Key Features

- **Multilingual capability:** Designed to function across 22 constitutionally recognised Indian languages listed in the Eighth Schedule of the Constitution.
- **Sovereign AI infrastructure:** Developed to ensure data sovereignty, security, and reduced dependence on foreign AI platforms.
- **National foundational model:** A base AI model that can support multiple downstream applications *(applications built on top of the core model).*

Potential Applications

- Public service delivery and e-governance
- Education and language translation
- Healthcare information systems
- Digital inclusion for regional language users

Significance

- Bharat GenAI is expected to strengthen India's AI ecosystem, promote inclusive digital access in regional languages, and enhance technological self-reliance in strategic AI capabilities.

AI-POWERED TOYS

AI-powered toy companions are increasingly being sold on e-commerce platforms, raising concerns about children's development and data safety.

What are AI Toys?

- AI toys *(internet-connected toys integrated with Artificial Intelligence systems)* are designed to interact with children through voice recognition, machine learning, and natural language processing.
- These toys often appear as **plush animals, interactive dolls, or robotic companions** and typically contain **embedded microphones and sensors** that allow them to listen to children's speech and generate responses.
- Manufacturers promote these toys as tools that can answer questions, assist learning, guide children through games or tasks, provide emotional support, and teach new skills.

Major Concerns

- **Data privacy risks:** AI toys may collect sensitive personal data such as children's voices, images, and behavioural patterns, raising concerns about data misuse.
- **Cybersecurity threats:** Internet-connected toys may be vulnerable to hacking, potentially exposing children to strangers or inappropriate content.
- **Psychological impact:** Excessive emotional dependence on AI companions may affect social interaction and emotional development.
- **Algorithmic bias:** AI systems may reproduce cultural or gender biases present in training datasets.

Regulatory Issues

- Existing child protection and data protection laws often struggle to keep pace with rapidly evolving AI-enabled consumer products.

MOLTBOOK PLATFORM

Moltbook has emerged as an experimental AI-only social media platform where artificial intelligence agents interact with each other.

About Moltbook

- Moltbook is a social networking platform designed exclusively for Artificial Intelligence agents rather than human users. The platform was developed by Matt Schlicht of Octane AI using the OpenClaw framework.
- The platform hosts topic-based communities known as **"submolts"** where AI agents powered by different **large language models (LLMs)** interact with each other through **application programming interfaces (APIs).**

Key Features

- **AI-exclusive interaction:** Only verified AI agents can post and interact, while humans primarily observe the interactions.
- **Cross-model communication:** AI agents developed using different models such as **GPT, Claude, or Gemini** can interact within the same environment.
- **Emergent behaviour:** AI agents have demonstrated the ability to generate **debates, humour, fictional belief systems, and collaborative discussions** without explicit programming.

Ethical and Governance Concerns

- The emergence of AI-only platforms raises important issues related to AI autonomy, accountability, alignment with human values, and regulatory oversight.
- It also raises questions about responsibility and governance when autonomous AI agents interact and generate content without direct human supervision.

ARCHITECTS OF ARTIFICIAL INTELLIGENCE

Time magazine named several leading technology figures as the "Architects of Artificial Intelligence" in its 2025 Person of the Year recognition.

What is an AI Architect?

- An **AI Architect** *(a senior technology professional responsible for designing Artificial Intelligence systems and infrastructure)* leads the planning, development, and deployment of AI-based solutions within organisations.
- The role requires a combination of advanced technical expertise, system architecture design skills, and strategic leadership.

Key Responsibilities

- Designing AI system architecture *(the structural design of AI software, models, and data pipelines).*
- Selecting appropriate *machine learning frameworks and algorithms.*
- Ensuring **scalability, security, and reliability** of AI systems.
- Integrating AI solutions into *existing enterprise technologies and digital platforms.*

Significance

- AI architects play a crucial role in translating research advances in Artificial Intelligence into practical applications, enabling sectors such as healthcare, finance, transportation, and public administration to adopt AI-driven solutions.

AI-PRENEURS OF INDIA

The Atal Innovation Mission (AIM) launched the "AI-Preneurs of India" initiative during the India AI Impact Summit 2026.

About

- AI-Preneurs of India is a flagship coffee table book documenting the journeys of 45 pioneering Artificial Intelligence startups in India.
- The book highlights startups working across more than 30 sectoral domains, including healthcare, education, sustainability, mobility, sports analytics, deep technology, and social impact.

Objectives

- The initiative aims to showcase how public innovation infrastructure, incubation support, and mission-driven governance are helping Indian startups build AI solutions for real-world challenges.
- It also demonstrates the geographical diversity of India's AI innovation ecosystem, extending beyond traditional technology hubs.

Significance

- The initiative positions India as a global contributor to responsible Artificial Intelligence development, rather than merely a consumer of frontier technologies.
- It also reinforces India's vision of leveraging AI for inclusive growth, technological innovation, and ethical deployment of emerging technologies.

GENERAL THEORY OF RELATIVITY

Scientists recently used one of the most powerful gravitational wave signals detected to test Einstein's General Theory of Relativity and examine the behaviour of black holes.

About

- The **General Theory of Relativity (1915)** was proposed by **Albert Einstein** as an extension of his **Special Theory of Relativity (1905)**. It provides a fundamental explanation of **gravity and the structure of space and time.**
- According to the theory, **gravity is not a conventional force** but the result of the **curvature of space-time** *(a four-dimensional continuum combining three spatial dimensions and time)* caused by **mass and energy**.

- Massive objects such as **stars, planets, and black holes** bend the surrounding space-time fabric. Other objects move along these curved paths, which we observe as gravitational attraction.

Key Predictions

- **Gravitational waves:** Ripples in space-time generated by accelerating massive objects, such as merging black holes or neutron stars.
- **Gravitational time dilation:** Time passes more slowly in strong gravitational fields.
- **Gravitational lensing:** Massive objects bend the path of light from distant sources.
- The theory also states that changes in gravitational fields propagate at the speed of light, meaning gravity operates as a dynamic interaction rather than an instantaneous force.

Significance

- Observations of gravitational waves by detectors such as **LIGO and Virgo** provide strong experimental confirmation of Einstein's theory and enable detailed studies of *extreme cosmic phenomena like black hole mergers.*

INDIA'S ASTRONOMY INFRASTRUCTURE

The Union Budget 2026–27 allocated ₹13,416.20 crore to the Department of Space, highlighting a stronger policy focus on astronomy and deep-space scientific research.

Key Budget Announcements

The government has prioritised the development and expansion of major astronomical facilities:

- **National Large Optical–Infrared Telescope (NLOT)** (a proposed 30-metre class optical–infrared telescope for observing distant galaxies, stars, and exoplanets with high sensitivity).
- **National Large Solar Telescope (NLST)** near Pangong Lake in Ladakh (a high-resolution solar telescope designed to study solar magnetic fields, sunspots, and space-weather phenomena).
- **Upgradation of the Himalayan Chandra Telescope (HCT)** at Hanle, Ladakh (a 2-metre optical–infrared telescope operated by the Indian Institute of Astrophysics for deep-sky observations).
- **Completion of the COSMOS-2 Planetarium** in Amaravati (a science outreach facility aimed at improving public engagement with astronomy).

Existing Astronomy Infrastructure

India's astronomy ecosystem already includes:

- **Giant Metrewave Radio Telescope (GMRT)** near Pune (one of the world's largest low-frequency radio telescope arrays operating in the metre wavelength range).
- **AstroSat** (India's first dedicated multi-wavelength space observatory launched in 2015 to study celestial sources in ultraviolet, X-ray, and visible bands).
- **Physical Research Laboratory (PRL), Ahmedabad** (a leading research institution contributing to planetary science and missions such as Chandrayaan and the Mars Orbiter Mission).
- **IN-SPACe (Indian National Space Promotion and Authorisation Centre)** (regulatory body enabling private sector participation in India's space sector).

Challenges and Way Forward

- India currently lacks large optical telescopes comparable to global facilities and sub-millimetre observatories *(instruments used to study cold gas clouds and star-forming regions)*.
- Strengthening domestic observatories, high-performance computing infrastructure, and international collaborations will be essential for expanding India's role in global astrophysical research.

SPACE SPINOFFS

Technologies originally developed for space exploration missions have produced important medical and healthcare applications on Earth.

What are Space Spinoffs?

- **Space spinoffs** *(civilian applications of technologies initially developed for space missions)* arise when innovations created for spacecraft, astronauts, or space research are adapted for everyday use.
- Since **1976**, **NASA** has documented **more than 2,000 spinoff technologies**, while **ISRO** has transferred **over 350 technologies to Indian industries**, including those related to healthcare and biomedical engineering.

Key Healthcare Applications

- **Medical imaging:** Image-processing techniques developed for analysing planetary images contributed to **MRI, CT scans, and digital mammography.**
- **Point-of-care diagnostics:** Miniaturised laboratory equipment developed for **microgravity medical testing** enabled portable diagnostic devices.
- **Wearable health monitoring:** Astronaut **biotelemetry systems** evolved into modern wearable devices that track **heart rate, respiration, and physical activity.**
- **Air and water purification:** Closed-loop **life-support systems** designed for spacecraft inspired hospital **air filtration and sterilisation technologies.**
- **Telemedicine:** Satellite communication technologies enable **remote medical consultations and teleradiology services.**

Significance

- Space spinoffs demonstrate how investment in space research generates technological benefits for society, particularly in healthcare, disaster response, and advanced medical technologies.

LHS 1903 PLANETARY SYSTEM

Astronomers have discovered a planetary system around the star LHS 1903 that challenges existing planet formation theories.

About the Planetary System

- The system was observed using the European Space Agency's CHEOPS (Characterising Exoplanet Satellite) space telescope.
- It contains four planets orbiting a small red dwarf star located approximately 117 light-years from Earth.

Characteristics of the Star

- **LHS 1903** is a **red dwarf star (M-dwarf)** *(a small, cool, low-luminosity star)* with about 50% of the Sun's mass and roughly 5% of the Sun's luminosity.

Planetary Composition

The planetary system consists of:

- Two rocky planets classified as **"super-Earths"** (rocky planets with masses between two and ten times that of Earth).
- Two gaseous planets classified as **"mini-Neptunes"** (planets smaller than Neptune but larger than Earth with thick gaseous atmospheres).
- Interestingly, the **outermost planet is rocky rather than gaseous**, contradicting existing **planet formation models**, which predict that planets located farther from a star are typically **gas-rich due to the availability of volatile materials.**

Significance

- The discovery challenges current understanding of planetary formation and migration theories and may improve models explaining the diversity of exoplanetary systems.

INTELLECTUAL PROPERTY AND SPACE ACTIVITIES

Growing human activity in outer space is raising complex questions about ownership and patent rights for inventions created in space.

Territorial Foundations of Patent Law

- **Patent law** *(legal protection granted for new inventions)* is traditionally **territorial**, meaning patent rights are enforced within specific **national jurisdictions.**
- Determining patent infringement usually depends on identifying *where an invention was created, used, or manufactured.*

Applicability in Space

- Outer space challenges this territorial framework because international space law prohibits national sovereignty over celestial bodies.
- However, states maintain jurisdiction over space objects they register.
- Under **Article VIII of the Outer Space Treaty**, jurisdiction over a spacecraft or station follows the **state of registry**, not the physical location in space.

Current Practice

- In practice, an invention created on a registered space object is legally treated as having occurred within the jurisdiction of the registering country.
- The **International Space Station (ISS)** follows this approach, with different modules governed by the laws of the countries that registered them.

Emerging Challenges

- Future **lunar or Martian settlements** involving multinational teams and shared infrastructure may make it difficult to determine **which country's patent laws apply.**
- This has prompted discussions about the need for a specialised international intellectual property framework for space activities.

GAS TURBINE ENGINE

The Minister for Defence visited DRDO's Gas Turbine Research Establishment (GTRE) in Bengaluru to review progress on indigenous military gas turbine projects, including tests of the Kaveri engine afterburner.

Gas Turbine Engine

- A **gas turbine engine** *(a type of internal combustion engine that converts fuel energy into mechanical power by rotating a turbine)* operates by compressing air, mixing it with fuel, and igniting the mixture to produce high-energy gases.

Main Components

- A typical gas turbine engine consists of three primary components:
  - **Compressor** (device that compresses incoming air to increase pressure before combustion).
  - **Combustion chamber** (section where compressed air mixes with fuel and burns at constant pressure).
  - **Turbine** (rotating component driven by hot exhaust gases that converts thermal energy into mechanical power).
- During operation, **compressed air enters the combustion chamber**, where fuel is injected and ignited. The resulting **high-temperature gases expand rapidly and spin the turbine**, producing power.

Applications

Gas turbine engines are widely used in:

- **Aviation:** As jet engines for aircraft propulsion.
- **Electric power generation:** Driving turbine generators in power plants.
- **Industrial applications:** Operating pipeline compressors and mechanical drives.

Historical Background

- The **first successful gas turbine engine** was demonstrated in **1903 in Paris**, marking an important milestone in the development of modern aviation and power-generation technologies.

BLACK BOX (FLIGHT RECORDER)

The Aircraft Accident Investigation Bureau (AAIB) recovered the black boxes from the Learjet-45 aircraft that crashed in Baramati, Maharashtra.

What is a Black Box?

- A **black box** *(a crash-protected electronic recording device installed in aircraft)* records critical flight information and cockpit audio to help investigators determine the causes of aviation accidents.
- Despite the name, the device is typically **bright orange or yellow** to make it easier to locate after a crash.
- The concept of the flight recorder was developed by **Australian scientist David Warren** in the 1950s.

Components of a Black Box

A modern aircraft black box usually consists of two separate recording devices:

- **Cockpit Voice Recorder (CVR)** (records cockpit conversations, radio communications, alarms, and other cockpit sounds).
- **Flight Data Recorder (FDR)** (records technical flight parameters such as altitude, airspeed, heading, vertical acceleration, and aircraft orientation including pitch and roll).

Location in Aircraft

- Both recorders are typically installed in the tail section of the aircraft, which statistically experiences less damage during crashes.

Crash Survival Features

Black boxes are designed to survive extreme conditions:

- **Material:** Reinforced casing made of titanium or stainless steel.
- **Impact resistance:** Capable of withstanding forces of about 3,400 g.
- **Fire resistance:** Can endure temperatures of about 1,100°C for at least 60 minutes.
- **Pressure resistance:** Designed to survive deep-sea pressure at depths of up to 6,000 metres.

Aircraft Accident Investigation Bureau (AAIB)

- The AAIB (India's official authority for investigating civil aviation accidents) was established in 2012 under the Ministry of Civil Aviation.
- It conducts investigations according to Annex 13 of the International Civil Aviation Organization (ICAO) and operates under the Aircraft (Investigation of Accidents and Incidents) Rules, 2017.

DIGITAL FRAUD IN INDIA

The Reserve Bank of India (RBI) has proposed compensating customers for losses arising from small-value digital fraud transactions.

RBI's Proposed Measures

- The **RBI** has proposed compensating customers **up to ₹25,000** for losses caused by **fraudulent digital transactions**, including cases where a **one-time password (OTP)** *(a temporary security code used to verify online transactions)* may have been shared inadvertently.
- The compensation will be available **once per customer** for unintended losses. Under the proposal, the payout will be **₹25,000 or up to 85% of the financial loss**, whichever is lower. In certain cases, **70% of the loss may be covered from the RBI's Deposit Education and Awareness Fund (DEAF)** *(a fund created from unclaimed bank deposits to promote financial literacy and protect depositors)*, while the **remaining share will be borne by the concerned bank.**
- The RBI will also release draft guidelines for consultation on preventing mis-selling of financial products, ensuring fair loan recovery practices, and limiting customer liability in unauthorised electronic banking transactions.

Status of Digital Fraud in India

- According to government data, cybersecurity incidents increased from 10.29 lakh in 2022 to 22.68 lakh in 2024. Despite this rise, the volume of digital payment fraud remains relatively low.
- RBI data indicate one fraudulent transaction for approximately every 1,01,242 digital transactions, with an average loss of about ₹1.40 for every ₹1 lakh transacted.

Key Drivers

- Major factors include rapid digitalisation, low digital literacy, phishing attacks, weak password practices, fake applications, and organised cybercrime networks.

Way Forward

- Strengthening cybersecurity enforcement, real-time fraud detection using artificial intelligence, digital literacy programmes, and international cooperation against cross-border cybercrime is essential to protect India's rapidly expanding digital financial ecosystem.

8 SOCIETY

NAMASTE SCHEME

For the first time, the Union government has released nationwide enumeration data of waste-pickers under the NAMASTE (National Action for Mechanised Sanitation Ecosystem) scheme.

About

- Over 52 lakh waste-pickers were enumerated across 35 States/UTs, with 84.5% from SC, ST, and OBC communities.
- In Delhi and Goa, the majority of waste-pickers are from the General category.

About NAMASTE Scheme

- Launched as a Central Sector initiative by the Ministry of Social Justice and Empowerment.
- The Scheme integrates waste-pickers into formal solid waste management from FY 2024-25. It provides ID cards via a mobile app, safety gear, skill training, health insurance under Ayushman Bharat-PMJAY, e-Shram registration, and capital subsidies for waste vehicles.

HAKKI-PIKKI TRIBE

The Embassy of India assisted Hakki-Pikki community members from Davangere, Shivamogga, and Chikkamagaluru districts, who were at risk of imprisonment in Chad.

About

- It is a tribe that lives in several states in west and south India, especially near forest areas.
- Hakki Pikkis (Hakki in Kannada means 'bird' and Pikki means 'catchers') are a semi-nomadic tribe, traditionally of bird catchers and hunters.
- Hakki Pikki people are believed to hail originally from the bordering districts of Gujarat and Rajasthan.
- Hakki Pikkis in Karnataka follow Hindu traditions and celebrate all Hindu festivals. They are non-vegetarians. The eldest son in a family is not supposed to cut his hair so that he can be identified easily.
- The tribe prefers cross-cousin marriages. The society is matriarchal, where the groom gives dowry to the bride's family. Monogamy is the norm.

JUSTICE GITA MITTAL COMMITTEE

The Supreme Court extended the tenure of the Justice Gita Mittal Committee by six months till July 31, 2026, to continue overseeing humanitarian relief for Manipur violence victims.

About

- This all-women panel, formed in August 2023 under Articles 32 and 142, comprises former judges Justice Gita Mittal (Chairperson, ex-CJ J&K HC)
- It probes violence against women, ensures medical/psychological aid, compensation, rehabilitation, legal support, and property restitution amid Meitei-Kuki clashes since May 2023.
- The panel has submitted 42 reports directly to SC, covering victim aid, skill development, and housing, despite no formal extension since July 2025.

SAFEGUARDING WOMEN AT WORKPLACE

Government reiterated commitment to strict enforcement of workplace safety legislation ensuring harassment-free professional environments for women.

About

- **Legal Framework:** The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 provides a statutory framework to prevent and redress sexual harassment in all workplaces, including government offices, private organisations, educational institutions, and the unorganised sector.
- **Vishaka Guidelines:**
  - The Supreme Court issued the Vishaka Guidelines in 1997 in the Vishaka vs State of Rajasthan case, recognising sexual harassment at the workplace as a violation of Articles 14, 15, and 21 of the Constitution.
  - The guidelines mandated preventive measures, complaint committees headed by women, and employer accountability, forming the basis of the 2013 Act.
- **Definition:** Sexual harassment includes unwelcome physical contact or advances, demands for sexual favours, sexually coloured remarks, showing pornography, and any unwelcome verbal, non-verbal, or physical conduct of a sexual nature.
- **Redressal Mechanism:**
  - Every organisation with ten or more employees must constitute an Internal Complaints Committee, while district-level Local Committees handle complaints from establishments with fewer than ten employees and domestic workers.
  - Complaints must generally be filed within three months, and the inquiry must be completed within ninety days.

- **Government Initiative:** The SHe-Box portal launched by the Ministry of Women and Child Development in 2024 enables online filing and monitoring of workplace sexual harassment complaints.

RISING DIGITAL ADDICTION AND MENTAL HEALTH ISSUES

The Economic Survey of India 2025–26 identifies excessive screen exposure and compulsive social media use as an emerging public health concern, particularly affecting children and adolescents.

Nature of Digital Addiction

- **Digital addiction** (behavioural dependence on smartphones, social media platforms, online gaming, and internet-based services) results in compulsive technology use that interferes with normal psychological functioning and daily activities.
- **Neurological vulnerability among adolescents:** Developing brain regions responsible for impulse control and decision-making increase susceptibility to reward-driven digital engagement systems.
- **Addictive design architecture of digital platforms:** Features such as infinite scrolling, algorithm-driven content feeds, auto-play videos, and reward-based notification systems stimulate dopamine release and reinforce prolonged platform use.

Health and Social Impacts

- **Mental health consequences associated with prolonged screen exposure:** Increased risk of anxiety disorders, depressive symptoms, attention difficulties, sleep disturbances, and behavioural impulsivity.
- **Physical health implications of sedentary digital behaviour:** Increased incidence of childhood obesity, musculoskeletal strain, vision-related problems, and lifestyle diseases.
- **Cognitive and educational impacts:** Continuous digital distractions reduce attention span, academic performance, and sustained cognitive concentration among students.

Key Policy Recommendations of the Economic Survey

- **Age-based access regulation for digital platforms:** The Survey recommends considering minimum age thresholds to reduce early exposure to addictive digital environments.
- **Mandatory age verification mechanisms:** Online platforms should implement reliable digital identity verification systems preventing minors from accessing inappropriate services.
- **Age-appropriate default settings:** Protective privacy controls and screen-time limits should automatically apply to accounts operated by minors.
- **Restrictions on targeted advertising directed at minors:** Regulation of algorithm-driven advertisements that exploit children's cognitive vulnerabilities.

Government Initiatives in India

- Tele-MANAS provides a twenty-four hour mental health helpline and digital counselling support, including assistance for technology addiction.
- National Institute of Mental Health and Neurosciences operates the Service for Healthy Use of Technology Clinic, India's first specialised centre for treating technology addiction.
- Digital Detox Centre in Karnataka offers structured counselling programmes addressing excessive screen use and social media dependence.

International Regulatory Approaches

- Online Safety Amendment Social Media Minimum Age Act establishes a statutory minimum social media usage age of sixteen years.
- France has proposed legislation requiring parental consent for social media accounts for users below fifteen years of age.

Preventive Policy Direction

- Integration of mental health counselling services within schools and universities to identify and address behavioural risks at an early stage.
- Expansion of public awareness programmes promoting responsible digital use and balanced screen habits.
- Development of network-level safeguards that distinguish educational digital access from recreational screen consumption.

9 CULTURE & HISTORY

DIAMOND TRIANGLE OF BUDDHIST SITES

UNESCO has reportedly included three Buddhist heritage sites from Odisha- Ratnagiri, Udayagiri and Lalitgiri, in India's tentative list for potential recognition as UNESCO World Heritage Sites.

About

- **The tentative list identifies sites** that are of outstanding universal value, either culturally or naturally, and suitable for potential inscription in the World Heritage List.
- These sites, collectively known as the **'Diamond Triangle'**, are believed to reflect the spread and evolution of all three major schools of Buddhism: **Hinayana, Mahayana and Vajrayana.**

Buddhists Sites			
Feature	**Lalitagiri (Cuttack)**	**Udayagiri (Jajpur)**	**Ratnagiri (Jajpur)**
Location	Located on Nandapahad hillock in the Assia hill range, within the Birupa river valley	Situated in the Assia hill range on the right bank of the Birupa River; also known as "Sunrise Hill" due to east-facing crescent-shaped hill	Located in the Assam hill range on the left bank of the Kelua River, a distributary of the Brahmani; also known as "Hill of Jewels"
Period / Continuity	Shows uninterrupted cultural continuity from the 2nd–3rd century BCE to the 13th century CE	Major Buddhist centre showing architectural and religious development over time	Received major patronage especially during the 8th–10th century CE
Key Archaeological Findings	Inscribed terracotta sealing reading "Sri Chandraditya Vihara Samagra Arya Bhikshu Sanghasa" (9th–10th century CE)	Inscriptions with Buddhist Dharanis on terracotta plaques and stone tablets	Copperplate inscription records residence of Queen Karpurashri
Architectural Importance	Massive stupa of Theravada phase containing relic caskets of khondalite stone, with inner steatite, silver, and gold caskets	Massive Chaityagriha showing evolution from circular to apsidal to rectangular architecture	Important monastery complex showing advanced Vajrayana Buddhist architecture
Religious / Sculptural Features	Images from Mahayana and Vajrayana pantheon such as Vajrapani, Manjusri, Tara, Jambhala, Hariti, and Aparajita	Sculptures of Avalokiteswara (colossal), Tara, Manjusri, Bhrikuti, Hariti, Chunda, Maitreya, Vairochana, Vasudhara	Major Vajrayana centre with rich sculptural and monastic remains
Patronage	Indicates continuous patronage across Theravada, Mahayana, and Vajrayana phases	Major Buddhist learning and religious centre	Patronised by Bhaumakara dynasty; female patronage by Queen Karpurashri

Odisha as an Important Buddhist Centre

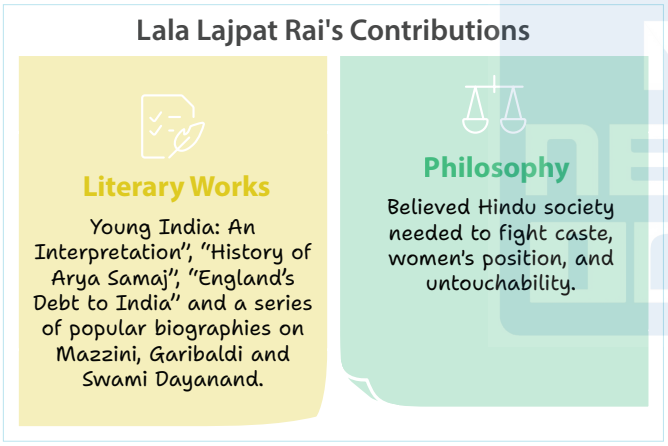
- **Patronage of Buddhism:** Buddhism flourished in Odisha under the Bhaumakara dynasty (8th–10th century CE), which supported monasteries and centres of learning.
- **Early Links with Buddhism:** Though Gautama Buddha did not visit Odisha, tradition holds that Tapassu and Bhallika from Utkala became his first disciples.
- **Impact of the Kalinga War:** After the Kalinga War (261 BCE), Emperor Ashoka adopted Buddhism and promoted it across India and Southeast Asia.
- **Maritime Connections:** Odisha maintained strong trade and cultural links with Southeast Asia, commemorated through the Baliyatra festival.

LALA LAJPAT RAI

The Prime Minister paid tributes to Punjab Kesari Lala Lajpat Rai on his birth anniversary.

About Lajpat Rai

- He was a lawyer, journalist, and freedom fighter.
- He was born on 28 January 1865 in a Punjabi Hindu family in Dhudike.
- Lala Lajpat Rai established the district branches of the Indian National Congress and Arya Samaj.
- He also contributed to newspapers like **The Tribune** and helped Mahatma Hansraj found the **Dayananda Anglo-Vedic School in Lahore.**
- He was elected President of the Indian National Congress in the Calcutta Special Session of 1920.
- In 1921, he founded **Servants of the People Society,** a non-profit welfare organization.
- He also founded the Punjab National Bank and the Lakshmi Insurance Company.



Death

- On 30 October 1928, Lala Lajpat Rai led a non-violent protest in Lahore against the Simon Commission.
- He was brutally beaten by police superintendent James A. Scott and later succumbed to his injuries on 17 November 1928.

SANT GURU RAVIDAS

To mark the 649th birth anniversary of Sant Guru Ravidas the Adampur airport is renamed Sri Guru Ravidas Ji Airport, Adampur.

About

- Guru Ravidas, a revered saint of the **Bhakti movement** in the **15th and 16th centuries,** is known for his powerful message of unity, devotion, and service to humanity.
- He is considered the founder of the **Ravidassia religion.**

Life and Teachings

- He was a staunch advocate against **caste-based discrimination** and worked tirelessly for the **upliftment of marginalised communities.**
- He promoted the principles of human **equality, love, and brotherhood,** transcending religious and social barriers.
- He envisioned a society called '**Beghumpura**' (a city without sorrow), where there is no suffering, no fear, and no discrimination.
- He gave a very broad message of **'karma'** to society by coining in the popular Hindi saying **'Mann Changa to Kathauti Mein Ganga'** (If your mind is pure, the Ganges is in your tub).

Legacy

- His devotional verses were included in the **Sikh scriptures** known as **Guru Granth Sahib.**
- **The Panch Vani text** of the **Dadu Panthi tradition** within Hinduism also includes numerous poems of Saint Ravidas.
- The Chief Architect of the Constitution, **Dr B.R. Ambedkar,** embodied the Constitutional principles around the values expressed by Guru Ravidasji.

THAIPUSAM

Recently, Thaipusam was celebrated by Tamil community in India and abroad.

DEVNIMORI RELICS

The Exposition of the Holy Devnimori Relics was recently inaugurated at Gangaramaya Temple, marking an important cultural and spiritual event in India–Sri Lanka Buddhist ties.

About

- **Location:** Devnimori is a Buddhist archaeological site located near Shamlaji in the Aravalli district of Gujarat.

- **Discovery & Excavation:** First explored in 1957 by archaeologist Prof. S. N. Chowdhry.
  - Excavations revealed significant evidence of early Buddhist worship and monastic traditions.
- **Key Archaeological Findings:**
  - The Sharira Stupa was specifically meant for enshrining bodily relics *(śarīra)* of the Gautama Buddha or eminent monks.
  - Relic Caskets containing sacred ashes, a copper box, gold and silver foil.
- **Chronology:** Dated to the 3rd–4th Century CE, corresponding to the post-Mauryan / early Gupta period.

SURAJKUND MELA

A tragic accident occurred at the Surajkund International Crafts Mela in Faridabad when a giant swing collapsed.

OL CHIKI SCRIPT

President Droupadi Murmu inaugurated the centenary celebration of the Ol Chiki script in New Delhi, emphasising its importance in preserving Santhal heritage.

About

- Ol Chiki was developed in **1925** by **Pandit Raghunath Murmu** to provide a dedicated writing system for the Santhali language.
- It comprises **30 letters** designed to capture Santhali phonetics with precision, allowing systematic documentation of its vocabulary and grammar.
- Santhali, a member of the **Austroasiatic language family**, is spoken across **Jharkhand, Odisha, West Bengal, Assam, and Bihar**.
  - It was included in the Eighth Schedule of the Constitution in 2003.

CHAKRAVARTI RAJAGOPALACHARI

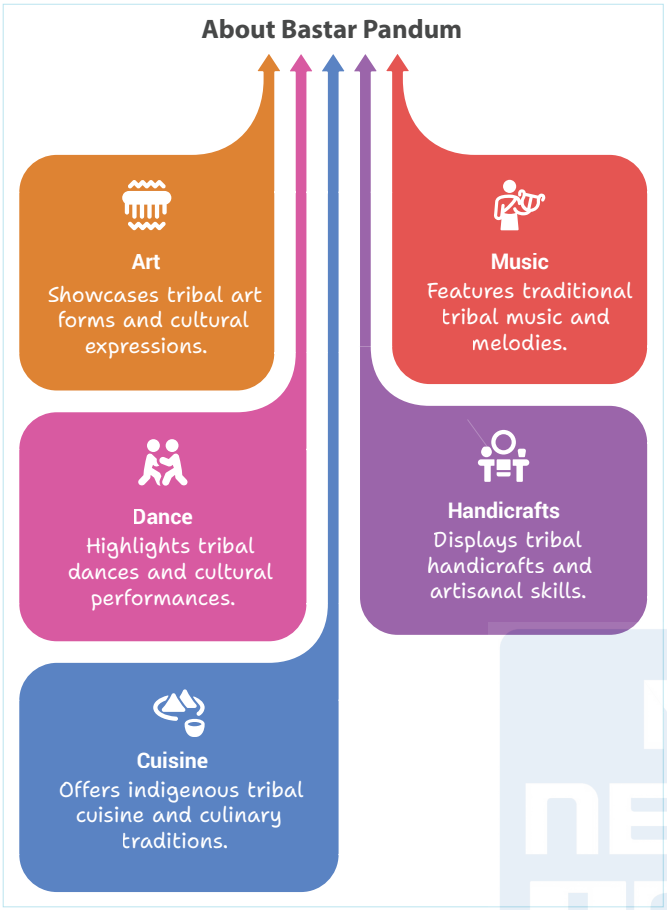
The President of India unveiled a bust of Shri Chakravarti Rajagopalachari, the first and only Indian Governor General of independent India, at Rashtrapati Bhavan.

About

- **Early Life:**
  - Chakravarti Rajagopalachari, popularly referred to as **Rajaji,** was born in **1878** in **Thorapalli, Tamil Nadu.**
  - His entry into public life was marked in 1917 when he became the chairperson of the municipality of Salem in 1917.
- **Role in India's Independence Movement:**
  - Rajaji's meeting with Mahatma Gandhi in **1919** transformed his political trajectory, prompting him to give up his legal career for the freedom struggle.
  - He participated in agitations against the **Rowlatt Act, the Non-Cooperation movement, the Vaikom Satyagraha, and the Civil Disobedience Movement** and was jailed five times between 1912 and 1941.
- **Post-independence,** Rajaji served as the **last Governor-General of India till 1950.**
  - He briefly served as **Tamil Nadu's Chief Minister** between 1952 and 1954.
  - He founded the **Swatantra Party in 1959**, representing classical liberal economic ideas.
- **Literary Contribution:** His most popular works include a retelling of the **Mahabharata and Ramayana in English,** and **Ramayana – Chakravarti Thirumagan in Tamil.**
- **In 1954** he was conferred with the **Bharat Ratna** for his contribution to Indian politics and literature.

BASTAR PANDUM FESTIVAL

Prime Minister Narendra Modi congratulated the people of Chhattisgarh for the special celebration of the 'Bastar Pandum' festival.



Key Points

- **Bastar Pandum:** A festival promoting Bastar's tribal culture through competitions in dance, music, crafts, and cuisine.
- **Anti-Naxal Initiative:** Target of Naxalism-free India by March 2026 with ₹1 crore incentive for Naxal-free villages.
- **Tribal Recognition:** GI tagging of tribal products and national honour for leaders like Birsa Munda and Veer Gundadhur.

MAHARSHI DAYANAND SARASWATI

The Prime Minister paid tributes to Maharshi Dayanand Saraswati on his birth anniversary.

Arya Samaj

- **About:** Arya Samaj is a Hindu reform movement founded by Swami Dayanand Saraswati in 1875, which upheld the Vedas as the supreme source of knowledge and truth.
- **Core Beliefs and Principles:** Emphasises Vedic authority, rejects idol worship, priestly rituals, animal sacrifice, social evils, and superstitions, and supports ideas such as karma (law of deeds), samsara (cycle of rebirth), and protection of the cow.
- **Religious Practices:** Promotes Vedic rituals such as havan/yajna (fire sacrifices) and observance of samskaras (sacraments) based on Vedic traditions.
- **Social Reforms:** Advocated female education, widow remarriage, and inter-caste marriage, and worked to remove social inequalities.
- **Institutional Contributions:** Established schools, orphanages, and widow homes, and participated in famine relief and medical assistance.

10 MISCELLANEOUS

WORLD NUCLEAR OUTLOOK REPORT

According to the new World Nuclear Outlook Report, five countries — China, France, India, Russia and the United States — could together account for nearly 980 GWe of global capacity in 2050.

About the Report

- The World Nuclear Outlook Report is published by the **World Nuclear Association (WNA)**.
  - It provides projections on the **future growth of nuclear power capacity, uranium demand, and the role of nuclear energy in global electricity generation.**
- **Objective:** The report aims to analyse how nuclear energy can contribute to **energy security, clean energy transition, and the reduction of carbon emissions**, especially in achieving net-zero targets.

Key Findings

- The report highlights that **global nuclear power capacity is expected to increase significantly by 2040 and 2050**, driven by rising electricity demand, climate commitments, and the need for reliable low-carbon energy.
  - **Global nuclear capacity** could reach 1,446 GWe by 2050, exceeding the tripling target of 1,200 GWe, with growth driven by reactors under construction, planned projects, and proposed or government-driven programs.
    - **China, France, India, Russia, and the USA** would account for most capacity, while newcomer nations aim for 157 GWe.
- **Uranium Demand:** It projects a **substantial increase in uranium demand**, as more nuclear reactors are constructed and existing ones operate for longer periods.
- **Regional Trends:** Major growth is expected in **Asia, particularly China and India**, while developed countries are focusing on **extending the life of existing reactors and developing small modular reactors (SMRs).**
- **Importance of Nuclear Energy:** The report emphasises that nuclear energy provides **reliable baseload power, low greenhouse gas emissions, and energy security**, making it important for climate change mitigation.
- **Significance for India:**
  - Current nuclear capacity stands at about **8.8 GW, with a long-term target of 100 GW by 2047**, supported by policy reforms that allow private and foreign participation while the state retains majority control.
  - India is expanding its nuclear power programme to reduce dependence on fossil fuels, enhance energy security, and achieve its net-zero emissions target by 2070.

GLOBAL TEACHER PRIZE 2026

Indian teacher Rouble Nagi has won the Global Teacher Prize 2026, receiving the one-million-dollar award at the World Government Summit in Dubai.

About

- It was launched in **2014** and is often referred to as the "Nobel Prize of Teaching".
- It is presented by GEMS Education and organised by the Varkey Foundation in collaboration with **UNESCO.**
- It recognises exceptional educators for their outstanding contributions to teaching and social transformation.

Additional Information

- Rouble Nagi is a pioneering educator from India, dedicated to making learning accessible to the most marginalised communities.
- Over the past two decades, she has established more than 800 learning centres across over 100 underserved communities and villages, reimagining abandoned walls as interactive educational murals that spark curiosity and engagement.

PANDIT DEENDAYAL UPADHYAYA

The Prime Minister Narendra Modi paid tributes to Pandit Deendayal Upadhyay on his death anniversary (11 February).

About

- Pandit Deendayal Upadhyaya (1916–1968) was born on Sept. 25, 1916, Pandit Deendayal Upadhyaya was a political thinker, economist, and founder of the **Bharatiya Jana Sangh (BJS)**.
- He studied in Kanpur and later joined the Rashtriya Swayamsevak Sangh (RSS), becoming a full-time *pracharak* in 1942.
- He was known for propounding the philosophy of **Integral Humanism (Ekatma Manav Darshan)**, which emphasised harmony between material and spiritual development, decentralisation, and a self-reliant village-based economy.
- He also contributed to ideological journalism through publications such as *Rashtra Dharma (monthly)*, *Panchajanya (weekly)*, and *Swadesh (daily)*.

Legacy

- He propounded the concept of **Antyodaya**, meaning the "rise of the last person," focusing on uplifting the poorest and most marginalised sections of society.
- Government schemes named after him include: Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY) and Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY).

KAMALA HYDROELECTRIC PROJECT

An Expert Appraisal Committee (EAC) of the Ministry of Environment, Forest and Climate Change (MoEFCC) has recommended environmental clearance for the Kamala Hydroelectric Project in Arunachal Pradesh, which may require the felling of approximately 23.4 lakh trees.

Kamala Hydroelectric Project

- The Kamala Hydroelectric Project is a multipurpose hydropower project proposed by the National Hydroelectric Power Corporation (NHPC) Limited, a Government of India public sector enterprise under the Ministry of Power responsible for developing and operating hydropower projects.
- **The project aims to achieve two primary objectives:**
  - **Electricity generation through hydropower**, contributing to India's renewable energy capacity.
  - **Flood moderation**, by regulating river flow and reducing downstream flood risks.

Location

- The project is planned on the Kamla River, which is a right-bank tributary of the Subansiri River.
- The Subansiri River is one of the largest tributaries of the Brahmaputra River, flowing through Arunachal Pradesh and Assam.

Environmental Concerns

- Construction of the project would require large-scale forest diversion and the felling of about 2.34 million trees in a biodiversity-rich Himalayan ecosystem.
- Such deforestation may affect forest cover, wildlife habitats, and ecosystem stability in the Eastern Himalayan region, which is recognised as a global biodiversity hotspot.

Regulatory Framework

- Environmental approval for such projects is governed by the Environment (Protection) Act, 1986 and the Environmental Impact Assessment (EIA) Notification, 2006.

WORLD RADIO DAY

The world radio day is observed on 13th February every year to commemorate the establishment of the United Nations Radio in 1946.

About

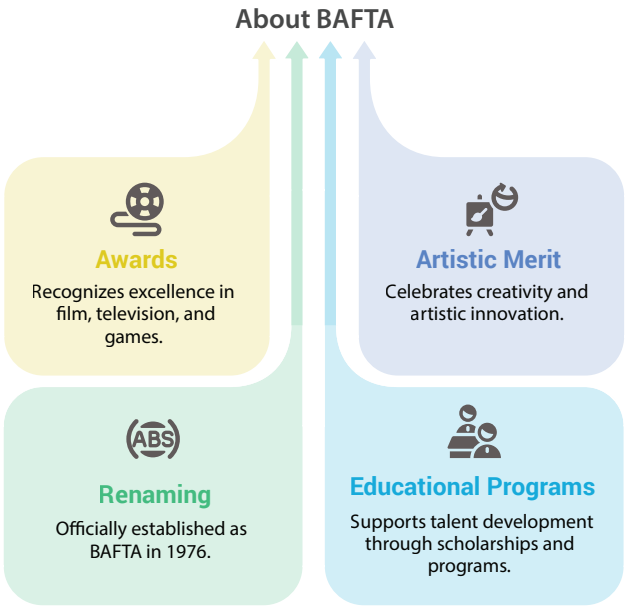
- **The theme** this year is "Radio and Artificial Intelligence: AI is a tool, not a voice."
  - It highlights how AI can enhance content production making radio more efficient and inclusive.
  - At the same time, the theme emphasises that technology must remain a support system, not a substitute for the human voice.
- World Radio Day was proclaimed by the **United Nations Educational, Scientific, and Cultural Organization (UNESCO) in 2011** and was later **adopted by the United Nations General Assembly in 2012.**
- The day has been observed yearly to promote support for broadcasters around the world and to increase awareness of the significance of the technology.

All India Radio (AIR)

- All India Radio (AIR), popularly known as Akashvani, is the radio vertical of Prasar Bharati, India's national broadcaster.
- **Motto:** Bahujan Hitaya, Bahujan Sukhaya", (for the welfare and happiness of the masses).
- **Established:** In 1936 and brought under public ownership after Independence, AIR has grown into one of the largest broadcasting organisations in the world.

FILM BOONG WON THE BAFTA AWARD

Manipuri film Boong, produced by Farhan Akhtar's Excel Entertainment, won the prestigious BAFTA Award for Best Children's & Family Film in London.



11 DATA RECAP

India AI Impact Summit, 2026

- The India AI Impact Summit 2026 attracted around six lakh participants and announced nearly $200 billion in AI investment commitments.
- India currently hosts more than 4,500 AI startups and possesses the world's third-largest AI talent pool according to the Stanford AI Index 2025.
- India operates about 38,000 GPUs for AI computing, with an additional 20,000 processors announced for expansion of sovereign compute capacity.
- NASSCOM estimates that Artificial Intelligence could contribute $450–500 billion to India's GDP by 2030.

16th Finance Commission (2026–31)

- The Finance Commission is a constitutional body established under Article 280 of the Constitution of India.
- The 16th Finance Commission was constituted in 2023 under the chairmanship of Dr. Arvind Panagariya.
- The Commission's recommendations will be implemented for the period 2026–27 to 2030–31.
- The states' share in the divisible tax pool remains 41 percent, continuing the framework of the previous commission.

PRAHAAR (India's National Counter-Terror Policy)

- PRAHAAR represents India's first comprehensive national counter-terrorism policy framework.
- The Multi-Agency Centre integrates intelligence from 28 states and more than 20 agencies.
- The National Investigation Agency reports a conviction rate of around 94 percent in terrorism cases.
- India collaborates with more than 90 countries on counter-terror intelligence and terror-financing investigations.

The Special Address and Motion of Thanks

- Article 87 of the Constitution mandates the President to deliver a Special Address to both Houses of Parliament.
- Amendments to the Motion of Thanks have been adopted in the Rajya Sabha in 1980, 1989, 2001, 2015 and 2016.
- No amendment to the Motion of Thanks has ever been passed in the Lok Sabha.

Managing Urbanization in India

- India has over 4,800 statutory towns and more than 3,900 census towns.
- The urban population in India reached about 36 percent in 2025 and may exceed 40 percent by 2036.
- Indian cities generate around 63–65 percent of the country's GDP while hosting only about 36 percent of the population.
- Under AMRUT programmes, over 4,900 water supply projects and 2,700 sewerage projects were implemented across 500 cities.

Menstrual Health as Fundamental Right

- The Supreme Court recognised menstrual hygiene as part of the Right to Life under Article 21.
- Menstrual health is also linked with the Right to Education under Article 21A and equality under Article 14.
- Schools are expected to provide free biodegradable sanitary napkins to girls from classes 6 to 12.

India–Malaysia Relations

- India and Malaysia established diplomatic relations in 1957.
- Bilateral trade between India and Malaysia reached nearly $20 billion in 2024–25.
- The 5th edition of the Harimau Shakti joint military exercise was held in Rajasthan in December 2025.
- The 10th India–Malaysia CEO Forum took place on 7 Feb. 2026.

Delhi Declaration – 2026

- The Second India–Arab Foreign Ministers' Meeting was held in New Delhi on 31 January 2026.
- The meeting included all 22 member states of the League of Arab States.
- The League of Arab States was established in 1945 in Cairo.
- Trade between India and Arab countries has exceeded $240 billion.

India's Energy Sector

- India is the third-largest consumer of energy in the world.
- The country aims to achieve 500 GW of non-fossil fuel electricity capacity by 2030.
- India targets net-zero emissions by 2070.
- Renewable energy capacity in India has expanded rapidly with solar and wind energy leading the transition.

Great Nicobar Island Project

- The Great Nicobar Island project is a large-scale infrastructure development plan in the Andaman and Nicobar Islands.
- The project includes a trans-shipment port, an international airport, a township and power infrastructure.
- It aims to enhance India's maritime connectivity and strategic presence in the Indo-Pacific region.
- The project has raised concerns regarding environmental impacts and biodiversity conservation.

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Objective Questions

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SUBJECTIVE QUESTIONS

SECTION A – 15 MARKS (250 WORDS)

GS PAPER I

1. Urbanisation in India is increasingly driven by the growth of medium and small cities. Discuss the opportunities and challenges associated with the rise of Tier-II and Tier-III urban centres in India's development trajectory.
2. Climate change is gradually altering the spatial and temporal dynamics of agriculture in India. Examine its implications for cropping patterns, water availability, and agricultural sustainability.
3. India's demographic dividend is often viewed as a major driver of economic growth. Critically examine the regional disparities and gender dimensions associated with India's demographic transition.

GS PAPER II

4. With the rapid advancement of digital technologies, the governance of Artificial Intelligence has emerged as an important policy concern. Analyse the significance of India's human-centric approach to Artificial Intelligence governance in the evolving global digital order.
5. Parliamentary democracy requires effective legislative oversight and meaningful deliberation. Examine the factors responsible for the declining quality of legislative scrutiny in the Indian Parliament.
6. India's engagement with the Global South has gained renewed momentum in recent years. Discuss the strategic significance of India's development partnerships with Africa and the Indo-Pacific region.
7. Fiscal relations between the Union and the States are central to the functioning of Indian federalism. Critically examine the challenges affecting cooperative fiscal federalism in India.

GS PAPER III

8. India has introduced several policy initiatives to develop a domestic semiconductor manufacturing ecosystem. Analyse the opportunities and constraints in achieving technological self-reliance in this sector.
9. Green hydrogen is expected to play a significant role in India's transition towards a low-carbon economy. Discuss the technological, economic, and policy challenges associated with scaling up green hydrogen production.
10. The increasing frequency of extreme weather events highlights the importance of resilient infrastructure. Evaluate India's preparedness in building climate-resilient infrastructure systems.

SECTION B – 10 MARKS (150 WORDS)

GS PAPER I

11. Discuss the role of India's cultural diplomacy in strengthening its global soft power.
12. Examine the significance of women's labour force participation in achieving inclusive economic growth in India.
13. Migration has emerged as an important factor shaping India's urban transformation. Comment.

GS PAPER II

14. Digital Public Infrastructure has significantly transformed governance and public service delivery in India. Discuss.
15. Evaluate the strategic importance of the India–Middle East–Europe Economic Corridor in the context of emerging global connectivity initiatives.
16. Discuss the role of multilateral institutions in addressing global climate governance challenges.

GS PAPER III

17. Explain the concept of carbon markets. How can they contribute to achieving India's climate commitments?
18. Discuss the emerging cybersecurity challenges in the era of Artificial Intelligence and digital platforms.
19. What factors have constrained the adoption of precision agriculture technologies in India?
20. Discuss the role of space technology in disaster management and climate monitoring in India.