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YOUR PATHWAY TO UPSC SUCCESS

WEEKLY CURRENT AFFAIRS

27TH OCT TO 31ST OCTOBER

Table of contents

01 INTERNATIONAL SOLAR ALLIANCE (ISA) — 8TH SESSION OF THE ASSEMBLY

BACKGROUND

- The 8th Session of the ISA Assembly was held from **27 to 30 October 2025** in Bharat Mandapam, New Delhi, India.
- Theme: **"One Sun, One World, One Grid" (OSOWOG).**
- Host nation: India, in partnership with ISA.
- Number of participating countries, ministers etc: Delegates from over 120 countries, more than 40 ministers attended.
- The ISA is an inter-governmental treaty-based organisation launched by India and France in 2015 at COP21.

WHAT IS ISA & WHY IT MATTERS?

- ISA's objective: to promote solar energy deployment worldwide, especially in sun-rich countries, improving energy access, energy security and lowering costs.
- Headquarters: Gurugram (Haryana), India.
- Strategic significance: In the global context of energy transition, ISA is one of the few multilateral organisations with a strong focus on the Global South.
- For India: Hosting the 8th session enhances India's leadership in renewables and aligns with its ambitions (e.g., to become a global solar hub).

KEY FOCUS AREAS & OUTCOMES OF THE 8TH SESSION

Here are the major themes and outcomes of the 8th Assembly, each with details and relevance.

A. THEME OSOWOG – "ONE SUN, ONE WORLD, ONE GRID"

- The theme emphasises a globally interconnected solar grid – enabling solar power to flow across geographies, time-zones and regions.
- Plan: Begin regional interconnection (Asia-Middle East-Africa) in Phase 1, later expand to Europe/Pacific.
- Significance: Moves beyond national solar capacity to cross-border/trans-regional solar power sharing, optimising solar utilisation when one region's sun is down but another's is up.

B. NEW INITIATIVES LAUNCHED

- **SUNRISE** (Solar Upcycling Network for Recycling, Innovation & Stakeholder Engagement): Focused on solar-waste (end-of-life panels/batteries), circular economy, recycling critical minerals.
- **SIDS Solar Procurement Platform**: 16 Small Island Developing States signed MoU with ISA & World Bank, for joint solar procurement, capacity building, resilience.
- **ISA Academy / Global Capability Centre**: For skilling, digital learning in solar domain.

C. REPORTS & KNOWLEDGE OUTPUTS

ISA launched five major reports at the Assembly:

- Ease of Doing Solar 2025

- Solar PV Skills & Jobs in Africa
- Solar Compass – Special Issue on Integrated PV Applications
- Global Floating Solar Framework
- Global Solar Trends & Outlook 2025

Implication: These serve as knowledge tools for policymaking, showing data-backed global trends and opportunities – important for analytical answers in mains.

D. INDIA'S LEADERSHIP & COMMITMENTS

- In her inaugural address, Draupadi Murmu (President of India) emphasised inclusive growth, solar access for remote/poor communities, women's participation in solar sector.
- India's achievements: Solar capacity growth, manufacturing expansion, share of non-fossil capacity.
- India as host and hub: Reinforces India's ambition to be global solar knowledge/ manufacturing centre.

E. FOCUS ON GLOBAL SOUTH, SIDS, LDCS

- Emphasis that solar transition must be inclusive: no village, no farmer, no island state should be left behind.
- Additional commitment to strengthen capacity in small island states via the platform.

F. CHALLENGES, OPPORTUNITIES & NEXT STEPS

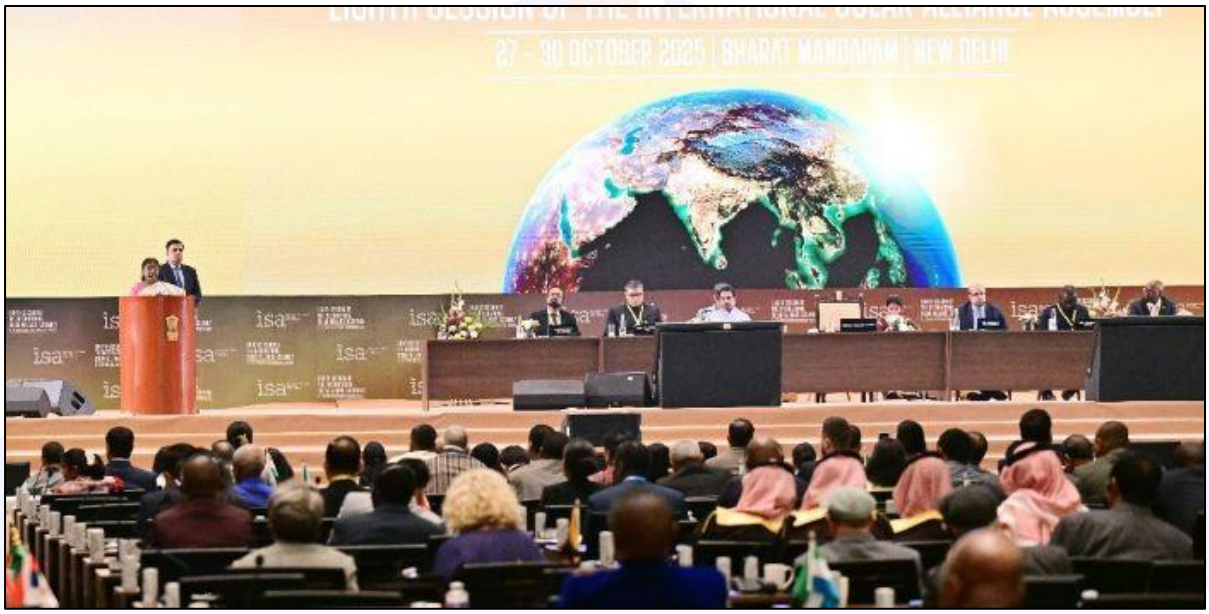
During the Assembly, discussions centred on:

- Financing: Mobilising large investment.
- Technology & supply chain: Solar manufacturing, modularisation, recycling.
- Grid integration, storage, cross-border transmission.
- Land use, environmental/future solar waste.
- For instance, SUNRISE deals with solar e-waste.

SIGNIFICANCE FOR INDIA & GLOBAL ENERGY TRANSITION

- **India's Energy Diplomacy**: Hosting ISA's 8th session gives India leadership among sun-rich and G-20 countries alike.
- **Global Solar Grid Vision:** OSOWOG if realised could mean large-scale solar export/ import across continents — new dimension of energy trade.

- **Solar Manufacturing & Value Chain**: With China joining ISA (announced at the Assembly) as a major manufacturing player, global solar supply chain dynamics may shift.
- **Renewables & Climate Goals**: Supports Paris Agreement goals, SDG 7 (Affordable & Clean Energy) and SDG 13 (Climate Action).
- **South-South Cooperation**: ISA as a vehicle for technology transfer, capacity building among developing countries.
- **Business & Innovation**: Reports launched help in investment and private sector participation.
- For UPSC mains, these can be used in essays/answers: e.g., Role of India in global climate governance; challenges in renewable energy transition; global value chains in solar manufacturing; link between technology and development.



KEY ISSUES, CRITIQUES & THINGS TO WATCH

- **Implementation Gap**: The vision (global grid, circular economy) is ambitious – realising it will require huge finance, coordination across borders, regulatory harmony.
- **Supply-chain dependencies**: Despite manufacturing push, India still depends on some imports (e.g., modules, minerals).
- **Land & ecological trade-offs**: Large solar parks can lead to land use conflicts, biodiversity impact.
- **Grid integration & storage**: Solar is intermittent; integrating large volumes requires storage, smart grids.

- **Solar waste / recycling**: The lifecycle issue is emerging; SUNRISE addresses it but operationalisation will matter.
  For mains answers critiquing the ISA session or India's solar strategy, these are useful angles.

PRELIMS YEAR QUESTION

Question: 1	Consider the following statements: (2016) 1. 1.The International Solar Alliance was launched at the United Nations Climate Change Conference in 2015. 2. 2.The Alliance includes all the member countries of the United Nations. Which of the statements given above is/are correct?
Option A	1 only
Option B	2 only
Option C	Both 1 and 2
Option D	Neither 1 nor 2
Answer	Ans: (a)

PRACTICE QUESTIONS

Question: 1	Which of the following reports were released during the 8th ISA Assembly? 1. Ease of Doing Solar 2025 2. Global Floating Solar Framework 3. Solar Compass – Integrated PV Applications Select the correct answer:
Option A	1 and 2 only
Option B	2 and 3 only
Option C	1, 2 and 3
Option D	1 only
Answer	Correct: C

Question: 2	The SUNRISE initiative launched during the 8th ISA Assembly is related to:
Option A	Promoting rooftop solar installations

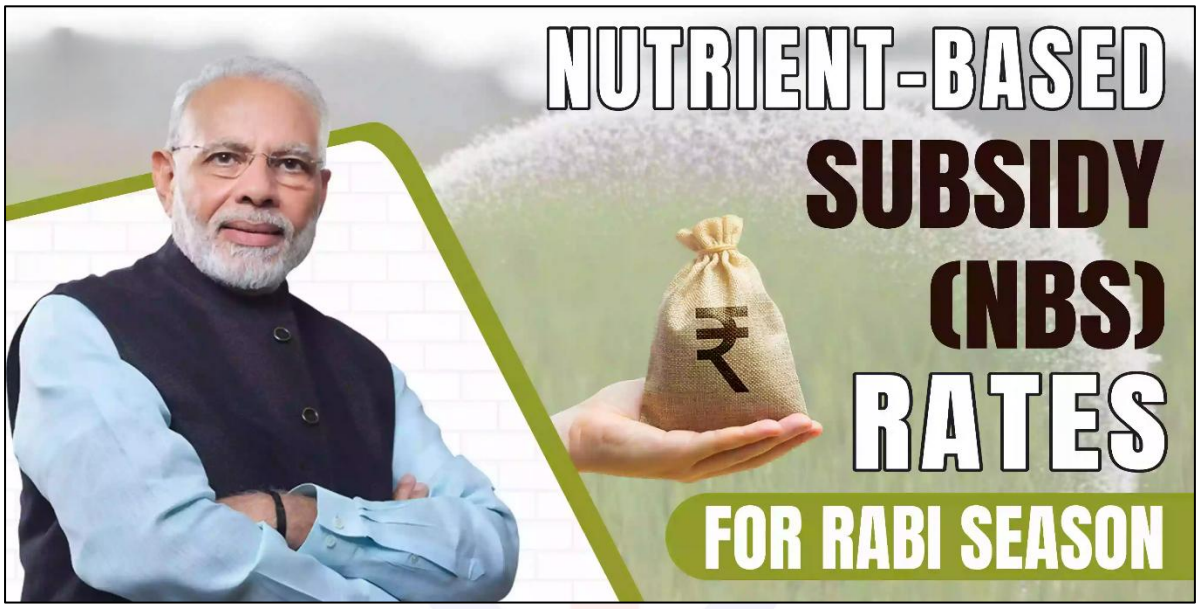
Option B	Solar waste recycling and innovation
Option C	Financing rural solar projects
Option D	Solar grid interconnectivity
Answer	Correct: B

Question: 3	The SIDS Solar Procurement Platform aims to:
Option A	Help Small Island Developing States collectively procure solar equipment.
Option B	Provide low-interest loans for solar start-ups in India.
Option C	Fund solar research in African nations.
Option D	Promote solar irrigation in South Asia.
Answer	Correct: A

Question: 4	Discuss how the ISA 8th Assembly promotes South–South Cooperation in renewable energy. (250 words)

02 NUTRIENT BASED SUBSIDY (NBS) SCHEME

Union Cabinet, chaired by Prime Minister **Narendra Modi**, has approved the **Nutrient Based Subsidy (NBS) rates** for **Phosphatic and Potassic (P&K) fertilizers** for the **Rabi season 2025–26** (from **October 1, 2025 to March 31, 2026**).



BACKGROUND

- **Launched: April 1, 2010** by the **Department of Fertilizers, Ministry of Chemicals and Fertilizers**.
- **Objective:** To promote **balanced fertilization**, **reduce fiscal burden**, and **encourage the use of non-urea fertilizers** in Indian agriculture.
- It replaced the **product-based subsidy regime** with a **nutrient-based subsidy** approach.

OBJECTIVE OF THE SCHEME

Objective	Explanation
Balanced Use of Nutrients	Encourage use of all primary (N, P, K) and secondary (S, Zn, etc.) nutrients to maintain soil health.
Rationalize Subsidy Burden	Move away from uncontrolled subsidies on specific fertilizers (like urea).

Encourage Competition	Allow fertilizer companies to fix their own MRP, leading to efficiency.
Promote Indigenous Production	Especially of Phosphatic and Potassic fertilizers.

WORKING MECHANISM OF NBS SCHEME

- **Nutrients Covered:**
  - **Primary Nutrients:** Nitrogen (N), Phosphate (P), Potash (K)
  - **Secondary Nutrients:** Sulphur (S)
  - **Micronutrients (since 2021):** Zinc (Zn), Boron (B)
- **Subsidy Calculation:**
  - Subsidy is **fixed per kg** of nutrient (N, P, K, S, etc.).
  - The subsidy per nutrient is announced **annually** by the Government.
  - Example: If subsidy on N = ₹18/kg, P = ₹45/kg, K = ₹10/kg, and S = ₹3/kg, then total subsidy for a fertilizer depends on its nutrient composition.
- **Fertilizer Manufacturers:**
  - Can determine their **Maximum Retail Price (MRP)**.
  - Receive subsidy based on the nutrient content.
- **Implementation:**
  - Implemented through **Direct Benefit Transfer (DBT)** in fertilizers.
  - Subsidy is paid to companies **after the sale** to farmers through **Point of Sale (PoS)** machines linked with Aadhaar-based authentication.

TYPES OF FERTILIZERS COVERED

Category	Examples
Phosphatic fertilizers (P)	DAP (Di-Ammonium Phosphate), SSP (Single Super Phosphate)
Potassic fertilizers (K)	MOP (Muriate of Potash)
Complex fertilizers (NPK)	10:26:26, 12:32:16, 15:15:15, etc.
Sulphur-based	SSP, Ammonium Sulphate

Urea is *not* included under NBS — it remains under a **separate controlled subsidy system**.

SUBSIDY STRUCTURE (EXAMPLE FY 2024–25)

Nutrient	Subsidy (₹/kg) FY 2024–25*
Nitrogen (N)	₹47.02/kg
Phosphate (P)	₹20.82/kg
Potash (K)	₹2.38/kg
Sulphur (S)	₹1.89/kg

(Approximate indicative values; actual notified rates may vary quarterly depending on global prices)

KEY FEATURES

- **Transparent pricing:** MRPs are market-determined.
- **Flexibility for manufacturers** to design new grades.
- **Encourages customized fertilizers.**
- **Supports soil health management** under schemes like *Soil Health Card*.
- **Direct benefit transfer (DBT) mode** ensures better monitoring and less leakage.

REFORMS AND UPDATES (2023–25)

- **2023 Update:**
  - Govt approved **₹38,000 crore** subsidy for Rabi season 2023–24 under NBS.
  - Focus on **self-reliance in DAP production** via the "Aatmanirbhar Bharat" plan.
- **Introduction of Micronutrient Subsidy (2021):**
  - Extended to **Zinc and Boron** fertilizers to tackle micronutrient deficiency.
- **Revamp of NBS Policy:**
  - Government planning a **One Nation–One Fertilizer** policy under "Bharat" brand (2022).

- All fertilizers under NBS are sold under **Bharat brand packaging**, though manufacturing company details remain.

- **Green Hydrogen Integration:**
  - Plans to promote **Green Ammonia and Green Urea** under NBS framework in coming years.

BENEFITS OF NBS

Benefit	Explanation
Promotes **balanced fertilization**	Prevents overuse of urea and nitrogenous fertilizers.
Ensures **nutrient security**	Encourages use of phosphatic and potassic fertilizers.
Reduces **fiscal burden**	Moves towards a more predictable subsidy regime.
Encourages innovation	Allows industry to launch new fertilizer grades.
Reduces leakages	With DBT and PoS authentication.

CHALLENGES AND CRITICISM

Challenge	Description
Urea not under NBS	Leads to **imbalance** in NPK ratio (currently 7:3:1 instead of ideal 4:2:1).
Frequent price fluctuations	Due to international raw material dependency.
Farmers' awareness low	Farmers often unaware of nutrient balance importance.
Delayed subsidy payments	Affects cash flow of companies.
Limited focus on micronutrients	Despite inclusion, adoption remains low.

WAY FORWARD

- **Include Urea under NBS** to ensure full nutrient balance.
- **Encourage organic and bio-fertilizers** within subsidy framework.
- **Promote domestic production** through Make-in-India for DAP, MOP, etc.

- **Periodic review** of NBS rates based on international prices.
- **Awareness programs** on balanced fertilizer usage via Soil Health Cards.

SCHEMES LINKED TO NBS

Scheme	Connection
Soil Health Card Scheme	Helps identify nutrient deficiency in soil for rational fertilizer use.
Paramparagat Krishi Vikas Yojana (PKVY)	Encourages organic alternatives.
DBT in Fertilizers	Ensures transparent subsidy release under NBS.

IMPORTANT FACTS FOR PRELIMS

- Implemented by **Department of Fertilizers, Ministry of Chemicals and Fertilizers**.
- Subsidy is **nutrient-based**, not fertilizer-based.
- **Urea** excluded from NBS.
- **Direct Benefit Transfer (DBT)** introduced in **2018** for fertilizer subsidy.
- **Zinc and Boron** added in 2021.
- **India imports ~25–30%** of its P&K fertilizers.

PSC PRELIMS PRACTICE MCQS

Question: 1	The Nutrient Based Subsidy (NBS) Scheme provides subsidy on which of the following nutrients? 1. Nitrogen 2. Phosphate 3. Potash 4. Sulphur Select the correct answer:
Option A	1 and 2 only
Option B	1, 2 and 3 only
Option C	1, 2, 3 and 4

Option D	2 and 3 only

Question: 2	Under the NBS Scheme, the subsidy is given to:
Option A	Farmers directly in their bank accounts
Option B	Fertilizer companies based on nutrient content
Option C	State Governments
Option D	Panchayats

Question: 3	Which one of the following fertilizers is not covered under the NBS Scheme?
Option A	DAP
Option B	MOP
Option C	SSP
Option D	Urea

Question: 4	Consider the following statements: 1. The NBS Scheme was introduced in 2010. 2. It is implemented by the Ministry of Agriculture and Farmers Welfare. 3. Micronutrients like Zinc and Boron are included under it. Which of the above are correct?
Option A	1 and 2 only
Option B	2 and 3 only
Option C	1 and 3 only
Option D	1, 2 and 3

Question: 5	What is the main aim of the NBS Scheme?
Option A	To promote crop diversification
Option B	To promote balanced use of fertilizers

Option C	To subsidize urea
Option D	To promote rainfed farming

Question: 6	The fertilizer subsidy under NBS is fixed based on:
Option A	Cost of fertilizer per tonne
Option B	Nutrient content per kilogram
Option C	Crop productivity levels
Option D	Farmer category

Question: 7	Which of the following micronutrients has been brought under NBS in recent years?
Option A	Copper and Iron
Option B	Zinc and Boron
Option C	Manganese and Nickel
Option D	Sulphur and Phosphorus

Question: 8	“One Nation – One Fertilizer” policy is implemented under which scheme?
Option A	PM-KISAN
Option B	PM-PRANAM
Option C	Nutrient Based Subsidy (NBS) Scheme
Option D	National Mission on Soil Health

Question: 9	Which of the following statements is/are correct regarding NBS Scheme? 1. It covers both urea and non-urea fertilizers. 2. Subsidy rates are fixed per kilogram of nutrients. 3. It is linked with Direct Benefit Transfer (DBT). Select the correct answer:
Option A	1 and 3 only

Option B	2 and 3 only
Option C	1 and 2 only
Option D	1, 2 and 3

Question: 10	Which of the following schemes complements the objectives of the NBS Scheme?
Option A	Soil Health Card Scheme
Option B	PM Matsya Sampada Yojana
Option C	PM Ujjwala Yojana
Option D	National Bamboo Mission

CORRECT ANSWERS:

1–(c), 2–(b), 3–(d), 4–(c), 5–(b), 6–(b), 7–(b), 8–(c), 9–(b), 10–(a)

03 RBI GOLD RESERVES SURPASS USD 100 BILLION

Reserve Bank of India (RBI) has stepped up its **gold repatriation efforts**, bringing back nearly **64 tonnes of gold** from abroad between **April and September 2025**, raising India's **gold reserves** to **USD 108 billion**.

WHAT ARE THE REASONS BEHIND RBI'S INCREASE IN ITS GOLD RESERVES?

- **Diversification of Forex Reserves:** India's forex reserves are mainly in US dollars, euros, and other currencies. Increasing gold holdings diversifies risks, protecting reserves from currency volatility.
- **Hedge Against Global Uncertainty:** During global crises like wars, inflation spikes, or financial instability, gold acts as a safe-haven asset.

    - Rising geopolitical tensions and market uncertainty drive the RBI to boost gold holdings as a safety buffer.

- **Strong Returns:** Gold prices show long-term appreciation, often outperforming currencies in uncertainty. The RBI's increased gold holdings ensure asset gains and reserve security.
- **De-dollarization Trend:** Many central banks like China, Russia, Turkey, and Poland are buying gold to cut US dollar dependence.
    - The RBI's gold purchases align with this de-dollarization trend, boosting monetary autonomy.
- **Domestic Factors and Management:** Part of the RBI's gold accumulation comes from domestic banks that import gold, adding to reserves without using foreign currency.
    - This marks a return to prudent reserve management, reflecting lessons from the 1991 crisis and 2008 Global Financial Crisis.

INDIA'S FOREIGN EXCHANGE RESERVE

- **Foreign Currency Assets (FCA)** are held in currencies such as the US dollar, euro, pound sterling, and Japanese yen.
- The reserves of gold maintained by the Reserve Bank of India.
- The Reserve Bank's financial holdings with the International Monetary Fund.
- **Special Drawing Rights (SDR),** a reserve asset created by the IMF to enhance the reserve assets of its member countries, earning interest.

- **Reserve Tranche Position (RTP):** The difference between a member's IMF quota and the IMF's holdings of the member's currency, which can be withdrawn without stringent conditions.
- **Total Reserves:** India's foreign exchange reserves stand at USD 702.28 billion as of October 2025.
- **Composition of Reserves:**
    - **Foreign Currency Assets (FCA):** USD 570.411 billion.
    - **Gold Reserves:** USD 108.546 billion
    - **Special Drawing Rights (SDRs):** USD 18.722 billion.
    - **Reserve Position with IMF:** USD 4.602 billion

WHY DOES THE RBI STORE PART OF INDIA'S GOLD RESERVES ABROAD?

- **Geopolitical Risk Mitigation:** RBI diversifies gold storage across London, New York, and Zurich to avoid over-concentration and ensure access during disruptions.
- **International Liquidity:** Gold in global hubs enables quick conversion to cash and access to international markets when needed.
- **Economic Resilience:** Overseas gold reserves can be pledged or swapped with global institutions like the IMF or BIS to quickly raise foreign currency and help India meet financial obligations during crises.
- **Trusted Custodians:** The Bank of England and BIS provide secure, reliable frameworks for gold storage.
- **Advanced Security:** Vaults in London, Switzerland, and New York feature reinforced structures, biometric access, and 24/7 monitoring for maximum protection.

04 PRADHAN MANTRI AYUSHMAN BHARAT HEALTH INFRASTRUCTURE MISSION

Pradhan Mantri Ayushman Bharat Health Infrastructure Mission was launched in **October 2021** to address the gaps in India's healthcare system exposed by the **COVID-19 pandemic** and to enhance preparedness for future health crises.

BACKGROUND

- **Launched: 25 October 2021** by the **Prime Minister** in **Varanasi, Uttar Pradesh**.
- **Implementing Ministry: Ministry of Health and Family Welfare (MoHFW)**.
- **Type: Centrally Sponsored Scheme (CSS)** with some **Central Sector components**.
- **Budget:** Around **₹64,180 crore (2021–26)**.
- **Tagline:** *"India's largest pan-India health infrastructure mission since independence."*

OBJECTIVE

To strengthen the public health infrastructure across the country and **build capacities for prevention, preparedness, and response** to future health emergencies, especially pandemics like COVID-19.

CORE VISION:

"From a reactive healthcare system to a proactive, preventive, and resilient health system."

COMPONENTS OF PM-ABHIM

The Mission is structured around **two broad categories**:

CENTRALLY SPONSORED COMPONENTS (SHARED BETWEEN CENTRE & STATES)

- **Strengthening Public Health Laboratories (PHLs)**
  - At **block, district, regional, and state levels**.
  - Establishing **Integrated Public Health Laboratories (IPHLs)** in all districts.
  - Target: ~730 districts and 3,000+ block-level labs.
- **Integrated District Public Health Offices (IDPHOs)**
  - To integrate all public health functions at the district level under one command.
- **Block Public Health Units (BPHUs)**
  - Established in all blocks to provide primary and preventive health services.
  - Focus on surveillance, testing, and community awareness.
- **Critical Care Hospital Blocks**
  - Set up in **602 districts** and **12 central institutions**.
  - To ensure availability of ICU and advanced treatment facilities.
- **Urban Health and Wellness Centres (HWCs)**
  - To provide preventive, promotive, and basic curative care in cities.

CENTRAL SECTOR COMPONENTS (FULLY FUNDED BY CENTRE)

- **National Institutions for One Health**
  - Integrates **human, animal, and environmental health** surveillance (One Health approach).
  - Monitors zoonotic and vector-borne diseases.
- **National Centre for Disease Control (NCDC) Strengthening**
  - Upgradation of **5 regional branches** and **20 metropolitan surveillance units**.
  - Improved real-time surveillance under *Integrated Health Information Platform (IHIP)*.

- **Bio-security and Bio-Safety Preparedness**
    - Strengthen capacity for detecting and managing emerging infectious diseases.
- **Regional Research Platforms (RRPs)**
    - In collaboration with **WHO–South-East Asia Region (SEAR)** for coordinated research.
- **National Institute for Health Data Science** *(proposed)*
    - Centralized data analytics for disease monitoring and health policy formulation.

INSTITUTIONAL FRAMEWORK

Level	Institution / Mechanism	Function
National	NCDC, One Health Institute, IHIP	Disease surveillance, data integration
State	State Health Institutes	Planning & implementation
District	District IPHL, IDPHO	Lab network, emergency response
Block	Block Public Health Unit	Local surveillance & community health

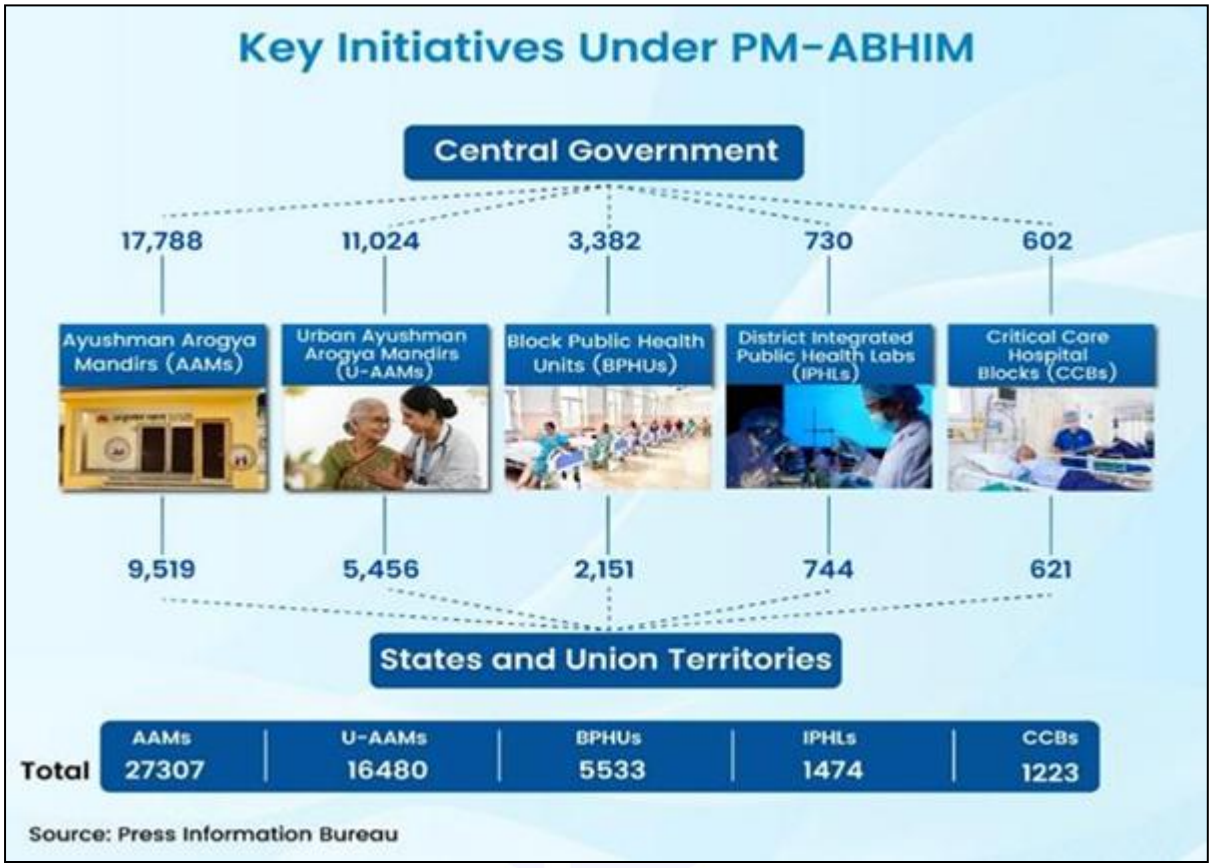
KEY FEATURES

- **Covers both rural and urban India.**
- Focuses on **core public health functions** — surveillance, diagnostics, critical care.
- Aims to create **robust IT-enabled health information systems.**
- Promotes **"One Health" approach** — integrating human, animal, and environmental health.
- Seeks **synergy with Ayushman Bharat (PM-JAY) and Health & Wellness Centres** for holistic healthcare delivery.
- Promotes **training, capacity building, and HR augmentation** in the health sector.

FUNDING PATTERN

Component Type	Funding Pattern
Centrally Sponsored	60:40 (Centre:State); 90:10 for NE & Himalayan states; 100% for UTs

Central Sector	100% funded by Centre



INTEGRATION WITH OTHER SCHEMES

Scheme	Integration Area
Ayushman Bharat – PM-JAY	Tertiary care access
Health and Wellness Centres (HWCs)	Primary care
National Health Mission (NHM)	Human resource and service delivery
Swachh Bharat Mission	Public health and sanitation
Digital Health Mission	Health data integration

SIGNIFICANCE OF PM-ABHIM

Aspect	Significance
Pandemic preparedness	Strengthens India's capacity to detect and respond to future outbreaks.

Public health decentralization	Empowers districts & blocks with dedicated infrastructure.
Data-driven health policy	Integrated Health Information Platform aids evidence-based decisions.
Reduced urban–rural gap	Ensures equitable healthcare access.
Boost to employment & research	Creates new roles for lab technicians, epidemiologists, health data managers.
Supports Atmanirbhar Bharat	Reduces dependency on foreign diagnostics and emergency supplies.

CHALLENGES

Challenge	Description
Implementation Delays	Construction, staffing, and coordination across levels.
Human Resource Shortages	Lack of trained microbiologists, epidemiologists, data analysts.
Data Privacy & Integration	Managing large health databases securely.
Financial Sustainability	Need for continuous funding post-2026.
Inter-sectoral Coordination	Effective "One Health" requires strong cooperation among multiple ministries (Health, Animal Husbandry, Environment).

PM-ABHIM VS AYUSHMAN BHARAT – PM-JAY

Parameter	PM-ABHIM	PM-JAY
Type	Infrastructure Mission	Insurance Scheme
Focus	Preventive & preparedness	Curative & hospitalization
Beneficiaries	Whole population (indirect)	~50 crore poor & vulnerable families
Implementation	MoHFW & States	National Health Authority (NHA)
Nature	Capacity building	Service delivery financing

HEALTHCARE INITIATIVES

Building a Healthier India through comprehensive Healthcare Reforms

1 PM-Ayushman Bharat Health Infrastructure Mission

Launched in October 2021 to strengthen India's public health infrastructure, surveillance, and pandemic preparedness across all care levels.

- ₹33,081.82 Crore Allocated
- 10,609 AAMs Approved
- 744 IPHLs Planned

2 Medical Education Infrastructure

Massive expansion in medical education through PMSSY scheme, establishing new AIIMS and upgrading medical colleges to correct regional imbalances.

- 387→780 Medical Colleges
- 1:811 Doctor Ratio
- 22 New AIIMS

3 Ayushman Bharat PM-JAY

World's largest government-funded health protection scheme providing ₹5 lakh health insurance cover per family per year with complete cashless transactions.

- 36.9 Cr Ayushman Cards
- 50 Cr Beneficiaries
- 1,949 Procedures

4 National Health Mission

Flagship programme providing universal access to affordable, equitable healthcare through NRHM and NUHM, achieving remarkable improvements in maternal and child health.

- 86% MMR Decline
- 73% IMR Decline
- Free All Services

5 Food Safety & Eat Right India

FSSAI's comprehensive food safety program including street vendor training, mobile testing labs, and awareness campaigns to ensure safe and nutritious food for all.

- 13.48L Inspections
- 3L+ Vendors Trained
- 305 Mobile Labs

6 Affordable Medicines & Financial Aid

Jan Aushadhi Kendras, AMRIT pharmacies, and financial assistance schemes like RAN ensuring affordable healthcare access for all economic segments.

- 16,000+ Jan Aushadhi
- ₹38,000 Cr Savings
- 50-90% Cost Reduction

WHO'S GLOBAL PANDEMIC AGREEMENT

- The World Health Organization (WHO) adopted the first Global Pandemic Agreement at its 78th World Health Assembly under Article 19 of the WHO Constitution.
- It aims to strengthen global health security and ensure equitable pandemic responses.
- Adopted on 20th May 2025, it promotes international cooperation for timely access to diagnostics, vaccines, and therapeutics.
- It is the second global legal instrument after the 2003 Framework Convention on Tobacco Control.

05 AYNI AIR BASE (TAJIKISTAN)

WHAT HAPPENED

- Ayni Air Base (also known as the Gissar Military Aerodrome, near Dushanbe in Tajikistan) was used by India under a bilateral agreement with Tajikistan.
- India's presence at Ayni has been **concluded**: the bilateral arrangement expired around 2021-22 and full withdrawal of personnel and assets was completed by early 2023.
- The official statement from the Ministry of External Affairs confirmed that India handed over the facility after the agreement ended.

BACKGROUND

- **Ayni Air Base** (also called *Gissar Military Aerodrome*) is located about **10 km west of Dushanbe**, Tajikistan's capital.
- It was **India's only overseas air base**, jointly developed with Tajikistan since the early 2000s.
- The project was part of India's strategic effort to gain a **foothold in Central Asia**, near the **Afghanistan border and the Wakhan Corridor**, only ~200 km from India's northern frontiers.

DEVELOPMENT HISTORY

Year	Event
1999–2001	India, along with Russia, helped refurbish the dilapidated Soviet-era Ayni base.

2002	India's **Border Roads Organisation (BRO)** upgraded the runway to 3,200 m, constructed air-traffic control towers, hangars and perimeter roads.
2005–2010	India stationed small Indian Air Force (IAF) contingents for maintenance and training, though no combat aircraft were permanently deployed.
2011 onwards	Tajikistan allowed limited Indian presence, but Russia (as CSTO member) retained overall control.
2021–23	Lease agreement expired and was not renewed. Full Indian withdrawal completed by 2023; formally announced in 2025.

STRATEGIC IMPORTANCE

- **Geographical Advantage:**
  - Close to Afghanistan — provided surveillance and logistical advantage during the post-9/11 operations.
  - Situated in the **heart of Central Asia**, giving India proximity to China's Xinjiang, Pakistan, and the CARs (Central Asian Republics).
- **Energy & Connectivity Hub:**
  - Gateway for India's **Connect Central Asia Policy (2012)**.
  - Potential node for accessing Central Asian oil, gas, and uranium resources.
- **Counterbalance to China & Pakistan:**
  - Enabled India to project limited air power and maintain influence in a region dominated by **China's BRI** and **Pakistan's ties through the SCO**.
- **Diplomatic Symbolism:**
  - Showed India's readiness to participate in **regional security architecture**, beyond South Asia.

WHY INDIA ENDED ITS PRESENCE?

Factor	Explanation
Expiry of Bilateral Agreement	The original arrangement (signed in early 2000s) was time-bound and expired around 2021–22. Tajikistan declined renewal.

Russian Sensitivity	Tajikistan is a CSTO member, where Russia dominates security decisions. Moscow opposed non-CSTO military presence.
Growing Chinese Influence	China's expanding footprint (through BRI and security pacts) made Tajikistan wary of allowing Indian presence that could upset China.
Reduced Operational Need	After the US withdrawal and Taliban return in Afghanistan (2021), Ayni's logistic importance for India sharply declined.
Domestic Priorities	India's strategic focus shifted toward the Indo-Pacific (Quad, IOR bases in Mauritius, Seychelles, Andaman).

IMPLICATIONS FOR INDIA

POSITIVE

- Frees resources for strengthening **Indo-Pacific maritime presence**.
- Encourages India to explore **multi-alignment and flexible security partnerships** instead of permanent bases.

NEGATIVE

- **Loss of Central Asian foothold:** No forward base north of the Himalayas now.
- Reduces **strategic depth against Pakistan and China.**
- India's influence in Central Asia may decline vis-à-vis China's Belt & Road Initiative (BRI).

INDIA'S CENTRAL ASIA ENGAGEMENT (POST-AYNI STRATEGY)

- **Connectivity Projects:**
    - *Chabahar Port* (Iran) and *International North-South Transport Corridor (INSTC)* for trade access.
- **Institutional Frameworks:**
    - Annual *India–Central Asia Summit* (first held in 2022).
    - *SCO* membership (since 2017) for regional coordination.
- **Defence Cooperation:**

- Regular *counter-terror exercises* (Kazakhstan, Uzbekistan).
- *Training programs* for Central Asian defence forces under ITEC.

- **Soft Power Engagement:**
  - Scholarships, medical tourism, cultural exchanges, digital connectivity initiatives.

BROADER GEOPOLITICAL CONTEXT

- **Russia:** Sees Central Asia as its "backyard."
- **China:** Expanding through *Belt and Road* and *security bases* (e.g., near Wakhan Corridor).
- **Pakistan:** Seeking influence through Taliban ties and Chinese backing.
- **India:** Faces challenges in maintaining balance without direct access.

WAY FORWARD FOR INDIA

- Strengthen **economic and digital linkages** with Central Asia.
- Use **multilateral platforms** (SCO, C5+India Dialogue) to enhance presence.
- Invest in **transport corridors** via Iran (Chabahar) and the *Ashgabat Agreement*.
- Deepen **security cooperation** (counter-terrorism, training, cyber-security).
- Build **flexible logistics access** rather than fixed bases (e.g., access agreements with Oman, Seychelles, Vietnam).

PRACTICE QUESTIONS

Question: 1	The Ayni Air Base, recently in news, is located in:
Option A	Kazakhstan
Option B	Uzbekistan
Option C	Tajikistan
Option D	Kyrgyzstan
Answer	Answer: C

Question: 2	The Ayni Air Base is also known as:
Option A	Farkhor Airbase

Option B	Gissar Military Aerodrome
Option C	Bishkek Tactical Base
Option D	Termez Base
Answer	Answer: B

Question: 3	India's presence at Ayni Air Base began during which period?
Option A	1980s
Option B	1990s
Option C	2000s
Option D	After 2015
Answer	Answer: C

UPSC MAINS QUESTIONS

- Discuss the strategic significance of Ayni Air Base in India's Central Asia policy. Why has India concluded its presence there?
- Evaluate how the end of India's presence in Ayni Air Base impacts its security and foreign policy interests in the Central Asian region.

06 INDIA & PULIYANKUDI LIME (TAMIL NADU)

Agricultural and Processed Food Products Export Development Authority (APEDA) has facilitated the first-ever air shipment of GI-tagged Indi Lime (Karnataka) and Puliyankudi Lime (Tamil Nadu) to the United Kingdom.

GEOGRAPHIC & AGRONOMIC CONTEXT

- The lime variety is predominantly cultivated around Puliyankudi (also spelled Puliyangudi) in the Tenkasi district of Tamil Nadu, at the foothills of the Western Ghats.
- Puliyankudi is even locally nick-named the “Lemon City of Tamil Nadu” due to the prominence of acid lime cultivation in the region.
- The soil and climatic conditions here — red loamy soils, tropical climate in the rain-shadow region of the Ghats — contribute to the lime’s distinct quality.

UNIQUE CHARACTERISTICS OF THE VARIETY

- The variety is often the “Kadayam” variety of acid lime in that region.
- Some of its standout features:
    - **High juice content**: About ~55% juice yield per fruit.
    - **High ascorbic acid (Vitamin C) content**: Reported around ~34.3 mg per 100 g in some documentation.

- **Thin peel** with rich essential oils (aroma) and wax-like surface that helps during transport.
- Each tree on average bears very large numbers of fruits — sources mention ~950 fruits per tree in typical setting.

ECONOMIC & AGRICULTURAL SIGNIFICANCE

- For the local farmers of Tenkasi district and adjoining areas (such as Sankarankovil, Kadayam, Kadayanallur, Kuruvikulam), this lime cultivation is a key income source.
- Because of its high juice yield and strong acidity/aroma, the variety is useful for juice production, culinary uses (pickles, sauces, flavouring), and possibly for essential oils.
- The recognition (see section 5) helps in branding the product, which can raise farmer incomes and support value-addition.

CHALLENGES & CONSIDERATIONS

- Despite its strengths, there may be issues: ensuring market linkages, maintaining quality, controlling spoilage/transport loss (since high juice content means delicate handling).
- Farmers need support in post-harvest infrastructure (cold chain, packaging), value-addition (juice, extract), and marketing (domestic & export).
- Agricultural diversification and comparing returns with other crops may matter — when specialty crop cultivation is chosen, input costs and risk also matter.
- Climate change, erratic rainfall, pests/diseases in lime orchards may pose future risk.

GI (GEOGRAPHICAL INDICATION) STATUS & TRADE POTENTIAL

- The Puliyankudi Acid Lime applied for GI tag (alongside other Tamil Nadu agri products) and was **officially granted the GI tag in April 2025**.
- GI registration helps in:
  - Protecting the uniqueness of the product and preventing unauthorized use of the name.
  - Branding and marketing benefits — premium pricing, market differentiation (domestic & export).
  - Promoting farmer producer organisations, collective marketing, and possibly export potential.

- Example of trade: According to sources, a first consignment of this GI-tagged lime (Puliyankudi Lime) along with another variety (Indi Lime) was shipped to the UK (150 kg of Puliyankudi Lime) via air freight.

IMPORTANT FACTS & FIGURES FOR PRELIMS

- **Location:** Puliyankudi, Tenkasi district, Tamil Nadu.
- **GI - Tag:** Puliyankudi Acid Lime got GI in April 2025.
- **Juice yield:** ~55%.
- **Ascorbic acid content:** ~34.3 mg/100 g.
- One tree bear ~950 fruits (in sources).

Question: 1	With reference to Puliyankudi Acid Lime, consider the following statements: 1. It is cultivated mainly in the deltaic regions of Tamil Nadu. 2. It recently received the Geographical Indication (GI) tag. 3. It is known for high juice yield and thin peel with aromatic essential oils. Which of the statements given above is/are correct?
Option A	1 and 2 only
Option B	2 and 3 only
Option C	1 and 3 only
Option D	1, 2 and 3
Answer	Answer: (b) Explanation: Puliyankudi Acid Lime is grown in the *Tenkasi district*, not the delta region. It got a GI tag in April 2025 and is famous for its high juice yield, aroma, and thin peel.

Question: 2	The Puliyankudi region, known for its acid lime cultivation, lies close to which of the following geographical features?
Option A	Eastern Ghats
Option B	Western Ghats
Option C	Nilgiri Hills
Option D	Palani Hills
Answer	Answer: (b)

	Explanation: Puliyankudi in Tenkasi lies at the foothills of the Western Ghats, which provide suitable red loamy soil and dry tropical climate for acid lime cultivation.

Question: 3	Which of the following characteristics make Puliyankudi Acid Lime distinct from other varieties? 1. High ascorbic acid (Vitamin C) content 2. Thick peel with low juice content 3. Naturally waxy surface aiding transport Select the correct answer using the code below:
Option A	1 and 3 only
Option B	2 only
Option C	1 only
Option D	1, 2 and 3
Answer	Answer: (a) Explanation: It has high ascorbic acid (~34 mg/100 g) and thin peel with a waxy surface, helping transport — not thick peel.

Question: 4	The Puliyankudi Acid Lime recently gained global attention when it was exported to which of the following countries along with the Indi Lime variety?
Option A	Japan
Option B	United Arab Emirates
Option C	United Kingdom
Option D	Singapore
Answer	Answer: (c) Explanation: In 2025, India exported its first consignment of GI-tagged Puliyankudi and Indi Limes to the United Kingdom.

Question: 5	Which of the following correctly describes the Puliyankudi Acid Lime?
Option A	A sweet lime variety from Erode district
Option B	A GI-tagged acid lime from Tenkasi with 55% juice yield

Option C	A hybrid lime developed by Tamil Nadu Agricultural University
Option D	A wild citrus variety found in the Western Ghats forests
Answer	Answer: (b) Explanation: Puliyankudi Acid Lime (Tenkasi, Tamil Nadu) is a GI-tagged acid lime variety with ~55% juice yield and rich Vitamin C content.

07 INDIA–NEPAL SIGN LANDMARK POWER AGREEMENTS

India and Nepal have signed two major **power cooperation agreements** to develop new **400 kilovolt (kV) cross-border transmission lines**.

WHAT ARE THE AGREEMENTS?

- India and Nepal signed a **long-term power trade agreement** in early January 2024: under this pact, India agreed to strive to import up to **10,000 MW** of electricity from Nepal over the next decade.
- On 29 October 2025, India and Nepal signed **Joint Venture (JV) and Shareholders' Agreements** to build two new high-capacity cross-border transmission lines: (a) Inaruwa (Nepal) – New Purnea (India) 400 kV, and (b) Lamki (Dododhara, Nepal) – Bareilly (India) 400 kV.
- India also approved additional export of power from Nepal: for example, approval of additional 251 MW from 12 hydropower projects in Nepal, taking authorised power exports to ~941 MW.

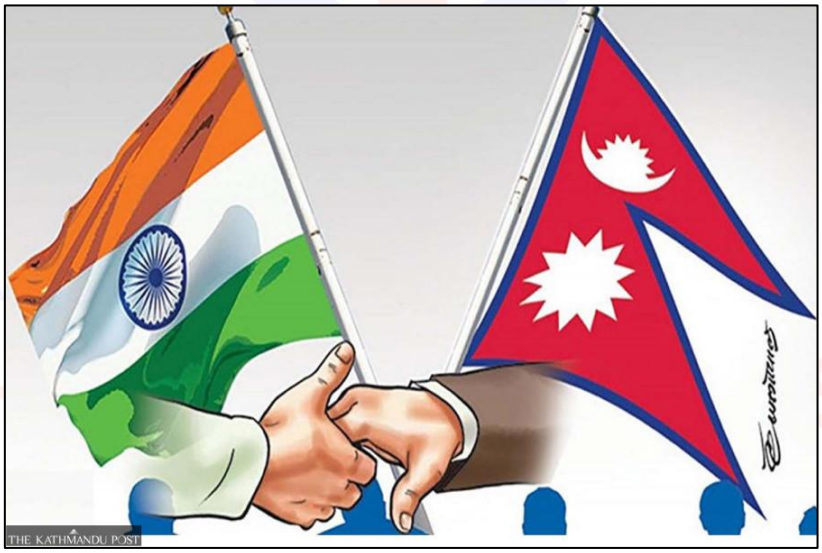
KEY FEATURES & MECHANISMS

- The two transmission lines will be executed via Joint Venture companies: one in Nepal (51% by NEA) and one in India (51% by Power Grid).
- Financing pattern: 80% debt and 20% equity for these transmission projects.
- The lines are expected to facilitate large-scale electricity exchange, strengthen grid stability and integrate Nepal's hydropower into regional markets.
- The long-term trade pact envisages Nepal becoming an electricity exporter and India as a large consumer/importer in the region.

WHY THIS MATTERS?

A) FOR REGIONAL ENERGY SECURITY & INTEGRATION

- These agreements deepen cross-border energy integration in South Asia. They enhance grid reliability, allow optimal utilisation of hydropower (Nepal) and demand-centres (India).
- They help India pursue its renewable energy goals (e.g., supplementing variable solar/wind with hydro imports) and helps Nepal monetise its hydropower potential.



B) FOR INDIA–NEPAL STRATEGIC RELATIONS

- Energy cooperation adds a strategic dimension to bilateral ties beyond trade & connectivity. It supports Nepal's economy and ties it to India's energy system—thereby reinforcing India's role in its near-neighbourhood.
- For Nepal, this generates foreign exchange, investment, infrastructure, and moves it from being import-oriented to export-oriented.

C) FOR INDIA'S BROADER AGENDA

- In the context of India's drive for clean energy transition and locational advantage in the Himalayas, such deals help secure hydropower and firming sources.
- Also aligns with India's "neighbourhood first" diplomacy, connectivity, and regional value chains.
- From GS 3 perspective: cross-border infrastructure, inter-linking grids, energy trade.

KEY ISSUES, CHALLENGES & RISKS

- **Transmission bottlenecks & Implementation delays:** Large transmission projects across borders require technical coordination, tariffs, regulatory harmonisation, land acquisition, financing.
- **Hydrology & seasonal variability:** Nepal's hydropower is monsoon-season dependent; lean season may limit exports.
- **Tariffs, cost, competitiveness:** India must price imports to make them viable vis-à-vis domestic power.
- **Geopolitical dimensions:** Nepal's balancing act between India, China, and other regional players (especially in power/hydro domain) is sensitive.
- **Environmental & social issues:** Large hydropower/reservoir or transmission can raise ecological/social concerns in Himalayan terrain.
- **Long-term contractual certainty:** Ensuring the 10,000 MW target becomes real requires concrete projects, financing, and guarantee of off-take.

QUESTION:

Question: 1	Examine the significance of the 2024–25 India–Nepal Power Agreements in transforming South Asia's regional energy architecture.

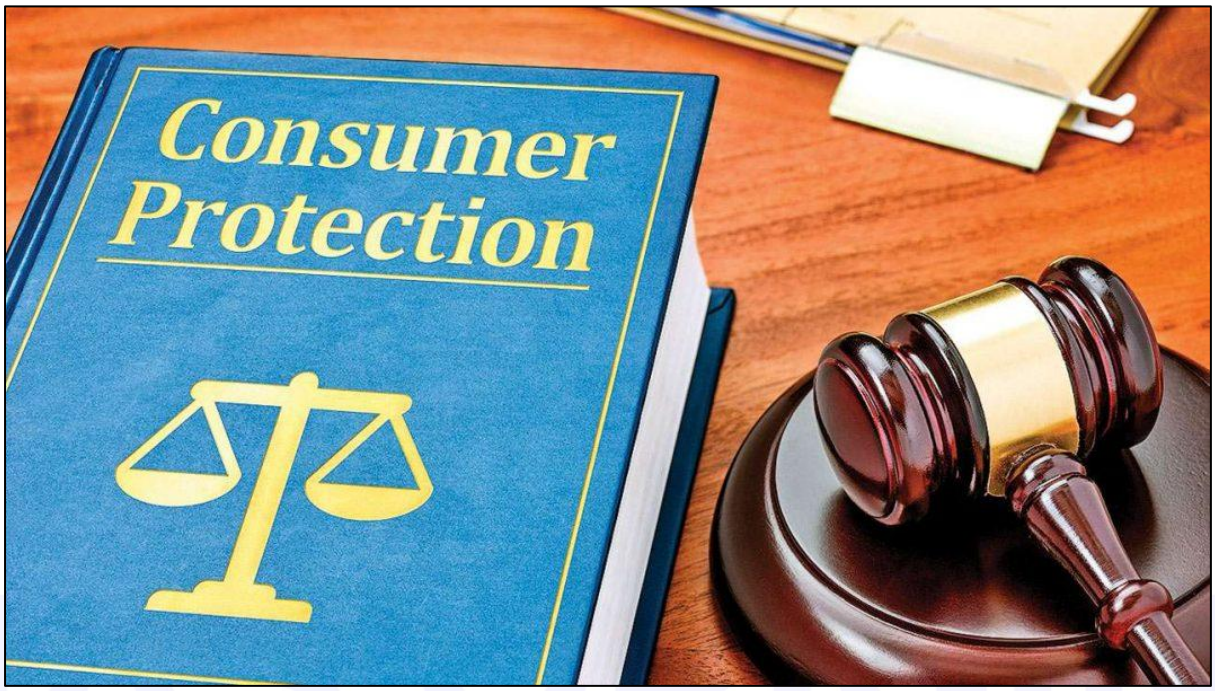
Question: 2	With reference to the India–Nepal power agreement signed in 2024, consider the following statements: 1. India agreed to import 10,000 MW of electricity from Nepal in the next decade. 2. Nepal will be importing solar energy from India. 3. The agreement was signed during the COP28 Summit in Dubai.

	Which of the statements is/are correct?
Option A	1 only
Option B	1 and 2 only
Option C	1 and 3 only
Option D	2 and 3 only
Answer	Answer: (a) Explanation: India agreed to import 10,000 MW of hydropower from Nepal; not solar. It was a bilateral pact, not part of COP28.

Question: 3	Which of the following pairs are correctly matched? **Transmission Line** / **Connects** 1. Inaruwa – Purnea / Nepal and India 2. Lamki – Bareilly / Nepal and India 3. Birgunj – Gorakhpur / India – Bangladesh Select the correct Answer:
Option A	1 only
Option B	1 and 2 only
Option C	2 and 3 only
Option D	1, 2 and 3
Answer	Answer: (b) Explanation: Inaruwa–Purnea and Lamki–Bareilly are cross-border India–Nepal lines. Birgunj–Gorakhpur connects India–Nepal, not Bangladesh.

08 LEGAL METROLOGY (PACKAGED COMMODITIES) AMENDMENT RULES, 2025

The **Department of Consumer Affairs** has notified the **Legal Metrology (Packaged Commodities) Amendment Rules, 2025**.The amendment introduces **specific provisions for packages containing medical devices**, aligning the **Legal Metrology (Packaged Commodities) Rules, 2011** with the **Medical Devices Rules, 2017**. This ensures **clarity, consumer protection, and regulatory harmony** in the medical device sector.



BACKGROUND

- **Parent Law:** Legal Metrology Act, 2009
    - Ensures uniform standards of weights & measures.
    - Protects consumers from misleading packaging or quantity frauds.
- **Subordinate Legislation:** Legal Metrology (Packaged Commodities) Rules, 2011 (LMPC Rules).
    - Mandate **declarations** on all pre-packaged commodities:
        - Name and address of manufacturer/importer
        - Net quantity
        - MRP (inclusive of all taxes)
        - Date of manufacture/expiry

- Country of origin (for imported goods)

- **Reason for Amendment (2025):**
  - Growing regulation of **medical devices**.
  - Need to reduce compliance overlaps between **Legal Metrology** and **Medical Devices Rules (2017)**.
  - Promote **ease of doing business** with clear timelines for implementation.

KEY PROVISIONS OF THE AMENDMENT (2025)

(A) APPLICABILITY TO MEDICAL DEVICES

- A new **proviso added** under Rule 2 and Rule 33:
  - For **medical devices**, declarations on the package shall be **governed by the Medical Devices Rules, 2017**.
  - This eliminates duplication and confusion between the two legal frameworks.

(B) FONT SIZE & LABELLING STANDARDS

- Under **Rule 7(2) and (3)** — For **medical devices**, the **height and width of letters and numerals** used in declarations will follow **Medical Devices Rules, 2017**, not LMPC norms.

(C) IMPLEMENTATION TIMELINE

- Any amendment related to **labelling requirements** will come into force only on:
  - **January 1** or **July 1** of a year; AND
  - After a **minimum transition period of 180 days** from the date of notification.
- Objective: Provide businesses ample time to change packaging and comply.

SIGNIFICANCE

FOR CONSUMERS

- Ensures **accurate and consistent labelling** on medical devices.
- Enhances **transparency** and **consumer protection** against misleading information.
- Aligns with "Right to Information" for consumers.

FOR INDUSTRY

- Reduces **regulatory overlap** → now one clear authority for medical-device declarations.
- Predictable timelines (180 days) → better **inventory and production planning**.
- Promotes **ease of doing business**.

FOR GOVERNMENT/REGULATORS

- Improves **coordination** between the Department of Consumer Affairs and the Ministry of Health.
- Reduces enforcement confusion at state level.
- Supports India's **regulatory reform agenda** under *Good Governance & Ease of Compliance*.

CHALLENGES AHEAD

- **State-level enforcement gaps** — different interpretations and weak monitoring.
- **E-commerce products** — online display of declarations still not uniformly implemented.
- **Awareness among small manufacturers** remains low.
- **Overlap with other regulators** (FSSAI, BIS, CPCB for eco-labelling).

PRACTICE MCQS

Question: 1	With reference to the Legal Metrology (Packaged Commodities) Amendment Rules, 2025, consider the following statements: 1. The Amendment primarily deals with packaging and labelling of food products. 2. It aligns the packaging standards for medical devices with the Medical Devices Rules, 2017. 3. The implementation of labelling changes can only begin on January 1 or July 1, with at least 180 days of transition. Which of the statements given above is/are correct?
Option A	1 and 2 only
Option B	2 and 3 only
Option C	1 and 3 only

Option D	1, 2 and 3
Answer	Answer: (b) Explanation: The Amendment is focused on medical devices, not food products (so Statement 1 is incorrect). It aligns Medical Devices packaging norms with Medical Devices Rules, 2017. The government introduced a structured timeline (Jan 1 or Jul 1) with a minimum 180-day transition for new labelling norms.

Question: 2	Which of the following Acts provides the overarching legal framework for the Legal Metrology (Packaged Commodities) Rules?
Option A	Essential Commodities Act, 1955
Option B	Consumer Protection Act, 2019
Option C	Legal Metrology Act, 2009
Option D	Standards of Weights and Measures Act, 1976
Answer	Answer: (c) Explanation: The Legal Metrology Act, 2009 governs uniform standards of weights, measures, and packaged goods declarations. The LMPC Rules (2011) were framed under this Act.

<table>
<tr><td>Question: 3</td><td>Consider the following pairs about recent amendments and their objectives:

<table><tr><td>Amendment</td><td>Objective</td></tr><tr><td>1. Legal Metrology (Packaged Commodities) Amendment Rules, 2025</td><td>Harmonize labelling of medical devices with Medical Devices Rules, 2017</td></tr><tr><td>2. Food Safety and Standards (Labelling and Display) Regulations, 2022</td><td>Introduce front-of-pack nutritional labelling</td></tr><tr><td>3. Drugs and Cosmetics (Amendment) Rules, 2021</td><td>Introduce barcoding and track-and-trace for drugs</td></tr></table>Which of the pairs given above is/are correctly matched?</td></tr>
<tr><td>Option A</td><td>1 and 2 only</td></tr>
<tr><td>Option B</td><td>1 and 3 only</td></tr>
<tr><td>Option C</td><td>2 and 3 only</td></tr>
<tr><td>Option D</td><td>1, 2 and 3</td></tr>
<tr><td>Answer</td><td>Answer: (d)
Explanation:
All three represent India’s effort to enhance consumer transparency and traceability — in commodities, food, and pharmaceuticals respectively.</td></tr>
</table>

<table>
<tr><td>Question: 4</td><td>The Legal Metrology (Packaged Commodities) Rules, 2011 mandate which of the following declarations on all pre-packaged commodities?

1. Name and address of the manufacturer
2. Country of origin (for imported goods)
3. Net quantity
4. Price excluding taxes

Select the correct answer using the code given below:</td></tr>
<tr><td>Option A</td><td>1, 2 and 3 only</td></tr>
<tr><td>Option B</td><td>2 and 4 only</td></tr>
</table>

Option C	1, 2, 3 and 4
Option D	1 and 3 only
Answer	Answer: (a) Explanation: Packages must show MRP inclusive of all taxes, so statement 4 is incorrect. Other three (name/address, country of origin, net quantity) are mandatory under LMPC Rules, 2011.

Question: 5	The Legal Metrology (Packaged Commodities) Amendment Rules, 2025 were notified by which of the following?
Option A	Ministry of Commerce and Industry
Option B	Department of Consumer Affairs, Ministry of Consumer Affairs, Food & Public Distribution
Option C	NITI Aayog
Option D	Bureau of Indian Standards (BIS)
Answer	Answer: (b) Explanation: The Amendment was issued by the Department of Consumer Affairs, under the Ministry of Consumer Affairs, Food & Public Distribution — which administers the Legal Metrology Act and Rules.

09 22ND ASEAN-INDIA SUMMIT

BASIC INFORMATION

Parameter	Details
Date	26 October 2025
Venue	Kuala Lumpur, Malaysia
Chair	Malaysia (ASEAN Chair 2025)
Mode	Hybrid (PM Narendra Modi attended virtually)
New Member	Timor-Leste joined as **11th ASEAN member**
Theme	*"Inclusivity and Sustainability"*
Type	22nd Annual ASEAN-India Summit
Partnership Framework	Comprehensive Strategic Partnership (since 2022)

CONTEXT & BACKGROUND

- India and ASEAN share **three decades of diplomatic engagement** (since 1992) and a **Comprehensive Strategic Partnership** (since 2022).
- The summit was held amid:
  - **Rising China–US competition** in the Indo-Pacific.
  - **Need for resilient supply chains** post-pandemic.

- **Maritime security concerns** in the South China Sea.

- It followed India's consistent focus under **"Act East Policy"** and **"Indo-Pacific Oceans Initiative (IPOI)"**.

KEY OBJECTIVES

- Review implementation of the **ASEAN-India Comprehensive Strategic Partnership (CSP)**.
- Adopt a **new Plan of Action (2026–2030)** for deeper cooperation.
- Expand maritime and economic collaboration.
- Reaffirm ASEAN's **"centrality"** in the Indo-Pacific architecture.

MAJOR OUTCOMES & HIGHLIGHTS

POLICY AND COOPERATION FRAMEWORK

- Adoption of **ASEAN–India Plan of Action (2026–2030)**.
- Launch of **2026 as the "ASEAN–India Year of Maritime Cooperation."**
- Endorsed **Joint Leaders' Statement on Sustainable Tourism.**
- India reaffirmed support to the **ASEAN Outlook on Indo-Pacific (AOIP)**.

ECONOMIC COOPERATION

- PM Modi called for **early review of AITIGA (ASEAN–India Trade in Goods Agreement)** to address trade imbalance and non-tariff barriers.
- Agreed to deepen collaboration on:
  - **Supply-chain resilience**,
  - **Digital economy**,
  - **Green and renewable energy**,
  - **Micro, Small & Medium Enterprises (MSMEs)**.

MARITIME & CONNECTIVITY

- India announced **ASEAN-India Maritime Exercise (AIME-2026)** under the "Year of Maritime Cooperation."
- Support for **India-Myanmar-Thailand Trilateral Highway** and its extension to Cambodia, Laos, Vietnam.
- Emphasis on **maritime safety, blue economy, and freedom of navigation**.

DEVELOPMENT & CAPACITY BUILDING

- India committed to:
  - Train **400 ASEAN professionals in renewable energy**.
  - Extend **Quick Impact Projects (QIPs)** to **Timor-Leste** for development cooperation.
  - Expand scholarships and cultural exchanges.

SIGNIFICANCE

FOR INDIA

- Strengthens **"Act East Policy"** and **Indo-Pacific engagement**.
- Enhances **maritime diplomacy** under the **SAGAR** vision (*Security and Growth for All in the Region*).
- Expands trade, connectivity and cultural linkages with one of India's largest regional partners.
- Helps **counterbalance China's Belt and Road Initiative (BRI)** influence in Southeast Asia.

FOR ASEAN

- India offers a **stable, democratic, and reliable partner** in the region.
- Supports **regional economic diversification** and **balanced geopolitics**.
- Boosts **capacity building** and **technology sharing**.

KEY CHALLENGES

Issue	Details
Trade Imbalance	India's trade deficit with ASEAN remains high.
Connectivity Delays	IMT Trilateral Highway & Kaladan projects face delays.
Divergent Interests	ASEAN members have varying stances toward China & Indo-Pacific issues.
Maritime Resource Management	Need for coordinated blue economy framework.

Limited Institutional Follow-up	Many earlier commitments suffer from weak implementation.

KEY AGREEMENTS / INITIATIVES

Initiative	Focus Area
ASEAN–India Plan of Action (2026-2030)	Political, security, economic, socio-cultural cooperation.
Year of Maritime Cooperation (2026)	Maritime connectivity, security, blue economy.
AITIGA Review	Trade facilitation, tariff rationalisation.
Joint Statement on Sustainable Tourism	Eco-tourism, heritage preservation.
Quick Impact Projects (QIPs)	Small-scale development in ASEAN (esp. Timor-Leste).

INDIA–ASEAN TRADE SNAPSHOT (2024–25)

Indicator	Value / Fact
Total Bilateral Trade	~USD 131 billion (2024-25)
ASEAN's share in India's trade	~11%
India's rank among ASEAN's trading partners	7th
Major Indian exports	Petroleum, vehicles, pharmaceuticals, machinery
Major imports	Electronics, palm oil, chemicals

PRACTICE MCQS

Question: 1	With reference to the 22nd ASEAN–India Summit (2025), consider the following statements: 1. The Summit was hosted by Malaysia under the theme "Inclusivity and Sustainability."

	2. Timor-Leste participated as a full ASEAN member for the first time. 3. The leaders adopted the ASEAN–India Plan of Action (2026–2030). Which of the statements given above is/are correct?
Option A	1 and 2 only
Option B	2 and 3 only
Option C	1 and 3 only
Option D	1, 2 and 3
Answer	Answer: (d) Explanation: The 22nd ASEAN–India Summit (October 2025) was hosted by Malaysia, under the theme "Inclusivity and Sustainability." Timor-Leste joined as the 11th ASEAN member, and the Plan of Action (2026–2030) was adopted to deepen cooperation.

Question: 2	Which of the following was declared during the 22nd ASEAN–India Summit (2025)?
Option A	2025 as the ASEAN–India Year of Sustainable Development
Option B	2026 as the ASEAN–India Year of Maritime Cooperation
Option C	2026 as the ASEAN–India Year of Digital Partnership
Option D	2025 as the ASEAN–India Year of Tourism and Connectivity
Answer	Answer: (b) Explanation: The leaders declared 2026 as the ASEAN–India Year of Maritime Cooperation, focusing on blue economy, maritime connectivity, and joint naval exercises.

Question: 3	The ASEAN–India Trade in Goods Agreement (AITIGA), often mentioned in summits, primarily aims to:
Option A	Establish a common ASEAN–India currency framework

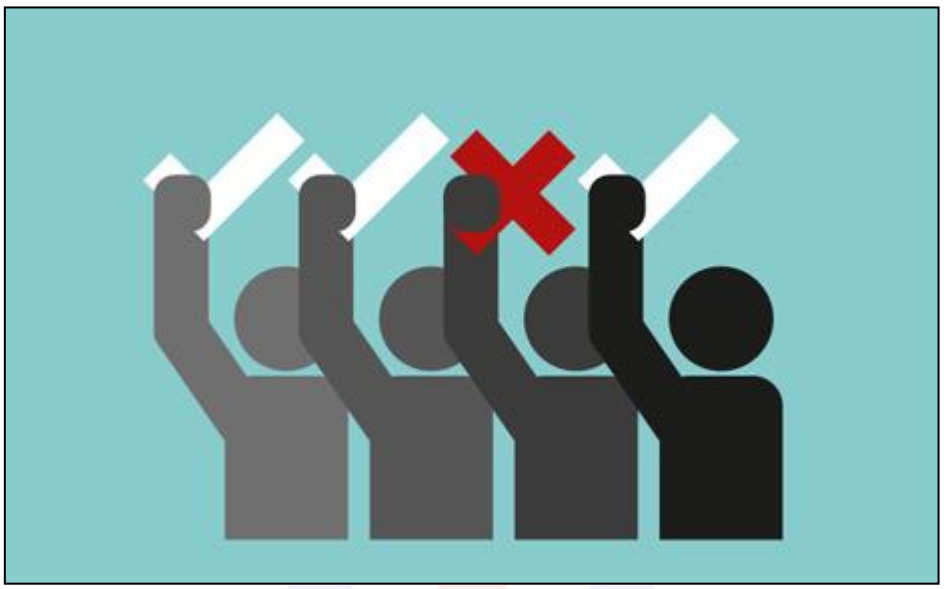
Option B	Liberalize and facilitate trade in goods between ASEAN and India
Option C	Regulate digital and e-commerce trade between ASEAN and India
Option D	Establish a single ASEAN–India customs authority
Answer	Answer: (b) Explanation: AITIGA, signed in 2009, is focused on liberalization of trade in goods, reducing tariffs and non-tariff barriers. The 2025 summit emphasized an early review of AITIGA to balance trade and improve market access.

Question: 4	Consider the following pairs regarding the key outcomes of the 22nd ASEAN–India Summit (2025): **Outcome** – **Focus Area** 1. Joint Leaders' Statement – Sustainable Tourism 2. ASEAN–India Maritime Exercise (AIME–2026) – Maritime Cooperation 3. Quick Impact Projects (QIPs) – Digital infrastructure development Which of the above pairs is/are correctly matched?
Option A	1 and 2 only
Option B	2 and 3 only
Option C	1 and 3 only
Option D	1, 2 and 3
Answer	Answer: (a) Explanation: Pair 1 ☑: The Joint Leaders' Statement on Sustainable Tourism was endorsed. Pair 2 ☑: ASEAN–India Maritime Exercise (AIME–2026) planned for maritime cooperation. Pair 3 ✗: Quick Impact Projects (QIPs) are small-scale developmental projects, not digital infrastructure projects.

Question: 5	Which of the following correctly reflects India's key focus areas at the 22nd ASEAN–India Summit (2025)? 1. Review of AITIGA for balanced trade 2. Strengthening maritime cooperation and connectivity 3. Promoting green energy and MSME collaboration 4. Establishing a regional defence alliance Select the correct answer using the code given below:
Option A	1, 2 and 3 only
Option B	2 and 4 only
Option C	1 and 3 only
Option D	1, 2, 3 and 4
Answer	Answer: (a) Explanation: India emphasized reviewing AITIGA, enhancing maritime security and connectivity, and cooperating on green energy & MSMEs. India did not propose any military or defense alliance (Statement 4 ✗).

10 INTERNAL PARTY DEMOCRACY IN INDIA

Internal party democracy in India is eroding, as **dynastic politics and power concentration within political families** have become prevalent **across both national and regional parties**.



MEANING AND CONCEPT

Internal Party Democracy (IPD) refers to the **democratic functioning within political parties**, ensuring that decisions on:

- Leadership,
- Candidate selection,
- Policy formulation, and
- Party management

  are taken through **transparent, participatory, and accountable processes**.

It ensures that parties reflect the democratic principles they advocate in public governance.

CONSTITUTIONAL AND LEGAL FRAMEWORK

Legal Basis	Description
Article 324	Empowers the **Election Commission of India (ECI)** to supervise and regulate elections, including political parties' registration and conduct.

Representation of the People Act (RPA), 1951	Provides registration of political parties (Section 29A), but **does not mandate internal democracy**.
Election Symbols (Reservation and Allotment) Order, 1968	Requires parties to submit a **constitution** ensuring elections for party posts and adherence to democratic norms.
Supreme Court Judgments	SC has emphasized democracy as a basic feature, suggesting that internal democracy is essential to the democratic ethos of India.

KEY FEATURES OF INTERNAL DEMOCRACY

- **Regular Party Elections:** Periodic elections for key positions — president, treasurer, office bearers, etc.
- **Transparent Candidate Selection:** Based on merit, ideology, and grassroots opinion, not nepotism or money power.
- **Inclusive Policy Formulation:** Consultation with state/district units and cadres in major policy decisions.
- **Accountability & Financial Transparency:** Disclosure of donations, expenditure, and audited reports to ECI.
- **Membership Participation:** Opportunities for ordinary members to vote and express dissent.

STATUS IN INDIA (GROUND REALITY)

Despite formal provisions, **Indian political parties largely lack internal democracy**.

Aspect	Reality
Leadership	Dominated by family dynasties or a single leader (e.g., Nehru-Gandhi in Congress, regional satraps in SP, DMK, RJD).
Elections	Often symbolic or manipulated; presidents are “unanimously” elected.
Decision-making	Centralized at the top, with limited role for grassroots workers.
Membership	No proper membership register or democratic participation.
Transparency	Poor disclosure of finances; opaque funding structures.

EXAMPLES

- **Congress Party:** Periodic "organizational elections" are rarely contested.
- **BJP:** Has a more structured organization, but real power rests with top leadership.
- **Regional Parties:** Highly personalized — e.g., TMC (Mamata Banerjee), DMK (Karunanidhi family), SP (Yadav family).
- **Aam Aadmi Party (AAP):** Initially promised internal democracy but faced criticism for centralizing power.

IMPORTANCE OF INTERNAL PARTY DEMOCRACY

- **Strengthens democratic culture** from grassroots to national level.
- **Prevents authoritarianism** within parties.
- **Improves policy responsiveness** and governance accountability.
- **Reduces corruption** and nepotism in candidate selection.
- **Enhances public trust** in political institutions.

CHALLENGES

Challenge	Description
Dynastic Politics	Leadership inherited by family members (Congress, DMK, RJD).
High Command Culture	Central leadership dictates decisions (AIADMK, TMC).
Lack of Regulation	No legal compulsion for democratic functioning.
Opaque Funding	No accountability in financial management.
Weak Intra-party Institutions	Poor grievance redressal and internal checks.

ROLE OF THE ELECTION COMMISSION OF INDIA (ECI)

ECI MANDATES:

- Political parties to submit their **constitution**,
- Maintain **organizational elections**,
- Furnish **audited accounts** annually.

However, ECI lacks **enforcement power** beyond **registration suspension** or **symbol withdrawal**, which it rarely uses.

COMMITTEE RECOMMENDATIONS

Committee	Key Recommendations
Dinesh Goswami Committee (1990)	Called for legal backing to internal democracy and financial transparency.
Law Commission (170th Report, 1999)	Suggested mandatory internal elections and periodic disclosure of finances.
Second ARC (2008)	Advocated a law to regulate internal party democracy, candidate selection, and funding.
ECI Proposal (2021)	Suggested linking party recognition with compliance on internal elections and audits.

WAY FORWARD / REFORMS

- **Legislative Action:** Amend RPA to enforce internal democracy as a legal requirement.
- **Empowering ECI:** Grant statutory authority to audit and penalize violations.
- **Transparency in Funding:** Mandatory real-time disclosure of donations.
- **Promote Intra-party Debates:** Encourage youth and women's participation.
- **Public Awareness:** Civil society pressure for internal reforms.
- **Link State Funding to Compliance:** Parties with better transparency should get incentives.

CONSTITUTIONAL MORALITY AND ETHICAL DIMENSION (FOR MAINS)

- Political parties are **instruments of democracy**; lack of internal democracy violates **constitutional morality** (Dr. B.R. Ambedkar).
- Internal democracy reflects **ethical governance**, **participatory politics**, and **good governance**.

UPSC PRELIMS MCQS

Question: 1	Which of the following statements about internal party democracy is/are correct?

	1. It is mandated under the Representation of the People Act, 1951. 2. The Election Commission of India supervises intra-party elections. 3. Political parties are required to submit their constitutions to the ECI.
Option A	1 and 2 only
Option B	2 and 3 only
Option C	1 and 3 only
Option D	1, 2 and 3
Answer	Answer: (b)

Question: 2	The Law Commission's 170th Report (1999) is significant in the context of:
Option A	Electoral bonds
Option B	Internal democracy within political parties
Option C	State funding of elections
Option D	Criminalization of politics
Answer	Answer: (b)

Question: 3	Which of the following reforms is not directly related to promoting internal party democracy?
Option A	State funding of elections
Option B	Mandatory internal elections
Option C	Transparent candidate selection
Option D	Financial audit of political parties
Answer	Answer: (a)

11 8TH CENTRAL PAY COMMISSION

The Union Cabinet has approved the **Terms of Reference (ToR) of the 8th Central Pay Commission.**

INTRODUCTION

- The **Central Pay Commission (CPC)** is a periodic expert body set up by the **Government of India** to review and recommend changes to the **salary, allowances, and pensions** of central government employees and defence personnel.
- The **Eighth Central Pay Commission (8th CPC)** has been **approved by the Union Cabinet in January 2025**, with implementation likely from **1 January 2026**.
- It directly affects about **50 lakh central government employees** and **~70 lakh pensioners**.

CONSTITUTIONAL AND LEGAL BASIS

Provision	Description
Article 309	Empowers Parliament to regulate recruitment and service conditions of persons in public service.
Article 320	Authorises the Union Public Service Commission to advise on matters relating to personnel policy.
Administrative Order	The Government constitutes each CPC by a **Cabinet resolution**, specifying its composition and Terms of Reference (ToR).

BACKGROUND: EVOLUTION OF PAY COMMISSIONS

Pay Commission	Year	Major Recommendations / Features
1st CPC	1946	Basic structure of civil service pay; minimum ₹55/month.
2nd CPC	1957	Rationalisation; introduction of "Dearness Allowance (DA)".
3rd CPC	1970	Linked pay to cost of living; introduced concept of "liberalised pension".
4th CPC	1983	Major salary hike; merger of DA with basic pay.
5th CPC	1994	Recommended 40% rise in salaries; focus on downsizing government.

6th CPC	2006	Introduced **Pay Bands** and **Grade Pay system**.
7th CPC	2014	Abolished grade pay; introduced **Pay Matrix** and **Fitment Factor = 2.57**; effective from 1 Jan 2016.
8th CPC	2025	Under consideration; implementation expected 1 Jan 2026.

COMPOSITION OF THE 8TH CPC

(ToR and names yet to be officially notified; expected features based on past practice)

- **Chairperson:** A retired Supreme Court Judge / senior bureaucrat.
- **Members:** Economists, defence experts, finance and administration officials.
- **Member-Secretary:** Senior officer from Department of Expenditure (Ministry of Finance).

TERMS OF REFERENCE (INDICATIVE)

- **Review of Pay Structure** – Basic Pay, Pay Matrix, and Fitment Factor.
- **Revision of Allowances** – e.g. HRA, Transport Allowance, DA, etc.
- **Pension & Retirement Benefits** – for existing and future pensioners.
- **Rationalisation of Pay Anomalies** – between different cadres and services.
- **Examine Productivity Linkage** – exploring performance-linked incentives.
- **Fiscal Sustainability** – ensure recommendations are viable for government finances.
- **Parity Issues** – Civil–Defence parity, central–state coordination.

EXPECTED IMPLEMENTATION TIMELINE

Stage	Tentative Timeframe	Description
Cabinet approval for setting up CPC	**Jan 2025**	Done
Appointment of Chairman & Members	**Mid-2025**	Under process
Submission of Report	**Late 2025 – Mid-2026**	Within 12–18 months
Implementation of Recommendations	**Likely from 1 Jan 2026**	After Cabinet review

KEY FINANCIAL COMPONENTS

A) FITMENT FACTOR

- It is the multiplier applied to basic pay to revise salaries under new pay matrix.
- 7th CPC used **2.57**; 8th CPC may propose **~2.8 – 3.0** (as per early estimates).
- Higher factor = higher salary hike.

B) MINIMUM PAY

- Under 7th CPC: ₹18,000 / month (Level 1).
- Expected 8th CPC revision: around **₹34,000 – ₹36,000** / month.

C) DEARNESS ALLOWANCE (DA)

- Adjusted twice a year to counter inflation.
- Once DA crosses **50%**, pay revision or dearness neutralisation is generally triggered.
- DA = 46% (mid-2024) → Expected > 50% (Jan 2025), prompting CPC formation.

D) PENSION REVISION

- Pension likely to be re-fixed using new pay matrix and same fitment factor.

E) ALLOWANCES RATIONALISATION

- Focus on harmonising HRA, TA, special compensatory allowances for hardship areas.

ECONOMIC AND FISCAL IMPLICATIONS

Parameter	Details
Beneficiaries	~50 lakh central staff + 70 lakh pensioners.
Estimated Outlay	Could exceed ₹1.5 – 2 lakh crore annually (0.5–0.7% of GDP).
Fiscal Impact	May widen fiscal deficit temporarily.
Positive Effects	Boost to consumption demand, multiplier effect on GDP.
Negative Effects	Inflationary pressure, higher borrowing needs.

SIGNIFICANCE

Dimension	Significance
Administrative Reform	Updates pay structure to reflect cost of living and performance.
Employee Morale	Improves motivation and retention in public service.
Macroeconomic Impact	Stimulates consumption but raises expenditure.
Equity	Addresses disparities among different service groups.
Political Economy	Popular among employees; politically sensitive.

CHALLENGES

- **Fiscal Sustainability:** Huge expenditure burden on the exchequer.
- **Delayed Implementation:** Arrears accumulate, straining budgets.
- **Productivity Link Missing:** Salary hikes not linked to output.
- **State Burden:** States usually follow Central pattern, worsening state finances.
- **Inter-Service Pay Parity:** Persistent grievances between IAS, IPS, Defence, etc.
- **Inflationary Effects:** Sudden wage hike may push inflation.

RELATED GOVERNMENT INITIATIVES

- **System of Periodic Pay Review:** Proposal to replace decennial CPCs with regular reviews.
- **7th CPC Pay Matrix Continuity:** Will likely be retained and updated.
- **Performance-Linked Incentive Scheme (PLIS):** May be recommended for future.

COMMITTEES & REPORTS ON PAY REFORMS

Committee	Year	Key Suggestion
Fifth CPC	1994	Reduce size of government workforce.
Sixth CPC	2006	Introduce pay bands and performance-based increments.
Seventh CPC	2014	Simplified pay matrix; digital transparency.

Expenditure Review Committee	2021	Advocated productivity-linked pay over routine CPCs.

GOVERNMENT STATEMENTS (2025)

- **Minister of State for Finance (Lok Sabha, Feb 2025):** "The government has begun consultations with ministries and states regarding the 8th CPC; implementation is planned from **January 2026**."
- **Cabinet Release (Jan 2025):** Approved setting up of 8th CPC to review pay and pension structure for central government employees.

PRACTICE MCQS

Question: 1	The Central Pay Commission is constituted under which constitutional provision?
Option A	Article 309
Option B	Article 312
Option C	Article 320
Option D	Administrative Resolution
Answer	Answer: (d) Explanation: CPCs are set up by an executive resolution of the Government, not by a constitutional provision directly.

Question: 2	Which of the following statements is correct regarding the Eighth Central Pay Commission? 1. It was approved by the Cabinet in January 2025. 2. Its recommendations are expected to be effective from January 2026. 3. It will revise salaries, pensions, and allowances of both central and state employees.
Option A	1 and 2 only
Option B	2 and 3 only
Option C	1 and 3 only

Option D	1, 2 and 3
Answer	Answer: (a)

Question: 3	The term Fitment Factor, often seen in news, refers to:
Option A	Formula used for dearness allowance calculation.
Option B	Multiplier used to revise basic pay under the new pay matrix.
Option C	Ratio of central to state employee pay.
Option D	Pay ratio between Class A and Class C employees.
Answer	Answer: (b)

Question: 4	Which of the following are expected outcomes of implementing a new Pay Commission? 1. Increase in private consumption demand 2. Decrease in government expenditure 3. Higher fiscal deficit
Option A	1 and 3 only
Option B	2 only
Option C	1 only
Option D	1, 2 and 3
Answer	Answer: (a)

Question: 5	The 7th CPC recommended which of the following reforms?
Option A	Introduction of Pay Matrix and abolition of Grade Pay
Option B	Introduction of Variable DA formula
Option C	Automatic linkage between pay and productivity
Option D	Pension reforms under NPS
Answer	Answer: (a)

12 CYCLONE MONTHA

Cyclone Montha, a **severe cyclonic storm**, made landfall in **Andhra Pradesh**, bringing **heavy rains, strong winds, and widespread damage** across coastal Andhra Pradesh and Odisha, and parts of Tamil Nadu.

WHAT IS CYCLONE MONTHA?

- Cyclone Montha is a **severe cyclonic storm** that formed over the Bay of Bengal in late October 2025.
- It intensified from a low-pressure area around 24 October, became a deep depression by 26 October, and was forecast to make landfall on 28 October near the Andhra Pradesh coast.
- The name "Montha" was contributed by Thailand and means a "fragrant flower" in Thai.

FORMATION & TRACK

- **Origin**: Southeast Bay of Bengal, ~24 October 2025.
- **Movement**: Moved north-northwestwards at ~12-17 km/h towards Andhra Pradesh coast.
- **Landfall**: Between Machilipatnam and Kalingapatnam near Kakinada (Andhra Pradesh) on the night of 28 October 2025.

KEY FEATURES / INTENSITY

- At landfall, the storm had **sustained winds** of about 90-100 km/h with gusts up to ~110 km/h.
- A "storm surge" of up to **10 feet (≈3 m)** was reported in some coastal areas.
- Heavy to **very heavy rainfall** in coastal Andhra Pradesh, parts of Odisha and Telangana were forecasted.

AFFECTED AREAS

- **Andhra Pradesh**: Coast around Kakinada, Machilipatnam, Kalingapatnam.
- **Odisha**: Coastal districts impacted by rainfall and winds.
- **Telangana**: Inland effects – heavy rain, flooding, damage.

IMPACTS & DAMAGE

- Initial assessments state **~₹53 billion** (≈US$603 million) damage in Andhra Pradesh alone.
- Agriculture: ~87,000 hectares of crops damaged in Andhra Pradesh.
- Casualties: At least 1-3 deaths reported; evacuation of tens of thousands of people.
- Infrastructure: Uprooted trees, snapped power lines, inundated roads, disrupted transport.

PREPARATION & RESPONSE

- Evacuations in advance: ~50,000 people moved to relief camps in Andhra Pradesh and Odisha.
- Relief camps activated, heavy vehicles banned in vulnerable coastal districts.
- Alerts: Red alerts issued for 19 districts in Andhra Pradesh.

SIGNIFICANCE (UPSC CONTEXT)

- **Disaster Management**: Demonstrates India's evolving preparedness for cyclones — early warnings, evacuation, multi-agency coordination.
- **Climate Change Link**: Increasing intensity/frequency of cyclones in Bay of Bengal tied to warming sea-surface temperatures.
- **Vulnerability & Resilience**: Coastal states are vulnerable; underscores need for resilient infrastructure, crop insurance, coastal zone management.

- **Inter-State Implications**: While landfall in Andhra, impacts travelled inland to Telangana and affected Odisha — showing cascading risk.
- **Policy Relevance**: Ties to GS 3 topics — disaster risk reduction, climate change adaptation, insurance, infrastructure resilience.

CHALLENGES & LESSONS

- **Agricultural Losses**: Huge crop damage; need for post-disaster support and protective crops.
- **Infrastructure Weaknesses**: Power, transport lines still vulnerable; rebuilding needs high investment.
- **Urban Flooding**: Inland cities (like Hyderabad) impacted — need for urban drainage and storm-water management.
- **Data Gaps**: Accurate casualty/infrastructure damage assessments often delayed.
- **Climate Adaptation**: With warming oceans, more severe storms expected — need long-term planning.

KEY FACTS & FIGURES FOR PRELIMS

Item	Detail
Landfall date	~28 October 2025 (night)
Wind speed	90-100 km/h sustained; gusts up to ~110 km/h
Damage estimate (AP)	~₹53 billion (US$603 million)
Name origin	“Montha” = Thai word for “fragrant flower”
Affected region	Andhra Pradesh (coast), Telangana (inland), Odisha (rain)

HOW TO USE IN UPSC ANSWERS

- Use this cyclone as a **case study** to illustrate India’s disaster management mechanism (evacuation, early warning).
- Tie to **climate change discussions** – showing how sea-surface warmings affect cyclones in the Bay of Bengal.
- In essays on *“Coastal resilience & disaster preparedness”*, mention crop/infra damage and need for adaptation.

- In **GS 3 (Disaster Management, Climate Change, Infrastructure)**: discuss policies like National Cyclone Risk Mitigation Project (NCRMP), cyclone shelters, early warning systems.

PRACTICE MCQS

Question: 1	With reference to Cyclone Montha (2025), consider the following statements: 1. It originated in the Arabian Sea and made landfall in Gujarat. 2. The name "Montha" was given by Myanmar and means "fragrant flower." 3. It caused widespread damage along the coast of Andhra Pradesh. Which of the statements given above is/are correct?
Option A	1 and 2 only
Option B	2 and 3 only
Option C	3 only
Option D	1, 2 and 3
Answer	Answer: (c) Explanation: Cyclone Montha originated in the Bay of Bengal, not the Arabian Sea. The name was given by Thailand, not Myanmar. It made landfall near Kakinada (Andhra Pradesh) and caused major damage.

Question: 2	Cyclone Montha formed due to which of the following conditions? 1. Warm sea-surface temperature in the Bay of Bengal (>26°C) 2. High vertical wind shear 3. Presence of Coriolis force 4. Sufficient moisture in the mid-troposphere Select the correct answer using the code below:
Option A	1, 2 and 3
Option B	1, 3 and 4
Option C	2 and 4 only

Option D	1, 2, 3 and 4
Answer	Answer: (b) Explanation: Cyclones require warm SST, Coriolis force, and moist mid-level air. High wind shear inhibits cyclone formation, so statement 2 is incorrect.

Question: 3	Consider the following pairs: **Cyclone** / **Origin Basin** / **Year** Mocha / Bay of Bengal / 2023 Biparjoy / Arabian Sea / 2023 Montha / Bay of Bengal / 2025 Which of the pairs given above is/are correctly matched?
Option A	1 and 2 only
Option B	1 and 3 only
Option C	2 and 3 only
Option D	1, 2 and 3
Answer	Answer: (d) Explanation: All three are correctly matched and part of India's recent cyclonic activity. Montha (2025) adds to the pattern of intensified post-monsoon Bay of Bengal cyclones.

Question: 4	"The increasing severity of post-monsoon cyclones like Montha indicates a changing climate regime in the Indian Ocean." Discuss.
Key Points	Post-monsoon cyclones (October–December) rising in intensity.
	Ocean heat content in Bay of Bengal ↑ ; slower dissipation of heat after monsoon.
	More frequent rapid intensification due to global warming.
	Need for regional cooperation (e.g., BIMSTEC, WMO) and satellite monitoring.
	Post-monsoon cyclones (October–December) rising in intensity.

13 SUPPLEMENTAL NUTRITION ASSISTANCE PROGRAM (SNAP)

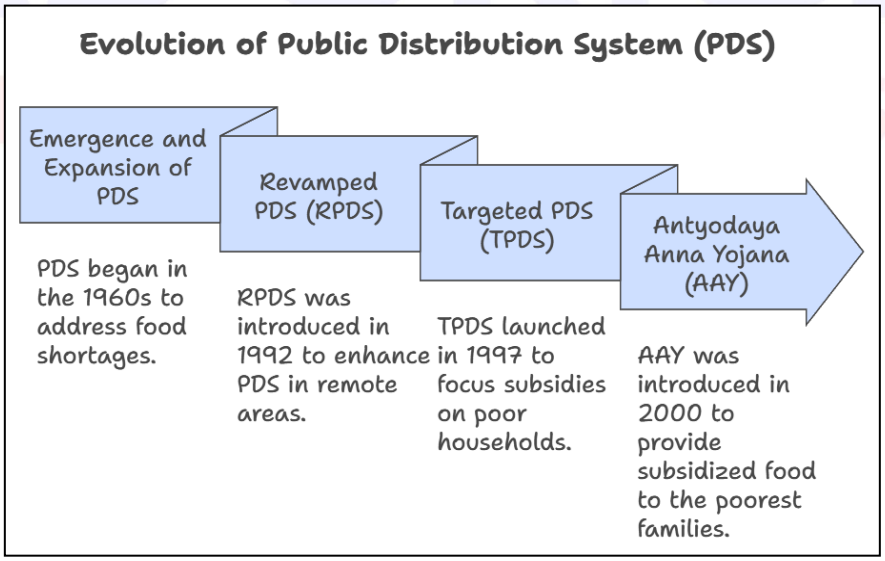
Millions of Americans will **lose Supplemental Nutrition Assistance Program (SNAP) benefits** as the **US government halts aid** amid **funding shortages and policy shifts**.

WHAT IS SNAP?

- SNAP is a U.S. federal programme that provides nutrition assistance to eligible, low-income individuals and households, helping them purchase food.
- It is administered by the United States Department of Agriculture (USDA) via its Food and Nutrition Service (FNS) and implemented at the state level in the U.S.
- Formerly known as the Food Stamp Programme; SNAP is the largest U.S. nutrition assistance programme.

PUBLIC DISTRIBUTION SYSTEM (PDS)

- **About:** PDS ensures food security by supplying essential foodgrains (e.g., wheat, rice, coarse grains) to vulnerable sections at subsidized prices.
- It operates under the National Food Security Act (NFSA), 2013, covering nearly two-thirds of India's population as per the 2011 Census.
- **Convergence with POSHAN Abhiyan:** PDS supports Poshan Abhiyan by ensuring food access through subsidized grains, while Poshan Abhiyan ensures nutrition outcomes via ICDS, cross-sectoral convergence, and data monitoring for improved maternal and child health.



14 KOYLA SHAKTI DASHBOARD

In alignment with the **Digital India Mission**, the **Ministry of Coal** has launched two transformative digital platforms - **Koyla Shakti** and **CLAMP** - aimed at enhancing transparency, operational efficiency, and governance in the coal sector.

KOYLA SHAKTI DASHBOARD

- **Unified Platform:** It is a unified digital platform for real-time monitoring and analytics of coal production, transportation, and supply.
- **Purpose:** Smart analytics dashboard for end-to-end coal supply chain monitoring.
- **Stakeholders:** Coal companies, railways, ports, ministries, and state departments.

FUNCTIONS:

- Real-time tracking of coal production, transport, and dispatch.
- Policy support through data analytics, forecasting, and incident alerts.
- Enhances transparency, efficiency, and strategic coordination.
- CLAMP Portal (Coal Land Acquisition, Management, and Payment)

The CLAMP Portal serves as a centralized digital system to streamline and digitize processes related to land acquisition, compensation, and rehabilitation & resettlement (R&R) in the coal sector.

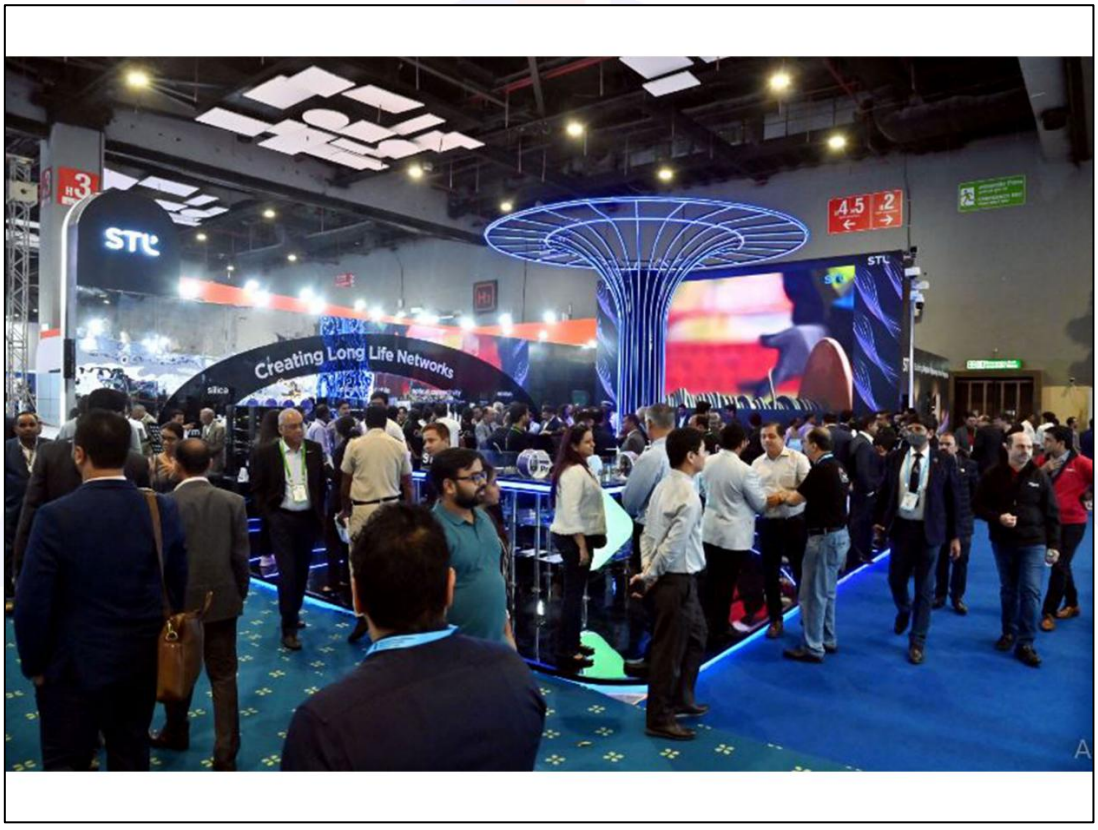
FEATURES:

- Centralized repository for land records across coal PSUs.
- Real-time data monitoring and process digitization.
- Improves transparency and inter-agency coordination.

15 2ND INTERNATIONAL BHARAT 6G SYMPOSIUM

BASIC INFORMATION

- Name: 2nd International Bharat 6G Symposium.
- Dates: **9–10 October 2025**.
- Venue: Yashobhoomi Convention Centre (India International Convention & Expo Centre), Dwarka, New Delhi.
- Hosts/Organisers: Bharat 6G Alliance (B6GA) in partnership with the India Mobile Congress 2025 and the Department of Telecommunications (DoT).
- Theme: "Ubiquitous, Trusted and AI-Native 6G Networks for a Sustainable Digital Society."



OBJECTIVES & AGENDA

- To establish India's leadership in next-generation connectivity (6G) and foster global collaboration among industry, academia, and government.
- Focus areas include:
    - Global 6G strategies & policy alignment
    - AI-native network architectures

    - Non-terrestrial networks (satellite/space) & integrated connectivity
    - Standardisation frameworks and spectrum harmonisation for 6G
- High-level agenda: 9 sessions covering global 6G initiatives, use-cases, enabling technologies, transition to AI-native networks, non-terrestrial networks, harmonisation of standards & spectrum.
- MoUs & Reports: Signing of multiple MoUs (industry–academia–government) and launch of industry reports during the event.

SIGNIFICANCE

A) STRATEGIC TECHNOLOGY LEADERSHIP

- India seeks to position itself as a global player in 6G technology. The symposium reinforces that ambition.
- It aligns with the "Bharat 6G Vision" document and the broader goal of digital sovereignty.

B) ECONOMIC & INDUSTRY IMPACT

- Provides a platform for start-ups, telecom vendors, global technology players (e.g., Ericsson, Nokia, Nvidia, Qualcomm) to engage and collaborate.
- Encourages R&D, standards development, test-beds and ecosystem building, which are vital for India's telecommunications manufacturing & services sectors.

C) POLICY & GOVERNANCE

- Highlights the role of policy (spectrum, standardisation, global cooperation) in enabling next generation networks.
- Enhances India's voice in global standard-setting forums (e.g., ITU, 3GPP).

D) GLOBAL COLLABORATION & STANDARDS

- The event brings global alliances and experts to India, facilitating cross-border cooperation in 6G.
- Critical given that 6G will require harmonised technologies (THz, satellite) and global standards for interoperability.

CHALLENGES & AREAS TO WATCH

- Translating symposium outcomes into **actual test-beds, commercial roll-out** of 6G (likely around 2030) is a long runway.

- Ensuring India's R&D and manufacturing capacity keeps pace with global leaders (USA, China, Europe).
- Spectrum allocation, harmonisation, and global consensus for 6G remain complex.
- Bridging the gap between urban advanced telecom hubs and remote/rural connectivity — ensuring inclusivity.
- Managing fiscal impact & incentives for 6G ecosystem, as well as data security and trust issues in networks branded as "AI-native".

KEY FACTS & FIGURES FOR PRELIMS

- Dates: 9-10 October 2025.
- Venue: Yashobhoomi, New Delhi.
- Organiser: Bharat 6G Alliance + DoT + IMC.
- Over 70 speakers from India and abroad (UK, USA, Europe, Japan, Germany, Finland, Sweden) expected.
- Agenda includes 9 sessions and MoUs will be signed.

UPSC RELEVANCE & USAGE

- **GS Paper 2 (Governance & Policy)**: Use this symposium as an example of how India is shaping its digital infrastructure strategy, global tech diplomacy, and policy frameworks for emerging technologies.
- **GS Paper 3 (Science & Technology, Infrastructure)**: Reference the event when discussing telecom evolution (5G → 6G), standardisation, spectrum policy, national manufacturing, and innovation ecosystems.
- **Essay** topics such as "India's digital sovereignty", "Emerging tech and global standardisation", "Make in India for Telecom" can incorporate this event.
- **Keywords:** Bharat 6G Vision, AI-native networks, non-terrestrial networks, spectrum harmonisation, test-bed, digital sovereignty.

N2ND INTERNATIONAL BHARAT 6G SYMPOSIUM

- **For Prelims:** India Mobile Congress, Bharat 6G Alliance, Telecom Technology Development Fund, International Telecommunication Union
- **For Mains:** Bharat 6G Vision and its alignment with Digital India and Viksit Bharat 2047, Challenges in India's 6G deployment and the roadmap for readiness

WHY IN NEWS?

- At the India Mobile Congress (IMC) 2025, India highlighted its growing leadership in next-generation telecom through the 2nd International Bharat 6G Symposium, marking a key step towards building a self-reliant, innovative, and globally connected 6G ecosystem for Viksit Bharat 2047.
- The IMC is Asia's most prominent technology expos, jointly organized by the Department of Telecommunications (DoT) and the Cellular Operators Association of India (COAI).

OUTCOMES AT 2ND INTERNATIONAL BHARAT 6G SYMPOSIUM AT IMC 2025?

- **New Delhi Declaration on 6G:** At the Symposium, global research alliances including Bharat 6G, 6G-IA (European organization), ATIS' Next G Alliance (North American organization), and others issued a Joint Declaration to shape 6G as a global public good.
    - The declaration outlines five core principles for 6G networks that are trusted and secure, resilient and reliable, open and interoperable, inclusive and affordable, and sustainable and globally connected.
    - The declaration also calls for skills development and global collaboration to build a future-ready, inclusive 6G ecosystem aligned with India's 6G Vision 2030.
- **Economic Vision:** The symposium highlighted India's 6G roadmap aiming for USD 1.2 trillion GDP impact by 2035 and 10% of global 6G patents, along with a threefold growth in satellite communications by 2033.
    - The Symposium showcased India's indigenous 4G stack as a milestone toward technological self-reliance and export readiness.
- **Focus on Collaboration and Inclusivity:** The symposium urged stronger global collaboration, indigenous R&D, and industry- academia synergy to build an inclusive 6G framework.
    - It highlighted India's shift from a technology consumer to a co-creator and global leader, backed by milestones like the rollout of one lakh indigenous 4G towers.

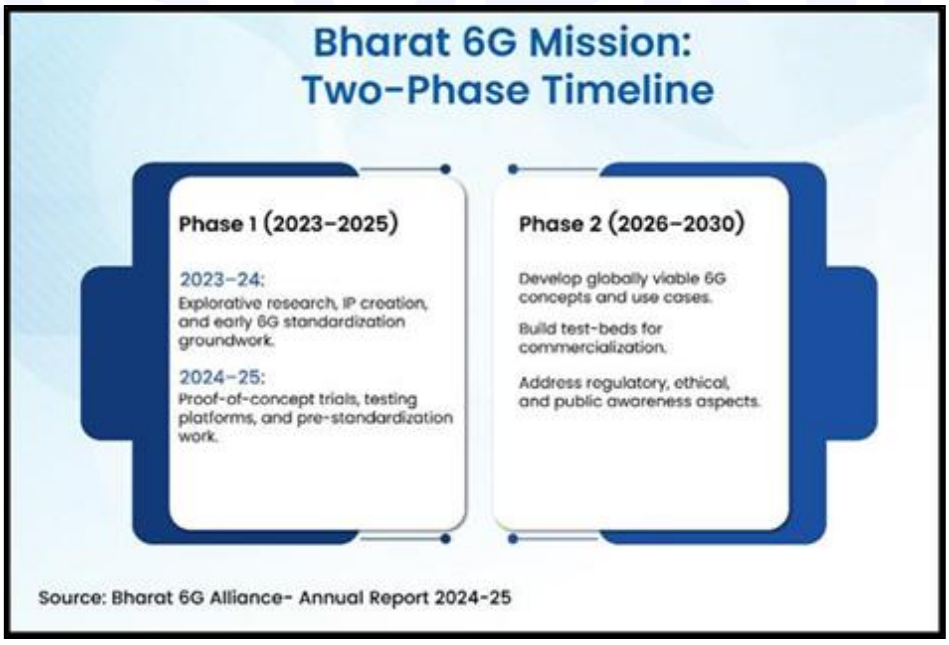
WHAT IS BHARAT 6G VISION?

Bharat 6G Vision: Launched in 2023, Bharat 6G Vision aims to position India as a global leader and co-creator in next-generation wireless communication.

It aligns with the Viksit Bharat 2047 goals, focusing on affordability, sustainability, and universal access by 2030.

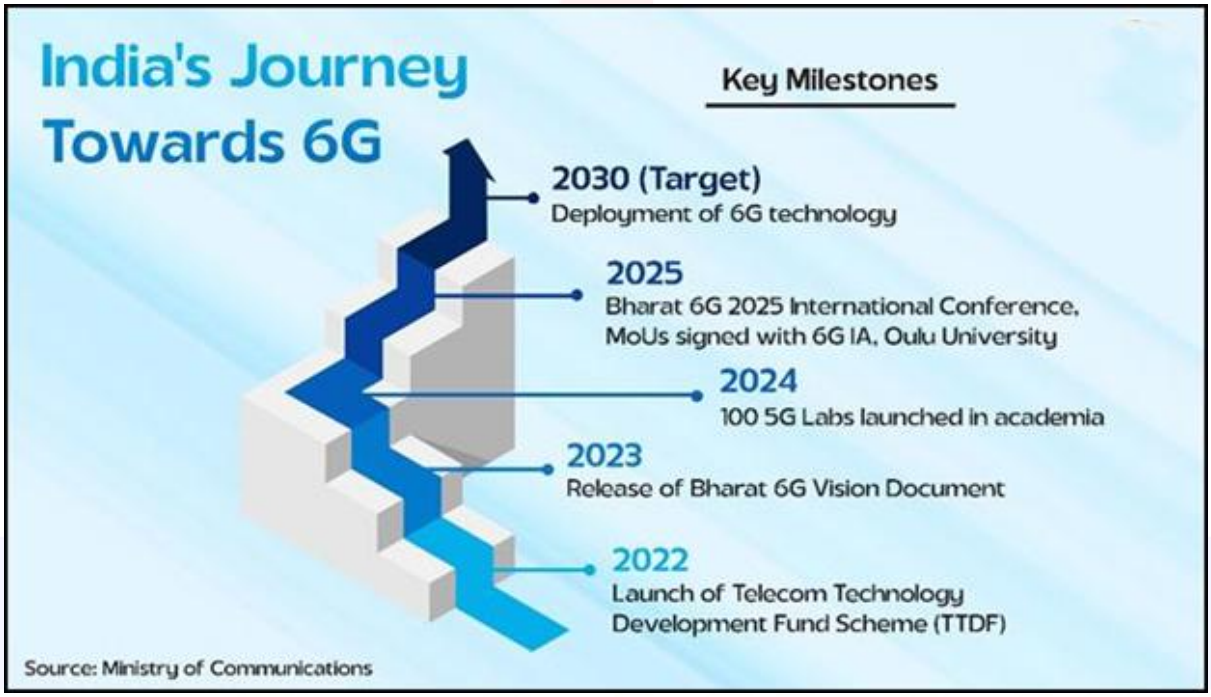
FEATURES OF THE VISION:

- **Bharat 6G Alliance (B6GA):** An industry-led, government-facilitated body uniting telecom operators, academia, startups, and R&D institutions.
    - It focuses on domains like spectrum, technology, sustainability, applications, and use cases.
    - Bharat 6G Alliance signed a Memorandum of Understanding with global alliances including Next G Alliance (USA), 6G-IA (Europe), 6G Forum (South Korea), 6G Flagship (Finland), 6G Brazil, and others to collaborate on research and global standards.
    - As of July 2025, the alliance comprises over 80 member organizations.
    - It is also working with Telecommunications Standards Development Society, India (TSDSI) and National Association of Software and Services Companies (NASSCOM) to leverage national expertise and ensure resilient, trusted supply chains.
- **Bharat 6G Mission:** Aims to make India a global co-creator and leader in 6G technologies by 2030.
    - Focuses on indigenous innovation, capacity building, and skills development.
    - Emphasizes sustainability, security, and inclusivity in telecom development.
    - Seeks to ensure that 6G innovation originates in India and benefits both national and global communities.



6G (SIXTH-GENERATION)

- It is the successor to 5G cellular technology. 6G will use higher radio frequencies to deliver data with near-zero delay, enabling speeds up to 1,000 times faster than 5G.
- The 6G Technology has been named 'International Mobile Telecommunications (IMT) 2030' by International Telecommunication Union (ITU), the specialised agency for Information and Communication Technologies of the United Nations.
- 6G will power real-time applications like remote surgery, smart robotics, and immersive virtual experiences, while AI integration will make networks smarter, faster, and more efficient.



KEY CHALLENGES IN 6G IMPLEMENTATION

TECHNOLOGICAL CHALLENGES

- **Lack of Indigenous R&D Capacity:**
  - India's telecom innovation is still heavily dependent on **foreign patents and equipment** (e.g., Ericsson, Nokia, Huawei).
  - 6G demands breakthroughs in **AI-native networks, terahertz spectrum, quantum communication**, etc., where India's R&D ecosystem is still developing.
- **AI-Native Network Complexity:**
  - 6G will integrate **Artificial Intelligence (AI)** into every layer of the network — making it autonomous but also highly complex to manage and secure.

- Developing indigenous AI algorithms for network optimization and trust management remains a challenge.

- **Quantum & Edge Computing Gaps:**
  - 6G requires **real-time data processing** and **quantum-safe encryption**, but India's infrastructure in these areas is nascent.
  - Dependence on imported chips and computing hardware adds to vulnerabilities.

INFRASTRUCTURE AND SPECTRUM CHALLENGES

- **Spectrum Availability and Harmonization:**
  - 6G requires **high-frequency terahertz (THz) bands (0.3–3 THz)**, which are yet to be identified and harmonized globally.
  - India must coordinate with global bodies like **ITU and 3GPP** for standardization while ensuring national security.
- **Energy-Intensive Networks:**
  - 6G networks will be far more **power-demanding** due to dense cell infrastructure, IoT devices, and data centers.
  - Sustainable energy solutions for telecom towers and data hubs are critical.
- **Backhaul and Fiber Connectivity:**
  - Only **~35% of mobile towers in India** are fiberized (DoT 2024 data).
  - 6G will require **>90% fiberization** and **low-latency satellite links**, especially for rural areas.

ECONOMIC & INDUSTRIAL CHALLENGES

- **High R&D and Deployment Costs:**
  - Developing indigenous 6G standards, prototypes, and pilot projects involves **multi-billion dollar investments**.
  - Private telecom operators already burdened by **4G/5G debts** may hesitate to invest early in 6G.
- **Dependence on Foreign Hardware Ecosystem:**
  - India still imports most **semiconductors, radio components, and chipsets**, limiting self-reliance in telecom manufacturing.

- The **semiconductor fabrication plants (fabs)** under construction will take years to scale up.

- **Startup Ecosystem Constraints:**
  - Although the **Bharat 6G Alliance** involves startups, few have the technical capacity to engage in high-end telecom R&D.

POLICY AND REGULATORY CHALLENGES

- **Lack of a Unified 6G Policy Framework:**
  - Unlike 5G, India's **6G roadmap lacks detailed implementation timelines, funding models, and private sector incentives.**
  - Coordination among ministries (DoT, MeitY, DST, DRDO) is still evolving.
- **Standardization and Global Alignment:**
  - To ensure interoperability, India must align with **global 6G standards** being developed by the **International Telecommunication Union (ITU)** and **3GPP**.
  - Balancing global collaboration with national data security remains a tightrope walk.
- **Data Privacy & Cybersecurity Risks:**
  - 6G will transmit enormous amounts of personal and machine data.
  - Current legal frameworks (e.g., **Digital Personal Data Protection Act, 2023**) may need stronger clauses for **AI-driven and quantum communication networks**.

SOCIAL AND HUMAN RESOURCE CHALLENGES

- **Digital Divide and Inclusivity:**
  - Urban India may access 6G early, but **rural and remote areas** still struggle with stable 4G connectivity.
  - Ensuring equitable access aligns with **Digital India** goals.
- **Skill Deficit in High-Tech Areas:**
  - Shortage of professionals trained in **AI, cybersecurity, chip design, and quantum communication** could hinder 6G deployment.
  - Need for specialized telecom and AI training programs.

WAY FORWARD

Challenge Area	Strategic Solutions
R&D & Innovation	Strengthen Bharat 6G Alliance; fund IITs and start-ups for 6G testbeds and patents.
Spectrum & Standards	Early spectrum allocation and participation in ITU & 3GPP negotiations.
Infrastructure	National Fiberization Mission 2.0 for last-mile connectivity.
Energy & Sustainability	Green telecom policies—solar-powered towers, energy-efficient chips.
Regulation	Draft 6G Policy & Cybersecurity Framework 2030 with AI ethics.
Human Capital	Launch specialized AI-Telecom skill programs under Skill India 2.0.

CONCLUSION

6G offers India a chance to move from "Digital Inclusion" to "Digital Leadership."
However, achieving the **Bharat 6G Vision 2030** demands a **synergized national effort**—combining innovation, regulatory foresight, skilled manpower, and sustainable infrastructure.
Without addressing these challenges, 6G may widen the **technological divide** instead of bridging it.

UPSC PRELIMS-STYLE MCQS

Question: 1	With reference to the 2nd International Bharat 6G Symposium (2025), consider the following statements: 1. It was organized by the Bharat 6G Alliance (B6GA) in collaboration with the Department of Telecommunications (DoT). 2. The event was held in Bengaluru to promote India's semiconductor ecosystem. 3. The main theme was "Ubiquitous, Trusted and AI-Native 6G Networks for a Sustainable Digital Society." Which of the statements given above is/are correct?
Option A	1 and 3 only

Option B	2 only
Option C	1 and 2 only
Option D	1, 2 and 3
Answer	Answer: (a) Explanation: The event was hosted at Yashobhoomi Convention Centre, New Delhi (not Bengaluru) by Bharat 6G Alliance and DoT, with the stated theme emphasizing AI-native and trusted 6G networks for sustainability.

Question: 2	The Bharat 6G Alliance (B6GA), often mentioned in context of India's 6G roadmap, primarily aims to:
Option A	Develop and regulate AI-based telecom products for export.
Option B	Facilitate collaboration among industry, academia, and government for 6G R&D and standardization.
Option C	Act as India's telecom regulatory authority for next-generation networks.
Option D	Build indigenous satellites for 6G backhaul networks.
Answer	Answer: (b) Explanation: B6GA is a collaborative platform launched in 2023 under the DoT to coordinate 6G research, standardization, and pilot projects involving government, industry, and academia.

Question: 3	Which of the following focus areas were discussed during the 2nd International Bharat 6G Symposium (2025)? 1. AI-native network architecture 2. Spectrum harmonization and global standardization 3. 6G-enabled digital health and education use-cases 4. Semiconductor manufacturing subsidy framework Select the correct answer using the code below:
Option A	1, 2 and 3 only
Option B	1 and 4 only
Option C	2 and 3 only
Option D	1, 2, 3 and 4

Answer	Answer: (a) Explanation: Focus areas included AI-native networks, non-terrestrial (satellite) networks, global standardization, and digital use-cases. Semiconductor policy was not part of this symposium's core agenda.

Question: 4	Consider the following pairs regarding 6G features and objectives: <table><tr><th>Feature</th><th>Purpose</th></tr><tr><td>1. Non-terrestrial networks</td><td>Integration of satellite and aerial connectivity with terrestrial networks</td></tr><tr><td>2. AI-native network design</td><td>Intelligent management and optimization of network operations</td></tr><tr><td>3. Spectrum harmonization</td><td>Coordinating frequency bands across countries for interoperability</td></tr></table> Which of the above pairs is/are correctly matched?
Option A	1 only
Option B	1 and 2 only
Option C	1, 2 and 3
Option D	2 and 3 only
Answer	Answer: (c) Explanation: All three are integral aspects of 6G architecture—ensuring intelligent, interoperable, and seamless communication globally.

Question: 5	The 2nd International Bharat 6G Symposium (2025) is significant for India because: 1. It strengthens India's participation in global 6G standard-setting forums like ITU and 3GPP. 2. It demonstrates India's ambition to commercialize 6G services by 2026. 3. It provides a platform for collaboration between startups, academia, and global telecom firms.

	Select the correct answer using the code below:
Option A	1 and 3 only
Option B	2 only
Option C	1, 2 and 3
Option D	1 only
Answer	Answer: (a) Explanation: India's commercial 6G rollout is not expected before 2030, but the symposium emphasizes collaboration and global standard-setting leadership.

UPSC MAINS-STYLE ANALYTICAL QUESTIONS

Question: 1	Discuss the significance of the 2nd International Bharat 6G Symposium (2025) in positioning India as a global leader in next-generation communication technologies. (250 words)
Key Points:	India's transition from 5G adopter → 6G innovator.
	Event highlights: Theme, global participation, AI-native network discussions.
	Bharat 6G Vision (Prime Minister's 2023 roadmap).
	Strategic autonomy & digital sovereignty.
	Role of Bharat 6G Alliance and academia-industry partnerships.
	India's contribution to global 6G standards (ITU, 3GPP).
	Significance for Digital India, Make in India, and telecom exports.
	Challenges: R&D funding, skilled manpower, global competition.

Question: 2	Examine the role of the Bharat 6G Alliance (B6GA) in fostering innovation and ensuring inclusive growth in India's telecom sector. (250 words)
Key Points:	B6GA as a coordination mechanism under DoT (launched 2023).
	Stakeholders: industry, startups, academia, and government.

	Objectives: research, test-beds, standardization, capacity building.
	Integration with Atmanirbhar Bharat, Digital Bharat, and Make in India.
	Promotion of open RAN and indigenous technologies.
	Ensuring rural connectivity and affordability in 6G design.
	Strengthening India's presence in global telecom governance.

Question: 3	6G technology aims to create "AI-native and trusted networks." What are the opportunities and challenges this poses for India? (250 words)
Key Points:	Opportunities:
	Smart governance, IoT, precision agriculture, telemedicine.
	Enhanced security through blockchain-enabled trust layers.
	New employment in AI-telecom and R&D sectors.
	Strengthening India's tech diplomacy through innovation.
	Challenges:
	Data privacy & AI bias concerns.
	Infrastructure & spectrum harmonization issues.
	Cybersecurity and quantum-resilient encryption needs.
	Balancing cost, accessibility, and inclusion.

16 RECLASSIFICATION OF CPSES

Government is planning to **revise the classification and performance assessment criteria** for **Central Public Sector Enterprises (CPSEs)** by introducing **two new 'Ratna' categories** in addition to the existing **Maharatna, Navratna, and Miniratna** statuses.

The **Department of Public Enterprises** under the **Ministry of Heavy Industries and Public Enterprises** grants **Maharatna**, **Navratna**, and **Miniratna** status to **CPSEs** based on their **financial performance**.

WHAT ARE THE KEY ASPECTS OF THE CPSES' RECLASSIFICATION?

- **New Evaluation Parameters:** New evaluation parameters under discussion include **corporate governance**, **succession planning and leadership development**, **capital expenditure**, **dividend payout**, **sustainable business practices**, and **alignment with Vision 2047**.
- **Re-evaluation Committee:** A **10-member committee** led by **Cabinet Secretary T.V. Somanathan** is conducting the **re-evaluation**, with its report due **before the Union Budget 2026–27.**
- **Objective of Revision:** It aims to **modernize the public sector** and align it with India's **national economic strategy** by developing **next-gen CPSEs** capable of **global competitiveness**.
    - It focuses on **accountability**, **performance-driven governance**, **efficiency**, and **strategic resource alignment** toward sectors vital for **India's future economic security**.
- **Current Ratna Categories:** India currently has **14 Maharatna**, **26 Navratna**, and **74 Miniratna** firms. The status enables **financial and operational independence** in **capital spending**, **joint ventures**, and **investments**.

WHAT ARE CPSES?

- **About:** A **Central Public Sector Enterprise (CPSE)** is a company, **majority-owned and controlled by the Government of India**, with at least **51% of its shares** held by the **Central Government**, either **directly or indirectly through other CPSEs**.
- This definition also extends to include the **subsidiary companies** of such enterprises.
- **Formation:** It is an entity that was either **incorporated under Indian company law** (like the **Companies Act, 2013**) or **established by a specific Act of Parliament**.

Classification of CPSEs			
Category	**Launch**	**Criteria**	**Examples**
Maharatna	❍ **Maharatna Scheme** was introduced for CPSEs in May, 2010, in order to **empower mega CPSEs to expand their operations and emerge as global giants.**	❍ Having **Navratna status.** ❍ Listed on Indian stock exchange with minimum prescribed public shareholding under **Securities and Exchange Board of India (SEBI)** regulations. ❍ An **average annual turnover of more than Rs. 25,000 crore** during the last 3 years. ❍ An average annual **net worth of more than Rs. 15,000 crore** during the last 3 years. ❍ An average **annual net profit after tax of more than Rs. 5,000 crore** during the last 3 years. ❍ Should have **significant global presence/international operations.**	❍ Bharat Heavy Electricals Limited, Bharat Petroleum Corporation Limited, Coal India Limited, GAIL (India) Limited, etc.
Navratna	❍ **Navratna Scheme** was introduced in **1997** in order to identify CPSEs that enjoy comparative advantages in their respective sectors and **to support them in their drive to become global players.**	❍ The **Miniratna Category – I and Schedule 'A' CPSEs, which have obtained 'excellent' or 'very good' rating** under the Memorandum of Understanding system in three of the last five years, and have composite score of 60 or above in the **six selected performance parameters,** namely, ❍ Net profit to net worth. ❍ Manpower cost to total cost of production/services. ❍ Profit before depreciation, interest and taxes to capital employed. ❍ Profit before interest and taxes to turnover. ❍ Earning per share. ❍ Inter-sectoral performance.	❍ Bharat Electronics Limited, Hindustan Aeronautics Limited, etc.
Miniratna	❍ **Miniratna scheme** was introduced in **1997** in pursuance of the policy objective **to make the public sector more efficient and competitive** and to grant enhanced autonomy and delegation of powers to the profit-making public sector enterprises.	❍ **Miniratna Category-I:** The CPSEs which have **made profit in the last three years continuously,** pre-tax profit is Rs.30 crores or more in at least one of the three years and have a positive net worth are eligible to be considered for grant of Miniratna-I status. ❍ **Miniratna Category-II:** The CPSEs which have **made profit for the last three years continuously and have a positive net worth** are eligible to be considered for grant of Miniratna-II status. ❍ Miniratna CPSEs **should have not defaulted in the repayment of loans/interest payment on any loans** due to the Government. ❍ Miniratna CPSEs **shall not depend upon budgetary support or Government guarantees.**	❍ **Category-I:** Airports Authority of India, Antrix Corporation Limited, etc. ❍ **Category-II:** Artificial Limbs Manufacturing Corporation of India, Bharat Pumps & Compressors Limited, etc.

Question: 1	With reference to the Indian Renewable Energy Development Agency Limited (IREDA), which of the following statements is/are correct? (2015) 1. It is a Public Limited Government Company. 2. It is a Non-Banking Financial Company. Select the correct answer using the code given below:
Option A	1 only
Option B	2 only
Option C	Both 1 and 2
Option D	Neither 1 nor 2
Answer	Ans: (c)

17 INDIA MARITIME WEEK (IMW) 2025

India Maritime Week (IMW) 2025, themed *"Uniting Oceans, One Maritime Vision,"* was inaugurated by the **Union Home and Cooperation Minister**, showcasing **India's goal to become a global maritime leader by 2047.**

BASIC INFORMATION

- **Dates:** 27–31 October 2025.
- **Venue:** Bombay (Mumbai) Exhibition / NESCO / Bombay Exhibition Centre, Goregaon, Mumbai.
- **Organiser:** Ministry of Ports, Shipping and Waterways (MoPSW), Government of India and Indian Ports Association (IPA).
- **Theme / Tagline:** "Uniting Oceans, One Maritime Vision."
- **Participation:** Over 100 countries, 500+ exhibitors, 100 000+ delegates expected.

KEY FOCUS AREAS

- Investment in ports, ship-building, inland waterways & maritime infrastructure.
- Green shipping, sustainability, digital technology in maritime operations.
- Blue economy, coastal & offshore development, port-led industrialisation.
- State / country sessions: Several Indian states and foreign countries showcased maritime investment opportunities.
- Women in maritime leadership (Maritime SheEO Conference) & legal/technical forums.

MAJOR HIGHLIGHTS & OUTCOMES

- Investment pledges of **₹12 lakh crore** were announced during IMW 2025.
- Ship-building sector drew ~20% of the investment focus.
- Over **600 MoUs** signed (investment commitments) across the maritime value chain.
- Key international investment: DP World pledged US$ 5 billion for infrastructure in India during the event.
- State-level participation: e.g., Odisha won "Best Stall Award" for its maritime heritage and growth story.

SIGNIFICANCE

- Reinforces India's intent to become a **global maritime hub**, in line with its "Maritime India Vision 2030" and "Maritime Amrit Kaal Vision 2047."
- Drives synergy between ports, shipping, logistics, inland waterways, manufacturing (ship-building) and blue economy.
- Promotes investment, innovation and sustainability in maritime sector — crucial for trade, economy, and strategic connectivity.
- Enhances India's standing in global maritime governance, supply-chains and regional connectivity frameworks.

CHALLENGES & OBSERVATIONS

- Translating investment pledges and MoUs into **actual projects and timely execution** remains a challenge.
- Ensuring **sustainability and green transition** in ports and shipping (e.g., zero-emission ships, shore power) needs strong policy and infrastructure push.
- Inclusivity: ensuring that smaller ports, inland waterways, coastal communities benefit — not just large port cities.
- Coordination: between centre, states, private sector, and international stakeholders for seamless maritime growth.
- Green shipping day & Women in maritime forum (SheEO) held as part of event.

INDIA'S MARITIME STRENGTH

- 11,000 km coastline, 13 coastal states, and a 23.7 lakh sq. km Exclusive Economic Zone (EEZ) make India a natural maritime power.

- 60% of India's GDP comes from coastal states, supporting 800 million livelihoods linked to the sea.
- India's maritime sector handles 95% of the country's trade by volume and 70% by value.
- The Maritime India Vision (MIV) 2030 and Maritime Amrit Kaal Vision 2047, guided by the Sagarmala Programme and the vision of MAHASAGAR (Mutual and Holistic Advancement for Security and Growth Across Regions), aim to make India a global maritime and trade hub while balancing economic growth with environmental sustainability.

MARITIME INDIA VISION 2030

- It includes over 150 strategic initiatives with Rs 3 - 3.5 lakh crore in investments to modernize ports, shipping, and waterways.
- Under MIV 2030, India's port capacity has nearly doubled from 1,400 million metric tonnes per annum (MMTPA) in 2013-14 to 2,762 MMTPA in 2024-25 a 92% rise at major ports and 80% at non-major ports.
- The number of Indian seafarers has surged by 200%, reaching 3.2 lakh.

MARITIME AMRIT KAAL VISION 2047

- India aims to handle one-third of global seaborne trade by 2047, up from 10% currently.
- It targets Rs 80 lakh crore investments to develop green corridors, hydrogen bunkering, and methanol-fueled vessels for sustainability.

MCQS

Question: 1	Which of the following statements about the India Maritime Week (IMW) 2025 is/are correct? 1. It was organised by the Ministry of Ports, Shipping and Waterways in Mumbai. 2. The theme of the event was "Uniting Oceans, One Maritime Vision." 3. Over 600 Memoranda of Understanding (MoUs) were signed during the event. Select the correct answer using the code below:
Option A	1 and 2 only
Option B	2 and 3 only
Option C	1, 2 and 3
Option D	1 only
Answer	Answer: (c) Explanation: IMW 2025, held in Mumbai (27–31 Oct), was organised by MoPSW. It adopted the theme "Uniting Oceans, One Maritime Vision" and saw 600+ MoUs signed worth ₹12 lakh crore.

Question: 2	Which of the following international firms announced a major investment commitment during India Maritime Week 2025?
Option A	DP World
Option B	Maersk
Option C	CMA CGM
Option D	MSC Shipping
Answer	Answer: (a) Explanation: Dubai-based DP World pledged a $5 billion investment in Indian maritime and logistics infrastructure during IMW 2025.

Question: 3	The India Maritime Week 2025 aligns with which of the following long-term national visions? 1. Maritime India Vision 2030 2. Sagarmala Programme

	3. Maritime Amrit Kaal Vision 2047 Select the correct code:
Option A	1 and 3 only
Option B	2 only
Option C	1, 2 and 3
Option D	1 only
Answer	Answer: (c) Explanation: IMW 2025 is a flagship event supporting Maritime India Vision 2030, Sagarmala, and Maritime Amrit Kaal Vision 2047, aimed at transforming India into a global maritime hub.

Question: 4	Which of the following was NOT a focus area of India Maritime Week 2025?
Option A	Blue economy and coastal industrialization
Option B	Green shipping and sustainability
Option C	Blockchain in e-Governance
Option D	Shipbuilding and port modernisation
Answer	Answer: (c) Explanation: Blockchain in e-Governance was not a theme. IMW focused on green shipping, blue economy, port infrastructure, and shipbuilding.

Question: 5	Consider the following pairs: **Forum / Initiative** — **Focus Area** Maritime SheEO Conference — Women in Maritime Leadership Green Maritime Day — Sustainability in Ports and Shipping Global Coastal Cities Forum — Maritime Trade Facilitation Which of the pairs given above is/are correctly matched?
Option A	1 only
Option B	1 and 2 only
Option C	2 and 3 only

Option D	1, 2 and 3
Answer	☑ Answer: (b) Explanation: Only the first two were part of IMW 2025. "Global Coastal Cities Forum" was not an official IMW session.

MAINS QUESTIONS (ANALYTICAL)

Question: 1	Discuss the significance of India Maritime Week (IMW) 2025 in the context of India's Maritime India Vision 2030 and Blue Economy strategy.
Key Points:	IMW 2025 as a convergence of policy, investment, and innovation.
	Strengthening India's position in global maritime trade.
	Role in promoting coastal infrastructure, inland waterways, shipbuilding.
	Blue Economy integration: fisheries, renewable ocean energy, and marine biodiversity.
	India's global ambitions under SAGAR (Security and Growth for All in the Region).

Question: 2	Examine the major challenges in translating the investment commitments made at India Maritime Week 2025 into tangible infrastructure outcomes.
Key Points:	Bureaucratic delays and inter-ministerial coordination gaps.
	Environmental clearances and sustainability issues.
	Private sector risk aversion, financing challenges.
	Need for digitalisation and skilled manpower.
	Importance of follow-up monitoring by MoPSW and IPA.

Question: 3	Evaluate the role of events like India Maritime Week in promoting India's maritime diplomacy and Indo-Pacific strategy.
Key Points:	IMW as a diplomatic platform to attract foreign investment and partnerships.
	Maritime connectivity with ASEAN, African, and Gulf nations.

	Support for Indo-Pacific cooperation — ensuring free and open seas.
	Enhancing India's maritime soft power and leadership role.
	Alignment with SAGAR and Act East Policy.
	IMW as a diplomatic platform to attract foreign investment and partnerships.

18 RASHTRIYA VIGYAN PURASKAR

Government of India has announced the **Rashtriya Vigyan Puraskar (RVP) 2025**, the nation's highest recognition for outstanding contributions in diverse fields of **science, technology, and technology-led innovation.**

Prominent Awardees of 2025: Vigyan Ratna (Posthumous)-**Prof. Jayant Vishnu Narlikar** – noted astrophysicist.

Known for co-developing the **Hoyle–Narlikar theory of gravity,** an alternative to **Einstein's general relativity** that supports the steady-state model of the universe.

RASHTRIYA VIGYAN PURASKAR

- **About:** The award has been instituted by the Ministry of Science and Technology.
- It aims to inspire excellence in Indian science and technology, promote innovation, and acknowledge achievements that contribute to national development.
- **Disciplinary Coverage:** It covers 13 fields such as Physics, Chemistry, Engineering, Agriculture, Environment, Atomic Energy, Space, etc.
- **Categories of Awards:** The Rashtriya Vigyan Puraskar is conferred under four categories:
    - **Vigyan Ratna (VR):** Lifetime achievement recognition.
    - **Vigyan Shri (VS):** Distinguished contributions.
    - **Vigyan Yuva–Shanti Swarup Bhatnagar (VY–SSB):** For scientists below 45 years.
    - **Vigyan Team (VT):** For exceptional collaborative work.

19 NATIONAL CRITICAL MINERAL MISSION (NCMM)

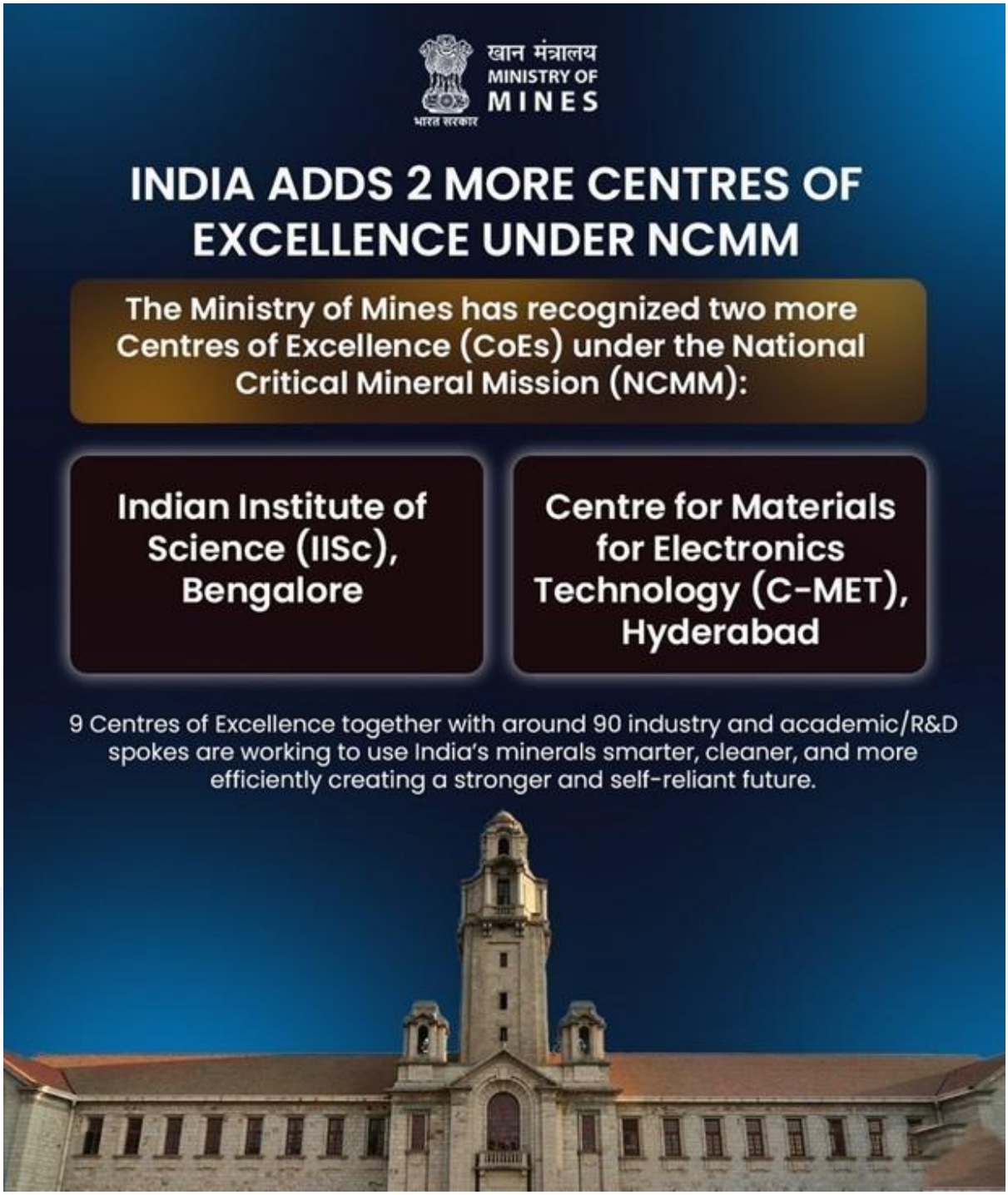
Ministry of Mines has recognized two additional Centres of Excellence (CoEs)- **Indian Institute of Science (IISc), Bengaluru** and **Centre for Materials for Electronics Technology (C-MET), Hyderabad** under the **National Critical Mineral Mission (NCMM).**

WHAT IS THE NCMM?

- The NCMM is a programme launched by the Government of India (via the Ministry of Mines) in January 2025 with the objective of developing a resilient value-chain for **critical minerals** — minerals vital for clean-energy technologies, defence, electronics, digital economy and related high-technology sectors.
- The mission covers the full "minerals lifecycle" — from exploration and mining (domestic and offshore) to beneficiation, processing, recycling and recovery of minerals from end-of-life products.
- A list of **24 critical minerals** has been identified by the Government (in June 2023) and included in Part D of the First Schedule of the Mines and Minerals (Development and Regulation) Act, 1957 so the Central Government has exclusive power for their leases/auctions.

KEY FEATURES & COMPONENTS

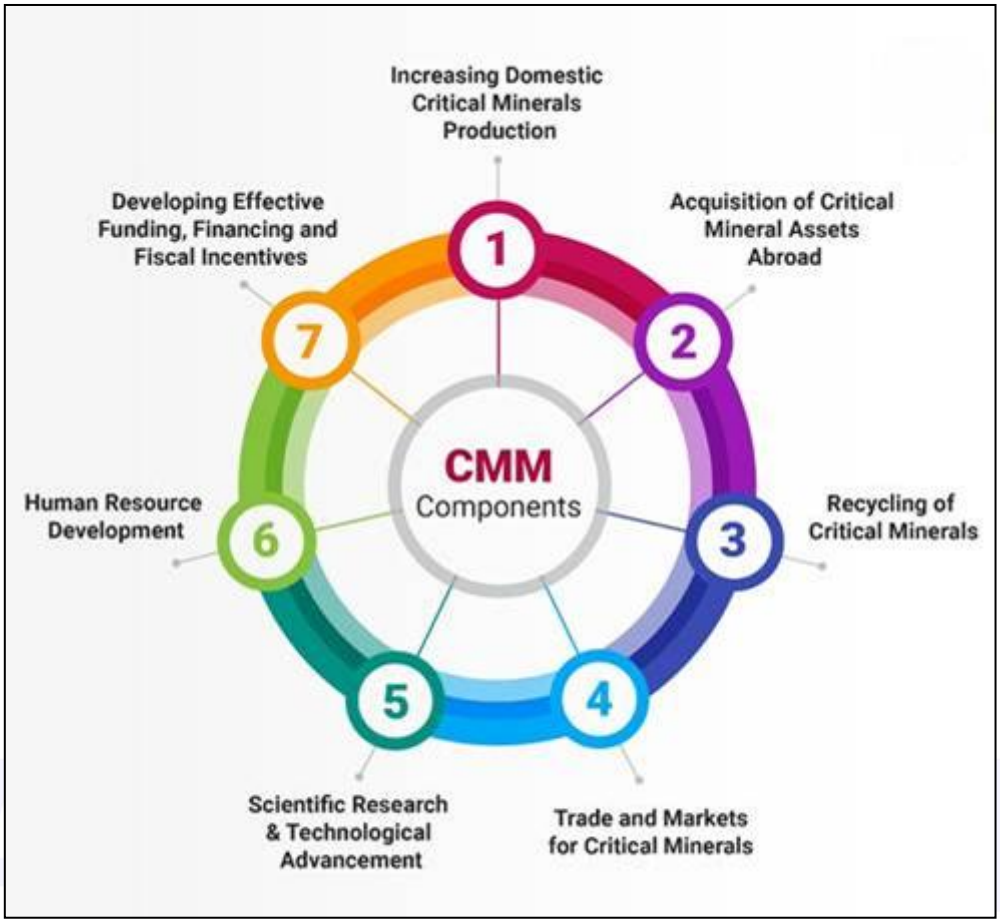
Feature	Details
Outlay & Duration	Mission approved for **₹16,300 crore** budgetary support and an expected **₹18,000 crore** from PSUs/private sector, making a total outlay of ≈ **₹34,300 crore** over seven years (FY 2024-25 to FY 2030-31).
Scope of Minerals	24 critical minerals (e.g., lithium, cobalt, nickel, graphene, rare-earth elements, etc) with possibility of additions/change over time.
Value-Chain Coverage	Exploration, mining, processing, recycling, stockpiling, recovery, overseas assets acquisition, regulatory & financial support.
Targets	For example, 1,200 domestic exploration projects by 2030-31; recover 400 kt of recycled material; set up 4 processing parks, 3 Centres of Excellence for critical minerals.
Incentives & Regulation	Fast-track approval for critical mineral mining projects; financial incentives for exploration and recycling; develop processing parks.



SIGNIFICANCE

- **Strategic & Geopolitical**: Critical minerals are vital for defence, aerospace, technology, EVs, renewable energy. Reducing import-dependence strengthens strategic autonomy and helps 'Atmanirbhar Bharat'.
- **Economic & Technology**: Strengthening domestic value-chain (processing, recycling) can create jobs, innovation, and exports in high-end sectors.

- **Clean Energy Transition**: Many critical minerals (Li, Co, Ni, REEs) are essential for batteries, solar/wind technologies, so mission aligns with India's climate objectives.
- **Supply-Chain Resilience**: With growing global resource risks (export restrictions, supply disruptions), NCMM helps build resilience and reduces vulnerability.



CHALLENGES & CONSIDERATIONS

- **Resource & Technology Gap**: India may have reserves, but processing, refining and end-use manufacturing are under-developed compared to global leaders.
- **Environmental & Social Issues**: Mining and processing of critical minerals often have heavy environmental footprints; need strong regulation and community consent.
- **Infrastructure & Capital**: Large investments required in extraction, processing parks, recycling facilities; private sector participation and financing are key.
- **Global Competition & Standards**: India must align with global norms, ensure access to technologies, and navigate geopolitics (e.g., China's dominance in rare-earths).

- **Implementation & Timelines**: Ambitious targets (1,200 projects, etc) require coordination across ministries, states, industry; monitoring and governance structures must be strong.

KEYWORDS / FACTS FOR UPSC

- **Critical Minerals:** minerals which are economically and strategically important but subject to supply risks.
- NCMM approved Jan 2025, duration 7 years (FY 2024-25 to FY 2030-31) with outlay ~₹34,300 crore.
- 24 critical minerals identified and included in Part D of Schedule under MMDR Act.
- **Components:** Exploration → Mining → Processing → Recycling → Stockpiling → Overseas assets.
- **Target:** 1,200 exploration projects, 4 processing parks, recycling target 400 kt, Centre of Excellence.

HOW TO USE IN UPSC ANSWERS

- **GS Paper 2 (International Relations / Economic Relations)**: Use NCMM to illustrate India's strategy for resource security and participation in global supply-chains; link to geo-economic competition.
- **GS Paper 3 (Economy / Science & Tech / Security)**: Use as example of industrial policy, technology chain, clean energy link, value-chain building, import-substitution, supply-chain resilience.
- **Essay Topics**: E.g., "Resource security and India's future", "Role of critical minerals in clean energy transition", "Atmanirbhar Bharat in mining & technology".
- **Structure for answer:** Context → Key features → Significance → Challenges/Way forward.

20 2ND INTERNATIONAL BHARAT 6G SYMPOSIUM

TAGS:

- GS Paper - 3
- Growth & Development
- IT & Computers
- Indigenization of Technology
- Scientific Innovations & Discoveries
- PIB

For Prelims: India Mobile Congress, Bharat 6G Alliance, Telecom Technology Development Fund, International Telecommunication Union

For Mains: Bharat 6G Vision and its alignment with Digital India and Viksit Bharat 2047, Challenges in India's 6G deployment and the roadmap for readiness

WHY IN NEWS?

At the **India Mobile Congress (IMC) 2025,** India highlighted its growing leadership in **next-generation telecom** through the **2nd International Bharat 6G Symposium,** marking a key step towards building a self-reliant, innovative, and **globally connected 6G ecosystem** for **Viksit Bharat 2047.**

The IMC is Asia's most prominent technology expos, jointly organized by the **Department of Telecommunications (DoT)** and the **Cellular Operators Association of India (COAI)**.

2ND INTERNATIONAL BHARAT 6G SYMPOSIUM AT IMC 2025?

- **New Delhi Declaration on 6G:** At the Symposium, global research alliances including Bharat 6G, 6G-IA (European organization), ATIS' Next G Alliance (North American organization), and others issued a Joint Declaration to shape 6G as a global public good.
    - The declaration outlines five core principles for 6G networks that are trusted and secure, resilient and reliable, open and interoperable, inclusive and affordable, and sustainable and globally connected.
    - The declaration also calls for skills development and global collaboration to build a future-ready, inclusive 6G ecosystem aligned with India's 6G Vision 2030.

- **Economic Vision:** The symposium highlighted India's 6G roadmap aiming for USD 1.2 trillion GDP impact by 2035 and 10% of global 6G patents, along with a threefold growth in satellite communications by 2033.
    - The Symposium showcased India's indigenous 4G stack as a milestone toward technological self-reliance and export readiness.
- **Focus on Collaboration and Inclusivity:** The symposium urged stronger global collaboration, indigenous R&D, and industry- academia synergy to build an inclusive 6G framework.
    - It highlighted India's shift from a technology consumer to a co-creator and global leader, backed by milestones like the rollout of one lakh indigenous 4G towers.

WHAT IS BHARAT 6G VISION?

- **Bharat 6G Vision:** Launched in 2023, Bharat 6G Vision aims to position India as a global leader and co-creator in next-generation wireless communication.
- It aligns with the Viksit Bharat 2047 goals, focusing on affordability, sustainability, and universal access by 2030.

FEATURES OF THE VISION:

- **Bharat 6G Alliance (B6GA):** An industry-led, government-facilitated body uniting telecom operators, academia, startups, and R&D institutions.
    - It focuses on domains like spectrum, technology, sustainability, applications, and use cases.
    - Bharat 6G Alliance signed a Memorandum of Understanding with global alliances including Next G Alliance (USA), 6G-IA (Europe), 6G Forum (South Korea), 6G Flagship (Finland), 6G Brazil, and others to collaborate on research and global standards.
    - As of July 2025, the alliance comprises over 80 member organizations.
- It is also working with Telecommunications Standards Development Society, India (TSDSI) and National Association of Software and Services Companies (NASSCOM) to leverage national expertise and ensure resilient, trusted supply chains.
    - Bharat 6G Mission: Aims to make India a global co-creator and leader in 6G technologies by 2030.
    - Focuses on indigenous innovation, capacity building, and skills development.

    - Emphasizes sustainability, security, and inclusivity in telecom development.
    - Seeks to ensure that 6G innovation originates in India and benefits both national and global communities.

- **Infrastructure:** The government funded two advanced testbeds, the 6G THz Testbed and the Advanced Optical Communication Testbed to promote research and innovation in next-generation telecom technologies.
- It also sanctioned 100 5G labs across academic institutions in FY 2023–24 to build a 6G-ready academic and startup ecosystem, and approved 104 research proposals on 6G network systems.

INDIA'S INITIATIVES FOR 6G ECOSYSTEM:

- **Telecom Technology Development Fund (TTDF):** Launched in 2022 to fund R&D in 5G and 6G technologies.
    - TTDF supports domestic companies, startups, and academic institutions developing telecom products for affordable rural connectivity.
    - As of September 2025, 115 projects worth Rs 310.6 crore have been approved, with durations of 1–5 years.
- **Technology Innovation Hub (TIH) at IIIT Bangalor:** Set up under National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS), to pioneer Advanced Communication Systems for 5G+ and 6G.

6G (SIXTH-GENERATION)

- It is the successor to 5G cellular technology. 6G will use higher radio frequencies to deliver data with near-zero delay, enabling speeds up to 1,000 times faster than 5G.
- The 6G Technology has been named 'International Mobile Telecommunications (IMT) 2030' by International Telecommunication Union (ITU), the specialised agency for Information and Communication Technologies of the United Nations.
- 6G will power real-time applications like remote surgery, smart robotics, and immersive virtual experiences, while AI integration will make networks smarter, faster, and more efficient.

WHAT ARE THE CHALLENGES RELATED TO 6G IMPLEMENTATION IN INDIA?

- **Infrastructure Readiness:** India's current 5G rollout is still expanding, and the shift to 6G will demand dense fiber networks, advanced semiconductors, and indigenous hardware, areas where domestic capability is still limited.

- **Limited R&D Ecosystem:** Despite initiatives like the Bharat 6G Mission, India's research output, patents, and private investment in frontier telecom technologies remain modest compared to global leaders like China and US.
- **Spectrum and Standards Gap:** The allocation and regulation of terahertz (THz) bands for 6G are still evolving globally, leaving India with uncertainty in planning its 6G roadmap.
- **Talent and Skill Shortage:** There's a shortage of trained professionals in AI, photonics, and network engineering needed for indigenous 6G innovation.
- **Affordability and Digital Divide:** High deployment costs could widen the gap between urban and rural connectivity if not supported by inclusive policies.
- **Security and Privacy Risks:** With ultra-fast data transfer and massive device connectivity, ensuring cybersecurity and data protection becomes more complex.

STEPS FOR SUCCESSFUL 6G IMPLEMENTATION

- **Promote Indigenous Manufacturing:** Integrate 6G components under Production Linked Initiative (PLI) Schemes for telecom, semiconductors, and electronics to reduce import dependency and enhance domestic production.
- **Skill Development and Human Capital:** Expand 5G Labs in academic institutions to create a 6G-ready talent pool and promote interdisciplinary courses in AI, IoT, photonics, and network engineering.
- **Spectrum Policy and Regulation:** Formulate a forward-looking National Spectrum Strategy for THz frequencies and encourage global harmonization through participation in ITU and global standard-setting bodies.
- **Inclusive Access and Affordability:** Align 6G rollout with Digital India and BharatNet to ensure equitable access in rural and remote regions, avoiding a new digital divide.

CONCLUSION

India's 6G journey reflects its shift from a technology adopter to a global innovator. With initiatives like the **Bharat 6G Alliance**, and strong global partnerships, the country is building a secure, inclusive, and future-ready telecom ecosystem paving the way for a **self-reliant and digitally empowered Viksit Bharat by 2047**.

Drishti Mains Question:

Question: India's 6G Vision aims to position the country as a global co-creator in next-generation telecom. Discuss.

FREQUENTLY ASKED QUESTIONS (FAQS)

1. What is Bharat 6G Vision 2030?
Launched in 2023, it aims to make India a global leader and co-creator in 6G, focusing on affordability, sustainability, and universal access by 2030.

2. What is the Telecom Technology Development Fund (TTDF)?
Launched in 2022, TTDF funds R&D and indigenous innovation in 5G and 6G technologies to boost rural connectivity and domestic manufacturing.

3. What is the Bharat 6G Alliance?
An industry-led and government-facilitated body uniting telecom operators, academia, startups, and R&D institutions to drive indigenous innovation and develop global 6G standards.

4. What is IMT-2030?
It is the official name for 6G technology designated by the International Telecommunication Union (ITU), the UN agency for ICT standards.

UPSC CIVIL SERVICES EXAMINATION, PREVIOUS YEAR QUESTION (PYQ)

PRELIMS

Question: 1	Which of the following is/are the aims/aims of the "Digital India" Plan of the Government of India? (2018) 1. Formation of India's own Internet companies like China did. 2. Establish a policy framework to encourage overseas multinational corporations that collect Big Data to build their large data centers within our national geographical boundaries. 3. Connect many of our villages to the Internet and bring Wi-Fi to many of our schools, public places and major tourist centers. Select the correct answer using the code given below:
Option A	1 and 2 only
Option B	3 only
Option C	2 and 3 only
Option D	1, 2 and 3
Answer	Ans: (b)

21 INTERNATIONALISATION OF INDIAN HIGHER EDUCATION

TAGS:

- GS Paper - 2
- Education
- Welfare Schemes
- Human Resource
- Skill Development
- Government Policies & Interventions

For Prelims: National Education Policy (NEP) 2020, Setting up and Operation of Campuses of Foreign Higher Educational Institutions in India Regulations 2023, Gross Enrolment Ratio (GER), Make in India, Digital India, Public-Private Partnerships.

For Mains: Significant Policy Reforms Driving Transformation in India's Higher Education Sector, Emerging Prospects and Challenges Linked to the Entry of Foreign Universities in India.

WHY IN NEWS?

17 foreign universities mainly from the UK and Australia, have received approval to set up campuses in India under UGC's 2023 regulations. This move aligns with National Education Policy (NEP) 2020 and comes amid growing demand for quality higher education in India.

HOW IS INDIA ADVANCING GLOBAL PARTNERSHIP IN HIGHER EDUCATION?

- **NEP 2020 Vision:** Guided by the principles of Access, Equity, Quality, Affordability, and Accountability, NEP 2020 aims to establish India as a global education hub.
    - It allows top 100 global universities to operate in India, fostering international collaboration, student and faculty mobility, and academic credit transfer to elevate the entire education ecosystem to global standards.
- **UGC's Regulations 2023:** To operationalize the NEP 2020's vision, UGC's (Setting up and Operation of Campuses of Foreign Higher Educational Institutions in India) Regulations 2023 was enacted, permitting top-ranked Foreign Higher Educational Institutions (FHEIs) to establish campuses in India.

- Eligible FHEIs must be ranked within the top 500 QS World University rankings.
- These institutions are mandated to maintain the same academic standards, curricula, and degree equivalence as their parent campuses abroad.
- They are granted operational autonomy, including flexibility in faculty recruitment—both Indian and foreign—and are not bound by existing fee caps applicable to Indian universities.

DRIVERS FOR FOREIGN UNIVERSITIES IN INDIA

- **Demand Surge for Quality Higher Education:** With over half its population under 30 and a Gross Enrolment Ratio (GER) below 30%, India presents a vast untapped higher education market.
  - Rising incomes, a growing middle class, English proficiency, and demand for global learning make it an attractive destination for foreign universities.
- **Supportive Policy Environment:** NEP 2020 promotes the internationalisation of education, inviting top global universities to India, while UGC's 2023 regulations provide a supportive framework for establishing their campuses.
- **Declining International Students:** Recent data shows a sharp decline in Indian students abroad due to stricter immigration policies, including restrictions on foreign students bringing dependents and other measures to reduce immigration in the UK, US, and Canada.
- **Diversification of Revenue:** With stagnant domestic enrolments and declining public funding, universities in the UK, Australia, and Canada see India as a strategic market for revenue diversification and financial stability.
- **Strategic Global Partnerships:** Indian campuses strengthen institutional ties, promote research collaboration and student exchange, and build a talent pipeline for future postgraduate recruits and global alumni networks.
  - E.g., UK–India Education and Research Initiative (UKIERI) promotes bilateral student and faculty exchange.

IMPLICATIONS OF GLOBALISING INDIAN HIGHER EDUCATION

- **Global Competitiveness:** Foreign universities introduce global curricula, teaching standards, and quality assurance, elevating India's academic ecosystem while attracting innovation and research funding.

- **Curbing Brain Drain:** Highly skilled talented students may now stay in India, reducing the massive annual outflow of billions of dollars spent on studying abroad.
- **Systemic Improvement:** The presence of foreign universities will drive Indian institutions to innovate, enhance quality and competitiveness, while their governance models and industry-academia linkages can serve as a blueprint for systemic reform.
- **Alignment with National Goals:** Courses in high-demand fields like AI, Data Science, and Finance will build a skilled workforce aligned with Make in India and Digital India, while fostering a diverse and cosmopolitan academic environment.
- **Affordable International Degrees:** Earning a foreign degree in India is far more affordable than studying abroad — e.g., Southampton University's 2026 fees for Undergraduate (UG) courses (Rs 13.86–23.10 lakh) are about half of UK on-campus costs.

CHALLENGES & SOLUTIONS FOR FOREIGN CAMPUSES IN INDIA

Challenges	Way Forward
Autonomy Challenges: Limited autonomy on fees, curriculum, faculty; **complex UGC approvals**.	**Stable Regulatory Framework:** Fast-track single-window clearances; **transparent policies on autonomy, taxation, and fund repatriation**.
Financial Viability: Balancing **affordability with costs**; meeting enrollment targets for break-even.	**Sustainable Financial Models:** Phased investments; **public-private partnerships**; allow surplus repatriation with **reinvestment clauses**.
Competition Challenges: Intense competition from IITs/IIMs; student skepticism on degree value.	**Strategic Academic Partnerships: Joint degrees, credit transfers**; collaborative research on India-specific themes.
Quality Assurance Issues: Attracting top faculty; ensuring **no dilution of curriculum/pedagogy standards**.	**Robust Monitoring & Evaluation:** Define success via **research, employability, and community impact** metrics.
Infrastructure Barriers: Land acquisition, **taxation, labour laws,** and infrastructure readiness.	**Cultural Integration:** Adapt curricula to **Indian context and values**; promote local skills and knowledge economy.

CONCLUSION

India's framework for **foreign universities**, driven by **NEP 2020** and **UGC 2023**, aims to **transform higher education** by **enhancing quality**, **curbing brain drain**, and **fostering global competitiveness**. Success hinges on **balancing foreign autonomy** with **national interest**, ensuring **affordability**, and creating **sustainable, mutually beneficial academic partnerships** for **long-term impact.**

DRISHTI MAINS QUESTION:

Question: Examine how National Education Policy (NEP) 2020 and UGC Regulations 2023 facilitate the internationalization of higher education in India and assess their policy implications

FREQUENTLY ASKED QUESTIONS (FAQS)

1. What is the policy framework for foreign universities setting up campuses in India?
NEP 2020 and UGC Regulations 2023 permit top-ranked Foreign Higher Educational Institutions (FHEIs) to establish campuses, promoting internationalization and quality parity.

2. Which eligibility criterion must foreign universities meet under UGC rules?
FHEIs must be ranked within the top 500 globally (overall or subject-wise) or demonstrate exceptional domain expertise as per UGC assessment.

3. How does the entry of foreign universities align with India's national development goals?
It supports goals like 'Make in India' and 'Digital India' by creating a skilled workforce in high-demand fields, curbing brain drain, and fostering research and innovation within the country.

UPSC CIVIL SERVICES EXAMINATION, PREVIOUS YEAR QUESTION (PYQ)

PRELIMS

Question: 1	Which of the following provisions of the Constitution does India have a bearing on Education? (2012) 1. Directive Principles of State Policy 2. Rural and Urban Local Bodies 3. Fifth Schedule 4. Sixth Schedule

	5. Seventh Schedule Select the correct answer using the codes given below:
Option A	1 and 2 only
Option B	3, 4 and 5 only
Option C	1, 2 and 5 only
Option D	1, 2, 3, 4 and 5
Answer	Ans- (d)

MAINS

1. Discuss the main objectives of Population Education and point out the measures to achieve them in India in detail. (2021)
2. How have digital initiatives in India contributed to the functioning of the education system in the country? Elaborate on your answer. (2020)

22 RECLASSIFICATION OF CPSES

TAGS:

- GS Paper - 2
- Government Policies & Interventions
- GS Paper - 3
- Growth & Development
- Inclusive Growth
- Infrastructure

WHY IN NEWS?

The Government is planning to revise the classification and performance assessment criteria for Central Public Sector Enterprises (CPSEs) by introducing two new 'Ratna' categories in addition to the existing Maharatna, Navratna, and Miniratna statuses.

The Department of Public Enterprises under the Ministry of Heavy Industries and Public Enterprises grants Maharatna, Navratna, and Miniratna status to CPSEs based on their financial performance.

WHAT ARE THE KEY ASPECTS OF THE CPSES' RECLASSIFICATION?

- **New Evaluation Parameters:** New evaluation parameters under discussion include corporate governance, succession planning and leadership development, capital expenditure, dividend payout, sustainable business practices, and alignment with Vision 2047.
- **Re-evaluation Committee:** A 10-member committee led by Cabinet Secretary T.V. Somanathan is conducting the re-evaluation, with its report due before the Union Budget 2026–27.
- **Objective of Revision:** It aims to modernize the public sector and align it with India's national economic strategy by developing next-gen CPSEs capable of global competitiveness.
    - It focuses on accountability, performance-driven governance, efficiency, and strategic resource alignment toward sectors vital for India's future economic security.
- **Current Ratna Categories:** India currently has 14 Maharatna, 26 Navratna, and 74 Miniratna firms. The status enables financial and operational independence in capital spending, joint ventures, and investments.

WHAT ARE CPSES?

- **About:** A Central Public Sector Enterprise (CPSE) is a company, majority-owned and controlled by the Government of India, with at least 51% of its shares held by the Central Government, either directly or indirectly through other CPSEs.
    - This definition also extends to include the subsidiary companies of such enterprises.
- **Formation:** It is an entity that was either incorporated under Indian company law (like the Companies Act, 2013) or established by a specific Act of Parliament.

FREQUENTLY ASKED QUESTIONS (FAQS)

1. What is a CPSE?

A Central Public Sector Enterprise (CPSE) is a company with ≥51% government ownership, incorporated under company law or an Act of Parliament, including its subsidiaries.

2. Who is re-evaluating CPSE classification?

A 10-member committee headed by Cabinet Secretary T.V. Somanathan is reviewing CPSE classification and will submit its report before the Union Budget 2026–27.

3. How does the proposed new 'Ratna' differentiation differ from the existing one?

Unlike the existing categories that depend on financial size and turnover, the new tiers will recognize CPSEs based on their strategic importance to national economic goals in critical sectors.

UPSC CIVIL SERVICES EXAMINATION, PREVIOUS YEAR QUESTION (PYQ)

Question: 1	With reference to the Indian Renewable Energy Development Agency Limited (IREDA), which of the following statements is/are correct? (2015) 1. It is a Public Limited Government Company. 2. It is a Non-Banking Financial Company. Select the correct answer using the code given below:
Option A	1 only
Option B	2 only
Option C	Both 1 and 2
Option D	Neither 1 nor 2
Answer	Ans: (c)

23 GOOGLE'S VERIFIABLE QUANTUM ADVANTAGE

TAGS:

- Quick Facts for Prelims
- GS Paper - 3
- IT & Computers

WHY IN NEWS?

Google announced that its quantum processor, **"Willow,"** has achieved the **first-ever verifiable quantum advantage** by utilizing a new algorithm called **Quantum Echoes,** which ran 13,000 times faster than the world's fastest supercomputers.

This achievement marks a major step toward real-world quantum applications like Hamiltonian learning.

WHAT IS GOOGLE'S VERIFIABLE QUANTUM ADVANTAGE?

- **Concept of Quantum Advantage:** It refers to the point where a quantum computer outperforms classical supercomputers on specific tasks.
- **Google's Verifiable Quantum Advantage:** Google's Willow quantum processor, featuring up to 105 qubits, successfully ran the Quantum Echoes algorithm, which tracks the forward and backward evolution of entangled quantum states to study quantum chaos and interference.
    - This enabled the measurement of the Out-of-Time-Order Correlator (OTOC) - a key indicator of how information gets "scrambled" through entanglement as quantum bits interact.
    - The Willow processor achieved the OTOC measurement in just two hours, a task estimated to take 13,000 times longer (equivalent to several years) on a classical supercomputer.
    - Unlike earlier demonstrations, the result can be independently verified by other quantum or classical systems, making it the first real-world, measurable quantum advantage

PRACTICAL APPLICATIONS:

- **Hamiltonian Learning:** OTOC circuits can aid in Hamiltonian Learning, a quantum technique where a computer simulates the behavior of a physical system (such as a molecule) and compares it with real experimental data to

accurately estimate unknown parameters like energy levels or interaction strengths.

- **Molecular Structure Estimation:** The OTOC method, tested using nuclear magnetic resonance (NMR) spectroscopy, helps analyze proteins, materials, and compounds by studying quantum spin behavior, leading to better insights into molecular geometry.

QUANTUM COMPUTING GLOSSARY

- **Quantum Technology:** Quantum computing/technology refers to a class of technologies that leverage the principles of quantum mechanics to perform computations and achieve capabilities not possible with traditional technology.
    - Quantum mechanics is a fundamental theory in physics that describes the behavior of matter and energy at very small scales, such as atoms and subatomic particles.
- **Qubit (Quantum Bit):** The basic unit of quantum information that can exist as 0, 1, or both simultaneously (superposition).
- **Superposition:** The ability of a quantum system to be in multiple states at once, giving quantum computers massive parallel processing power.
- **Entanglement:** A quantum link where qubits remain connected, where changing one instantly affects the other, even if they're far apart.
- **Quantum Gate:** The building block of quantum circuits, they perform controlled operations on qubits (like classical logic gates).
- **Quantum Circuit:** A network of quantum gates arranged to perform a specific computation or algorithm.
- **Quantum Interference:** It is the process of reinforcing correct answers and cancelling wrong ones using the wave-like nature of qubits.
- **Quantum Simulation:** Using quantum computers to model molecules, materials, or physical systems too complex for classical machines.

FREQUENTLY ASKED QUESTIONS (FAQS)

1. What is a verifiable quantum advantage?

It's when a quantum computer outperforms classical supercomputers on a task, and the result can be independently verified by other quantum or classical systems.

2. What is an Out-of-Time-Order Correlator (OTOC)?

A quantum observable that tracks how information gets "scrambled" among entangled qubits, revealing the level of quantum chaos in a system.

3. What is Hamiltonian Learning and why is it important?
A quantum method where simulated OTOC signals are compared with real data to estimate unknown molecular parameters like energy levels or interactions.

4. What are the practical uses of OTOC-based experiments?
They aid molecular structure analysis, material design, and drug discovery through precise simulation of atomic-scale systems.

UPSC CIVIL SERVICES EXAMINATION PREVIOUS YEAR QUESTION (PYQ)

PRELIMS

Question: 1	Which one of the following is the context in which the term "qubit" is mentioned?
Option A	Cloud Services
Option B	Quantum Computing
Option C	Visible Light Communication Technologies
Option D	Wireless Communication Technologies
Answer	Ans: (b)

24 INDIA MARITIME WEEK (IMW) 2025

TAGS:

- Rapid Fire CA
- Quick Facts For Prelims
- GS Paper - 2
- Government Policies & Interventions
- GS Paper - 3
- Growth & Development
- Infrastructure

India Maritime Week (IMW) 2025, themed *"Uniting Oceans, One Maritime Vision,"* was inaugurated by the **Union Home and Cooperation Minister**, showcasing **India's goal to become a global maritime leader by 2047.**

IMW 2025 is a premier five-day event uniting maritime experts, innovators, and leaders from 85 countries.

INDIA'S MARITIME STRENGTH

- 11,000 km coastline, 13 coastal states, and a 23.7 lakh sq. km Exclusive Economic Zone (EEZ) make India a natural maritime power.
- 60% of India's GDP comes from coastal states, supporting 800 million livelihoods linked to the sea.
- India's maritime sector handles 95% of the country's trade by volume and 70% by value.
- The Maritime India Vision (MIV) 2030 and Maritime Amrit Kaal Vision 2047, guided by the Sagarmala Programme and the vision of MAHASAGAR (Mutual and Holistic Advancement for Security and Growth Across Regions), aim to make India a global maritime and trade hub while balancing economic growth with environmental sustainability.

MARITIME INDIA VISION 2030

- It includes over 150 strategic initiatives with Rs 3 - 3.5 lakh crore in investments to modernize ports, shipping, and waterways.
- The number of Indian seafarers has surged by 200%, reaching 3.2 lakh.

- Under MIV 2030, India's port capacity has nearly doubled from 1,400 million metric tonnes per annum (MMTPA) in 2013-14 to 2,762 MMTPA in 2024-25 a 92% rise at major ports and 80% at non-major ports.

MARITIME AMRIT KAAL VISION 2047

- India aims to handle one-third of global seaborne trade by 2047, up from 10% currently.
- It targets Rs 80 lakh crore investments to develop green corridors, hydrogen bunkering, and methanol-fueled vessels for sustainability.

25 RASHTRIYA VIGYAN PURASKAR 2025

TAGS:

- Rapid Fire CA
- Achievements of Indians in Science & Technology
- Scientific Innovations & Discoveries
- GS Paper - 3

The Government of India has announced the **Rashtriya Vigyan Puraskar (RVP) 2025**, the nation's highest recognition for outstanding contributions in diverse fields of **science, technology, and technology-led innovation.**

Prominent Awardees of 2025: Vigyan Ratna (Posthumous)-**Prof. Jayant Vishnu Narlikar** – noted astrophysicist.

Known for co-developing the **Hoyle–Narlikar theory of gravity,** an alternative to **Einstein's general relativity** that supports the steady-state model of the universe.

RASHTRIYA VIGYAN PURASKAR

- **About:** The award has been instituted by the Ministry of Science and Technology.
- It aims to inspire excellence in Indian science and technology, promote innovation, and acknowledge achievements that contribute to national development.
- **Disciplinary Coverage:** It covers 13 fields such as Physics, Chemistry, Engineering, Agriculture, Environment, Atomic Energy, Space, etc.
- **Categories of Awards:** The Rashtriya Vigyan Puraskar is conferred under four categories:
    - **Vigyan Ratna (VR):** Lifetime achievement recognition.
    - **Vigyan Shri (VS):** Distinguished contributions.
    - **Vigyan Yuva–Shanti Swarup Bhatnagar (VY–SSB):** For scientists below 45 years.
    - **Vigyan Team (VT):** For exceptional collaborative work.

26 NATIONAL CRITICAL MINERAL MISSION (NCMM)

TAGS:

- Rapid Fire CA
- GS Paper - 3
- Industrial Policy
- Industrial Growth

The Ministry of Mines has recognized two additional Centres of Excellence (CoEs)- Indian Institute of Science (IISc), Bengaluru and Centre for Materials for Electronics Technology (C-MET), Hyderabad under the National Critical Mineral Mission (NCMM). Earlier, seven institutes had already been recognized under this initiative.

CoE will function on a Hub & Spoke model, pooling expertise of academic, R&D, and industry partners.

NATIONAL CRITICAL MINERAL MISSION (NCMM)

- About: The National Critical Mineral Mission (NCMM) was announced in the Union Budget 2024–25 to ensure India's long-term mineral security.
- The mission seeks to strengthen India's critical mineral supply chain by ensuring steady availability from both domestic and international sources.

COVERAGE & OBJECTIVES:

- The NCMM covers all stages of the mineral value chain - exploration, mining, beneficiation, processing, and recycling from end-of-life products.
- It aims to secure access to minerals essential for clean energy, electronics, and strategic sectors.

KEY FEATURES:

- Focus will also be on offshore mining of polymetallic nodules rich in cobalt and rare earth elements (REEs).
- Governance: The Empowered Committee on Critical Minerals will oversee the mission, with the Ministry of Mines as the nodal authority.

CRITICAL MINERALS

Critical minerals are vital for a country's economic growth and national security. Their limited global availability poses supply chain risks.

KEY APPLICATIONS:

- **Solar Energy:** Minerals like silicon, tellurium, indium, and gallium are crucial for photovoltaic (PV) cells. India's 64 GW solar capacity depends heavily on them.
- **Wind Energy:** Rare earth elements such as neodymium and dysprosium are vital for wind turbine magnets.
- **Electric Vehicles:** Lithium, nickel, and cobalt power lithium-ion batteries under the National Electric Mobility Mission Plan (NEMMP).
- **Energy Storage:** Advanced batteries for energy storage rely on lithium, cobalt, and nickel.

PRACTICE MCQS

Question: 1	Which of the following statements regarding the National Critical Mineral Mission (NCMM) are correct? 1. It was approved by the Union Cabinet in January 2025. 2. It aims to ensure a resilient value chain for minerals essential for clean energy technologies. 3. The Mission will be implemented by the Ministry of Coal. Select the correct answer using the code below:
Option A	1 and 2 only
Option B	2 and 3 only
Option C	1 and 3 only
Option D	1, 2 and 3
Answer	Answer: (a) Explanation: The NCMM was approved in January 2025 under the Ministry of Mines, not the Ministry of Coal. It aims to ensure domestic availability and processing of critical minerals for green and high-tech industries.

Question: 2	The total financial outlay for the National Critical Mineral Mission (NCMM) over seven years (FY 2024-25 to FY 2030-31) is approximately—
Option A	₹16,300 crore
Option B	₹18,000 crore

Option C	₹34,300 crore
Option D	₹50,000 crore
Answer	Answer: (c) Explanation: The Mission has an outlay of ₹34,300 crore — ₹16,300 crore from the Government and ₹18,000 crore from public/private partnerships.

Question: 3	Which of the following minerals are included under India's list of 'critical minerals'? 1. Lithium 2. Graphite 3. Titanium 4. Rare Earth Elements Select the correct code:
Option A	1, 2 and 4 only
Option B	2, 3 and 4 only
Option C	1, 2, 3 and 4
Option D	1 and 3 only
Answer	Answer: (c) Explanation: All four minerals — lithium, graphite, titanium, and REEs — are on India's 24 critical mineral list (2023 notification under MMDR Act Schedule Part D).

Question: 4	Which of the following is NOT an objective of the National Critical Mineral Mission (NCMM)?
Option A	Promoting domestic exploration and mining of critical minerals.
Option B	Creating processing and recycling infrastructure for clean technologies.
Option C	Encouraging import dependence for minerals to ensure competitive pricing.
Option D	Securing overseas mineral assets through international partnerships.
Answer	Answer: (c)

	Explanation: NCMM aims to reduce import dependence, not encourage it, by building domestic capacity and global partnerships.

Question: 5	Consider the following pairs: **Initiative / Policy** — **Ministry / Nodal Body** National Critical Mineral Mission — Ministry of Mines KABIL (Khanij Bidesh India Ltd) — Ministry of Mines National Mineral Exploration Trust — Ministry of Environment, Forest and Climate Change Which of the pairs are correctly matched?
Option A	1 and 2 only
Option B	2 and 3 only
Option C	1 and 3 only
Option D	1, 2 and 3
Answer	Answer: (a) Explanation: The first two (NCMM and KABIL) are under the Ministry of Mines. The National Mineral Exploration Trust (NMET) is also under the Ministry of Mines — not MoEFCC.

UPSC MAINS ANALYTICAL QUESTIONS

Question: 1	Discuss the significance of the National Critical Mineral Mission (NCMM) in strengthening India's economic security and clean energy transition.
Points	Key Points:
	Context: India's energy shift → EVs, renewables → rising need for Li, Co, Ni, REEs.
	Significance:
	Reduces import dependence (currently 80–90% on some minerals).
	Enables value addition via processing, recycling, R&D.

	Supports green industrialisation and clean energy goals (Net Zero 2070).
	Boosts strategic autonomy and supply chain resilience.
	Example: Lithium exploration in J&K (Reasi), international tie-ups via KABIL.
	Way Forward: Technology transfer, skill-building, ESG compliance.

Question: 2	Examine the major challenges that India faces in implementing the National Critical Mineral Mission (NCMM). Suggest measures to overcome them.
Key Points:	Challenges:
	Lack of advanced refining and processing technologies.
	Environmental concerns from mining operations.
	High capital cost and limited private participation.
	Global market volatility and dominance of China in REEs.
	Bureaucratic delays, inter-ministerial coordination gaps.
	Measures:
	Public–Private Partnerships, strategic reserves.
	Recycling ecosystems, circular economy.
	International collaborations (e.g., US-led Mineral Security Partnership).
	Digital exploration and sustainability norms.

Question: 3	"Critical minerals are the new oil in the era of clean energy transition." Discuss this statement in the context of India's policy initiatives.
	Introduction: Importance of minerals like lithium, nickel, cobalt, graphite, REEs for batteries, solar, wind.
	India's policy initiatives:

	NCMM (2025) for full value chain.
	Critical Minerals List (2023).
	KABIL for overseas acquisition.
	PLI for battery storage, solar PV, EVs.
	Analysis: Ensures economic security, energy resilience, and global competitiveness.
	Conclusion: Critical minerals underpin India's "Atmanirbhar" clean energy future; success depends on timely implementation and innovation.

27 GOOGLE'S AI C2S-SCALE

Google DeepMind's AI model Cell2Sentence-Scale 27B (C2S-Scale) produced a **new, lab-confirmed hypothesis on cancer cell behavior**, marking a breakthrough in **AI-driven drug discovery and biological research**.

C2S-SCALE MODEL

- C2S-Scale is a large language model (LLM) built on Google's Gemma-2 architecture, trained to understand gene expression as a language.
- With 27 billion parameters, the model can capture subtle relationships among genes, cells, and tissues, reflecting AI "scaling laws"—where larger models gain emergent abilities that smaller models lack.
- **Working:** It translates single-cell RNA sequencing (scRNA-seq) data and interprets biological functions as 'cell sentences', learning patterns from millions of cells to understand cellular functions.
- **Breakthrough:** The AI hypothesized that the drug silmitasertib could act as a conditional amplifier, making cancer cells more visible to the immune system only in the presence of low interferon.
- **Significance:** C2S-Scale enables in-silico (computer-based) screening at unmatched speed and scale, accelerating scientific discovery.

GOOGLE DEEPMIND

- **About:** It is an Alphabet-owned AI research lab dedicated to achieving Artificial General Intelligence (AGI) and applying it to solve complex challenges in science, healthcare, and climate change.
- **Achievements:** Its notable breakthroughs include AlphaFold for protein structure prediction, AlphaGo for strategic reasoning, and the Gemini large language models.

28 INDIA'S FIRST NATIONAL POLICY ON GEOTHERMAL ENERGY

Ministry of New and Renewable Energy (MNRE) has launched **India's first National Policy on Geothermal Energy 2025,** aiming to tap India's vast but underutilized geothermal potential to advance the nation's **Net Zero 2070 commitment,** ensure energy security, and diversify its renewable energy mix.

KEY FEATURES OF THE NATIONAL GEOTHERMAL ENERGY POLICY 2025?

- **Broad Scope of Application:** The policy encompasses all major aspects of geothermal energy development including:
    - Geothermal Resource Assessment
    - Power Production Systems
    - Direct-use Applications
    - Ground (Geothermal) Source Heat Pumps (GSHP)
    - Utilization of abandoned oil and gas wells for geothermal energy extraction is encouraged.
    - Extraction of valuable mineral by-products like silica, borax, cesium, and lithium will be regulated under the Mines and Minerals (Development and Regulation) Act (MMDR Act),1957 with applicable royalties.
- **Promotion of Emerging Tech:** It also promotes emerging and innovative technologies such as:
    - Enhanced Geothermal Systems (EGS)
    - Advanced Geothermal Systems (AGS)
    - Geothermal energy storage
    - Offshore geothermal wells
- **Geothermal Resource Data Repository:** Establishment of a comprehensive geothermal resource data repository through inter-ministerial collaboration with agencies such as the Ministry of Mines, Ministry of Earth Sciences, Geological Survey of India (GSI), and National Data Repository (NDR).
    - Permission for resource assessment surveys will be granted to developers for R&D and feasibility studies.
- **Fiscal & Financial Support:** Under the Renewable Energy Research and Technology Development Programme (RE-RTD):

- Up to 100% financial support for government and non-profit research institutions.
- Up to 70% support for private sector entities including start-ups and manufacturing units.

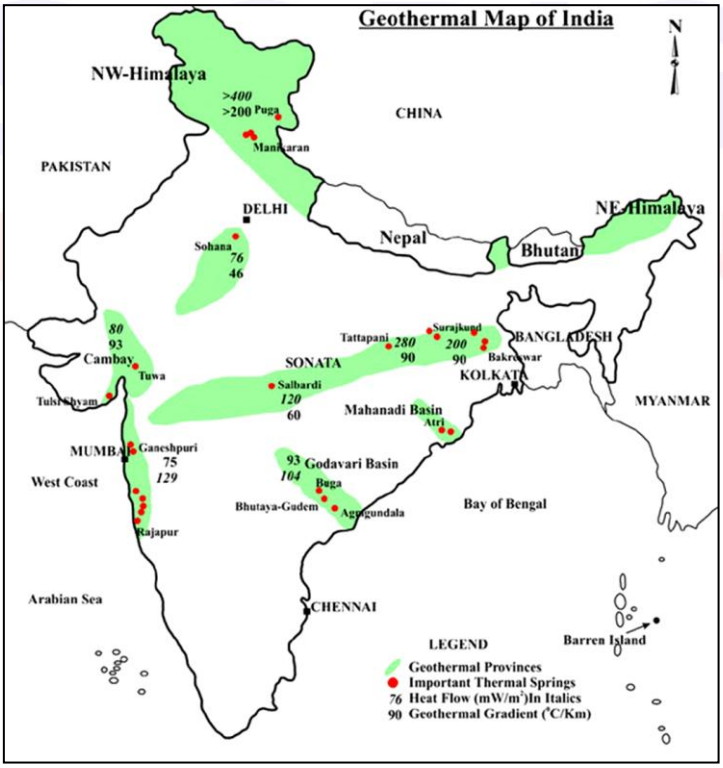
- **Additional support mechanisms:**
  - Inclusion under the Indian Carbon Credit Trading Scheme.
  - Waiver of open access charges.
  - Eligibility under Renewable Purchase Obligations (RPOs).
  - State-Level Guidelines: State/UT governments will have the authority to issue:
  - Exploration leases (valid for 3–5 years)
  - Development leases for power generation or direct-use (valid for up to 30 years)
  - Establishment of a single-window clearance mechanism through designated state nodal agencies.

WHAT IS GEOTHERMAL ENERGY?

- **About:** Geothermal energy refers to the heat derived from the Earth's interior, which can be used for heating buildings, and generating electricity.
  - It is considered a renewable energy source because the Earth continuously produces heat within its core.
- **India's Geothermal Potential:**
  - India's geothermal potential-spread across 381 hot springs and 10 geothermal provinces including Ladakh(Puga valley), Himachal Pradesh, Gujarat, Odisha, and Chhattisgarh.
  - A potential of about 10,600 MW of geothermal power has been estimated in the country.
  - Globally, geothermal energy contributes 15.4 GW (2019), led by the U.S., Indonesia, and the Philippines.
- **Sources:**
  - Deep reservoirs: Hot water or steam found deep within the Earth is accessed through drilling.
  - Surface reservoirs: Geothermal reservoirs located near the surface, especially in western U.S., Alaska, and Hawaii, are more easily accessible.

- Shallow ground: The shallow layers of the Earth maintain a constant temperature (50–60°F), which can be used for direct heating and cooling applications.

- **Benefits:**
  - **Renewable Source:** With proper management, the rate of energy extraction can be balanced with the natural heat recharge rate of the reservoir.
  - **Continuous Supply:** Geothermal power plants can operate 24×7, providing a consistent energy supply unaffected by weather conditions.
  - **Small Land Footprint:** Geothermal plants occupy less land area per GWh compared to coal, solar, or wind energy installations.
  - **Less Water Consumption:** Additionally, geothermal systems consume less water than most conventional energy sources.
- **Disadvantages/issues of Geothermal Energy:**
  - If improperly harnessed, geothermal projects can lead to pollutant release.
  - Incorrect drilling may release hazardous gases and minerals trapped deep inside the Earth.
  - Higher capital costs, techno-economic viability issue due to remote location.



SIGNIFICANCE

- **Clean-energy diversification**: Geothermal offers a **24×7 renewable baseload** option which complements solar & wind.
- **Energy security & net-zero support**: Aligns with India's goal of **Net Zero by 2070**; reduces dependence on fossil fuels and imported energy resources.
- **Broader applications** beyond electricity: Heating/cooling, greenhouse farming, tourism, aquaculture – contributing to rural & regional development.
- **Industrial & innovation push**: Enables domestic manufacturing of geothermal equipment, drilling tech, monitoring systems and strengthens the "Make in India" drive.
- **Global cooperation & standardization**: Opens avenues for India to collaborate with geothermal pioneers (Iceland, USA, Norway) and to develop global best practices.

CHALLENGES & AREAS TO WATCH

- **Exploration and upfront cost risk**: Geothermal projects involve high risks in site selection, drilling; many resources still unproven.
- **Technology & infrastructure gap**: India has limited experience in high-enthalpy geothermal power generation compared to countries like USA, Indonesia, Philippines.
- **Transmission & grid integration**: Locating geothermal plants often in remote/hilly areas (e.g., Himalayan provinces) adds logistics and transmission cost.
- **Environmental & social concerns**: Drilling, subsurface disruptions, water usage, land-use change may raise local consent and ecological issues.
- **Financial viability & business models**: Competitive funding, long gestation, need for tariff design; ensuring investor confidence is crucial.
- **State-level coordination and governance**: Since mineral/land matters are concurrent, needs strong state-centre coordination and fast clearances.

MCQS

Question: 1	Which of the following statements regarding the National Policy on Geothermal Energy 2025 is/are correct? 1. It is India's first dedicated national policy framework for the development and utilization of geothermal energy. 2. It allows 100 % FDI in the geothermal energy sector.

	3. The policy is implemented by the Ministry of Power. Select the correct answer using the code given below:
Option A	1 only
Option B	1 and 2 only
Option C	2 and 3 only
Option D	1, 2 and 3
Answer	Answer: B. 1 and 2 only Explanation: It was launched by the Ministry of New and Renewable Energy (MNRE), not the Ministry of Power. It indeed allows 100 % FDI and is India's first such dedicated policy.

Question: 2	Consider the following geothermal provinces identified under the 2025 policy: 1. Himalayan province 2. Son-Narmada-Tapi lineament zone 3. Andaman-Nicobar volcanic arc 4. Bundelkhand plateau Which of the above are officially recognized geothermal provinces of India?
Option A	1, 2 and 3 only
Option B	1 and 3 only
Option C	2 and 4 only
Option D	1, 2, 3 and 4
Answer	Answer: A. 1, 2 and 3 only Explanation: India has around 10 geothermal provinces (e.g., Himalayan, Andaman-Nicobar, Son-Narmada-Tapi, Cambay, Godavari, West Coast, etc.). Bundelkhand is not one.

Question: 3	Under the National Policy on Geothermal Energy 2025, which of the following incentives have been provided to encourage private investment?

	1. Viability Gap Funding (VGF) 2. Single-window clearance system 3. Concessional loans and tax exemptions 4. 100 % foreign direct investment (FDI) Select the correct answer using the code below:
Option A	1 and 2 only
Option B	1, 2 and 3 only
Option C	2, 3 and 4 only
Option D	1, 2, 3 and 4
Answer	Answer: D. 1, 2, 3 and 4 Explanation: All these are included: financial incentives (VGF, loans), administrative reforms (single-window), and 100 % FDI.

Question: 4	Which of the following statements best describes geothermal energy?
Option A	Energy obtained from the heat generated by nuclear reactions beneath Earth's crust.
Option B	Energy derived from the heat of Earth's interior used for electricity and direct heating applications.
Option C	Solar energy stored in soil layers over time.
Option D	Energy produced from the motion of oceanic tectonic plates.
Answer	Answer: B Explanation: Geothermal energy refers to heat energy from Earth's interior, harnessed via hot springs, steam, or reservoirs for electricity, heating, etc.

Question: 5	Which of the following can be direct (non-power) applications of geothermal energy as recognized under the policy? 1. Greenhouse and aquaculture heating 2. Cold storage and space heating/cooling 3. Desalination of seawater 4. Geo-tourism Select the correct answer using the code given below:

Option A	1 and 2 only
Option B	2 and 4 only
Option C	1, 2 and 4 only
Option D	1, 2, 3 and 4
Answer	Answer: D. 1, 2, 3 and 4 Explanation: The policy explicitly supports both electricity generation and direct-use applications, including agriculture, aquaculture, tourism, and desalination research.

UPSC MAINS-LEVEL ANALYTICAL QUESTIONS

Question: 1	"The National Policy on Geothermal Energy 2025 reflects India's strategic shift towards diversified and reliable renewable energy sources." Examine.
Key Points for Answer:	Context: dependence on intermittent renewables; need for base-load clean energy.
	Policy framework: MNRE's first national geothermal roadmap; FDI, fiscal incentives, pilot projects.
	Significance: 24×7 power, rural energy, heating/cooling, energy security.
	Challenges: exploration risk, high capital cost, remote location grid issues.
	Way forward: R&D, PPP models, global collaboration, regulatory clarity.

Question: 2	Discuss the potential role of geothermal energy in achieving India's Net Zero 2070 target and ensuring energy security.
Key Points for Answer:	Baseline of India's renewable mix (solar/wind dominance).
	Geothermal as stable, base-load renewable complement.

	Reduces fossil-fuel import dependence.
	Supports direct decarbonization in heating, agriculture, and industry.
	Need for indigenous technology and state-centre cooperation.

Question: 3	Enumerate the major challenges hindering geothermal energy development in India and suggest appropriate policy measures to overcome them.
Key Points for Answer:	Challenges: exploration risk, high cost, technical expertise gap, data paucity, land & environmental clearances, financing.
	Measures: viability-gap funding, R&D, pilot projects, skill training, use of abandoned oil wells, hybrid systems, and stronger institutional mechanisms (Centre of Excellence).

29 NATIONAL BLOCKCHAIN FRAMEWORK (NBF)

Blockchain technology has become a major digital innovation with the launch of the National Blockchain Framework (NBF) in September 2024 to enhance transparency, accountability, and efficiency in public services.

WHAT IS THE NATIONAL BLOCKCHAIN FRAMEWORK (NBF)?

- The NBF is an initiative of the Ministry of Electronics & Information Technology (MeitY) of India, designed to provide a unified architecture and infrastructure for deploying permissioned blockchain applications across government and industry.
- It was officially launched in September 2024 with a budget of about ₹ 64.76 crore.
- The aim is to enable trusted, transparent, secure digital service delivery, reduce fraud, enhance governance, and support India in becoming a global blockchain innovation hub.

KEY COMPONENTS & FEATURES

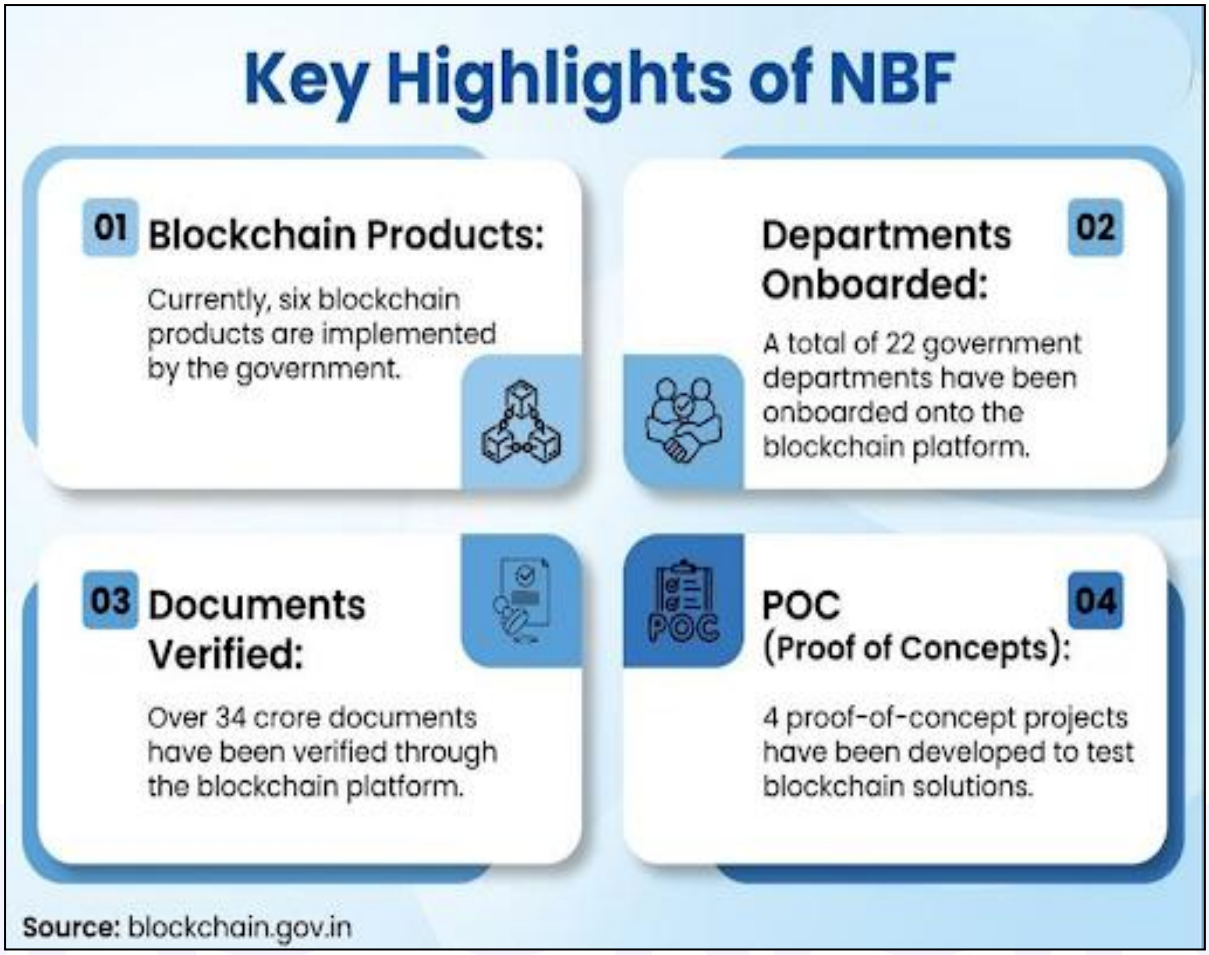
CORE COMPONENTS

- **Vishvasya Blockchain Stack**: An indigenous modular blockchain-platform offered as Blockchain-as-a-Service (BaaS). It supports permissioned blockchain applications, smart contracts, API gateway, hosted on distributed NIC data centres (Bhubaneswar, Pune, Hyderabad).
- **NBFLite**: A lightweight "sandbox" version of NBF for startups, academia and rapid prototyping of blockchain applications.
- **Praamaanik**: A blockchain-enabled solution for verifying the authenticity and origin of mobile apps.
- **National Blockchain Portal**: A platform providing access to resources, standardisation guidelines, and support for cross-sector blockchain adoption.

KEY FEATURES & TECHNICAL ARCHITECTURE

- **Distributed Infrastructure**: The blockchain stack is hosted across multiple NIC data-centres to ensure resilience, scalability and fault-tolerance.
- **Permissioned Blockchain**: The framework uses permissioned (not fully public) ledgers — only verified participants can validate transactions. This is suited to governance/government applications.

- **Smart Contracts & API Gateway**: Enables creation and integration of smart contracts into existing digital systems, along with API layers for interoperability.
- **Security, Privacy & Interoperability**: Emphasis on data integrity, privacy of sensitive government records, and interoperability between blockchain applications.



SIGNIFICANCE

- **Enhancing trust in governance**: By enabling immutable, tamper-proof records (for documents, certificates, property rights, supply chains) the NBF strengthens transparency and accountability.
- **Digital India & Aatmanirbhar Bharat alignment**: The framework fosters indigenous technology development (Vishvasya stack) and reduces dependency on foreign platforms.
- **Support for multiple sectors**: Use-cases in certificates & documents chain, logistics/tracking, judiciary chain (ICJS integration), property records, etc.
- **Start-up & innovation ecosystem**: NBFLite helps startups and academia to experiment with blockchain, supporting capacity building and research.

CHALLENGES & ISSUES

- **Scalability & Performance**: Handling large volumes of transactions across departments and states remains a technical challenge.
- **Interoperability & Legacy Systems**: Integrating blockchain apps with existing government systems and between different blockchain networks requires standardisation.
- **Skill Gap**: Blockchain technology (smart contracts, ledger design, cryptography) demands skilled manpower which is still limited.
- **Regulatory & Privacy Concerns**: How permissioned blockchain networks align with data protection, privacy laws and governance frameworks is still under refinement.
- **Cost & Adoption**: Up-front costs, vendor-lock-in fears, and change management in government departments can hinder adoption.

KEYWORDS / FACTS FOR PRELIMS

- **Launch date:** September 2024 (official) with budget ~₹ 64.76 crore.
- Developed by MeitY.
- **Core modules:** Vishvasya Blockchain Stack, NBFLite, Praamaanik, National Blockchain Portal.
- Hosted on NIC Data Centres at Bhubaneswar (Odisha), Pune (Maharashtra), Hyderabad (Telangana).
- Permissioned blockchain and Blockchain-as-a-Service (BaaS).
- **Use-cases:** Digital certificates chain, property record chain, judiciary chain, supply chain tracking.

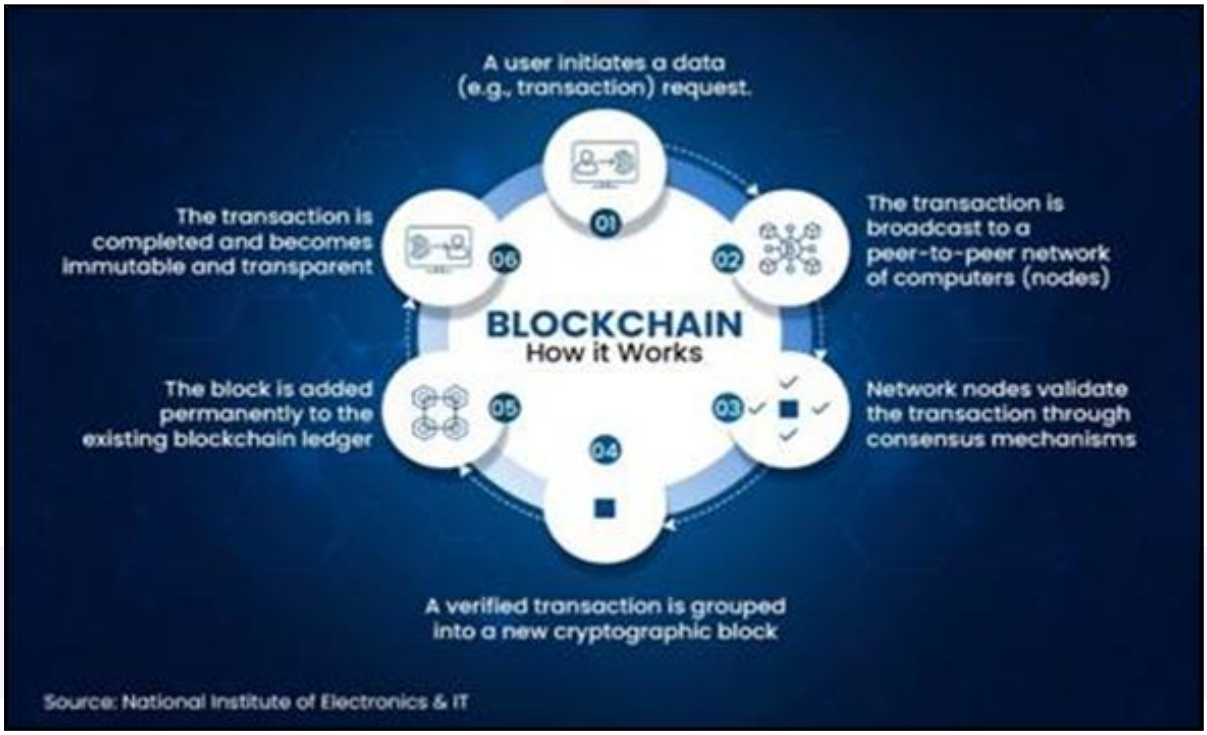
HOW TO USE IN UPSC ANSWERS

- **GS Paper 2 (Governance & Policy / E-governance)**: Use NBF as an example of digital infrastructure enabling transparency & accountability; discuss how blockchain can reform public service delivery and governance.
- **GS Paper 3 (Science & Technology / Digital Infrastructure)**: Use NBF to talk about emerging tech in India, how blockchain fits into digital infrastructure, challenges of big-data, distributed ledger, permissioned vs public blockchains.
- **Essay topics**: For essays like *"Technological innovations for improving governance in India"* or *"Balancing privacy, security and innovation in digital India"*, NBF is a relevant case study.

- Structure for mains answer: Context → Key features of NBF → Significance → Challenges & Way forward.

BLOCKCHAIN

- Blockchain is a distributed, immutable, and transparent digital ledger that records transactions securely across multiple computers (nodes).
- It removes the need for intermediaries by enabling verifiable trust among participants.
- Features: Key features include decentralization, immutability, transparency, and security—all crucial for reliable governance systems.



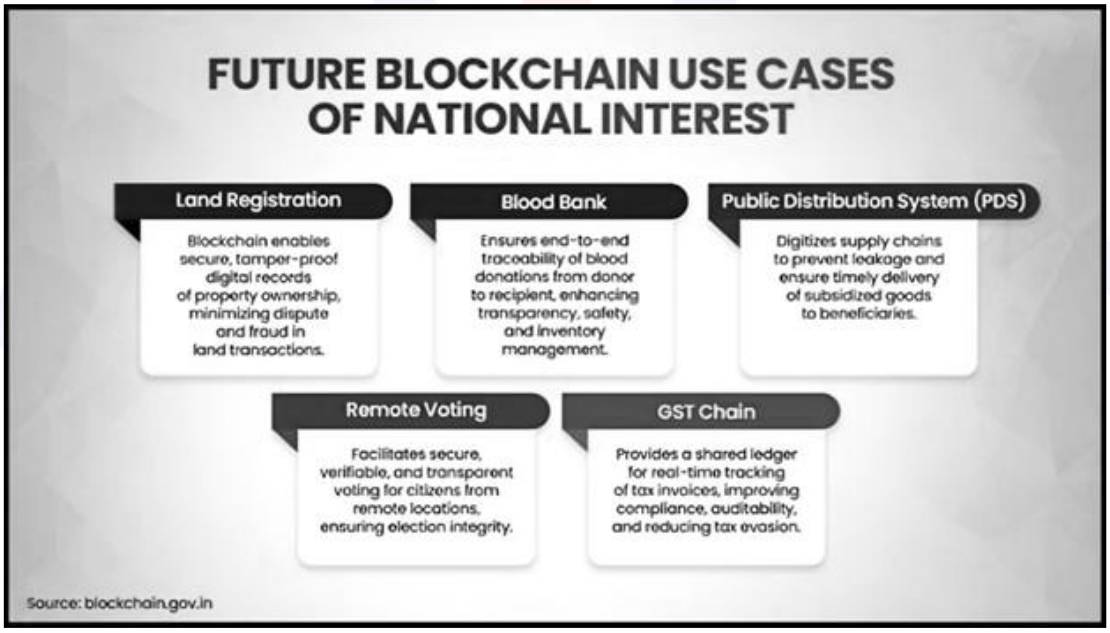
KEY INITIATIVES PROMOTING BLOCKCHAIN ADOPTION IN INDIA

- **National Strategy on Blockchain:** The National Strategy on Blockchain by MeitY outlines India's roadmap for blockchain development, addressing challenges and setting short- and long-term goals for its integration across sectors.
- **Centre of Excellence (CoE) in Blockchain:** NIC has set up a CoE to offer consultancy, training, and support for pilot blockchain projects before large-scale implementation.
- **TRAI's Role:** Telecom Regulatory Authority of India (TRAI) has integrated Distributed Ledger Technology (DLT) to curb spam and fraud in SMS transmission.

- **RBI's Blockchain Initiatives:** RBI conducted a pilot for Digital Rupee (e₹) in retail transactions to promote traceable, instant, and inclusive payment systems using blockchain.
- **NSDL's Adoption of Blockchain:** National Securities Depositories Limited (NSDL) developed the Debenture Covenant Monitoring System to track asset charges and covenants on a tamper-proof ledger, boosting investor confidence.

HOW IS INDIA BUILDING A BLOCKCHAIN-READY WORKFORCE?

- **Skill Development:** Over 214 programs have trained 21,000+ government officials in emerging technologies including blockchain.
- **Post Graduate Diploma in FinTech & Blockchain:** Offers 900-hour training on blockchain, fintech, AI, cybersecurity, and regulatory frameworks.
- **BLEND programme by C-DAC:** Blockchain Technology and Application Development (BLEND) is an online course for engineering students and professionals to learn blockchain architecture and real-world applications.
- **FutureSkills PRIME:** MeitY-backed initiative for upskilling IT manpower in 10 emerging technologies including blockchain.



MCQS

Question: 1	Which of the following statements is/are correct about the National Blockchain Framework (NBF)? 1. It was launched by the Ministry of Electronics and Information Technology (MeitY).

	2. The framework uses permissionless (public) blockchain networks for governance. 3. Vishvasya Blockchain Stack is the core component of NBF. Select the correct answer using the code given below:
Option A	1 and 2 only
Option B	1 and 3 only
Option C	2 and 3 only
Option D	1, 2 and 3
Answer	Answer: B. 1 and 3 only Explanation: It was launched by MeitY in 2024. It is a permissioned blockchain framework (not public). Vishvasya Blockchain Stack is its core component.

Question: 2	With reference to the Vishvasya Blockchain Technology Stack, consider the following statements: 1. It is an indigenous Blockchain-as-a-Service (BaaS) infrastructure hosted by NIC data centres. 2. It allows startups and academia to test blockchain applications through its NBFLite version. 3. It is managed by the National Informatics Centre under the Ministry of Power. Which of the statements given above is/are correct?
Option A	1 only
Option B	1 and 2 only
Option C	2 and 3 only
Option D	1, 2 and 3
Answer	Answer: B. 1 and 2 only Explanation: Vishvasya Stack is a BaaS platform hosted on NIC data centres (Bhubaneswar, Pune, Hyderabad). NBFLite is indeed a sandbox for startups and academia. It comes under MeitY, not the Ministry of Power.

Question: 3	Which of the following components is/are part of the National Blockchain Framework (NBF)? 1. Vishvasya Blockchain Stack 2. Praamaanik Application 3. National Blockchain Portal 4. Digital India e-Registry Select the correct answer using the code below:
Option A	1 and 2 only
Option B	1, 2 and 3 only
Option C	1, 3 and 4 only
Option D	1, 2, 3 and 4
Answer	Answer: B. 1, 2 and 3 only Explanation: NBF includes Vishvasya Stack, Praamaanik, and National Blockchain Portal. Digital India e-Registry is not a part of NBF.

Question: 4	Which of the following statements best explains the purpose of the National Blockchain Framework (NBF)?
Option A	It aims to create a public cryptocurrency under Government of India.
Option B	It provides a national standard architecture for blockchain-based applications in governance and industry.
Option C	It aims to replace all existing digital platforms with a decentralized public ledger.
Option D	It regulates private crypto exchanges operating in India.
Answer	Answer: B Explanation: The NBF is meant to develop a unified, permissioned blockchain architecture for transparent, tamper-proof governance and enterprise applications.

Question: 5	Which of the following are potential applications under India's National Blockchain Framework? 1. Land and property records management

	2. Judiciary data integration (ICJS) 3. Tracking logistics and supply chains 4. Cryptocurrency trading regulation Select the correct answer using the code given below:
Option A	1 and 2 only
Option B	1, 2 and 3 only
Option C	2 and 4 only
Option D	1, 2, 3 and 4
Answer	Answer: B. 1, 2 and 3 only Explanation: NBF supports governance-related blockchain use cases — property records, judiciary chain, supply chain tracking — not cryptocurrency trading regulation.

UPSC MAINS-LEVEL ANALYTICAL QUESTIONS

Question: 1	"Blockchain technology has the potential to transform India's governance system from reactive to proactive." In this context, evaluate the role of the National Blockchain Framework (NBF).
Key Points for Answer:	Context: Governance challenges—corruption, inefficiency, lack of transparency.
	Features of NBF: MeitY initiative; permissioned blockchain; Vishvasya Stack; NBFLite; Praamaanik; NIC hosting.
	Impact on Governance: Tamper-proof data, faster service delivery, transparency in records (land, supply chains, judiciary).
	Challenges: Integration with legacy systems, data privacy, interoperability, capacity building.
	Way Forward: Awareness programs, skill training, inter-departmental standards, pilot projects before large-scale rollout.

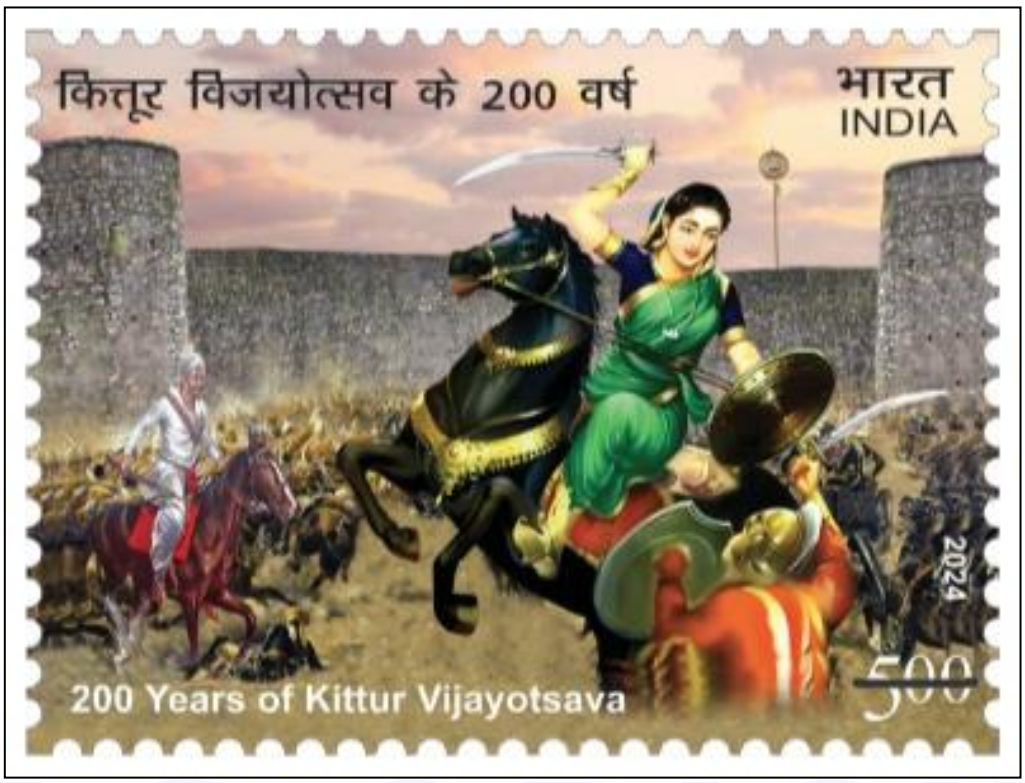
Question: 2	Discuss the significance of the National Blockchain Framework in India's journey toward digital sovereignty and self-reliance in technology.

Key Points for Answer:	Aatmanirbhar Bharat alignment: Indigenous BaaS (Vishvasya Stack) reduces dependency on foreign blockchain solutions.
	Digital sovereignty: Local control of data, privacy, and technology standards.
	Supports start-ups and academia: NBFLite sandbox.
	Contributes to Digital India, IndiaAI, National Data Governance Framework.
	Way forward: Strengthen domestic R&D, encourage PPP innovation labs, ensure alignment with global standards.

Question: 3	Enumerate the major challenges in implementing blockchain technology in Indian governance and suggest measures to ensure effective adoption of the National Blockchain Framework.
Key Points for Answer:	Challenges:
	Limited awareness and skill gap in government departments.
	Interoperability between legacy and blockchain systems.
	Data protection and privacy concerns.
	High cost and infrastructure requirements.
	Suggestions:
	Capacity building under Digital India 2.0.
	Unified data standards and interoperability protocols.
	Pilot-based scaling (property, education, healthcare).
	Coordination between MeitY, NIC, and state governments.

30 RANI CHENNAMMA

Government of India marked **200 years of Rani Chennamma's historic victory at Kittur (1824)** with the release of a **special Rs 200 commemorative coin** celebrating her courage and leadership against British rule.



RANI CHENNAMMA OF KITTUR (1778–1829)

Keywords: *First female freedom fighter of India, rebellion of 1824, Doctrine of Lapse (precursor), Kittur uprising, early resistance against British imperialism.*

BACKGROUND:

- **Born:** 1778, in *Kakati* village, *Belagavi district* (present-day Karnataka).
- **Family:** Belonged to the **Lingayat community**.
- **Marriage:** Married **Raja Mallasarja of Kittur**, a small princely state in Karnataka.
- She was trained in **horse riding, sword fighting, archery, and statecraft** — a rare achievement for women of that era.

CAUSES OF THE REVOLT (1824):

- **Annexation Policy:**
    - After her husband's death, her son **Shivalingappa** ascended the throne.

- However, her son soon **died**, leaving Kittur without a natural heir.

- **Adoption Issue:**
  - Rani Chennamma **adopted a boy, Shivalingappa**, and declared him the heir to Kittur throne.
  - But the **British East India Company**, led by **St. John Thackeray (Collector of Dharwad)**, **refused to recognize** the adoption.
- **Doctrine of Lapse – Precursor:**
  - Though the **Doctrine of Lapse** was formally introduced by **Lord Dalhousie (1848–56)**,
    the **British refusal in 1824** to accept the adopted heir was an **early instance of that principle**.
- **British Annexation Attempt:**
  - The British attempted to seize Kittur under the pretext of no legitimate heir and unpaid tribute.

THE REVOLT OF 1824:

- **Led by:** *Rani Chennamma*, assisted by her trusted lieutenant **Sangolli Rayanna** and **Amatur Balappa**.
- **Initial Victory:**
  - Rani's forces **defeated and killed** the British collector **St. John Thackeray** during the first battle.
  - The British forces were initially **forced to retreat** from Kittur.
- **British Reinforcements:**
  - The British later sent **larger forces from Bombay Presidency**, led by **Colonel Deacon**.
  - Rani fought bravely but was eventually **betrayed by two of her own officers** (notably **Subanna** and **Shekappa**), which led to her capture.

AFTERMATH:

- Rani Chennamma was **imprisoned at Bailhongal Fort** in 1824.
- She **died in captivity in 1829** (aged around 51).
- Her lieutenant **Sangolli Rayanna** continued the guerrilla war against the British until he too was captured and executed in 1831.

SIGNIFICANCE:

- **Early Symbol of Resistance:**
    - One of the **first female rulers** to **rebel against British authority** — *long before 1857 Revolt*.
    - Represented the **spirit of self-rule (Swaraj)** and **female leadership in India's freedom struggle**.
- **Inspiration for Future Leaders:**
    - Her courage and defiance inspired later revolutionaries like **Rani Lakshmibai of Jhansi (1857)** and **Queen Abbakka of Ullal**.
- **Precursor to Anti-Colonial Movements:**
    - The **Kittur uprising (1824)** is regarded as one of the **earliest organized armed resistances** against British annexation in South India.

IMPORTANT KEYWORDS FOR UPSC NOTES:

- **Kittur Revolt – 1824**
- **British Officer Killed – St. John Thackeray**
- **Lieutenants – Sangolli Rayanna, Amatur Balappa**
- **Captured – 1824; Died – 1829, Bailhongal Fort**
- **First Female Freedom Fighter of India**
- **Precursor to Doctrine of Lapse**
- **Region – Belagavi (Karnataka)**

LEGACY:

- The **Government of India** and **Karnataka State** honor her as a **national heroine**.
- **Statues:** Prominent ones in **Parliament House, New Delhi**, and **Kittur Fort**.
- **Commemorations:**
    - *Kittur Utsav* celebrated annually in her memory.
    - *India Post* released a **commemorative stamp (1977)**.
- **In Literature:** Folk songs and ballads in Kannada celebrate her bravery.

UPSC MAINS (GS PAPER-1) – POSSIBLE QUESTION:

Question: 1	"Rani Chennamma of Kittur's uprising in 1824 marks the first spark of Indian resistance against British annexation policies." Discuss her role and the historical significance of the Kittur rebellion.
Structure for Answer:	Introduction: Context of British expansion in early 19th century.
	Body: • Background of Rani Chennamma. • Causes of rebellion (adoption dispute, British policy). • Course of revolt (battle, leadership, betrayal). • Outcome and continued resistance by Sangolli Rayanna.
	Conclusion: Significance as a precursor to later revolts; symbol of women's valor and early nationalism.

PRACTICE MCQS

Question: 1	With reference to Rani Chennamma of Kittur, consider the following statements: 1. She was the ruler of a princely state in present-day Tamil Nadu. 2. She led an armed rebellion against the British in 1824. 3. Her revolt is considered one of the earliest organized anti-British uprisings in India. Which of the statements given above is/are correct?
Option A	1 and 2 only
Option B	2 and 3 only
Option C	1 and 3 only
Option D	1, 2 and 3
Answer	Answer: (b) Explanation: Rani Chennamma ruled Kittur (in Karnataka), not Tamil Nadu. She led the 1824 rebellion, an early anti-colonial movement before 1857.

Question: 2	Which of the following statements about the Kittur Revolt of 1824 is/are correct? 1. The revolt began after the British refused to recognize her adopted son as heir to the Kittur throne. 2. The Doctrine of Lapse was officially applied by Lord Dalhousie to annex Kittur. 3. Rani Chennamma initially defeated British forces and killed the Collector, St. John Thackeray. Select the correct answer using the code given below:
Option A	1 and 3 only
Option B	2 only
Option C	1 and 2 only
Option D	1, 2 and 3
Answer	Answer: (a) Explanation: Though similar in spirit to the Doctrine of Lapse, it was not formally in use yet. The revolt began over succession rights, and Thackeray was killed in battle.

Question: 3	Who among the following was a close associate and military commander of Rani Chennamma during the Kittur uprising?
Option A	Tatya Tope
Option B	Sangolli Rayanna
Option C	Velu Nachiyar
Option D	Subanna
Answer	Answer: (b) Explanation: Sangolli Rayanna was the chief lieutenant of Rani Chennamma and led guerrilla warfare even after her imprisonment.

Question: 4	Rani Chennamma's rebellion is often regarded as a precursor to the Revolt of 1857 because: 1. It was based on the issue of succession and British annexation. 2. It inspired later female leaders like Rani Lakshmibai.

	3. It used religious appeals to mobilize soldiers against the British. Which of the statements given above are correct?
Option A	1 and 2 only
Option B	2 and 3 only
Option C	1 only
Option D	1, 2 and 3
Answer	Answer: (a) Explanation: The revolt was about succession and self-rule, and Rani Chennamma's courage inspired later freedom fighters, especially Rani Lakshmibai.

Question: 5	Consider the following pairs: **Event / Personality** — **Region / State** 1. Rani Chennamma — Karnataka 2. Velu Nachiyar — Tamil Nadu 3. Rani Lakshmibai — Madhya Pradesh Which of the pairs given above are correctly matched?
Option A	1 and 2 only
Option B	2 and 3 only
Option C	1, 2 and 3
Option D	1 and 3 only
Answer	Answer: (c) Explanation: Rani Chennamma → Kittur, Karnataka Velu Nachiyar → Sivaganga, Tamil Nadu Rani Lakshmibai → Jhansi, Madhya Pradesh (modern-day Uttar Pradesh–MP border area).

31 CHINA'S "WILDLIFE DIPLOMACY"

China's "Wildlife Diplomacy" has entered a new phase, with the **loan of golden snub-nosed monkeys** *(Rhinopithecus roxellana)* **to European zoos** (in France and Belgium) under a **10-year agreement.**

WHAT IS WILDLIFE DIPLOMACY?

- Wildlife diplomacy refers to the use of fauna (and sometimes flora) by a country as part of its foreign policy toolkit. In China's case, it includes **loaning or gifting iconic species**, partnering in conservation research, and using these acts as symbols of goodwill and cooperation.
- China's best-known example is "Giant Panda diplomacy" (often simply "panda diplomacy"), where pandas are sent on long-term loan to foreign zoos under bilateral agreements.
- More recently, China has begun deploying other species (e.g., Golden Snub-Nosed Monkey) as part of this diplomatic strategy.
- Beyond animal lending, China engages in international wildlife-conservation partnerships, capacity-building programs (e.g., the "Green Silk Road Envoy" program), and uses wildlife-conservation discourse to enhance its soft-power image.

KEY MECHANISMS & EXAMPLES

MECHANISMS:

- *Long-term loans / gifts* of charismatic species to foreign zoos under bilateral or multilateral agreements. For example, pandas sent to the U.S. under cooperation agreements.
- *Conservation research and habitat protection partnerships* with foreign institutions, linked to these animal-loan treaties.
- *Capacity-building & training abroad* via China's environmental diplomacy: e.g., offering training to officials from many countries in biodiversity & ecosystem-services conservation.
- *Symbolic animals as diplomatic gifts/ambassadors* to mark anniversaries or milestones in bilateral relations: e.g., golden snub-nosed monkeys sent to France & Belgium in 2025, marking 60 years of diplomatic relations.

EXAMPLES:

- In February 2024, China's Wildlife Conservation Association signed new agreements with the U.S. and Spain to send pandas as part of "a new era of panda diplomacy."
- In 2025, China sent rare golden snub-nosed monkeys to European zoos (France & Belgium) as a possible successor to panda diplomacy.

SIGNIFICANCE & STRATEGIC DIMENSIONS

- **Soft Power & Diplomacy:** These gestures help China project a benign, conservation-oriented image globally, fostering goodwill and enhancing cultural-diplomatic ties. According to analyses, panda diplomacy is a form of soft-power tool that signals the rank of relations between China and a partner country.
- **Conservation Leadership:** By partnering internationally, China claims a leadership role in global biodiversity conservation, aligning with global goals (e.g., UN biodiversity frameworks).
- **Economic & Research Collaboration:** These wildlife ties often include research, habitat conservation investment, zoo infrastructure upgrades, ecological tourism, which can have economic benefits for host countries.
- **Symbolism & Milestones:** Using rare species on loan to mark diplomatic anniversaries or new cooperation agreements adds symbolic value to bilateral relations.

- **Conservation Finance:** Host zoos often pay fees or share costs with China for the maintenance, breeding, and conservation of the species, effectively injecting funding into Chinese conservation ecosystems.

CRITIQUES, CHALLENGES & IMPLICATIONS

- **Ethical & Welfare Concerns:** Transporting animals across continents, ensuring their welfare, adapting to new environments, and returning offspring to China raise animal-welfare and ethical issues.
- **Soft-Power vs Hard-Power Tension:** While offering soft-power advantages, such diplomacy may divert attention from more substantive environmental policy issues (e.g., China's role in global wildlife-trade control, habitat destruction).
- **Selective Use of Wildlife Diplomacy:** The strategy heavily relies on charismatic "ambassador" species — which may overshadow broader conservation priorities or less charismatic species.
- **Geopolitical Signalling:** Countries receiving iconic species may be signalling alignment with China, which may have implications in bilateral geopolitics.
- **Conservation vs Ambassadorial Focus:** Critics argue that the focus on diplomacy may sometimes prioritize image over scientific conservation outcomes or aligning with host-country ecological priorities.
- **International Conservation Credibility:** While China engages in wildlife diplomacy, some global conservation watchers point to inconsistent policies in other areas (e.g., maritime fishing, habitat protections).

IMPLICATIONS FOR INDIA & UPSC RELEVANCE

FOR INDIA:

- India can view China's wildlife diplomacy as part of **eco-diplomacy** and **nature-based diplomatic tools**, and consider how it conducts its own wildlife partnerships.
- As India engages in bilateral and multilateral conservation forums (e.g., IORA, BIMSTEC, IBSA), understanding China's strategies helps appreciate dynamics in global biodiversity governance.
- When negotiating wildlife-trade, habitat-protection, or migratory-species agreements, India must note China's dual role as consumer, habitat-state, and wildlife-diplomacy actor.

UPSC RELEVANCE:

- **GS Paper 2 (International Relations):** Illustrates the use of soft-power, environmental diplomacy, and China's foreign-policy instruments beyond military/economic.
- **GS Paper 3 (Environment & Conservation):** Links wildlife conservation, international treaties, species protection, and global biodiversity governance.
- **Essay Topics & Ethics:** Example for themes like "Soft power and global environmental governance", "Wildlife conservation in diplomacy", "Ethics of wildlife diplomacy".

GOLDEN SNUB-NOSED MONKEY

- It is a primate species native to the mountainous forests of central and southwestern China.
- Classified as Endangered by the IUCN, the golden snub-nosed monkey is known for its golden-orange fur, blue face, and thick coat adapted to cold climates.
- It also holds deep cultural significance in Chinese art and folklore, including associations with the Monkey King from classical literature.

32 ICELAND

Iceland once one of the **last mosquito-free places on Earth,** has recorded its **first-ever mosquitoes** after the country's **hottest spring** on record, highlighting how **global warming** is altering ecosystems even in the coldest parts of the planet.

Driven by **global warming, Iceland is heating up four times** faster than the **Northern Hemisphere,** with rising temperatures and humidity now creating ideal conditions for mosquito survival, and breeding.

Mosquitoes are **cold-blooded** and thrive in **warm, humid conditions** between **10°C and 35°C**, with peak activity when humidity **exceeds 42%.**

ICELAND

- Iceland is a Nordic island country in the North Atlantic known as the "Land of Fire and Ice" for its glaciers and volcanoes. Its capital is Reykjavík, the world's northernmost capital city.
- Iceland's coastline meets the Greenland Sea (north), the Norwegian Sea (east), and the Atlantic Ocean (south and west).
- The Denmark Strait separates Iceland from Greenland.
- Iceland is the only place to observe the Mid-Atlantic Ridge with its divergent volcanic and related earthquake dynamics of seafloor spreading.
- The Arctic fox is the only native land mammal on Iceland.

33 YUGE YUGEEN BHARAT NATIONAL MUSEUM

The **first gallery** of the **Yuge Yugeen Bharat National Museum** is expected to open by **end-2026,** the museum is set to become the **largest in the world**, replacing the existing National Museum.

YUGE YUGEEN BHARAT NATIONAL MUSEUM

- **Yuge Yugeen Bharat National Museum** is set to be **India's largest museum**, showcasing **5,000 years of Indian civilization**—from the **Indus Valley Civilization to modern India**.
- The name **"Yuge Yugeen Bharat"** translates to **"Eternal India through the Ages"**, highlighting the continuity of Indian civilization.
- It will be located on the **North and South Blocks** of **Raisina Hill, New Delhi**, where the offices of the **Prime Minister's Office** and **Ministries of Defence and Finance** currently stand.

KEY HIGHLIGHTS

Feature	Details
Announced by	Prime Minister Narendra Modi
Venue	North and South Blocks, New Delhi
Managing Agency	Ministry of Culture

Theme	Depicting 5,000 years of Indian history and culture
Number of Galleries	8 galleries covering different eras
Digital Integration	AI, AR, VR, holographic projections, and immersive displays
Objective	To present India's civilizational journey and cultural evolution

CONCEPT AND STRUCTURE

The museum will consist of **8 thematic galleries**, arranged **chronologically and thematically**:

- **Ancient India** – Indus Valley Civilization, Vedic period, Mauryan & Gupta Empires.
- **Classical Age** – Development of art, science, and philosophy.
- **Medieval Period** – Bhakti & Sufi movements, Mughal art and architecture.
- **Colonial Era** – British rule, freedom struggles, socio-economic transformation.
- **Freedom Movement** – Key events, revolutionaries, and political movements.
- **Post-Independence India** – Constitution, governance, modernization.
- **Modern India** – Space, science, technology, and economic progress.
- **Vision for Future** – India's role as **Vishwaguru** and **Digital Bharat**.

ARCHITECTURAL FEATURES

- **Integration of heritage and modern design**—adaptive reuse of colonial-era buildings.
- Use of **sustainable materials**, **solar energy**, and **green technologies**.
- Will include **interactive exhibits**, **digital archives**, and **augmented reality experiences**.

OBJECTIVES

- To **chronicle India's cultural, scientific, and political evolution**.
- To **promote national pride and awareness** of India's civilizational heritage.
- To **educate youth** and **international visitors** about India's timeless contributions.
- To align with **"Amrit Kaal Vision 2047"**—India's goal of becoming a **developed nation** by 2047.

SIGNIFICANCE

- Will be a **global cultural landmark** showcasing India's soft power.
- Acts as a **repository of civilizational wisdom**, blending **ancient and modern narratives**.
- Promotes **tourism, research, and education** in art, culture, and heritage.
- Reinforces India's **identity as one of the world's oldest continuous civilizations**.

LINK WITH OTHER INITIATIVES

- **Azadi Ka Amrit Mahotsav** – Celebrating 75 years of independence.
- **Digital India Mission** – Integration of AR/VR for a tech-driven experience.
- **Ek Bharat Shreshtha Bharat** – Promoting unity in diversity.
- **Cultural Mapping Project** – Comprehensive database of cultural assets.

UPSC-LEVEL MCQS

Question: 1	The "Yuge Yugeen Bharat National Museum" will be established in which of the following locations?
Option A	Red Fort Complex, Delhi
Option B	North and South Blocks, New Delhi
Option C	Central Vista Avenue
Option D	Rashtrapati Bhavan Premises
Answer	Answer: B

Question: 2	Which ministry is responsible for the establishment of the Yuge Yugeen Bharat National Museum?
Option A	Ministry of Home Affairs
Option B	Ministry of Culture
Option C	Ministry of Tourism
Option D	Ministry of Education

Answer	Answer: B

Question: 3	What is the main theme of the Yuge Yugeen Bharat National Museum?
Option A	Colonial History of India
Option B	Ancient Art and Architecture
Option C	India's Civilizational Journey through Ages
Option D	Technological Progress of Modern India
Answer	Answer: C

Question: 4	The concept of "Yuge Yugeen Bharat" is associated with which of the following visions?
Option A	Atmanirbhar Bharat
Option B	Amrit Kaal Vision 2047
Option C	Make in India
Option D	Azadi Ka Amrit Mahotsav
Answer	Answer: B

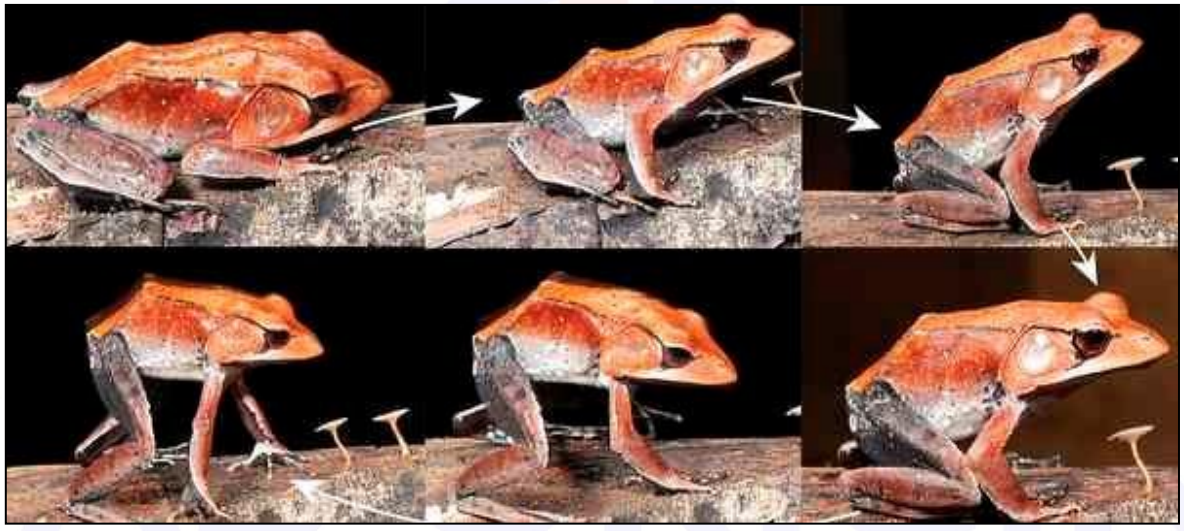
Question: 5	Which of the following technologies will be integrated into the Yuge Yugeen Bharat National Museum?
Option A	Virtual Reality (VR)
Option B	Augmented Reality (AR)
Option C	Artificial Intelligence (AI)
Option D	All of the above
Answer	Answer: D

34 RARE DEFENCE TRAITS IN INDIAN FROGS

A team from the University of Delhi's Systematics Lab, has documented for the first time rare anti-predator defence behaviours in two Indian frog species, published in Herpetological Notes.

RARE DEFENCE TRAITS IN INDIAN FROGS:

- The study uncovers **unique behavioural adaptations** in frogs, including **biting, shrieking, and body-raising**, to deter predators.
- These are among the **first such recorded instances** in Indian amphibians, expanding knowledge of their survival strategies.
- Of the 7,800+ known frog species worldwide, only around **650 exhibit such defence responses**, making the Indian cases scientifically valuable.



SPECIES AND THEIR BEHAVIOURAL FEATURES:

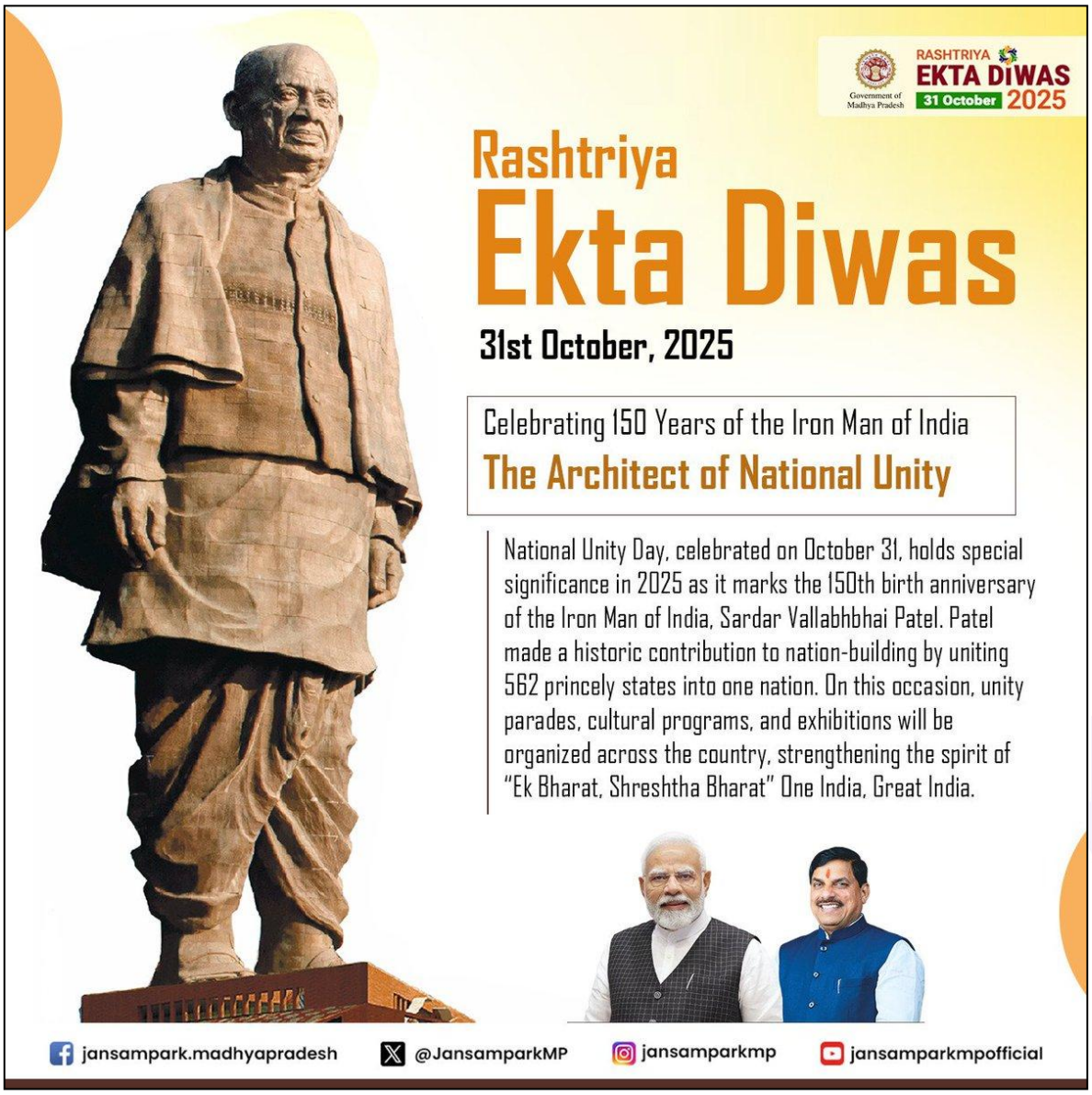
- **Apatani Horned Toad (Xenophrys apatani) – Arunachal Pradesh:**
  - A nocturnal frog with **cryptic, leaf-litter camouflage** that hides it during the day.
  - When threatened, it **inflates its body**, emits a **sharp distress call**, and may **bite predators** — a first-time observation in India.
- **Bicoloured Frog (Clinotarsus curtipes) – Western Ghats, Kerala:**
  - A diurnal forest species that **arches its body by stretching limbs vertically**, appearing larger and more menacing.
  - This **body-raising posture** is believed to intimidate predators and was experimentally verified in the wild.

IMPLICATIONS:

- **New Behavioural Records:** Adds previously unknown defensive behaviours to the global amphibian database.
- **Evolutionary Insight:** Suggests adaptive responses evolved to suit diverse Indian ecological niches.
- **Biodiversity Awareness:** Reinforces how much remains undocumented in India's rich amphibian fauna.

35 SARDAR VALLABHBHAI PATEL

Ministry of Culture is organizing grand cultural performances on **Rashtriya Ekta Diwas** (31 October 2025) to commemorate the 150th birth anniversary of Sardar Vallabhbhai Patel, with Prime Minister of India as Chief Guest.



RASHTRIYA EKTA DIWAS (NATIONAL UNITY DAY) – 2025

DATE:

- Celebrated annually on **31st October**.
- **2025** holds **special significance** as it marks the **150th birth anniversary** of **Sardar Vallabhbhai Patel**, also known as the **Iron Man of India**.

HISTORICAL BACKGROUND

- The Government of India introduced **Rashtriya Ekta Diwas in 2014**, to honor the **birth anniversary of Sardar Vallabhbhai Patel (1875–1950)**.
- Patel played a **pivotal role in the integration of 562 princely states** into the Indian Union after independence.
- His leadership was instrumental in shaping **India's political unity and administrative cohesion**.
- The day emphasizes the vision of **"Ek Bharat, Shreshtha Bharat" (One India, Great India)**.

SIGNIFICANCE IN 2025

- Marks **150 years** since the birth of Sardar Patel.
- Special national programs, unity parades, cultural events, and exhibitions are being organized across India.
- Reinforces themes of **national integration, unity, and integrity** amidst regional diversity.
- Symbolically linked with the **Statue of Unity**, the world's tallest statue (182 m) in Gujarat, inaugurated in **2018**.

GOVERNMENT INITIATIVES LINKED WITH RASHTRIYA EKTA DIWAS

- **Run for Unity:**
  - Mass participation event held across India to promote unity and integrity.
- **'Ek Bharat, Shreshtha Bharat' Programme (2015):**
  - Promotes cultural exchange between paired states and UTs.
  - Encourages linguistic, cultural, and social unity.
- **Statue of Unity Project:**
  - Located at **Kevadia (Ekta Nagar)**, Gujarat.
  - Built to commemorate Patel's role in national unification.
- **Unity Pledge:**
  - Citizens take a unity pledge to maintain peace, harmony, and unity in the country.
- **Exhibitions and Cultural Programs:**

- Highlight India's integration journey, administrative reforms, and Patel's legacy.

CONTRIBUTION OF SARDAR VALLABHBHAI PATEL

- First **Deputy Prime Minister and Home Minister** of India.
- Instrumental in the **merger of princely states** using diplomacy and strategic persuasion.
- Advocated for a **strong central government** to maintain unity and security.
- Played a key role in the **formation of the Indian Administrative Service (IAS)** and **Indian Police Service (IPS)** — often referred to as the "**steel frame of India**."

MCQS

Question: 1	Rashtriya Ekta Diwas is observed to commemorate which of the following contributions of Sardar Vallabhbhai Patel?
Option A	Drafting of the Constitution
Option B	Integration of princely states into the Indian Union
Option C	Framing of economic policies of independent India
Option D	Leadership of the Non-Cooperation Movement
Answer	Answer: (b) Explanation: Sardar Patel was responsible for integrating 562 princely states into independent India using diplomacy and statesmanship.

Question: 2	The "Statue of Unity", dedicated to Sardar Vallabhbhai Patel, is located on the banks of which river?
Option A	Sabarmati
Option B	Narmada
Option C	Tapi
Option D	Godavari
Answer	Answer: (b) Explanation: The Statue of Unity is located on the banks of the Narmada River near Kevadia (Ekta Nagar), Gujarat.

Question: 3	Which of the following initiatives is directly linked to the celebration of Rashtriya Ekta Diwas?
Option A	Ek Bharat Shreshtha Bharat
Option B	Swachh Bharat Abhiyan
Option C	Digital India Mission
Option D	Azadi Ka Amrit Mahotsav
Answer	Answer: (a) Explanation: Ek Bharat Shreshtha Bharat promotes unity through state–state cultural exchange, aligning with the spirit of National Unity Day.

Question: 4	Who among the following described Sardar Vallabhbhai Patel as the “Iron Man of India”?
Option A	Jawaharlal Nehru
Option B	Mahatma Gandhi
Option C	Subhas Chandra Bose
Option D	Lord Mountbatten
Answer	Answer: (b) Explanation: Mahatma Gandhi bestowed the title “Iron Man of India” on Patel for his strong will and determination in uniting the nation.

Question: 5	Which ministry is primarily responsible for organizing Rashtriya Ekta Diwas at the national level?
Option A	Ministry of Home Affairs
Option B	Ministry of Culture
Option C	Ministry of Information & Broadcasting
Option D	Ministry of Education
Answer	Answer: (a) Explanation: The Ministry of Home Affairs (MHA) coordinates all activities related to Rashtriya Ekta Diwas celebrations and unity parades nationwide.

36 NAURADEHI SANCTUARY TO BECOME 3RD HOME FOR CHEETAHS

Madhya Pradesh Chief Minister announced that Nauradehi Wildlife Sanctuary will become the third home for cheetahs in the state after Kuno National Park and Gandhi Sagar Sanctuary.

Nauradehi Wildlife Sanctuary is one of India's largest sanctuaries, spread over 1,197 sq. km, and serves as a crucial wildlife corridor in the upper Vindhyan range of Madhya Pradesh.

LOCATED IN:

- The sanctuary lies across Sagar, Damoh, and Narsinghpur districts of Madhya Pradesh, situated between the **Yamuna and Narmada River basins**.
- Major rivers like **Bamner, Kopra, and Bearma** flow through it.

HISTORY AND ECOLOGY:

- Declared a sanctuary to conserve central Indian fauna, Nauradehi has **mixed deciduous forests**, **Vindhyan sandstone formations**, and **diverse soil types** (red, black, and alluvial).
- It supports over 250 animal species, including tiger, leopard, sloth bear, wild dog, chinkara, sambhar, and blackbuck, along with 170+ bird species such as storks, vultures, and pheasants.

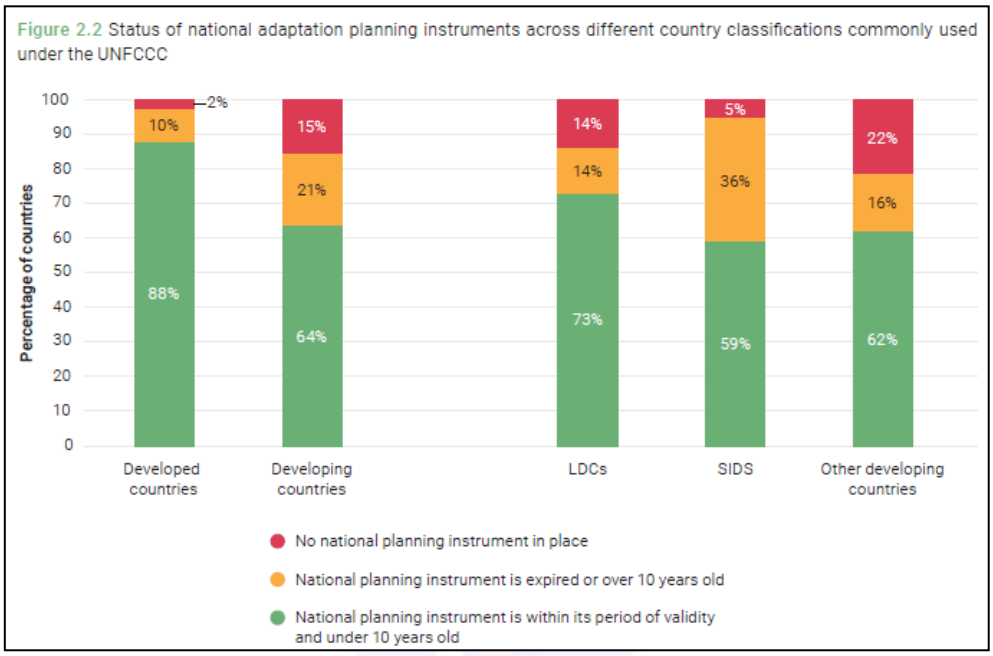
- **Features:**
    - **Altitude:** 400–600 metres above sea level.
    - **Rainfall:** Around 1,200 mm annually.
    - Rich in **grasses, herbs, shrubs, and bamboo**, making it ideal for herbivores and potential cheetah prey base.

CHEETAH CONSERVATION IN INDIA:

- The **Asiatic cheetah** became extinct in India in **1952** due to hunting and habitat loss.
- The Government of India launched **Project Cheetah**, reintroducing **African cheetahs from Namibia** at **Kuno National Park (2022)** and later at **Gandhi Sagar Sanctuary (2024)**.
- **Nauradehi** will now serve as the third site, ensuring species expansion, genetic diversification, and ecosystem restoration in central India.

37 UNEP ADAPTATION GAP REPORT 2025

The UN Environment Programme (UNEP) released the Adaptation Gap Report 2025: "Running on Empty", warning that the global finance gap for climate adaptation in developing countries has widened drastically.



WHAT IS THE ADAPTATION GAP REPORT?

- The Adaptation Gap Report is an annual assessment by UNEP that tracks global progress on **adaptation to climate change** — in three dimensions: planning (policies/strategies), implementation (on-ground actions), and financing (mobilisation of funds).
- The 2025 edition is titled **"Running on Empty"** (released 29 October 2025).
- It focuses particularly on the financing shortfall (adaptation finance gap) for developing countries, and how this threatens achievement of adaptation goals.

WHAT'S NEW IN 2025?

Key updates and standout findings from the 2025 report:

- **Adaptation cost estimates**: Developing countries will need around **US$ 310 billion per year by 2035**, based on modelled costs. When using data derived from Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs), the need rises to **US$ 365 billion per year**.
- **Finance flows**: International public adaptation finance to developing countries in 2023 was only **US$ 26 billion**, down from ~US$ 28 billion in the previous year.

- **Gap magnitude**: Hence, the adaptation finance gap (the difference between needs and available flows) is estimated at **12-14 times** the current funding levels.
- **Missed targets**: The report warns that the goal agreed in the Glasgow Climate Pact (to double 2019 adaptation finance levels by 2025) is very likely to be missed.
- **Debt concerns**: A large portion (~58 %) of adaptation finance is in **loan form**, much of it non-concessional, raising concerns of debt burden for vulnerable countries.
- **Planning & implementation progress**: Although somewhat improved — such as more countries having national adaptation plans and over 1,600 reported implemented adaptation actions (in biodiversity, agriculture, water, infrastructure) — the report emphasises that implementation remains far too slow to meet emerging climate risks.

SIGNIFICANCE OF THE REPORT

- **For global climate policy**: It underscores that adaptation — often the weaker sibling to mitigation — is facing a massive shortfall in finance even as climate impacts accelerate. The thematic emphasis shifts from "we will adapt" to "we are under-adapted and underfunded".
- **For developing countries**: Many are already bearing the brunt of climate impacts (floods, droughts, storms, glacial melt). The finance gap means they risk reversing development gains, increasing poverty, and suffering loss & damage.
- **For financing architecture**: The report pushes for rethinking climate finance: more grants and concessional support, less debt burden, deeper private-sector engagement, blended finance models, and stronger policy/market signals.
- **For India & comparable nations**: It serves as a benchmark of what millions of vulnerable people face — countries like India must not only plan adaptation but mobilise much larger resources, integrate adaptation into development, and also act as global actors in climate-finance negotiations.

KEY FACTS FOR PRELIMS / NOTES

Item	Detail
Report	Adaptation Gap Report 2025: "Running on Empty"
Released on	29 October 2025 by UNEP

Annual adaptation cost need (developing countries by 2035)	US$ 310 billion (modelled) / US$ 365 billion (NDC/NAP-derived)
Public adaptation finance in 2023 to developing countries	US$ 26 billion
Finance gap multiplier	Adaptation needs are ~12-14 times current flows
Loan vs grant share	~58% of adaptation finance comes via loans (incl. non-concessional)

CHALLENGES & KEY ISSUES HIGHLIGHTED

- **Financing inadequacy**: Huge gap between need and flows; adaptation often less attractive to private investors because returns are less tangible.
- **Debt risk**: Vulnerable countries are borrowing to adapt, which may increase their debt burden and reduce resilience.
- **Implementation lag**: Many countries have plans but fewer have fully operative implementation, monitoring & evaluation frameworks.
- **Private sector under-participation**: Private investment in adaptation remains very low (~US$ 5 billion) compared to potential (~US$ 50 billion) if policies are supportive.
- **Equity & climate justice**: Those least responsible for greenhouse gases face the biggest adaptation gaps — raising ethical, geopolitical and developmental concerns.
- **Need for transformational adaptation**: Adaptation must move from incremental project-by-project to systemic, anticipatory, integrated with development, and resilient infrastructure.

RELEVANCE FOR INDIA

- India is classified as a **developing country highly vulnerable to climate impacts** (heatwaves, glacial retreat in Himalayas, monsoon disruptions, sea level rise on coasts) — making adaptation critical.
- The report's findings underscore that India must accelerate adaptation financing, integrate adaptation in national and state plans (e.g., National Adaptation Fund, NAPCC, State Action Plans) and also push for global finance flows.

- India's role in global climate diplomacy (G20 presidency, COP processes) means it can leverage the report to advocate for increased adaptation finance, non-debt instruments, and capacity building for Global South.
- For UPSC: Use the report to illustrate issues of climate finance architecture, adaptation vs mitigation divide, debt-vulnerability nexus, and how adaptation links to SDGs and climate-justice.

HOW TO USE IN UPSC ANSWERS

- **GS 3 (Environment & Climate Change):** Use insights from the report when discussing climate adaptation, climate finance, vulnerability of developing countries, and global financing architecture.
- **GS 2 (International Relations):** The report's findings can inform discussions on climate justice, global south-north equity, negotiations in UNFCCC, adaptation financing commitments.
- **Essay/Case Study:** "Why climate adaptation is under-funded despite growing risks" or "Bridging the adaptation finance gap: challenges & pathways" — key insights from this report provide structure.
- **Prelims:** Important facts (US$ 310–365 bn need, US$ 26 bn current flows, gap 12-14×) are good for one-liners.

MCQS

Question: 1	The Adaptation Gap Report 2025 was recently released by which of the following organizations?
Option A	United Nations Framework Convention on Climate Change (UNFCCC)
Option B	Intergovernmental Panel on Climate Change (IPCC)
Option C	United Nations Environment Programme (UNEP)
Option D	World Meteorological Organization (WMO)
Answer	Answer: (c) Explanation: The Adaptation Gap Report is an annual flagship publication of UNEP, assessing progress on adaptation planning, implementation, and finance.

Question: 2	According to UNEP's Adaptation Gap Report 2025, the annual adaptation finance needs of developing countries by 2035 are estimated at:

Option A	USD 100 billion
Option B	USD 250 billion
Option C	USD 310–365 billion
Option D	USD 500 billion
Answer	Answer: (c) Explanation: The 2025 report estimates annual adaptation needs at US $ 310 billion (model-based) and US $ 365 billion (based on NDCs/NAPs) for developing nations.

Question: 3	Which of the following statements is/are correct as per the UNEP Adaptation Gap Report 2025? 1. The adaptation finance gap is estimated to be about 2–3 times the current flow levels. 2. Around 58% of adaptation finance is in the form of loans. 3. The Glasgow Climate Pact target of doubling 2019 adaptation finance by 2025 is unlikely to be met. Select the correct answer:
Option A	1 and 2 only
Option B	2 and 3 only
Option C	1 and 3 only
Option D	1, 2 and 3
Answer	Answer: (b) Explanation: The adaptation finance gap is 12–14 times (not 2–3 times). About 58% of finance is through loans. The Glasgow Pact doubling target will likely be missed.

Question: 4	Which of the following correctly describes the theme/title of the Adaptation Gap Report 2025?
Option A	“Adapt or Perish”
Option B	“Running on Empty”
Option C	“Closing the Finance Divide”
Option D	“Adaptation at Crossroads”
Answer	Answer: (b)

	Explanation: UNEP titled its 2025 report "Running on Empty", highlighting severe underfunding and stagnation in global adaptation finance.

Question: 5	In the context of climate adaptation finance, which of the following correctly differentiates "Adaptation" from "Mitigation"?
Option A	Adaptation deals with reducing emissions, while mitigation focuses on adjusting to climate impacts.
Option B	Adaptation focuses on reducing greenhouse gas emissions at source.
Option C	Adaptation involves adjusting human and natural systems to minimize climate change impacts.
Option D	Both adaptation and mitigation have the same policy objectives.
Answer	Answer: (c) Explanation: Adaptation = adjustment to minimize adverse impacts of climate change. Mitigation = reduction of GHG emissions or enhancement of carbon sinks.

UPSC MAINS–LEVEL ANALYTICAL QUESTIONS

Question: 1	The UNEP Adaptation Gap Report 2025 reveals that global adaptation finance is running on empty." Discuss the major findings of the report and their implications for developing countries. (250 words)
Key Points for Answer:	UNEP's 2025 report: "Running on Empty".
	Finance gap 12–14×; only US$ 26 bn delivered vs US$ 310–365 bn needed.
	58% of funds as loans → rising debt vulnerability.
	Doubling target of Glasgow Pact likely missed.
	Implications: under-prepared infrastructure, food insecurity, human vulnerability, climate migration, loss & damage.
	Calls for more concessional finance, private sector participation, capacity building, and integration of adaptation into development.

Question: 2	Examine why adaptation finance remains inadequate despite growing climate risks, and suggest policy measures to bridge the gap. (250 words)
Key Points for Answer:	Causes of inadequacy: low political priority vs mitigation, lack of quantifiable ROI, fragmented donor approach, poor bankable project pipelines, and debt-driven funding models.
	Bridging measures:
	Establish predictable grant-based global adaptation funds.
	Mainstream adaptation in national budgets.
	Promote blended finance and sovereign green bonds.
	Strengthen local governance and climate risk insurance.
	International cooperation under UNFCCC Article 9 obligations.

Question: 3	"For countries like India, climate adaptation is both a developmental and a survival imperative." Analyze the statement in light of UNEP's Adaptation Gap Report 2025. (250 words)
Key Points for Answer:	Key Points:
	India's high vulnerability: monsoon variability, heatwaves, glacial retreat, coastal floods.
	UNEP report: adaptation underfunded → risk to Global South.
	India's national adaptation initiatives: NAPCC, NAFCC, State Action Plans, Climate Resilient Agriculture, PM-Fasal Bima Yojana, Green Climate Fund projects.
	Need for: mainstreaming adaptation in infrastructure, using LiFE mission principles, enhancing early-warning systems, leveraging G20/COP forums for finance.
	Conclusion: Adaptation finance and implementation are essential to safeguard economic and social stability.

38 JAI STRATEGY

The Southern Command of the Indian Army has initiated the implementation of the Prime Minister's "JAI Strategy" — Jointness, Atmanirbharta, and Innovation, aligning defence preparedness with the upcoming Tri-Services Exercise 'Ex Trishul'.

WHAT IS THE JAI STRATEGY?

- The acronym **JAI** stands for **Jointness**, **Atmanirbharta** (self-reliance) and **Innovation**.
- It has been articulated by the Government of India, under the leadership of the Narendra Modi administration, as a guiding paradigm for the **future of India's defence preparedness**.
- The strategy seeks to transform the Indian Armed Forces and defence-industrial ecosystem by emphasising:
    - **Jointness**: Enhanced coordination and integration among the Army, Navy and Air Force for seamless multi-domain operations.
    - **Atmanirbharta**: Greater self-reliance in defence manufacturing — promoting indigenous systems, reducing dependence on imports, leveraging Make in India.
    - **Innovation**: Incorporating next-generation technologies — AI, Cyber, ISR (Intelligence, Surveillance & Reconnaissance), Electronic Warfare, unmanned systems — and adopting new operational concepts.

WHY IS THE JAI STRATEGY IMPORTANT?

- **Strategic shifts in warfare**: Modern conflicts are multi-domain, integrating land, sea, air, space and cyber. Jointness allows faster decision-making and combined application of force.
- **Geopolitical environment**: With challenges at India's borders and evolving Indo-Pacific dynamics, self-reliance (Atmanirbharta) ensures resilience and reduces vulnerabilities in supply-chains and logistics.
- **Technological leap**: Innovation is key to gaining qualitative edge — faster adaptation, cost-effectiveness, indigenous R&D, reducing dependence on external actors.
- **Defence economics**: By promoting domestic defence industry, creating strategic manufacturing ecosystems, the JAI Strategy supports employment, exports, economic growth and strategic autonomy.

KEY ELEMENTS & IMPLEMENTATION MEASURES

- **Tri-Services Exercises**: Example — Ex Trishul organised by the Southern Command to validate joint operations across difficult terrains, amphibious operations, cyber & EW dimensions.
- **Indigenous systems deployment**: Encouraging use of domestically produced weapons, platforms. Emphasis in exercises on "effective employment of indigenous systems".
- **Organisational reforms**: Realigning theatre commands, joint logistic support, integrated command structures to operationalise jointness.
- **Innovation ecosystems**: Encouraging start-ups, academic partnership, defence public sector units (DPSUs) and private sector to co-innovate — aligning with Make in India and Defence R&D.
- **Atmanirbharta in machinery & supply chain**: Strengthening defence manufacturing base, indigenous design, reducing imports, and building tracking/reliability in supply chains.

CHALLENGES & ISSUES

Challenge	Explanation
Inter-service culture & systems	Historically, Army, Navy and Air Force operate in silos; building true jointness requires doctrinal, procedural and cultural change.

Technology & innovation gap	Indigenous technology maturity needs scaling up; defence R&D cycles are long and risk-laden.
Manufacturing & supply-chain readiness	Building full value-chain (design-build-maintenance) domestically takes time, investment and policy clarity.
Cost & budget pressures	Modernisation, innovation, joint command structures & theatre reforms require significant funding amid competing priorities.
Integration of legacy systems	Ensuring old platforms integrate into new joint & multi-domain frameworks without creating vulnerabilities.

MCQ

Question: 1	The term "JAI Strategy", recently in news, refers to which of the following in the Indian context? 1. Jointness among armed forces 2. Atmanirbharta in defence manufacturing 3. Innovation in defence technology 4. Judicial Accountability and Independence Select the correct answer using the code given below:
Option A	1 and 2 only
Option B	2 and 3 only
Option C	1, 2 and 3 only
Option D	1, 2, 3 and 4
Answer	Answer: (c) 1, 2 and 3 only Explanation: The JAI Strategy stands for Jointness, Atmanirbharta, and Innovation, representing India's approach to modernising its armed forces and achieving self-reliance in defence. It is unrelated to judicial reforms.

Question: 2	Which of the following best describes the "Jointness" component of the JAI Strategy?
Option A	Establishing separate commands for each service
Option B	Coordinated and integrated operations among Army, Navy, and Air Force

Option C	Promoting foreign collaborations in defence
Option D	Centralising all logistics under Ministry of Finance
Answer	Answer: (b) Coordinated and integrated operations among Army, Navy, and Air Force Explanation: Jointness implies synergy among all three services to conduct seamless multi-domain operations (land, sea, air, space, cyber) for faster and effective decision-making.

39 SARANDA WILDLIFE SANCTUARY

The Supreme Court of India has reserved its verdict on the Jharkhand government's plea to reduce the proposed Saranda Wildlife Sanctuary area from 310 sq km to 250 sq km, citing the need to protect tribal habitation and community rights.

WHAT IT IS?

- The Saranda Sanctuary is a proposed wildlife sanctuary in West Singhbhum district of Jharkhand, located within the Saranda Forest Division, known as one of Asia's largest Sal (Shorea robusta) forests and a key biodiversity hotspot at the Jharkhand–Odisha border.

LOCATION:

- Situated in **southern Jharkhand**, the Saranda region—meaning "**land of seven hundred hills**"—covers about 856 sq km, of which 816 sq km is reserved forest.
- It lies within the **Singhbhum Elephant Reserve**, forming a vital ecological corridor between Jharkhand, Odisha, and Chhattisgarh.

HISTORY:

- Declared a **game reserve in 1968** under the Bihar Forest Act.
- The **National Green Tribunal (2022)** directed Jharkhand to notify it as a sanctuary under the **Wildlife Protection Act, 1972**.

KEY FEATURES:

- **Flora:** Dense cover of **Sal**, **Kusum**, **Mahua**, and rare orchids.
- **Fauna:** Habitat for Asian elephants, four-horned antelope, sloth bears, flying lizards, and migratory birds.
- **Communities:** Home to **Ho**, **Munda**, **Oraon**, and **PVTGs**, reliant on forest produce like mahua and resin.
- **Mineral Wealth:** Contains nearly 26% of India's iron ore reserves, making it a major mining zone for SAIL and private operators.

SIGNIFICANCE:

- **Ecological Hotspot:** Forms a vital carbon sink and biodiversity reserve in eastern India.
- **Elephant Corridors:** Maintains wildlife connectivity between Saranda, Similipal, and Sundargarh forests.
- **Tribal Livelihood & Rights:** Balances conservation with protection of tribal forest rights under FRA, 2006.

40 CYPRUS

Cyprus Foreign Minister Constantinos Kombos is on a three-day visit to India, meeting External Affairs Minister to advance the India–Cyprus strategic partnership.

Cyprus is an island nation in the eastern Mediterranean Sea, known for its rich history, cultural heritage, and strategic geopolitical location linking Europe, Asia, and Africa. It is a member of the European Union since 2004 and the Eurozone since 2008.

Location: Situated at the northeastern end of the Mediterranean basin, Cyprus lies about 65 km south of Turkey, 100 km west of Syria, and 770 km southeast of mainland Greece.

CAPITAL: THE CAPITAL CITY IS NICOSIA (LEFKOSIA).

- The world's **only divided capital**, shared between the **Republic of Cyprus** in the south and the **Turkish Republic of Northern Cyprus** (recognized only by Turkey) in the north.

GEOGRAPHICAL FEATURES:

- **Area:** 9,251 sq. km — third-largest island in the Mediterranean after Sicily and Sardinia.
- **Terrain:** Dominated by the **Troodos Mountains** in the south and **Kyrenia Range** in the north, separated by the fertile **Mesaoria Plain**.
- **Highest Peak:** Mount Olympus (Troodos) at 1,951 metres.

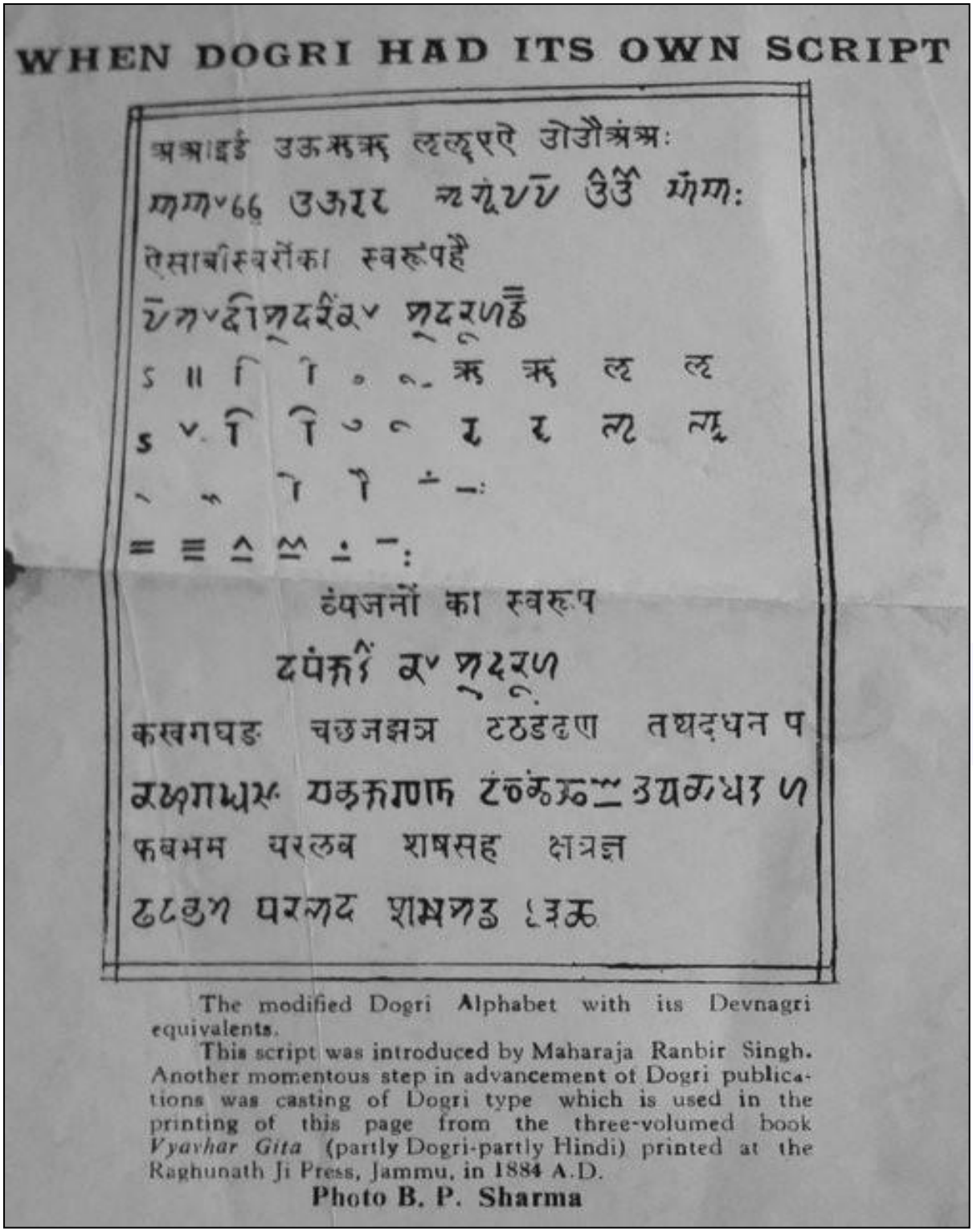
- **Climate:** Typical Mediterranean climate — hot, dry summers and mild, wet winters.

HISTORICAL CONTEXT:

- Gained **independence from Britain in 1960**.
- Since **1974**, the island has been **divided** after a Turkish military invasion following a coup; **36% of the north** remains under **Turkish occupation**.

41 DOGRI LANGUAGE

A recent sociolinguistic study in Jammu has raised alarms over the declining use of Dogri language, revealing that urban youth show near-zero proficiency in reading or writing Dogri.



The modified Dogri Alphabet with its Devnagri equivalents.

This script was introduced by Maharaja Ranbir Singh. Another momentous step in advancement of Dogri publications was casting of Dogri type which is used in the printing of this page from the three-volumed book *Vyavhar Gita* (partly Dogri-partly Hindi) printed at the Raghunath Ji Press, Jammu, in 1884 A.D.

Photo B. P. Sharma

INTRODUCTION

- **Dogri** is an **Indo-Aryan language** primarily spoken in the **Jammu region of Jammu & Kashmir**, parts of **Himachal Pradesh**, and **northern Punjab**.
- It is one of the **22 scheduled languages** of India, recognized in the **Eighth Schedule** of the Constitution in **2003** (via the **92nd Constitutional Amendment Act**).
- Dogri represents the **cultural identity of the Dogra people**, who inhabit the foothills of the Himalayas — especially around Jammu.

HISTORICAL BACKGROUND

- Dogri was **historically regarded as a dialect of Punjabi**, but linguists now classify it as a **member of the Western Pahari group** of Indo-Aryan languages.
- The earliest references to Dogri can be traced back to **Amir Khusrau's writings (14th century)**, who mentioned it among northern Indian languages.
- The language evolved under influences from **Sanskrit, Persian, and Punjabi** due to trade, migration, and Mughal rule.

CONSTITUTIONAL AND LEGAL STATUS

Aspect	Details
Recognition	Added to the **Eighth Schedule** by the *92nd Constitutional Amendment Act, 2003*.
Official Status	One of the **official languages of the Union Territory of Jammu & Kashmir** (as per *Jammu and Kashmir Official Languages Act, 2020*).
Script	Traditionally written in **Takri script**, but now largely written in **Devanagari script**.
Constitutional Relevance	Recognition allows Dogri to be used in education, public service examinations, and government communication.

LINGUISTIC FEATURES

Feature	Description
Language Family	Indo-European → Indo-Iranian → Indo-Aryan → Western Pahari group
Phonology	Shares features with Punjabi but has softer consonant tones.
Grammar	Uses **postpositions** (like Hindi), gender distinction (masculine/feminine), and verb conjugation similar to other Pahari languages.
Vocabulary	Mix of Sanskritic words and Persian-Arabic loanwords.
Script	Primarily **Devanagari**, though Takri has historical significance.

GEOGRAPHIC DISTRIBUTION

- **Major Region:** Jammu, Udhampur, Kathua, Samba, Reasi districts.
- **Other States:** Parts of Himachal Pradesh (Chamba) and Punjab (Pathankot).
- **Estimated Speakers:** Around **2.6–3 million people** (Census 2011).

LITERATURE AND CULTURE

- Dogri literature is rich in **folk tales, songs, ballads, and poetry**, reflecting Dogra life, heroism, and nature.
- The **Sahitya Akademi** recognized Dogri as a separate language in **1969**.
- **Notable Writers and Poets:**
    - **Padma Sachdev** – first modern woman poet in Dogri; Sahitya Akademi Award (1971).
    - **Ram Nath Shastri** – often called the *"Father of Dogri Literature."*
    - **Krishna Smailpuri, Chhatrapal, Ved Rahi** – contributed to modern prose and theatre.
- Dogri literary works often depict **Dogra identity**, **Jammu's folklore**, and **Himalayan ethos**.

INSTITUTIONS AND PROMOTION

Institution / Initiative	Role
Sahitya Akademi	Publishes Dogri literature and awards annual prizes.
Dogri Sanstha, Jammu	Promotes Dogri research, publications, and literary events.
University of Jammu	Offers courses and research programs in Dogri.
Doordarshan & AIR Jammu	Broadcasts in Dogri to promote regional awareness.
National School of Drama (NSD)	Encourages Dogri theatre.

CHALLENGES

Challenge	Description
Declining usage among youth	Preference for Hindi/English in education and jobs.
Limited publishing opportunities	Few Dogri newspapers and magazines.
Script challenges	Loss of traditional Takri script usage.
Urban migration	Reduces intergenerational language transmission.
Insufficient digital presence	Dogri needs better representation in Unicode, software, and online content.

GOVERNMENT EFFORTS FOR PRESERVATION

- **Inclusion in the Eighth Schedule (2003)** → Legal and educational recognition.
- **Dogri as official language of J&K (2020)** → Boost to its administrative use.
- **Sahitya Akademi Awards & Translations** → Promotion of Dogri literature nationwide.
- **Inclusion in school curriculum** in Jammu division.

- **Central Institute of Indian Languages (CIIL), Mysuru** → Documentation and linguistic studies.

MCQS

Question: 1	Dogri language belongs to which of the following language families?
Option A	Dravidian
Option B	Austro-Asiatic
Option C	Indo-Aryan
Option D	Tibeto-Burman
Answer	Answer: (c) Indo-Aryan

Question: 2	Which script was traditionally used to write Dogri language?
Option A	Devanagari
Option B	Takri
Option C	Perso-Arabic
Option D	Gurmukhi
Answer	Answer: (b) Takri

Question: 3	Dogri was included in the Eighth Schedule of the Constitution by which Constitutional Amendment?
Option A	71st Amendment
Option B	92nd Amendment
Option C	97th Amendment
Option D	101st Amendment
Answer	Answer: (b) 92nd Amendment

Question: 4	Who is known as the “Father of Dogri Literature”?
Option A	Padma Sachdev
Option B	Ram Nath Shastri
Option C	Ved Rahi

Option D	Krishna Smailpuri
Answer	Answer: (b) Ram Nath Shastri

Question: 5	Consider the following statements: 1. Dogri is one of the 22 scheduled languages under the Eighth Schedule. 2. It is the official language of the Union Territory of Jammu & Kashmir. 3. It belongs to the Dravidian language family. Which of the above statements are correct?
Option A	1 and 2 only
Option B	2 and 3 only
Option C	1 and 3 only
Option D	1, 2 and 3
Answer	Answer: (a) 1 and 2 only

42 OLLO TRIBE

The Assam Rifles' Khonsa Battalion has launched a skill-based empowerment programme under Operation Sadbhavana for women of the Ollo tribe in Arunachal Pradesh's Tirap district.

INTRODUCTION

- The **Ollo Tribe** (also known as **Lisu** or **Yobin**) is an **indigenous tribal community** inhabiting the **easternmost part of Arunachal Pradesh**, especially **Anjaw District** near the **Indo-Myanmar border**.
- The tribe lives in **remote, mountainous regions**, making them one of India's **least-known frontier communities**.
- In **2024**, the Government of India officially **recognized the Ollo Tribe as a distinct Scheduled Tribe (ST)** under the Constitution of India — a significant socio-political milestone.

GEOGRAPHIC DISTRIBUTION

Region	Details
State	Arunachal Pradesh
Districts	Anjaw (especially in Walong and Kibithoo circles)
Border Areas	Close to the India–Myanmar border; some ethnic kin reside in northern Myanmar.
Terrain	Hilly, forested, and ecologically sensitive region of the Eastern Himalayas.

The Ollo villages lie in the **Mishmi Hills** range — an area of immense **biodiversity and strategic significance**.

HISTORICAL BACKGROUND

- The **Ollo (Lisu/Yobin)** people are believed to have **migrated centuries ago** from the **northern regions of Myanmar (Burma)** into present-day Arunachal Pradesh.
- Due to their remote habitation and lack of formal documentation, they remained **outside mainstream recognition** for decades after Indian independence.
- They were historically **classified with other frontier tribes** or misidentified, delaying their Scheduled Tribe status.
- Their **recognition as a separate tribe in 2024** rectified this long-standing exclusion.

ETHNIC AND LINGUISTIC IDENTITY

Aspect	Details
Ethnic Group	Tibeto-Burman origin (part of the *Sino-Tibetan* family)
Language	*Ollo language* — a dialect of *Lisu*, written in *Fraser script* (Roman-based), though Devanagari is also used for formal communication.
Related Groups	Lisus of Myanmar, Yobin of Nagaland, and certain tribes of China's Yunnan province.
Religion	Traditionally animist; however, a portion has adopted **Christianity** due to missionary influence.

SOCIO-CULTURAL CHARACTERISTICS

- **Society**: Egalitarian, clan-based; governed by traditional councils.
- **Occupation**: Primarily **shifting cultivation (jhum)**, hunting, and forest produce collection.
- **Festivals**:
    - **Mikgo-Mikshik Festival** – main agricultural festival, symbolising fertility and community bonding.
    - **Ani-Reh Festival** – marks the arrival of spring and thanksgiving to nature.

- **Art & Craft**: Skilled in **bamboo and cane weaving**, wood carving, and making traditional costumes.
- **Marriage customs**: Monogamous; arranged or love marriages both exist.
- **Attire**: Distinctively woven shawls, tunics, and headgear reflecting clan identity.

RECOGNITION AS A SCHEDULED TRIBE (2024)

Parameter	Details
Year of Inclusion	2024
Act/Notification	*Constitution (Scheduled Tribes) Order (Amendment) Bill, 2024*
State Concerned	Arunachal Pradesh
Status	Granted **distinct recognition as "Ollo Tribe"** separate from the generic "Other Tribes" category.
Significance	Ensures access to reservation benefits, representation, and welfare schemes.

CONSTITUTIONAL & ADMINISTRATIVE SIGNIFICANCE

- Added under **Article 342** of the Constitution, which empowers the President to specify Scheduled Tribes in each State.
- This inclusion:
    - Provides **political representation** in local bodies and legislative assemblies.
    - Extends **educational and employment reservations**.
    - Enables **developmental funds and welfare programs** targeted at STs.

LIVELIHOOD AND ECONOMY

Sector	Description
Agriculture	Slash-and-burn (jhum) cultivation, millet, maize, ginger, vegetables.
Livestock	Rearing mithun (semi-domesticated bovine), pigs, and poultry.

Forest Produce	Bamboo, cane, medicinal plants, honey.
Trade	Limited local barter; logistical challenges due to terrain and lack of road connectivity.

STRATEGIC AND ENVIRONMENTAL IMPORTANCE

- Ollo-inhabited areas are **located near the tri-junction of India–China–Myanmar**, making them vital for:
  - **Border management and national security.**
  - **Environmental conservation** in the Eastern Himalayas.
  - **Cultural continuity** in India's frontier regions.
- The tribe plays a role in **India's border-area development and ecological stewardship** programs.

CHALLENGES FACED BY THE OLLO TRIBE

Issue	Description
Geographical isolation	Remote and difficult terrain restricts connectivity and access to education/healthcare.
Lack of awareness	Many members were unaware of government schemes prior to ST recognition.
Limited infrastructure	Roads, schools, and hospitals are sparse.
Cross-border migration	Cultural overlap with Myanmar poses identity and security concerns.
Language endangerment	Younger generations increasingly shift to Hindi or English.

GOVERNMENT INITIATIVES & WELFARE MEASURES

- **Scheduled Tribe recognition (2024)** → first step toward targeted development.
- **Ministry of Tribal Affairs** and **Arunachal Pradesh Government** to include Ollo villages under:
  - *Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN)*
  - *Eklavya Model Residential Schools (EMRS)*

- *Van Dhan Vikas Kendras*
- *Digital India – Tribal Empowerment Schemes*

- Improved **border area infrastructure** under *Vibrant Villages Programme (VVP)*.

MCQS

Question: 1	The recently recognized Ollo Tribe belongs to which Indian State?
Option A	Manipur
Option B	Arunachal Pradesh
Option C	Nagaland
Option D	Mizoram
Answer	Answer: (b) Arunachal Pradesh

Question: 2	The Ollo (Lisu) language belongs to which language family?
Option A	Dravidian
Option B	Indo-Aryan
Option C	Sino-Tibetan
Option D	Austro-Asiatic
Answer	Answer: (c) Sino-Tibetan

Question: 3	Which of the following constitutional provisions relates to the specification of Scheduled Tribes in India?
Option A	Article 341
Option B	Article 342
Option C	Article 243M
Option D	Article 366
Answer	Answer: (b) Article 342

Question: 4	The Mikgo-Mikshik Festival is associated with which community?
Option A	Apatani
Option B	Ollo

Option C	Nyishi
Option D	Galo
Answer	Answer: (b) Ollo

Question: 5	The Ollo Tribe's recognition as a Scheduled Tribe in 2024 is significant because: 1. It grants constitutional and legal protection under the ST category. 2. It extends reservation benefits in education and employment. 3. It allows cross-border movement with Myanmar under Article 370. Select the correct answer:
Option A	1 and 2 only
Option B	2 and 3 only
Option C	1 only
Option D	1, 2 and 3
Answer	Answer: (a) 1 and 2 only

43 APPOINTMENT OF CHIEF JUSTICE OF INDIA

Chief Justice Bhushan Ramakant Gavai has formally recommended Justice Surya Kant, the senior-most Supreme Court judge, to succeed him as the 53rd Chief Justice of India (CJI).

WHAT IT IS?

The Chief Justice of India (CJI) is the head of the Supreme Court and the Judiciary of India, responsible for judicial administration, allocation of cases, and upholding constitutional values.

Constitutional Article: The appointment of the CJI is governed by **Article 124(2)** of the **Indian Constitution**, which states that the President shall appoint every Judge of the Supreme Court after consultation with such Judges of the Supreme Court and of the High Courts as deemed necessary.

PROCESS OF APPOINTMENT:

- **Initiation by the Law Minister:** At least **one month before the retirement** of the incumbent CJI, the **Union Law Minister** seeks the recommendation of the outgoing CJI for the appointment of the next Chief Justice of India.
- **Seniority Principle:** Traditionally, the **senior-most Judge of the Supreme Court** deemed fit for the office is recommended as the next CJI. However, if there are concerns about fitness or integrity, the outgoing CJI consults other judges as per **Article 124(2)**.

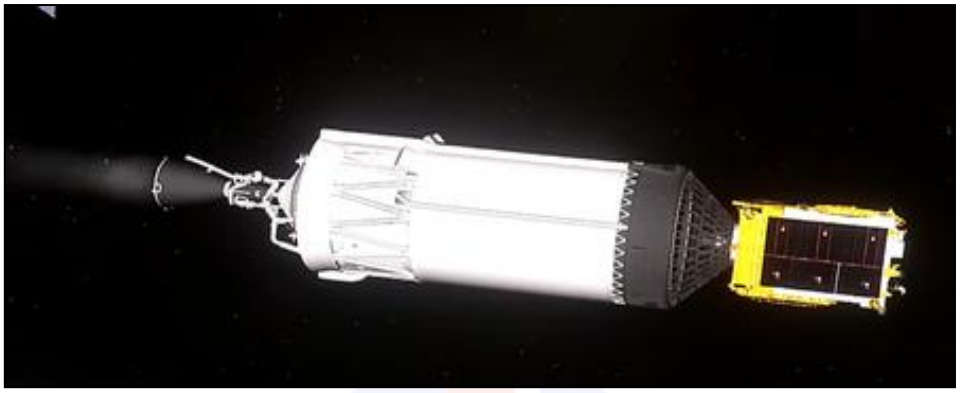
- **Recommendation Transmission:** The **CJI's recommendation** is submitted by the Law Minister to the **Prime Minister**, who then **advises the President** to make the appointment.
- **Presidential Appointment:** The **President of India** formally appoints the CJI through a **warrant under seal**, following which the appointee takes oath before the President.
- **Convention and Collegium Role:**
    - While the **collegium system** (CJI + four senior-most judges) primarily handles appointments of other judges, it indirectly reinforces the seniority norm in the CJI's selection.
    - The process ensures **institutional continuity**, merit consideration, and balance between executive consultation and judicial independence.

KEY PRINCIPLES UNDERLYING THE APPOINTMENT:

- **Seniority and Merit:** The senior-most judge is appointed, maintaining institutional stability.
- **Consultative Process:** Based on conventions, not codified law, ensuring judicial input.
- **Executive Approval:** President acts on the advice of the Council of Ministers, preserving constitutional propriety.

44 GSAT-7R SATELLITE

The Indian Space Research Organisation (ISRO) is set to launch the CMS-03 (GSAT-7R) communication satellite in November, aboard the Launch Vehicle Mark-3 (LVM-3) from Sriharikota.



INTRODUCTION

- **GSAT-7R** is an **advanced military communication satellite** developed by the **Indian Space Research Organisation (ISRO)**.
- It is a **naval communication satellite** designed **exclusively for the Indian Navy**, as part of India's effort to strengthen its **Network-Centric Warfare (NCW)** capabilities.
- The satellite is a **replacement and enhancement** of the earlier **GSAT-7 ("Rukmini")** launched in 2013.

BACKGROUND AND NEED

- The Indian Navy requires **secure, real-time communication** between warships, submarines, aircraft, and land bases across the **Indian Ocean Region (IOR)**.
- Increasing Chinese naval presence and surveillance in the IOR have accelerated India's **defense space modernization**.
- GSAT-7R will ensure **integrated communication and coordination** among naval assets, improving **Maritime Domain Awareness (MDA)**.

KEY FEATURES OF GSAT-7R

Feature	Details
Developer	ISRO for Indian Navy

Launch Vehicle	GSLV Mk-II or LVM3 (expected)
Launch Site	Satish Dhawan Space Centre (SDSC), Sriharikota
Orbit Type	Geostationary Orbit (~36,000 km)
Frequency Bands	UHF, C-band, Ku-band (upgraded multi-band capability)
Coverage Area	Entire Indian Ocean Region and extended maritime boundaries
Lifespan	~10–12 years
User Agency	Indian Navy (Primary), Tri-services (Secondary support)

STRATEGIC SIGNIFICANCE

ENHANCED MARITIME COMMUNICATION

- Provides **secure satellite links** among naval platforms.
- Enables **real-time surveillance, tracking, and mission control** in distant waters.

FORCE MULTIPLICATION

- Strengthens India's **Blue Water Navy capabilities**.
- Integrates **ships, submarines, and aircraft** under a unified communication network.

COMPLEMENT TO EXISTING SATELLITES

- **GSAT-7** → Navy
- **GSAT-7A** → Indian Air Force
- **GSAT-7B** → Indian Army
- **GSAT-7R** → Will enhance interoperability among these tri-service satellites.

ATMANIRBHAR BHARAT IN DEFENSE SPACE

- Part of the government's focus on **indigenous defense communication systems**.
- Reduces reliance on foreign satellites for military coordination.

TECHNICAL UPGRADES OVER GSAT-7

Parameter	GSAT-7	GSAT-7R
Launch Year	2013	2025 (expected)
Coverage	Western IOR	Extended IOR + South China Sea
Frequency Bands	UHF	UHF + C + Ku
Data Handling	Limited	AI-based secure data encryption
Communication Speed	Medium	High-speed, anti-jamming links
Interoperability	Navy-only	Tri-service interoperability

BROADER CONTEXT

- Aligns with **India's Defense Space Strategy (2024)** to integrate all armed forces under the **Defense Space Agency (DSA)**.
- Supports **Maritime Theatre Command** operations and India's **Indo-Pacific strategy**.
- Enhances India's **satellite-based reconnaissance and command system**.

MCQS

Question: 1	GSAT-7R satellite is primarily developed for:
Option A	Indian Army
Option B	Indian Air Force
Option C	Indian Navy
Option D	Indian Coast Guard
Answer	Answer: (c) Indian Navy

Question: 2	Which of the following frequency bands are used by GSAT-7R?
Option A	L-band only
Option B	S and Ka bands only
Option C	UHF, C, and Ku bands
Option D	VHF and C bands

Answer	Answer: (c) UHF, C, and Ku bands

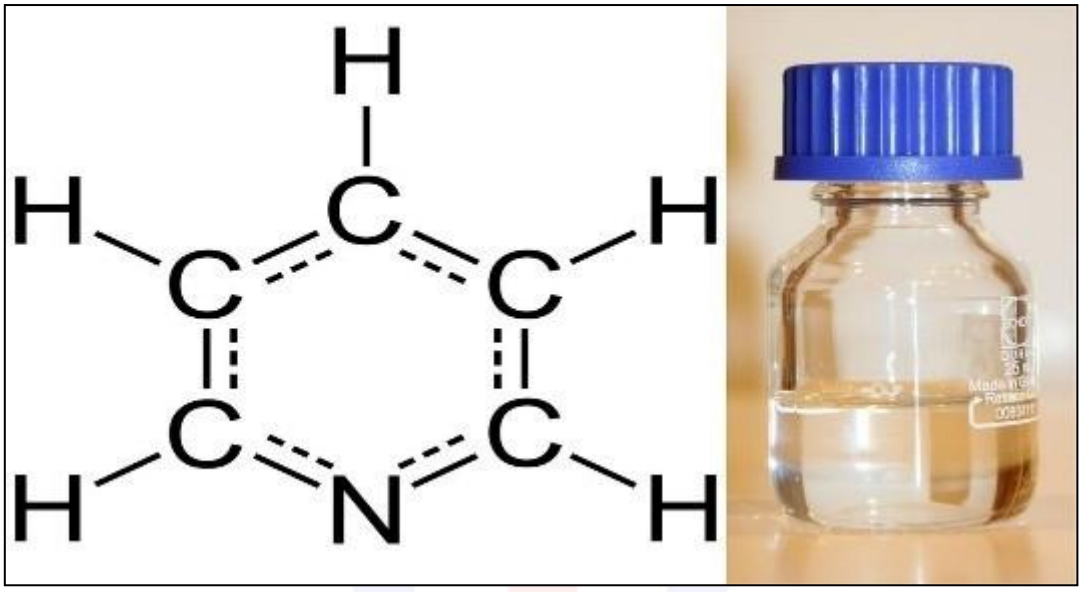
Question: 3	The GSAT-7R satellite is expected to be launched using which launch vehicle?
Option A	PSLV-C56
Option B	GSLV Mk-II or LVM3
Option C	GSLV Mk-III (Cryogenic)
Option D	SSLV
Answer	Answer: (b) GSLV Mk-II or LVM3

Question: 4	Consider the following statements about GSAT-7R: 1. It will enhance tri-service communication interoperability. 2. It is placed in Low Earth Orbit. Which of the above is/are correct?
Option A	1 only
Option B	2 only
Option C	Both 1 and 2
Option D	Neither 1 nor 2
Answer	Answer: (a) 1 only

Question: 5	GSAT-7R satellite contributes primarily to which strategic objective?
Option A	Agricultural data mapping
Option B	Civil aviation coordination
Option C	Maritime Domain Awareness and defense communication
Option D	Weather monitoring in the Bay of Bengal
Answer	Answer: (c) Maritime Domain Awareness and defense communication

45 BENZENE

Two centuries after its discovery, benzene remains a cornerstone of modern chemistry and industry. Yet, it stands as a double-edged molecule — the foundation of modern materials but also a source of grave environmental and health risks.



Benzene (C_6H_6) is a colorless, volatile, aromatic hydrocarbon that forms the structural foundation of countless industrial compounds including plastics, dyes, detergents, and pharmaceuticals. Its unique ring structure makes it the cornerstone of aromatic chemistry.

DISCOVERED BY:

It was first isolated in **1825 by Michael Faraday** from the oily residue of illuminating gas in London and later structurally explained by **August Kekulé (1865)**, who proposed its cyclic hexagonal ring — a revolutionary concept in organic chemistry.

CHARACTERISTICS:

- **Chemical Stability:** Despite being unsaturated (C_6H_6), it exhibits remarkable stability due to delocalized π-electrons — a phenomenon known as *aromaticity*.
- **Physical Properties:** Colorless, sweet-smelling, highly flammable liquid; insoluble in water but miscible with organic solvents.
- **Industrial Derivatives:** Forms the base for styrene, phenol, cyclohexane, nylon, and polystyrene.

LIMITATIONS:

- **Toxicity:** Benzene is a known carcinogen, causing leukaemia and bone marrow disorders upon prolonged exposure.
- **Environmental Persistence:** Its volatility and resistance to breakdown contribute to air and groundwater contamination.
- **Occupational Hazard:** Historically, exposure in refineries and chemical plants led to widespread industrial diseases, prompting global regulation.

APPLICATIONS:

- **Petrochemicals:** Key feedstock for BTX compounds (benzene, toluene, xylene) — used in plastics, rubber, and fibers.
- **Pharmaceuticals:** Base for synthesis of drugs like aspirin, sulfa drugs, and antihistamines.
- **Synthetic Materials:** Used in making nylon, resins, and polymers — essential for automobiles, textiles, and electronics.
- **Dyes and Detergents:** Integral to aromatic intermediates for coloring agents and surfactants.
- **Modern Electronics:** Used in conducting polymers and OLEDs, showcasing its evolving role in nanomaterials and flexible electronics.

46 VANDE MATARAM – 150 YEARS CELEBRATION

Prime Minister, in his Mann Ki Baat address, called for nationwide participation to celebrate the 150th anniversary of "Vande Mataram", describing it as a "mantra that unites 140 crore Indians".

Vande Mataram (meaning "I bow to thee, Mother") is **India's national song**, symbolizing reverence to the motherland and evoking patriotism and unity among citizens.

WRITTEN BY:

Composed in **Sanskritised Bengali** by **Bankim Chandra Chattopadhyay** in the **1870s**, it was first published in his novel Anandamath (1882).

HISTORY:

- The song's **first public rendition** was by **Rabindranath Tagore** at the **1896 Congress Session**.
- It became the **anthem of India's freedom struggle**, sung in protests and revolutionary gatherings despite being banned by the British.
- The **Indian National Congress (1937)** adopted its **first two stanzas** as the **National Song**, balancing inclusivity and secular appeal.
- On **January 24, 1950**, the **Constituent Assembly** accorded Vande Mataram equal honour to the **National Anthem "Jana Gana Mana."**

FEATURES:

- **Spiritual Patriotism:** Depicts the nation as a nurturing mother embodying both emotional and divine strength.
- **Secular Adaptation:** Only the first two stanzas, devoid of religious imagery, are used officially to ensure inclusivity.
- **Cultural Symbolism:** Serves as a unifying call cutting across linguistic and regional divides.
- **Historical Legacy:** Its association with movements like **Swadeshi (1905)** and **Quit India (1942)** made it the lyrical soul of resistance.

CURRENT STATUS:

- Recognized by the Government of India as equal in stature to the National Anthem.
- Instrumental version is played at the closing of every Parliament session.
- Citizens are encouraged to show equal respect to both Vande Mataram and Jana Gana Mana, as affirmed by a Delhi High Court affidavit (2022).

47 CRYODIL

Scientists at the ICAR–National Institute of Animal Nutrition and Physiology (NIANP), Bengaluru, have developed CRYODIL, India's first egg yolk-free semen preservation solution for buffalo breeding, capable of extending semen shelf life to 18 months.

CRYODIL is a ready-to-use, egg yolk-free semen extender designed to preserve buffalo semen for long durations while maintaining fertility and motility.

- **Developed by:** Developed by scientists at the National Institute of Animal Nutrition and Physiology (NIANP) under the Indian Council of Agricultural Research (ICAR), Bengaluru.
- **Aim:** To provide a safe, efficient, and affordable alternative to traditional egg-yolk-based semen extenders and enhance buffalo breeding efficiency in India.

FEATURES:

- **Long Shelf Life:** Preserves semen for up to **18 months** without contamination or loss of motility.
- **Microbe-Free Solution:** Eliminates risk of microbial contamination associated with egg yolks.
- **Stable Composition:** Uses purified **whey proteins** instead of egg yolk, ensuring consistent semen quality.
- **Cost-Effective:** Cheaper and easier to produce compared to imported commercial extenders.

- **Field-Tested Innovation:** Successfully tested on **24 buffalo bulls**, showing higher post-thaw sperm movement and fertility potential.

SIGNIFICANCE:

- **Boosts Buffalo Breeding:** Enhances success rate of artificial insemination, crucial for India's dairy productivity.
- **Promotes Atmanirbhar Bharat:** Reduces dependence on costly foreign extenders, fostering indigenous innovation.
- **Improves Dairy Economics:** Increases milk yield potential by improving breeding efficiency.

48 EAST TIMOR (TIMOR-LESTE) JOIN ASEAN AS THE 11TH MEMBER OF ASEAN

East Timor (Timor-Leste) was formally admitted as the 11th member of ASEAN at the 47th ASEAN Summit in Kuala Lumpur, marking the bloc's first expansion since the 1990s.

East Timor, officially the Democratic Republic of Timor-Leste, is a sovereign island nation in Southeast Asia, and one of the world's youngest republics (independent since 2002).

Location: It lies in the eastern half of Timor Island in the Malay Archipelago, bordered by Indonesia to the west, and the Timor Sea (north of Australia) to the south.

Capital: Dili.

Geographical Features: Mountainous terrain with **Mount Tatamailau (2,963 m)** as the highest peak; dry tropical climate, sandalwood vegetation, and rich biodiversity including civet cats and crocodiles.

49 AMAZON FACE EXPERIMENT

In Brazil's Amazon rainforest, scientists have built a unique experiment called **AmazonFACE** to simulate future atmospheric conditions by pumping **carbon dioxide (CO_2)** into the forest canopy.

The goal is to understand how the Amazon — often called the "lungs of the Earth" — will adapt to rising CO_2 levels in the coming decades.

ABOUT THE PROJECT:

- **AmazonFACE (Free-Air CO_2 Enrichment)** is located near **Manaus**, Brazil.
- The setup includes **six steel tower rings**, each surrounding 50–70 mature trees.
- Three rings will be fumigated with elevated CO_2 to mirror **future climate projections (2050–2060)**, while others serve as controls.
- Sensors monitor forest responses every 10 minutes — tracking CO_2 absorption, oxygen release, and changes in humidity.
- The project is led by **INPA (National Institute for Amazon Research)** and **Universidade Estadual de Campinas**, with support from **Brazil and the United Kingdom**.

50 RUSSIA TESTED POSEIDON DRONE

Russia has successfully tested a Poseidon drone declaring it impossible to intercept.

POSEIDON DRONE

- It is a new atomic-powered and nuclear-capable underwater drone.
- It outperforms all existing systems in speed and depth.
- It is designed to travel at a speed of up to 200 kph (124 mph) significantly faster than any existing torpedoes or warships.
- It is designed to evade defenses to cause a tsunami powerful enough to devastate a coastal city.

51 CLIMATE INEQUALITY REPORT 2025

The Climate Inequality Report 2025, co-authored by Lucas Chancel and Cornelia Mohren of the World Inequality Lab, found that wealthy individuals drive the climate crisis more through their investments than their consumption.

KEY FINDINGS

- It highlights that wealthy individuals contribute more to the climate crisis through asset ownership than consumption, with the top 1% responsible for 41% of emissions linked to private capital and 15% of consumption-based emissions.
- Their per-capita emissions are up to 680 times higher than those in the bottom 50%.
- Ownership-based emissions in countries like the US, France, and Germany far exceed consumption-based estimates, highlighting the disproportionate impact of the rich.

IMPACTS

- The report warns that climate change could worsen wealth inequality, projecting the top 1% could control 46% of global wealth by 2050 if they dominate climate investments.

SUGGESTIONS

- The report proposes a carbon-adjusted wealth tax to discourage high-carbon investments and fund the green transition, arguing it would be more progressive and effective than consumer-focused carbon taxes.
- Additional recommendations include banning new fossil fuel investments and expanding public ownership of low-carbon infrastructure to reduce inequality.
- With the global carbon budget for 1.5°C warming nearly exhausted, urgent action is needed to prevent climate change from worsening global wealth disparities.

52 HAL–RUSSIA DEAL: SJ-100 TO BE MADE IN INDIA

The Hindustan Aeronautics Limited (HAL) and Russia's United Aircraft Corporation (UAC) have signed a Memorandum of Understanding for production of civil commuter aircraft **SJ-100**.

ABOUT

- The **SJ-100** is a **twin-engine, narrow-body** passenger aircraft. So far, over **200 units** have been produced and are operated by **more than 16 commercial airlines** worldwide.
- Under this collaboration, **HAL will have the rights to manufacture the SJ-100** for domestic customers — a move expected to be a **game changer for short-haul connectivity** under the **UDAN Scheme**.
- This will also mark the **first time a complete passenger aircraft is produced in India** since the **AVRO HS-748**, which HAL manufactured between **1961 and 1988**.
- The SJ-100 project is not only a step towards **'Aatmanirbharta' in civil aviation**, but will also **strengthen the private sector**, and **generate employment** across the aviation manufacturing ecosystem.

DO YOU KNOW?

- Over the next decade, India's aviation sector is projected to need **over 200 jets** in this category for regional connectivity and **around 350 more** for nearby international destinations across the Indian Ocean region.

53 GREEN FODDER REVOLUTION

India, the world's largest milk producer, is facing a severe **shortage of fodder and livestock feed**, and risks undermining decades of progress in rural development and nutrition.

ABOUT

- India is accounting for **approximately 23–24% of global milk output**, and over 70 million farmers are directly involved in dairying.
- It contributes to **one-third of rural household income,** especially for small and marginal farmers.
- Livestock contributes **over 5% to India's Gross Value Added (GVA)** and **more than 30% of the agriculture and allied sector's GVA**, supporting **80 million rural households**.

CHALLENGES FACING DAIRY SECTOR IN INDIA

- **Fodder Crisis:** According to government estimates, India faces **a deficit of 11–32% in green fodder**, **23% in dry fodder**, and **over 40% in concentrated feed.**
    - The situation is particularly dire in high-output states like **Uttar Pradesh, Bihar, and Rajasthan**, where demand far outstrips supply.
- **Low Per Animal Yield:** India's **per-animal yield remains low**, largely due to poor nutrition, despite being world's largest producing milk.
- **Economic and Livelihood Impact:** Poor feeding practices cause **up to half of the potential productivity loss** in dairy animals.
    - For smallholders owning two or three animals, even a **one-litre drop in milk yield** per day can lead to serious economic distress.
    - Malnutrition also **extends calving cycles**, **increases disease risks**, and **raises veterinary expenses**.

REASONS BEHIND FODDER GAP IN INDIA

- **Urbanization and infrastructure expansion** have encroached upon traditional grazing lands.
- **Crop residues** such as paddy straw are increasingly diverted to **industrial use**, leaving less for livestock.
    - Some residues provide **low nutritional value**, sustaining but not enhancing productivity.

- **Climate variability** — including droughts, erratic rainfall, and rising temperatures — has **hurt seasonal fodder crops** like berseem and maize.
- Rising **Prices of Fodder Seeds & Commercial Feed:** Many farmers are being **forced to sell livestock** prematurely, breaking productive herds and destabilizing **milk procurement chains**.
    - If unchecked, this could erode **rural incomes**, threaten **food security**, and compromise India's **dairy leadership** globally.

WHY DOES FODDER MATTERS?

- Fodder isn't just animal feed — it's the fuel behind India's dairy economy. Poor-quality or insufficient fodder leads to:
    - Reduced milk yield and quality;
    - Higher veterinary costs;
    - Increased methane emissions from inefficient digestion;
    - Greater vulnerability to diseases like **Lumpy Skin Disease;**

WAY FORWARD

- Addressing the fodder crisis demands **coordinated policy and scientific interventions**:
    - Establish **dedicated fodder zones** at village levels.
    - Promote **multi-cut, high-yielding, drought-resistant fodder varieties** such as sorghum, maize, and napier.
    - Train farmers in **silage making, hydroponics**, and **fodder preservation**.
    - Encourage **fodder-food crop integration** through sustainable agronomic practices.
    - Use **satellite mapping and AI-based forecasting** to identify fodder-deficit areas.
    - Develop **region-specific fodder packages** through agricultural and veterinary universities.
- **Towards a Green Fodder Revolution:** Inspired by the **success of the Green Revolution** in food grains, **the Green Fodder Revolution** would involve:
    - Diversifying cropping systems to include high-yield fodder varieties like Napier grass, maize, and legumes;
    - Promoting agroforestry and silvopasture to integrate trees and fodder crops;

- Investing in fodder banks and cold chains to store surplus during lean seasons;
- Training farmers in sustainable fodder cultivation and feed management;
- Policy support through subsidies, insurance, and inclusion in flagship schemes like PM-Kisan;

- **Role of Cooperatives and Private Dairy Players:** India's **dairy cooperatives like Amul** can lead the response by:
  - Setting up **local fodder banks**.
  - Distributing **fodder seeds** and providing **feeding advisory services**.
  - Establishing **contract farming partnerships** with private players to ensure steady fodder supply.
- Just as India overcame past challenges through the **White Revolution**, it now needs a **Green Fodder Revolution** — one ensuring every dairy animal has **adequate, nutritious feed year-round**, securing both **rural livelihoods** and the **nation's food future**.

54 ADJUSTED GROSS REVENUE (AGR)

The Supreme Court allowed the Union government to review and reconsider additional demand in adjusted gross revenue (AGR) dues against financially distressed telecom operator Vodafone Idea (Vi).

ABOUT ADJUSTED GROSS REVENUE (AGR)

- Adjusted Gross Revenue (AGR) refers to the usage and licensing fee that telecom operators are required to pay to the Department of Telecommunications (DoT), under the Telecom Regulatory Framework.
- It is a crucial component in determining the share of revenue the telecom operators must pay to the government.

BACKGROUND

- The concept of AGR originated under the National Telecom Policy, 1999, when India shifted from a fixed license fee regime to a revenue-sharing model.
- Telecom operators agreed to share a percentage of their AGR as licence fees and spectrum usage charges (SUC) with the government.

55 BUREVESTNIK MISSILE

Russia has successfully tested its nuclear-powered **Burevestnik cruise missile.**

BUREVESTNIK MISSILE

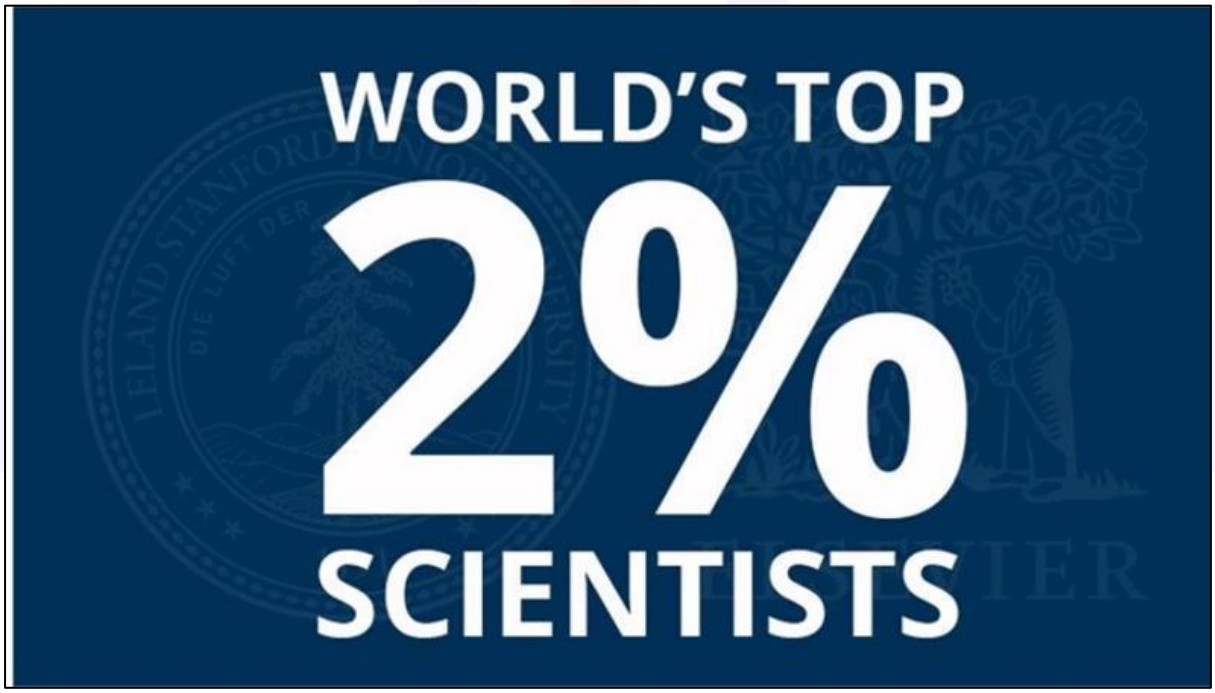
- It was first revealed by Russia in 2018 and recently it reportedly flew 14,000 km over 15 hours during test.
- NATO refers to it as the **SSC-X-9 Skyfall** and is named for the **storm petrel**, a bird that some believe foreshadows a storm.
- It boasts an unlimited range and the ability to evade missile defenses.

56 STANFORD/ELSEVIER'S RANK LIST

Stanford University's **"World's Top 2% Scientists list" 2025** was recently released .

WORLD'S TOP 2% SCIENTISTS LIST" 2025

- Stanford professor John Ioannidis annually publishes a list of the world's top 2% scientists based on a composite metric called the c-score, derived from Elsevier's Scopus database. The 2025 list includes 6,239 Indian scientists, with the top 10 ranked between 288 and 952, mostly from lesser-known institutions.
- Curiously, six of seven Nobel laureates ranked far lower, raising questions about the metric's validity.
- It is a prestigious ranking that highlights the most influential researchers across a broad range of scientific fields.
- It is compiled in collaboration with Elsevier.



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