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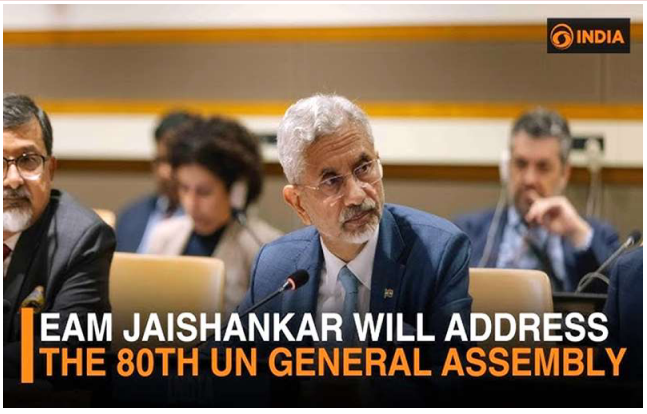
BURNING NEWS

UNGA 80th : India's Bilateral Engagements



Context:

- External Affairs Minister (EAM) **Dr. S. Jaishankar** conducted a series of **bilateral meetings** on the sidelines of the **80th Session of the United Nations General Assembly (UNGA 80)** in New York (September 2025).
- These meetings reaffirmed **India's commitment to multilateralism and global partnerships**, especially in the **Global South**.

Key Bilateral Meetings Held:

India–Mexico:

- **Counterpart:** Juan Ramon de la Fuente, Secretary of Foreign Affairs.
- **Venue:** Meeting held in **New Delhi** (before UNGA).
- **Focus Areas:**
    - Strengthening bilateral political and economic ties.
    - Creation of a **fresh roadmap for cooperation**, building on past diplomatic exchanges.
    - Emphasis on **strategic alignment**, trade, and cooperation in multilateral forums (e.g., UN, G20).

India–Cyprus:

- **Counterpart:** Constantinos Kombos, Foreign Minister of Cyprus.
- **Focus Areas:**
    - Review of bilateral ties after PM Modi's visit to Cyprus earlier in 2025.
    - Discussed regional developments in **Europe**.
    - India reaffirmed support for:
        * A **comprehensive and lasting solution to the Cyprus issue**.
        * Adherence to the **UN-agreed framework and UNSC resolutions**.

India–Pacific Island Countries (FIPIC) Engagement:

Held on the sidelines of the **Forum for India-Pacific Islands Cooperation (FIPIC) Foreign Ministers' Meeting (FMM)** in New York.

- **Countries Engaged:**
    - **Marshall Islands:** FM Kalani Kaneko
    - **Tuvalu:** FM Paulson Panapa
    - **Palau:** Minister of State Gustav Aitaro
    - **Solomon Islands:** FM Peter Shanel Agovaka
    - **Tonga:** PM Dr. Aisake Valu Eke
- **Focus Areas:**
    - Strengthening India's **Act East & Indo-Pacific policies**.
    - Reaffirmed India's commitment to **developmental partnerships**, **climate resilience**, and **capacity-building** in the Pacific region.
    - Promoting cooperation in areas like:
        * Renewable energy
        * Healthcare
        * Education
        * Disaster risk reduction

Strategic Significance:

Aspect	Significance
Multilateralism	India continues to push for reformed multilateralism and South-South cooperation.
Pacific Outreach (FIPIC)	Reflects India's long-term interest in the **Indo-Pacific** as a free, open, and inclusive region.
Europe Relations	Ties with Cyprus reflect India's nuanced stance on sensitive international issues.
Mexico Engagement	Strengthening Global South partnerships and expanding India's presence in Latin America.

What is UNGA?

Feature	Details
Established	1945, under the UN Charter
Inaugural Session	January 10, 1946 (51 member states)
Headquarters	New York City, USA (permanent HQ from 1951)
Current Membership	193 member states
Significance	Main deliberative, policymaking, and representative organ of the United Nations

Foundation of UNGA

- Created **after the failure of the League of Nations**, to uphold collective peace and cooperation.
- UNGA embodies the principle of **sovereign equality**, giving each member **one vote**.

Structure of UNGA

Component	Details
Annual Sessions	Begins every **September**; **Special Sessions** held as needed.
One Vote per Member	Every member has **equal voting rights**, regardless of size or power.
Presidency	Rotates yearly among five regional groups: Africa, Asia-Pacific, Eastern Europe, Latin America and Caribbean, Western Europe and others.
Observers	Holy See, Palestine, and international organisations participate **without voting rights**.
Decision-Making	- **Two-thirds majority** required for key issues: peace & security, elections, budget. - **Simple majority** for other matters.
Seating Arrangement	Alphabetical order; heads of states sit in the first row during general debate.

UNGA's Six Main Committees

Committee	Function
1st – Disarmament and International Security (DISEC)	Deals with disarmament and global security.
2nd – Economic and Financial	Focuses on economic growth and development.
3rd – Social, Humanitarian, and Cultural	Covers human rights and humanitarian issues.
4th – Special Political and Decolonization	Addresses colonial legacy, peacekeeping, and special missions.
5th – Administrative and Budgetary	Manages UN budgeting and administrative issues.
6th – Legal	Handles international legal matters and treaty interpretation.

Other Key Bodies Under UNGA

Body	Role
General Committee	Coordinates session agendas (President + Vice Presidents + Chairs of committees).
UN Disarmament Commission	Provides recommendations on disarmament.
International Law Commission	Develops and codifies international law.
UN Peacebuilding Commission	Advises on post-conflict recovery.
Human Rights Council	Promotes and protects human rights globally.
Others	UN Environment Assembly, Commission on the Status of Women, Commission on Population and Development.

Functions and Powers of UNGA

Function	Explanation
Deliberative Role	Debates on global issues: peace, security, human rights, development.
Recommendations	Issues **non-binding recommendations** to states and the UNSC.
Budget Approval	Approves **UN budget**, assesses member contributions.
Appointments	- Elects non-permanent UNSC members. - Appoints Secretary-General (on UNSC recommendation). - Elects judges to **ICJ** and members of **UNHRC**, ECOSOC.
Subsidiary Organs	Can create bodies/commissions to address specific global concerns.
Uniting for Peace Resolution (1950)	Allows UNGA to act when **UNSC is blocked by veto** (e.g., in Syria, Palestine).
Special Sessions	Convenes special sessions for urgent global matters.
Equal Representation	All countries, large or small, have equal voting power.

UNGA – Major Achievements

Achievement	Impact
Universal Declaration of Human Rights (1948)	Foundation of global human rights; inspired 80+ international treaties.
UN Peacekeeping (since 1948)	Over **70 missions** to support peace and protect civilians.
Decolonization Declaration (1960)	Helped over **80 nations gain independence**.
Convention Against Apartheid (1973)	Declared apartheid a **crime against humanity**.
Millennium Development Goals (2000)	Lifted **1+ billion** people out of poverty by 2015.
2030 Agenda for Sustainable Development (2015)	Adopted **17 SDGs** for poverty, planet, and prosperity.
Treaty on Prohibition of Nuclear Weapons (2017)	First binding treaty banning nuclear weapons.
Global Compacts on Refugees & Migration (2018)	Principles for managing large-scale migration and refugee protection.

Challenges Faced by UNGA

Challenge	Description
Lack of Enforcement Power	Resolutions are **non-binding**; no compulsory compliance.
Consensus Difficulties	193 members = slow, **watered-down outcomes**.
Geopolitical Tensions	Rivalries (e.g., **US-China-Russia**) block action on crises.
Resource Constraints	Funding gaps delay implementation of key programs.
Global Divisions	Ideological blocs like G77, NAM, Western powers cause **fragmentation**.
Dependency on Member States	Political interference can sideline critical issues.
UNSC Paralysis	Vetoes in UNSC limit coordination with UNGA.
Rising Complex Crises	Climate change, pandemics, and cyber threats demand **better coordination**.

Reforms Needed in UNGA

Reform Area	Suggestion
Internal Functioning	Improve accountability, transparency, and evaluation.
Funding Models	Develop **independent funding** mechanisms to reduce dependency.
Legal Follow-Up	Monitor implementation of resolutions more effectively.
UNSC-UNGA Coordination	Promote synergy and resolve **deadlocks** in peace and security issues.
Reduce Political Interference	Insulate decision-making from powerful nations' agendas.
Broader UN Reform	Push for **more inclusive global governance**, especially in the **Security Council**.

India and UNGA – A Strong Legacy

Contribution	Detail
Founding Member	India joined the UN in **1945**; a long-standing supporter of multilateralism.
Anti-Colonial Voice	Co-sponsored the **1960 Decolonization Declaration**.
Historic Leadership	**Vijaya Laxmi Pandit** became the **first woman UNGA President** in 1953.
Security Council Membership	Served **8 times**; last in **2021–2022**, leading debates on maritime security.
Push for UNSC Reform	Advocates **permanent membership** for India, Germany, Brazil, and Japan.
Global Peacekeeping	Major contributor to **UN peacekeeping missions**.
Climate Action	Champion of **climate justice** and launched **International Solar Alliance (ISA)**.
Counterterrorism	India has pushed for **Comprehensive Convention on International Terrorism (CCIT)** since 1996.
2028-29 Bid	India is seeking a **non-permanent seat** in UNSC for the 2028-29 term.

Trump's Gaza Peace Plan : "Peace for Our Time" in West Asia?

1. Why in News

- On **October 9, 2025**, **US President Donald Trump** announced that **both Hamas and Israel had agreed to the first phase of his Gaza Peace Plan**, a 20-point framework aimed at ending two years of violent conflict.
- His announcement came **just days before a high-stakes diplomatic visit** to **Israel and Egypt (October 13, 2025)** — his first visit since the ceasefire was brokered.
- This initiative is being seen as an ambitious attempt to position the US as the **sole architect of peace in West Asia**, bypassing traditional multilateral forums like the UN, OIC, and Arab League.

2. Context & Strategic Importance

- The ceasefire follows **intensive two-year conflict** in Gaza, marked by Israeli military operations, regional instability, and a humanitarian crisis.
- Trump's **20-point peace framework**, first revealed on **September 27**, attempts to:
  - Remove Hamas from power.
  - Rebuild Gaza with international aid (led by the US).
  - Create a **"deradicalised, terror-free Gaza"**.
  - Set the stage for eventual **Palestinian self-determination** under a reformed Palestinian Authority (PA).
- It is part of a **larger geopolitical strategy** to:
  - **Revive the Abraham Accords.**
  - Draw in **Saudi Arabia** and other Gulf states.
  - Isolate **Iran** and rejectionist actors.

3. Highlights of Trump's Middle East Visit

Visit to Israel (Tel Aviv & Knesset)

- Trump arrived early Monday (Oct 13) for a **7-hour visit**.
- Met **families of Israeli hostages** in a closed-press event.
- Addressed **Israeli lawmakers at the Knesset**.
- Reinforced US support to Israel during implementation of Gaza ceasefire.

Visit to Egypt (Sharm el-Sheikh)

- Trump flew directly to Sharm el-Sheikh for a **peace ceremony**.
- Egypt was a key mediator in post-ceasefire negotiations.

- Discussions focused on:
    - Next phases of the peace deal.
    - Disarmament of Hamas.
    - Humanitarian reconstruction of Gaza.

Key Quote (Aboard Air Force One):

> *"We are gonna make everybody happy — Jewish, Muslim, Arab countries. They're all into this deal."*
>
> – **Donald Trump**, en route to Israel.

4. Key Provisions of the 20-Point Gaza Peace Plan

Stakeholder	Concessions / Gains
Israel	Hostage release, Gaza demilitarisation, no role for Hamas, Israeli security presence
Hamas (or Gaza leadership)	Amnesty offers, restoration of aid, reconstruction guarantees, no forced displacement
Palestinian Authority	Role in transitional governance, pending reforms
Arab States	Reference to Palestinian statehood pathway, interfaith dialogue, invitation to join accords
US	Sole leadership through "Board of Peace" chaired by Trump; US-led reconstruction plan; symbolic military presence

5. Challenges & Criticisms

Structural Weaknesses

- **Excludes key players**: No role for the UN, Arab League, OIC, EU, or China.
- **No clear roadmap** to the **two-state solution**.
- **Hamas unlikely to disarm** after surviving a two-year military onslaught.
- Reconstruction requires handling over **2 million displaced Gazans** and decades' worth of destruction

Security Risks

- **Rejectionist actors** like Iran, Hezbollah, ISIS, and Al-Qaeda are **not on board**.
- High chance of spoilers undermining fragile arrangements.

Governance Gaps

- Creating a **"Hamas-proof" Palestinian government** is politically implausible.
- Reforming the PA to meet Israeli conditions while satisfying Palestinian aspirations is contradictory.

6. Broader Geopolitical Implications

Global Order

- Reflects rising **unilateralism** in peace processes.
- Mirrors Trump-era **deal-making diplomacy**: transactional, leader-centric, media-driven.

For India

- Peace in West Asia aligns with:
    - **Energy security** (India imports ~60% of crude from region).
    - **Protection of Indian diaspora** (~9 million in GCC).
    - **Trade & connectivity corridors** (IMEC, INSTC).
- India must watch for:
    - Potential destabilisation if the plan fails.
    - Space for strategic diplomacy balancing ties with **Israel, Iran, Palestine, GCC**.

7. Historical Echoes: "Peace for Our Time"?

Leader	Quote	Aftermath
Chamberlain (1938)	"Peace for our time" after Munich Pact	WWII began within a year
Bush (2003)	"Mission Accomplished" on Iraq War	Over a decade of insurgency
Trump (2025)	"The war is over… The region will normalise"	Too early to predict

Critics warn against premature declarations of peace without solving the root causes of conflict.

8. Way Forward

For the US & Allies	For India
Ensure **multilateral consultation**	Engage **constructively with all stakeholders**
Establish **neutral monitoring mechanisms**	Push for **humanitarian relief in Gaza**
Phase-wise reconstruction with Arab co-leadership	Safeguard **diaspora & economic interests**
Address **political rights of Palestinians**	Use platforms like **BRICS+, UNGA** for balanced diplomacy

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Wassenaar Arrangement

Why in News

The Wassenaar Arrangement, an international export control regime, is currently confronting challenges in adapting its rules and oversight to emerging cloud technologies. This situation is prompting revisions to key control lists and enforcement strategies.

What is the Wassenaar Arrangement?

- A multilateral export control regime aiming to regulate the trade and transfer of conventional arms and dual-use goods and technologies—items usable for both civilian and military ends.
- Established in 1996 to succeed the Cold War-era Coordinating Committee for Multilateral Export Controls (COCOM).
- Named after Wassenaar, a suburb near The **Hague, Netherlands, where the agreement for its creation was originally reached in 1995.**
- **Purpose: Enhance transparency and promote responsible behavior in arms and sensitive technology transfers, helping to prevent accumulation and spread that could lead to destabilization.**

Membership and India's Role

- Comprises 42 member countries who coordinate on shared responsibilities and partake in regular exchanges.
- India joined the group in 2017, integrating the Arrangement's control lists into its Special Chemicals, Organisms, Materials, Equipment, and Technologies (SCOMET) framework.
- The Arrangement is headquartered in Vienna, Austria.

How Does It Work?

- Exchange of Information: Members routinely share data about technologies and materials exported to or denied from non-member countries. This includes both conventional and nuclear-capable items.
- Comprehensive Lists: Maintains, reviews, and updates detailed lists of regulated chemicals, technologies, processes, and items assessed as sensitive or significant for military/strategic interests.
- Controlling Movement: Regulates export to prevent advanced technology or equipment from being acquired by parties that could undermine international security and stability.
- Enforcement and Transparency: Through information sharing and strict controls, members keep trade accountable and aligned with global peace and security goals.

India's Integration

- With its 2017 membership, India incorporated Wassenaar control standards into its domestic export control system under the SCOMET list.
- India collaborates on group reviews, contributes export data, and aligns its strategies to the Arrangement's evolving standards.

Contemporary Challenges

- The advent of cloud computing and related digital technologies has created new complications in export regulation. Unlike physical goods, digital technology can cross borders instantly, making traditional monitoring and control more difficult and requiring innovative regulatory approaches.

International Civil Aviation Organization (ICAO)

1. Background — India's Re-election

India has been **re-elected to Part II of the Council** of the International Civil Aviation Organization (ICAO). This re-election solidifies **India's active role** in global aviation policy-making and underscores its **growing influence** in international civil aviation matters.

2. What is ICAO?

The International Civil Aviation Organization (ICAO) is a **specialized agency of the United Nations (UN)**, established in **1944** through the **Convention on International Civil Aviation**, commonly known as the **Chicago Convention**.

- **Main Aim:** To develop **safe, secure, and efficient international air transport** for peaceful purposes.

Key Facts:

Feature	Details
Establishment	1944
Member States	193
Headquarters	Montreal, Canada

3. Governance Structure of ICAO

ICAO is governed by two key bodies: the **Assembly** and the **Council**.

A. ICAO Assembly

- Serves as the **supreme decision-making body** of the organization.
- Comprises **all 193 Member States** that are parties to the Chicago Convention.
- Meets **once every three years** to decide general policy, approve budgets, and elect Council members.

B. ICAO Council

- The Council is the **governing body** of ICAO, consisting of **36 elected Member States**.
- Members are elected by the Assembly for **three-year terms**.
- It ensures continuous work between assemblies and formulates detailed **operational and technical standards**.

4. Functions of ICAO

ICAO sets global standards for the **safety, security, efficiency, and environmental sustainability** of international air transport.

Function	Description
Standard Setting	Establishes international **norms** for aviation safety, security, navigation, and environmental performance.
Coordination Platform	Acts as a global forum for **cooperation** among 193 member states on civil aviation challenges.
Liberalization of Air Transport	Promotes regional and international agreements aimed at **liberalizing aviation markets**.
Legal Framework	Develops and recommends international aviation **laws** to support safe and organized growth of global air transport.

5. India's Role and Significance

India's re-election to **Part II of the ICAO Council** allows it to continue **shaping global aviation standards**.

- It strengthens India's commitment to promoting **safe and sustainable civil aviation**.
- India has been an **active participant** in ICAO since **1947**, influencing regulatory developments and regional cooperation in air navigation.

Why ICAO Matters

- It plays a key role in ensuring **uniform aviation safety standards** across the world.
- It facilitates **cooperation** between countries for seamless and safe international flight operations.
- It advances efforts to reduce aviation's **environmental impact** through global carbon reduction initiatives.

Conclusion

The International Civil Aviation Organization serves as the **global pillar of civil aviation governance**. India's continued representation on its Council underscores the nation's **strategic importance and technical capability** in global aviation affairs, contributing to safer, more sustainable, and globally coordinated air travel.

International Social Security Association (ISSA)

Why in News?

The **Union Labour Ministry of India** recently highlighted the significant expansion of social protection within the country, reporting a jump from just **19% coverage in 2015 to over 64% in 2025**. This progress was showcased at a conclave of the **International Social Security Association (ISSA)** held in Kuala Lumpur, demonstrating India's commitment to enhancing welfare programs.

About the International Social Security Association

The International Social Security Association (ISSA) is the leading international body for social security, promoting excellence in administration globally.

- **Foundation:** It was established in **1927** under the auspices of the **International Labour Organization (ILO)**.
- **Mission:** Its principal objective is to promote excellence in social security administration worldwide by offering **professional guidelines**, expert knowledge, services, and support to enable its members to develop **dynamic social security systems**.
- **Membership:** It is the main international organization for **social security organizations, governments, and departments** dealing with social security matters. **India** is a member country of this organization.
- **Headquarters: Geneva, Switzerland**.

Governance of the International Social Security Association

The ISSA operates through a structured set of statutory bodies to manage its global activities:

- **General Assembly:**
  - **Role:** The **highest statutory body** and the constituent assembly of the Association.
  - **Composition:** Composed of all members of the ISSA who are directly represented.
  - **Meetings:** It meets every **three years** to set the organization's overarching strategy.
- **Council:**
  - **Role:** The **electoral body** of the Association.
  - **Composition:** Consists of the titular delegates from each country that has at least one affiliate member in the ISSA. Each of these countries holds **one titular delegate**.
- **Bureau:**
  - **Role:** Serves as the **administrative authority** of the Association.

- **Composition:** Includes the **President** of the ISSA, the **Treasurer**, the **Secretary General**, and elected members who represent the different geographical regions of the world.

- **Control Commission:**
  - **Role:** Responsible for financial oversight.
  - **Function:** It **examines the financial records** and the annual reports presented by the Treasurer, ensuring that all financial transactions comply with the established Financial Regulations.

NATO Pipeline System (NPS)

Why in News?

Recently, the **Polish government** announced that it has signed a preliminary agreement to finally connect its national fuel infrastructure to the **NATO Pipeline System (NPS)**, specifically the **Central Europe Pipeline System (CEPS)**. This move, a major security investment costing an estimated €4.7 billion, is intended to strengthen Poland's energy and defense security on NATO's eastern flank amid rising tensions with Russia.

About NATO Pipeline System

- **Origin and Purpose:** It was set up during the **Cold War** in the 1950s to ensure a continuous and secure supply of fuel (jet fuel, diesel, gasoline, and lubricants) for NATO forces in the event of a conflict.
- **Scale and Coverage:**
  - It is an approximately **10,000 kilometres** long network.
  - It runs through **12 NATO countries** (with Poland set to become the 13th member after integration).
  - It has a total fuel storage capacity of **4.1 million cubic metres**.
- **Structure and Linkages:** The NPS links together **storage depots, military air bases, civil airports, pumping stations, truck and rail loading stations, refineries,** and entry/ discharge points.
- **Funding:** Bulk distribution is carried out using facilities funded through the common-funded **NATO Security Investment Programme (NSIP)**.
- **Oversight:** It is overseen by the **Petroleum Committee**, which is the senior advisory body in NATO on consumer logistics and reports to the Logistics Committee.

Key Components and Management

Component	Description
National Systems	Eight national pipeline systems that are controlled and operated by their respective national organisations.
Multinational Systems	Two multinational systems, the largest of which is the **Central Europe Pipeline System (CEPS)**.
Central Europe Pipeline System (CEPS)	A multinational system spanning over 5,300 km across five core nations (Belgium, France, Germany, Luxembourg, and the Netherlands). It is managed by the **CEPS Programme Office** under the aegis of the **NATO Support and Procurement Agency (NSPA)**.
Dual-Use Model	While prioritizing military needs, the CEPS uses its spare capacity to deliver jet fuel to major **civil airports** (like Frankfurt, Brussels, and Schiphol), with commercial traffic often accounting for the majority of the fuel transported.

Poland's Integration (The Eastern Flank)

- **Strategic Need:** The existing network ends in Western Germany, leaving NATO's eastern-flank members unconnected. The current fuel supply to bases in Poland relies on more vulnerable methods like rail and road tankers.
- **Project Details:** The plan involves building a new **300-kilometre pipeline** from the German border to the Polish military base in Bydgoszcz, which is home to NATO's Joint Force Training Centre.
- **Significance:** This investment enhances the logistical resilience and operational efficiency of NATO forces deployed near the eastern frontier, supporting the alliance's deterrence and defense posture.

India-UK Connectivity and Innovation Centre (CIC)

Why in News?

- India and the United Kingdom recently **announced the launch of the India-UK Connectivity and Innovation Centre (CIC)** at the **India Mobile Congress (IMC) 2025**. This landmark strategic partnership aims to drive innovation in digital connectivity, particularly in areas critical for the future of telecommunications, such as **6G technology** and **AI-enabled networks**.

About India-UK Connectivity and Innovation Centre (CIC)

- The CIC is a **strategic partnership** between India and the UK, designed to advance **digital inclusion** and shape the future of **secure, innovative, and resilient communications** between the two nations.

Key Features and Goals

- **Implementation:** It will be implemented under the **UK-India Technology Security Initiative**, jointly delivered by the **UK Research and Innovation (UKRI)** and India's **Department of Telecommunications (DoT)**.
- **Focus:** The Centre will bridge **cutting-edge university research** with **lab testing, field trials, and market deployment** by bringing together the complementary strengths of both countries.
- **Funding:** Both nations have jointly committed an initial **£24 million** (approximately ₹ 250 crore or ₹ 282 crore) over **four years** to support applied research, academic-industry collaborations, joint testbeds, and participation in global standards development.

Three Strategic Focus Areas (Over the Next Four Years)

1. **Transforming Telecom with AI:** Using advanced **Artificial Intelligence (AI)** tools to optimise networks, enhance efficiency, and enable new digital services.
2. **Non-Terrestrial Networks (NTNs):** Developing **satellite and airborne systems** to deliver high-speed, reliable connectivity to **rural and remote regions**, thereby advancing universal broadband access and digital inclusion.
3. **Telecoms Cybersecurity:** Strengthening network resilience through **open, interoperable, and secure communication systems** for both businesses and consumers.

Significance and Alignment

The CIC is a key component of the broader **UK-India Technology Security Initiative** and serves as a flagship example of the **UK-India Research and Innovation Corridor**. It reflects the shared ambition outlined in the **India–UK 2035 Vision** to deepen bilateral ties in science, technology, and security, paving the way for joint technological leadership in next-generation telecoms.

Henley Passport Index 2025

Why in News?

The **Henley Passport Index 2025** has drawn recent attention due to **significant shifts** in the global rankings, particularly involving traditional powerhouses and developing nations:

- **India's Rank Fluctuation:** The rank for the **Indian passport** has seen considerable fluctuation throughout the year. While it saw a rise to the **77th rank** earlier in 2025, the latest index (as of October 2025) indicates a slip back to **85th rank**, allowing visa-free access to **57 countries**.
- **US Drops Out of Top 10:** The **United States' passport** has fallen out of the top 10 for the first time in the index's 20-year history, ranking **12th** (tied with Malaysia), with visa-free access to 180 destinations.
- **Continued Asian Dominance: Singapore** continues to lead the index, with **South Korea** and **Japan** remaining near the top.

About Henley Passport Index

The Henley Passport Index is a **popular and authoritative ranking of global passports** that measures their strength by the **number of destinations** that holders can visit **without a prior visa**.

- **Data Source:** It is compiled and published by Henley & Partners, a global citizenship and residence advisory firm, based on exclusive data from the **International Air Transport Association (IATA)**.
- **Scoring Criteria:** A passport scores 1 point for every destination that can be entered visa-free, with a visa-on-arrival (VOA), a visitor's permit, or an Electronic Travel Authority (ETA). A score of 0 is given where a visa is required or a government-approved e-Visa is needed before departure.
- **Scope:** The index includes **199 different passports** and **227 different travel destinations**.
- **History:** It started in 2006 as the Henley & Partners Visa Restrictions Index (HVRI).
- **Significance:** A stronger passport reflects a country's **diplomatic relations, economic influence, and international trust**, as visa-free access is typically a result of reciprocal agreements.

MERCOSUR Group

Why in News?

India and Brazil have agreed to significantly expand the scope of their existing **Preferential Trade Agreement (PTA)** with the MERCOSUR bloc, with the goal of boosting **bilateral trade to $20 billion by 2030**, up from the current level of approximately $12 billion. This understanding was reached during a meeting in New Delhi between India's Commerce and Industry Minister and the Vice President of Brazil in October 2025.

About MERCOSUR Group

Feature	Details
Full Form	Southern Common Market (MERCOSUR for its Spanish initials)
Nature	South American regional **economic organization** and **customs union**.
Rank	Fourth largest integrated market globally (after EU, NAFTA/USMCA, and ASEAN).
Creation	Established in **1991** by signing the **Treaty of Asunción**.
Objective	Free movement of goods, services, capital, and people; became a customs union in January 1995.
Headquarters	**Montevideo, Uruguay**.
Official Languages	Spanish and Portuguese.

Member Countries:

- **Full Members:** Argentina, Brazil, Paraguay, and Uruguay.
- **Later Full Members:** Bolivia (accession pending) and Venezuela (suspended since December 1, 2016).
- **Associate Members:** Chile, Colombia, Ecuador, Guyana, Peru, and Suriname.

Governance of MERCOSUR Group

- **Common Market Council (CMC):** The bloc's **highest decision-making body**. It coordinates foreign and economic policy, comprised of the foreign and economic ministers of each full member. Decisions are made by **consensus**.
- **Presidency:** Rotates every **six months** among its full members.

India and MERCOSUR

India and MERCOSUR signed a **Preferential Trade Agreement (PTA) in 2004**, which became operational in 2009. The recent agreement with Brazil seeks to make this pact more **comprehensive** and **robust** by expanding the number of products covered under tariff concessions and addressing non-tariff barriers.

India-Mongolia Strategic Partnership : Expanding Energy, Mineral and Defence Ties

- The recent **State Visit of the President of Mongolia to India** (October 2025) marked the 70th anniversary of diplomatic relations and the 10th anniversary of the Strategic Partnership, yielding significant agreements across various sectors.

Why in News?

- The President of Mongolia visited India to commemorate the enduring diplomatic and strategic ties between the two nations, which resulted in the signing of **ten Memoranda of Understanding (MoUs)** and a renewed focus on energy, critical minerals, and defence cooperation.
- This visit is pivotal for advancing Mongolia's "Third Neighbour" policy and diversifying its economic and strategic partnerships.

Key Outcomes of the Visit

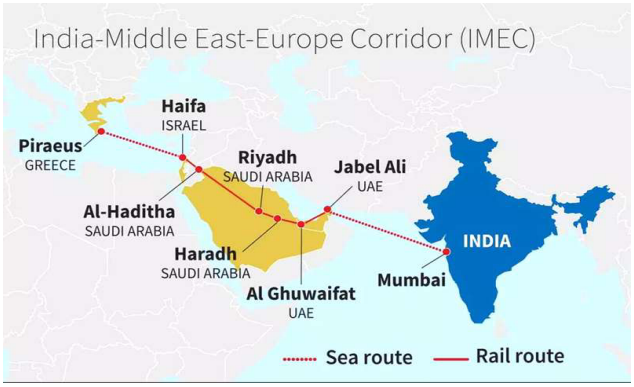
Area of Cooperation	Key Initiatives and Agreements	Strategic Significance for India/Mongolia
Energy & Economic	**$1.7 billion Oil Refinery Project** in Dornogobi, funded by India's Line of Credit, reaffirmed for completion by **2028**. The refinery will process 1.5 million tonnes of crude oil annually.	India's largest global development partnership; crucial for Mongolia's energy independence from Russia/China.
Critical Minerals	MoU signed on **Geology and Mineral Resources**. India expressed interest in sourcing **coking coal**, **uranium**, **copper**, **gold**, and **rare earth elements** from Mongolia.	Helps India diversify its critical mineral supply chains, reducing dependence on other nations like China.
Defence & Security	Appointment of a **Resident Defence Attaché** at the Indian Embassy in Ulaanbaatar. Launch of a new **capacity-building programme** for Mongolia's border security forces. Continuation of **Nomadic Elephant** and **Khaan Quest** joint exercises.	Strengthens bilateral defence ties and promotes regional stability through non-coercive security cooperation.
Connectivity & Logistics	Mongolia's airline plans to begin **charter flights** to New Delhi and Amritsar. India is exploring logistical routes via **Vladivostok (Russia)** and **Tianjin (China)** for coking coal imports. India announced **free e-visas** for Mongolian nationals.	Essential for boosting bilateral trade, tourism, and addressing Mongolia's landlocked challenge.
Culture & People-to-People	Agreement to send the **holy relics** of Lord Buddha's disciples (Sariputra and Maudgalyayana) to Mongolia in 2026. MoUs on cultural exchange, Sanskrit training for Gandan Monastery, and digitization of ancient Mongolian manuscripts.	Reinforces the deep, shared **Buddhist heritage** and soft power links.
Development & Technology	MoUs signed on sharing **digital solutions** (like India Stack) and **cooperative promotion**. India to provide grants (up to **$50,000 per project**) for small-scale development projects.	Embeds Indian technological and industrial presence; supports Mongolia's modernization efforts.

Logistical Challenges for Mineral Imports

A major impediment to strong economic ties is Mongolia's landlocked status. India's efforts to import critical minerals like **coking coal** face significant logistical hurdles:

- **Reliance on Neighbors:** Imports must be routed through the ports of **Tianjin (China)** or **Vladivostok (Russia)**, increasing cost and delivery time.
- **Viable Routes:** India is actively negotiating with Russia and Mongolia to utilize the **Trans-Siberian Railway** to Vladivostok, followed by the **Eastern Maritime Corridor (Vladivostok-Chennai)**. However, the Russian route is currently estimated to be **more expensive** than the Chinese route.
- **Industry Stance:** Companies like **JSW Steel** have previously put plans to source coking coal from Mongolia on hold, citing significant logistical unfeasibility due to these transport challenges.

India–Middle East–Europe Economic Corridor (IMEC)



Why in News?

- The **India–Middle East–Europe Economic Corridor (IMEC)**, launched at the **2023 G20 Summit**, faces significant threats to its implementation and strategic viability due to ongoing **conflicts in West Asia** and the growing accessibility of **Arctic shipping routes**.

What is the IMEC?

The IMEC is a **strategic multi-modal connectivity initiative** agreed upon at the G20 Summit in New Delhi.

- **Goal:** To establish an **integrated network** of ports, railways, roads, sea lines, energy pipelines, and digital infrastructure to boost trade between India, the Middle East, and Europe.
- **Structure:** It has two main parts:
  - **Eastern Corridor:** Connects India to the Gulf region.
  - **Northern Corridor:** Connects the Gulf region to Europe.
- **Signatories:** Key signatories include **India, the US, Saudi Arabia, UAE, France, Germany, Italy, and the EU**.
- **Strategic Context:** It is designed as a **transparent, sustainable, and debt-free alternative** to China's **Belt and Road Initiative (BRI)** and is part of the G7's Partnership for Global Infrastructure and Investment (PGII).

Economic and Strategic Benefits for India

The corridor offers significant advantages for India:

- **Cost and Time Reduction:** It is projected to reduce logistics costs by **~30%** and transport time by **~40%** compared to the Suez Canal route, enhancing export competitiveness.
- **Trade Diversification:** It offers a crucial **alternative route** to European markets, reducing reliance on choke points like the Suez Canal.
- **Policy Alignment:** It strengthens India's **Act West policy** by deepening engagement with the Middle East for energy security and diaspora links.
- **Energy and Climate Goals:** It supports India's **One Sun One World One Grid (OSOWOG)** initiative by facilitating the harnessing of solar and green hydrogen energy from the Middle East.

Key Challenges Facing IMEC

The corridor's viability is hampered by several geopolitical and logistical obstacles:

- **Geopolitical Instability in West Asia:** Conflicts, particularly the Gaza conflict, threaten the core route by worsening regional security and potentially stalling infrastructure projects planned through **Israel, Saudi Arabia, and Jordan**.
- **Arctic Route Competition:** Climate change is making **Arctic sea routes** more accessible. These routes are **shorter and more cost-effective** for shipping between Asia and Europe, potentially undercutting IMEC's competitive edge.
- **Maritime Insecurity:** Attacks by **Houthi rebels in the Red Sea** create maritime disruptions, forcing shipping detours and raising the risk exposure for IMEC's maritime segments.
- **Exclusion of Regional Powers:** Key strategically located countries like **Turkey, Egypt, and Iran** are not signatories, which could lead to the creation of rival corridors and complicate regional influence.
- **Funding Uncertainty:** While IMEC aims to mobilize **$600 billion by 2027**, it currently **lacks a clear funding roadmap** and a concrete cost-sharing plan among the member nations, posing a major challenge for implementing large-scale, long-term infrastructure projects.

Strategies for Successful IMEC Implementation

To overcome these challenges, India and its partners need a multi-pronged strategy:

- **Strengthen Geopolitical Engagement:** India must lead active diplomacy to **facilitate conflict resolution** in West Asia and strategically push for the **inclusion of other key regional actors** like Turkey, Iran, Qatar, and Egypt to expand the corridor's reach and counter regional rivalries.
- **Secure Funding and Governance:** Establish an **IMEC Secretariat** for coordination and dispute resolution. A **clear financial roadmap** and cost-sharing mechanism must be developed, leveraging **Public-Private Partnerships (PPPs)** and green bonds.
- **Mitigate Security Risks:** Diversify trade routes and develop **contingency plans** against maritime disruptions. Enhance regional security cooperation through forums like the **IORA** and **GCC**.
- **Promote Technological Integration:** Lead in digital connectivity by promoting **UPI-based payments, undersea data cables, and 5G infrastructure** to maximize the corridor's value.

India's Taliban Policy : "Engagement Without Recognition"

Why in News?

Following the visit of Afghanistan's Foreign Minister to New Delhi—the highest-level Taliban visit since 2021—India upgraded its technical mission in Kabul to a full embassy. This move solidifies India's sustained policy of **"engagement without recognition"** toward the Taliban government.

India's "Engagement Without Recognition" Approach

India's strategy is a nuanced diplomatic stance that separates functional diplomatic ties from formal political acceptance:

- **Non-Recognition:** India **does not grant *de jure* legitimacy** (formal recognition) to the Taliban regime, aligning with global sentiment that the Taliban has failed to meet **UN requirements** for an inclusive government and human rights protection.
- **Functional Engagement:** India **maintains *de facto* diplomatic channels** through its full embassy in Kabul.
- **Purpose:** The primary goals are to **coordinate humanitarian aid**, protect India's **strategic interests and investments** (over USD 3 billion), and sustain political dialogue while safeguarding against regional security threats.
- **Precedent:** This approach is consistent with international law (Vienna Conventions) and has been used by India in other contexts (e.g., Taiwan, Myanmar junta).

Why India is Engaging with the Taliban

India maintains contact despite non-recognition due to several strategic and pragmatic reasons:

- **Countering Regional Influence:** Engagement helps **balance the growing influence of China and Pakistan** in Kabul, ensuring India maintains a strategic foothold and supports Afghan sovereignty.
- **Security Assurances:** The Taliban has shown a **positive stance towards India**, including an emphasis that **Kashmir is a bilateral issue with Pakistan** and providing assurances that Afghan soil will not be used for **anti-India terror activities**.
- **Protecting Investments:** To ensure the safety and continuity of its past development projects, such as the **Salma Dam** and the **Kabul Parliament building**.
- **First-Mover Advantage:** Early diplomatic engagement helps enhance India's influence before other regional powers deepen their ties.

Key Challenges in India-Afghanistan Relations

- **Security and Terrorism:** Despite Taliban assurances, doubts persist due to their historic links with anti-India militant groups like **Lashkar-e-Taiba** and **Jaish-e-Mohammed**.
- **Pakistan's Influence:** Pakistan's historical support to the Taliban and its security establishment's influence complicate peace and stability.

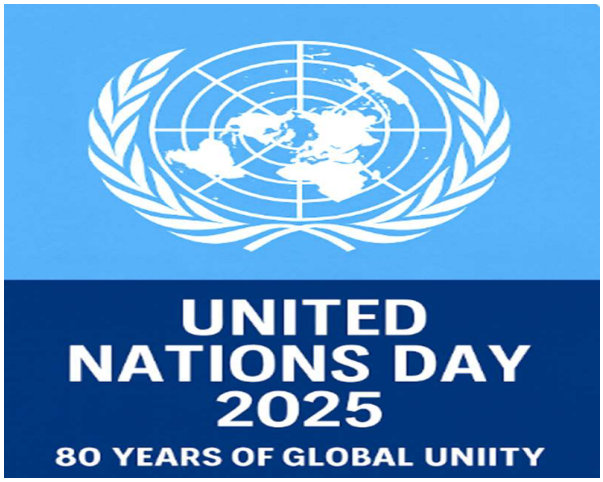
- **Political and Social Hurdles:** The Taliban's non-democratic rule, suppression of **women's rights**, and lack of minority protections conflict with India's values-based foreign policy.
- **Drug Trafficking:** Afghanistan remains the largest global **opium producer** (the **Golden Crescent**), funding terrorism and exacerbating drug crises in neighboring regions, including India.

Strategies to Strengthen Ties

India can strengthen its ties by focusing on:

1. **Economic Connectivity:** Boosting trade and investment, particularly through the **Chabahar Port** (bypassing Pakistan), the Air Freight Corridor, and exploring resource partnerships in mining.
2. **Counter-terrorism Cooperation:** Institutionalizing intelligence sharing and anti-narcotics collaboration.
3. **Multilateral Diplomacy:** Leveraging forums like the **Heart of Asia**, **SCO**, and **Moscow Format** for coordinated reconstruction and counterterrorism efforts.
4. **Humanitarian & Soft Power:** Continuing aid and expanding educational **scholarships** and vocational training to promote goodwill and social rights advocacy.

UN Day 2025: Commemorating 80 Years of Global Cooperation



Why in News?

- The world marks **United Nations (UN) Day** on **October 24, 2025**, celebrating **80 years** since the organization was established in 1945.
- The day specifically commemorates the **entry into force of the UN Charter**, which officially brought the United Nations into existence.

Key Facts About the United Nations (UN)

The UN is the pre-eminent intergovernmental organization dedicated to global peace, security, and cooperation.

- **About:** Established after **World War II** as the successor to the League of Nations. The **UN Charter** was signed on June 26, 1945, and officially came into force on **October 24, 1945**.
- **Founding:** It was ratified by **51 nations**, including the five permanent Security Council members (US, UK, USSR/Russia, China, France). **India is a founding member** of the UN.
- **Evolution & Membership:** Membership has grown from 51 countries in 1945 to **193 countries** in 2025.
- **Expanded Focus:** The scope of the UN has expanded to include critical areas like **health, environment, gender equality, human rights**, and **sustainable development**.
- **Core Goals:**
    - Maintain **international peace and security**.
    - Develop **friendly relations** among nations.
    - Achieve **international cooperation** in solving global problems.
    - Act as a **center for harmonizing actions** of nations to reach common objectives.
- **Headquarters:** New York City, US .

Key Achievements of the UN

The UN, through its principal organs and specialized agencies, has been central to shaping the modern world order.

- **Peacekeeping and Conflict Resolution:**
  - Deployed over **70 peacekeeping missions** since 1948 in conflict zones (e.g., Congo, South Sudan).
  - The **Nobel Peace Prize 1988** was awarded to the **United Nations Peacekeeping Forces**.
- **Human Rights Protection:**
  - Adopted the landmark **Universal Declaration of Human Rights (1948)**.
  - Established bodies like the **Human Rights Council (2006)** and the **International Criminal Court (ICC)** to ensure justice and accountability.
- **Sustainable Development and Poverty Reduction:**
  - Introduced the **Millennium Development Goals (MDGs)** (2000–2015) and the **Sustainable Development Goals (SDGs)** (2015–2030) to guide global efforts in reducing poverty and promoting equality.
- **Global Health and Humanitarian Aid:**
  - The **World Health Organization (WHO)** successfully led the eradication of smallpox and coordinated the global **Covid-19** response (e.g., through **COVAX**).
  - Agencies like the **World Food Programme (WFP)** and **UNHCR** (refugee agency) provide essential aid to millions affected by disasters and conflict.
- **Decolonization and Nation-Building:** Supported the independence and sovereignty of more than **80 countries**, mainly in Asia and Africa.
- **Climate and Environmental Action:** Facilitated key global accords such as the **Paris Agreement (2015)** and established the **Intergovernmental Panel on Climate Change (IPCC)** in 1988.
- **International Law and Justice:** Strengthened the rule of law through the **International Court of Justice (ICJ)** and global conventions like **UNCLOS** (Law of the Sea).

25th Year of India-Germany Strategic Partnership

Why in News?

India's **Union Commerce and Industry Minister** recently met with the **German Federal Minister for Economy and Energy**. The meeting was held to **commemorate 25 years of the India-Germany Strategic Partnership** and to discuss ways to significantly enhance cooperation in vital areas such as trade, investment, technology, green energy, and skilling.

Significance of the 25th Year of India-Germany Strategic Partnership

The partnership, institutionalized in 2000, has matured into a comprehensive relationship covering various critical domains:

- **25 Years of Strategic Partnership:** This milestone reflects the **strength and resilience of bilateral ties** spanning economic, technological, environmental, and educational domains. The focus remains on boosting **economic cooperation, industrial collaboration, and investment** in sustainability and technology.

- **Economic & Commercial Relations:**
    - **Germany** is a key player, ranking **12th among India's trading partners** (2.37% of India's foreign trade) with total trade hitting a record **USD 33.33 billion** (2023–24).
    - It ranks **9th among foreign investors in India**, with a cumulative FDI of **USD 14.5 billion** (April 2000–December 2023).
- **Technology, Digitalization, and Innovation:** Cooperation extends to **emerging technologies** like semiconductors, AI, and quantum tech, with key efforts focused on:
    - Sharing knowledge on **Digital Public Infrastructure (DPI)**.
    - The **Indo-German Digital Dialogue (IGDD)** to formalize digital cooperation.
- **Green and Sustainable Development Partnership (GSDP):** A key area focusing on climate action and sustainability through initiatives like the **International Solar Alliance (ISA)**, biodiversity protection (Global Biodiversity Framework), and cooperation on the **circular economy** and **solar waste recycling**.
- **Strategic & Defence Collaboration:** Both countries align strategically on issues like **UNSC reforms** (under the **G4** framework) and supporting the **Indo-Pacific** and **ASEAN centrality**. Defence ties include **joint military exercises** (e.g., *TARANG SHAKTI*) and negotiations for a **mutual logistics support agreement**.
- **Skilled Migration and Mobility:** The relationship aims to fully implement the **Migration and Mobility Partnership Agreement (MMPA)** to facilitate **legal labour migration**, curb irregular migration, and promote skilled and green workforce development.

Key Challenges in the Bilateral Partnership

Despite strong ties, certain geopolitical and economic issues pose hurdles:

- **Geopolitical Divergence:**
    - **Russia/Ukraine:** India's neutral stance and increased energy imports from Russia contrast with Germany's deteriorated relationship with Russia and its shift towards energy independence. This creates a persistent **fault line** in core threat assessments.
    - **China:** Germany favours a "de-risking" approach while continuing trade, whereas India views China as a **strategic rival** and seeks containment through alliances like the **Quad**.
- **Economic and Trade Barriers:** The **EU–India Free Trade Agreement (FTA)** remains stalled due to disagreements over **market access, tariffs, Intellectual Property Rights (IPR)**, and data protection.
- **Regulatory Misalignment:** Tension exists between India's push for **data localization** (mandating critical data be stored within its borders) and the EU's **GDPR**, which is designed for the free and secure flow of personal data within the bloc.
- **Perception Gaps:** Germany's **values-based foreign policy** on democracy and human rights can clash with India's focus on **strategic autonomy**, causing friction over domestic issues like citizenship laws and political arrests.

Steps to Strengthen the Partnership

To realize the full potential of the strategic partnership, both nations need actionable steps:

- **Foreign Policy Alignment:** Establish a **dedicated, regular strategic dialogue** between top diplomats and intelligence officials to share and reconcile threat assessments, especially concerning regional security.

- **Deepening Economic & Trade Ties:** Treat the **EU–India FTA as a strategic priority** requiring high-level political will to resolve pending disputes. Establish **targeted partnerships** in critical sectors like pharmaceuticals and automotive semiconductors to build complementary supply chains.
- **Accelerating Technological & Green Collaboration:** Include a **commercialization track** in the Innovation and Technology Partnership Roadmap. Swiftly **operationalize the Green Hydrogen Roadmap** with time-bound targets for joint ventures and pilot projects.
- **Enhancing Defence & Security Cooperation:** Finalize the **mutual logistics support agreement** to sustain an Indian Ocean presence and operationalize the Joint Working Group on Counter-Terrorism for **real-time intelligence sharing** on cyber-terrorism and terror financing.
- **Building Trust:** Germany should view **India's strategic autonomy as a shared multipolar goal**, which can help manage disagreements on geopolitical issues like Russia.

Commonwealth Games (CWG) in 2030

Why in News?

India is poised to host the **centenary edition** of the **Commonwealth Games (CWG) in 2030**, with **Ahmedabad** chosen as the proposed venue. This move is seen as a crucial step in India's larger, long-term bid to host the **2036 Summer Olympics**.

- India last hosted the CWG in **2010 (Delhi)**.
- India has a strong CWG record, finishing **4th** at Birmingham 2022.
- The **2026 CWG** will take place in **Glasgow, Scotland**.

What are Commonwealth Games?

- **About:** The CWG is the **world's 2nd largest multi-sports event** (after the Olympic Games), uniting athletes from **71 nations and territories** and celebrating the diversity and unity of the Commonwealth.
- **Evolution:** It was first held in **1930 in Hamilton, Canada**, as the **British Empire Games**. It was renamed the **Commonwealth Games** from **1978** onwards.
- **Purpose and Values:** Held **once every 4 years**, it is often referred to as the **Friendly Games**, reflecting core values of **Humanity, Equality, and Destiny**. It promotes sports, education, and recreation while celebrating the Commonwealth's cultural and linguistic diversity.
- **Governing Body:** The **Commonwealth Games Federation (CGF)** is responsible for the direction and control of the Games.

The 'Commonwealth'

- **About:** It is a **voluntary association of 56 independent and equal countries**, representing a population of **2.7 billion people**, with shared goals of **development, democracy, and peace**.
- **Historical Genesis:**
    - **Imperial Conference (1926):** Established that the UK and its Dominions were **equal members** within the British Empire.
    - **London Declaration (1949):** Established the **Modern Commonwealth of Nations**, allowing republics and non-British monarchies to join.

- **Membership:** Composed of 56 independent countries, most formerly British colonies. Membership is voluntary, with countries like **Gabon and Togo** joining in 2022.
- **India and the Commonwealth: India is the largest Commonwealth member by population** and the **4th largest financial contributor**. It has a significant history with the bloc, having hosted the Commonwealth Summit (1983) and the CWG (2010) in New Delhi.

The recommendation of Ahmedabad as the host for the 2030 Centenary Games is an important step that will be put forward to the full Commonwealth Sport membership for a final decision at the General Assembly in Glasgow.

EDITORIALS

Crux of The Hindu & Indian Express

International Issues

India–Russia BRICS Grain Exchange & BRICS Expansion

Context:

- On **September 25, 2025**, **PM Narendra Modi met Russian Deputy PM Dmitry Patrushev** in New Delhi.
- Discussion held on **creating a BRICS Grain Exchange** to enhance **agricultural trade cooperation** among BRICS nations.
- Aim: **Boost mutual agricultural trade** among BRICS members.
- Venue: **World Food India 2025**.

BRICS Grain Exchange Proposal

What is the BRICS Grain Exchange?

- A proposed **common agricultural platform** to:
  - Facilitate **grain and agri-trade** among BRICS nations.
  - Improve **market access** and **trade integration**.
  - Reduce dependency on **Western-dominated** food markets.

Purpose:

- Strengthen **mutual food security**.
- Improve **agricultural trade efficiency**.
- Potentially **stabilize grain prices** across member countries.

India–Russia Bilateral Cooperation Highlights

Key Sectors:

- Agriculture
- Fertilizers
- Food processing
- Trade & Energy
- Defence (contextual background)

Diplomatic Tone: "Russia highly values its special and privileged strategic partnership with India." – Dmitry Patrushev

- **Trade Turnover** (2024): Reached a **historic high**.
- India considered a **key ally** of Russia in the global arena.

Additional Discussion: India–Eurasian Economic Union (EAEU) FTA

- Both sides discussed **progress on an FTA** between:
  - **India** and the **EAEU** (comprising Russia, Belarus, Kazakhstan, Armenia, Kyrgyzstan).
- Aim: To enhance **bilateral trade**, reduce tariffs, and improve market access.

Relevance of the BRICS Grain Exchange

For India :

- Enhances **agricultural exports** to BRICS nations.
- Helps Indian farmers by **diversifying markets**.
- Strategic alternative to **Western-controlled grain pricing**.

For BRICS:

- Creates a **South–South trade platform** in agriculture.
- Builds **economic autonomy** and food security.
- May reduce reliance on the **US dollar** for food trade.

What is BRICS and its origin ?

About BRICS

Origin and Evolution:

- **2001**: Term *BRIC* coined by economist **Jim O'Neill** (Brazil, Russia, India, China).
- **2006**: First informal BRIC meet (G8 Outreach Summit, Russia).
- **2009**: First formal BRIC summit (Russia).
- **2010**: South Africa joins '! **BRICS** formed.

Current Membership:

As of **2025**, BRICS has **11 members**:

- Original 5: **Brazil, Russia, India, China, South Africa**
- New Members (2024–25):
  - **Egypt, Ethiopia, Indonesia, Iran, Saudi Arabia**, **UAE**
- Note: Saudi Arabia listed on BRICS website, but has **not officially joined**, per sources.

3. BRICS Expansion: Partner Country Category (2024 Onwards)

Concept:

- Introduced at **16th BRICS Summit, Kazan (Russia), Oct 2024**.
- Allows **non-members to engage with BRICS** without voting/veto rights.
- Designed to strengthen ties with **emerging economies**.

Confirmed Partner Countries (as of Jan 2025):

- **9 countries** officially accepted invitation:
  - **Belarus, Bolivia, Cuba, Kazakhstan, Malaysia**
  - **Thailand, Uganda, Uzbekistan, Nigeria**

  Nigeria became the **9th Partner Country** (Jan 2025) – Africa's largest population and 4th largest economy.

Initially Invited 13 Countries (by Region):

Region	Countries
Latin America	Cuba, Bolivia
Eurasia	Belarus, Türkiye
Africa	Algeria, Nigeria, Uganda
SE Asia	Indonesia, Malaysia, Thailand, Vietnam
Central Asia	Kazakhstan, Uzbekistan

- **Indonesia**: Transitioned from Partner to **Full BRICS Member** in **Jan 2025** post-election.

4. BRICS Objectives & Goals

Core Objectives:

- Promote **economic growth** and **inclusive global governance**.
- **Intra-BRICS trade** and **investment cooperation**.
- **Reform** of global institutions (UN, IMF, World Bank).
- Empower **Global South**: fair trade, climate justice, development support.
- **People-to-people exchanges**: cultural, educational, and social linkages.

5. BRICS Structure & Key Mechanisms

Mechanism	Purpose
New Development Bank (NDB)	Fund infrastructure & development projects
Contingent Reserve Arrangement (CRA)	$100B safety net for financial crises
BRICS Academic Forum	Promote research & academic collaboration

- Operates through **consensus-based framework** – no formal HQ or secretariat.

6. BRICS+ Economic and Strategic Significance

Economic Strength:

- **45% of global population**
- **35% of global GDP (PPP)**

Strategic Role:

- **Counterbalance to G7** (Western bloc).
- Advocates **fair trade, climate justice**, and **technology access**.
- Promotes **de-dollarization**: e.g., India–UAE trade in **rupees & dirhams**.
- **BRICS Currency**: under discussion – could reshape global trade.
- Cooperation in:
  - Digital payments
  - Cross-border payment systems
  - Renewable energy & technology

7. Significance of BRICS Grain Exchange Proposal

Strategic Importance:

- Enhances **food security** and **agriculture trade integration** within BRICS.
- Helps **bypass Western-dominated grain markets**.
- Can **stabilize prices**, improve **supply chains**, and **boost farmer income**.

Implications for India:

- Improves **agriculture export avenues**.
- Strengthens **strategic partnership with Russia**.
- Aligns with India's food processing & fertilizer goals.

Challenges Facing BRICS:

	Challenge	Solution
Overlapping Groupings	BRICS overlaps with other groupings like **IBSA** (India, Brazil, South Africa) and **BASIC** (Brazil, South Africa, India, China), leading to potential inefficiencies.	Clearly define the roles of each grouping to avoid duplication of efforts and ensure complementarity.
Geopolitical Tensions	Diverging geopolitical interests among member countries, especially regarding **China's Belt and Road Initiative**, may cause tensions.	Promote open dialogue and focus on shared goals like global governance reform to maintain unity.
Economic Slowdowns	Economic slowdowns in some BRICS member countries could impact the group's collective economic objectives.	Boost intra-BRICS trade and investments to reduce reliance on external economies and stimulate internal growth.
Power Imbalance	The dominance of **China**, **India**, and **Russia** in BRICS could limit the influence of smaller members like **Brazil** and **South Africa**.	Empower smaller members through initiatives tailored to their priorities, ensuring equal influence within BRICS.

Trump says Putin's offer on nuclear arms control 'sounds like a good idea

Why in News

- U.S. President **Donald Trump** has responded positively to Russian President **Vladimir Putin's** offer to **voluntarily maintain limits** on strategic nuclear weapons under the framework of the expiring **New START Treaty**.
- The discussion on **nuclear arms control** between the U.S. **President Donald Trump** and **Russian President Vladimir Putin** comes in the backdrop of **Russia's 2023 decision to suspend participation in the New START Treaty**, which remains the **last major arms control framework** between the two nuclear superpowers.

- Putin has now offered to **voluntarily maintain limits** set by the treaty if the U.S. reciprocates. Trump has responded positively, saying it "**sounds like a good idea**."

Key Highlights

Topic	Detail
◇ **Putin's Proposal**	Russia is willing to **voluntarily continue limits** on deployed nuclear weapons under the New START agreement if the **U.S. reciprocates**.
◇ **Trump's Response**	Trump said the idea "**sounds good**," but no formal commitment has been made yet.
◇ **New START Treaty**	Signed in **2010**, expires in **February 2026**. It is the **last remaining arms control treaty** between the U.S. and Russia.
◇ **Russia's Concern**	Russia warned that U.S. supply of **long-range Tomahawk missiles** to Ukraine would **destroy diplomatic ties**.
◇ **Ukraine Missile Request**	Ukraine has requested Tomahawk missiles capable of striking **deep into Russia**, including **Moscow**.
◇ **U.S. Status**	The U.S. is considering Ukraine's request but faces inventory challenges.
◇ **Background Tensions**	Follow recent **Russian drone incursions into NATO airspace** and deteriorating U.S.-Russia relations.

What is the New START Treaty?

Feature	Description
Full Form	Strategic Arms Reduction Treaty (New START)
Signed	2010 (by U.S. President Obama and Russian President Medvedev)
In Force	Since 2011
Validity	Initially till 2021, extended till **February 2026**
Replaces	START-I (1991–1994) and SORT (2002)

Objectives of the New START Treaty

- Slow down the **strategic arms race**.
- Impose **verifiable limits** on U.S. and Russian **long-range nuclear weapons**.
- Maintain **strategic stability** and reduce chances of miscalculation or accidental war.
- Foster **transparency and trust** through mutual inspections.

Arms Limitations under New START

Category	Limit
Deployed ICBMs, SLBMs, and Bombers	700
Deployed Nuclear Warheads	1,550
Deployed + Non-Deployed Launchers & Bombers	800

- **ICBMs**: Intercontinental Ballistic Missiles
- **SLBMs**: Submarine-Launched Ballistic Missiles

Compliance & Verification Mechanisms

- **On-site inspections** by both countries.
- **Data exchanges** on missiles and warheads.
- **Advance notifications** of missile launches.
- **Bilateral Consultative Commission (BCC)** to resolve disputes.

Limitations of the Treaty

Issue	Explanation
Does NOT cover tactical nukes	Excludes **non-deployed** and **non-strategic (tactical)** nuclear weapons, which are significant in number.
Missile defense systems	Russia opposes U.S. initiatives like **space-based missile interceptors** (e.g., "Golden Dome").
Hypersonic threats	U.S. is concerned about Russian systems like **Kinzhal** and **Avangard** hypersonic glide vehicles.
Suspension by Russia	In 2023, Russia **suspended its participation**, raising fears of a new arms race.

Why the Treaty Matters Globally

- The U.S. and Russia together hold **~87% of the world's nuclear warheads**:
  - Russia: ~5,459
  - U.S.: ~5,177
- Without New START, **no legal framework** remains to regulate the world's two largest nuclear arsenals.

- Its expiration or collapse could lead to:
    - Unchecked **nuclear arms buildup**
    - Collapse of **mutual verification**
    - Increase in **strategic instability**

Major Global Nuclear Disarmament Treaties

Treaty	Objective	Status
NPT (1968)	Prevent spread of nuclear weapons; promote disarmament; allow peaceful nuclear energy use	In force
CTBT (1996)	Ban all nuclear testing	Signed by many; **not yet in force** (India, U.S., China among non-ratifiers)
TPNW (2017)	First legally binding treaty to **ban nuclear weapons** under international law	In force since 2021 (India, U.S., Russia **not signatories**)

Significance of the Development

1. Potential Step Toward Arms Control Stability

- Positive rhetoric could pave the way for **renewed dialogue** on arms control.
- Important as **New START** is the **only active arms limitation** treaty post-termination of INF.

2. High Stakes with Ukraine Conflict

- Putin links missile deliveries to a breakdown in diplomatic ties.
- **Tomahawk missiles** can strike targets over 2,500 km away — covering most of **European Russia**.

3. Diplomatic Signal from Russia

- Despite hostilities, Putin's offer suggests Russia is still **interested in nuclear parity and predictability**.

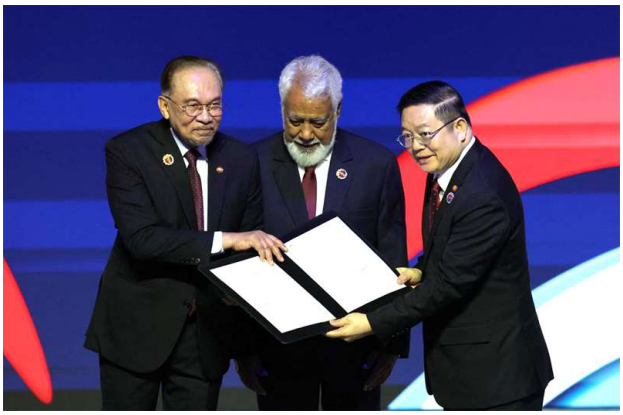
4. Trump's Return to Foreign Policy

- Trump's comment, though informal, signals his **continued influence** on strategic U.S.-Russia dynamics.

Conclusion

Putin's proposal to **voluntarily maintain nuclear limits** under the expiring New START treaty and Trump's **positive response** offer a glimmer of hope for renewed nuclear arms control talks. However, tensions over **Ukraine**, especially regarding the potential delivery of **long-range Tomahawk missiles**, continue to threaten the **fragile strategic balance** between the U.S. and Russia. The coming months will be crucial for the future of **global nuclear stability**.

East Timor formally admitted to ASEAN in the group's first expansion since the 1990s



Why in News

- **East Timor (Timor-Leste)** was **formally admitted as the 11th member of ASEAN** on **October 26, 2025**, marking **ASEAN's first expansion since the 1990s**.
- The ceremony took place in **Kuala Lumpur**, where East Timor's flag was added alongside the other 10 ASEAN nations.
- **PM Xanana Gusmão** pledged that Timor-Leste would be a "productive and responsible member" of ASEAN.

Background / Context

- **ASEAN (Association of Southeast Asian Nations)** was founded in **1967** to promote political, economic, and security cooperation in Southeast Asia.
- **East Timor applied for ASEAN membership in 2011** and gained **observer status in 2022**.
- The 2025 admission represents ASEAN's **first expansion since Cambodia's entry in 1999**.
- East Timor's inclusion is seen as a **symbol of regional inclusivity** and ASEAN's willingness to integrate its least developed member.

About East Timor (Timor-Leste)

- **Location:** Island nation in **Southeast Asia**, part of the **Eastern Lesser Sunda Islands**, situated between **Indonesia** (West Timor) and **Australia**.
- **Capital:** Dili
- **Highest Point:** Mount Tatamailau
- **Major Rivers:** Lakla, Lies, Seical
- **Natural Resources:** Gold, petroleum, natural gas, manganese, marble
- **Climate:** Dry tropical, moderate rainfall
- **Population:** ~1.4 million (young population; ~65% under 30 years)
- **Ethnicity:** Predominantly Papuan, Malayan, Polynesian origins

Historical Context

- **Colonial Past:** Portuguese colony for over **400 years**.
- **1975:** Indonesia invaded and annexed East Timor after Portuguese withdrawal.
- **1999:** UN-sponsored referendum led to independence.
- **2002:** Became the **first new sovereign state of the 21st century**.
- **Challenges:** High unemployment, malnutrition, 42% below the poverty line.

About ASEAN (Association of Southeast Asian Nations)

Establishment

- **Date of Founding:** 8 August 1967
- **Place:** Bangkok, Thailand
- **Founding Document:** *ASEAN Declaration (Bangkok Declaration)*
- **Founding Members:** Indonesia, Malaysia, Philippines, Singapore, Thailand
- **Motto:** "One Vision, One Identity, One Community"
- **Objectives:** Regional stability, economic growth, social progress, and cultural development

Subsequent Membership Expansion

Country	Date of Joining
Brunei Darussalam	7 January 1984
Viet Nam	28 July 1995
Lao PDR	23 July 1997
Myanmar	23 July 1997
Cambodia	30 April 1999
Timor-Leste (East Timor)	**26 October 2025**

Total Members (as of 2025): 11

ASEAN Charter (2008)

- Entered into force on **15 December 2008** in Jakarta.
- **Significance:**
  - Provided **legal personality** to ASEAN.
  - Established a **binding legal and institutional framework**.
  - Set **targets, norms, and accountability mechanisms**.
- Registered with the **United Nations** under Article 102(1) of the UN Charter.

Key Features Introduced by the Charter:

- New political commitment and legal framework.
- Establishment of new ASEAN bodies and **two Deputy Secretaries-General**.
- Enhanced role of **ASEAN Foreign Ministers** and **Secretary-General**.
- Greater frequency of ASEAN meetings.

ASEAN Summit

- **Highest policy-making body** of ASEAN.
- Comprises **Heads of State or Government** of Member States.
- Held **twice annually**.
- **First ASEAN Summit:** Bali, Indonesia (23–24 February 1976).

- Chaired by the **Member State holding ASEAN Chairmanship**.

ASEAN Coordinating Council (ACC)

- Established: **2008** (under Article 8 of the ASEAN Charter).
- Composition: **ASEAN Foreign Ministers**.
- Functions:
    - Prepares ASEAN Summit meetings.
    - Coordinates implementation of summit decisions.
    - Oversees **cross-pillar initiatives** and coherence among ASEAN Community Councils.
    - Approves appointments of **Deputy Secretaries-General**.

ASEAN Community Councils

ASEAN operates under **three pillars**, each with its own Council:

- **APSC Council** – *Political-Security Community*
- **AEC Council** – *Economic Community*
- **ASCC Council** – *Socio-Cultural Community*

Implications for India

- Enhances **India's Act East Policy** — greater connectivity and engagement in Southeast Asia.
- May open **new maritime cooperation avenues** with East Timor (strategically located between Indonesia and Australia).
- India could explore **energy cooperation**, **capacity building**, and **IT training partnerships**.

PM's Participation in the 22nd ASEAN–India Summit

1. Why in News

- The **22nd ASEAN–India Summit** was held on **26 October 2025** in **Kuala Lumpur**.
- **PM Narendra Modi participated virtually**, reflecting the growing role of India in Southeast Asia.
- The Summit focused on **reviewing ASEAN–India relations** and **strengthening the Comprehensive Strategic Partnership**.
- Significance: This was **PM Modi's 12th participation**, showing India's long-term commitment to ASEAN.

2. Key Developments

(a) Timor Leste's ASEAN Membership

- **Timor Leste** was welcomed as the **11th member of ASEAN**, making it part of the bloc's first expansion since the 1990s.
- India extended its **support for human development** in Timor Leste.
- Significance: Strengthens **regional inclusivity** and opens new opportunities for **trade, education, and development cooperation**.

(b) India's Strategic Position

- PM Modi reiterated India's commitment to:
    - **ASEAN Unity**
    - **ASEAN Centrality** in regional architecture
    - **ASEAN Outlook on the Indo-Pacific (AOIP)**
- Congratulated ASEAN for adopting **ASEAN Community Vision 2045**, which envisions a **peaceful, inclusive, and economically integrated Southeast Asia**.

3. Economic and Trade Cooperation

- Highlighted the **early review of ASEAN–India FTA (AITIGA)**:
    - Could unlock the **full economic potential** of India-ASEAN trade.
    - Important for **regional cooperation** and strengthening economic ties.

4. Security and Counterterrorism

- PM emphasized that **terrorism remains a serious challenge** to global peace and security.

- Stressed the need for **collective action and regional unity** against terrorism.

5. Key Announcements and Initiatives by India

Area	Initiative	Significance
Strategic Partnership	Support for **ASEAN–India Plan of Action (2026–2030)**	Strengthens **long-term cooperation**
Tourism	Adoption of **Joint Leaders' Statement on Sustainable Tourism**	Promotes **ASEAN–India Year of Tourism**
Maritime Cooperation	2026 designated as **ASEAN–India Year of Maritime Cooperation**	Enhances **blue economy and maritime security**
Defence & Security	Proposals for **Second Defence Ministers' Meeting** and **Maritime Exercise**	Secures **maritime trade routes & regional stability**
Disaster Preparedness	India continues as **First Responder**, enhancing **HADR cooperation**	Provides rapid response in **regional crises**
Energy & Sustainability	Training of **400 professionals** under **ASEAN Power Grid initiative**	Supports **renewable energy and regional integration**
Development Cooperation	Extend **Quick Impact Projects (QIPs)** to Timor Leste	Promotes **grassroots development**
Education & Research	Proposed **Centre for Southeast Asian Studies at Nalanda University**	Builds **regional expertise and cultural understanding**
Technology & Infrastructure	Cooperation in **infrastructure, semiconductors, emerging tech, rare earths**	Boosts **economic resilience and innovation**
Culture & Heritage	**East Asia Summit Maritime Heritage Festival** at Lothal, Gujarat	Promotes **cultural diplomacy and maritime history**

6. Diplomatic Appreciation

- PM Modi thanked **Malaysian PM Anwar Ibrahim** for hosting the Summit.
- Appreciated **Philippines' President Marcos Jr.** for coordination.
- ASEAN leaders acknowledged India's **long-standing support** and the **Act East Policy**.

Trump–Xi APEC Meeting – The Last Chance to Stop Another US–China Trade War

1. Background: What's Happening?

- The **United States (US)** and **China** have been in a trade conflict for many years.
- They have both **imposed extra taxes (tariffs)** on each other's goods.
- These tariffs make imported goods more expensive.

Why?

- The US says China follows **unfair trade practices**.
- China says the US is trying to **limit its growth and global influence**.

At present, there is a **temporary peace deal (truce)** between them that ends on **November 10, 2025**. If no new deal is made, **the old high tariffs will return**, and the **trade war may start again**.

2. What Is the APEC Meeting?

- **APEC (Asia-Pacific Economic Cooperation)** is a meeting of countries around the Pacific Ocean to discuss trade and cooperation.
- In **2025**, it will be held in **South Korea (Oct 31–Nov 1)**.
- **US President Donald Trump** and **Chinese President Xi Jinping** will meet there to talk directly.
- This meeting is seen as the **"last big chance"** to stop another trade war.

3. The Situation Right Now

- US and China are holding **talks in Kuala Lumpur (Malaysia)** before the APEC summit.
- The goal is to **reach a deal** before the truce ends on **Nov 10, 2025**.
- President Trump has said that if no progress is made, he will **impose 100% tariffs** (double prices on Chinese goods) starting **Nov 1, 2025**.
- China is also preparing its own **countermeasures** if this happens.

4. Timeline of Events

Month & Year	Event
April 2025	US put **145% tariffs** on most Chinese goods. China replied with **125% tariffs** on US goods.
May 2025	A **90-day truce** started to reduce tariffs temporarily and continue talks.
August 2025	Truce extended by **another 90 days**.
November 2025	Truce ends — old tariffs may return if no new deal.

5. Why Are They Fighting?

1. **Trade Gap:** The US buys more from China than it sells to China — it wants to reduce this gap.
2. **Technology & Patents:** The US says Chinese companies copy or force American firms to share their technology.
3. **Market Access:** US companies face restrictions while entering the Chinese market.
4. **Global Power Rivalry:**Both countries want to be the world's technology and trade leader.

6. Recent Escalations (Tensions Growing)

(a) China's New Export Controls

- China placed new **export restrictions** on rare materials like:
  - **Rare earth elements** (used in electronics & defence)
  - **Synthetic diamonds**
  - **Battery materials**
- These are vital for **electric vehicles, chips, and defence equipment**.
- China's rule now covers even **foreign-made products** that use **Chinese materials**.

(b) US Response

- The US signed an agreement with **Australia** to get minerals from there instead.
- Trump also announced plans for **100% tariffs** on Chinese imports if no deal is reached.

(c) Maritime Port Fees

- Both countries started charging **extra port fees** on each other's ships in October 2025
- These fees will **increase every year until 2028**.
- This means **higher shipping costs**, which affects trade between them.

7. What Could Happen Next?

Possibility	What It Means	Effect
Deal is made	Both agree to extend the truce or cut some tariffs	Markets calm down; trade war avoided
No deal	Tariffs return or increase	Prices rise, trade war restarts
Halfway outcome	Talks continue, but no full deal	Ongoing uncertainty for businesses

8. Effects on the Economies

On the United States

- If tariffs rise, **American consumers and businesses pay more**.
- Prices of daily goods may go up.
- Businesses might delay new investments due to uncertainty.

On China

- Losing access to the US market will **slow its economic growth**.
- **Small factories** could face losses or close down.
- **Unemployment** may rise.
- China will try to sell more to **other regions (Africa, ASEAN, Europe)** — but that takes time.

On the World

- **Supply chains** (especially for electronics, vehicles, and tech) could be disturbed.
- **Prices of minerals and metals** may rise.
- Some countries (like India, Vietnam, and Mexico) may benefit if companies move their factories out of China.

9. Political Goals Behind the Meeting

- **Donald Trump** wants a win before the US elections — he wants to show he can get a good deal.
- **Xi Jinping** wants to show strength and stability in China's economy.
- Both leaders may try to claim **political success at home**, even if the deal is small.

10. Why This Matters for the World

- US and China together make up **about 40% of global trade**.
- If they fight, the whole world economy suffers.
- A trade war could lead to:
    - Slower global growth
    - Higher inflation
    - Job losses in many countries
- The APEC meeting could therefore decide **whether the world economy stays stable or faces another shock**.

11. What It Means for India

Area	Impact
Trade	If companies move out of China, some may invest in India — good for Make in India.
Manufacturing	India may get more orders for electronics and machinery.
Imports	Some raw materials and tech parts may become costly due to global shortages.
Diplomacy	India can act as a **neutral middle ground** and build better trade relations with both.

12. What Should Be Done?

- Both sides need to **keep talking** instead of increasing tariffs.
- **APEC and WTO** should help countries solve trade problems peacefully.
- Countries (including India) should **reduce overdependence** on one market.
- Focus should be on **stable, long-term trade rules**.

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NCRB Data on Crime Against Children (2023)

Why in News :

- The National Crime Records Bureau (NCRB) released its latest report showing a 9.2% rise in crimes against children in 2023, with a total of 1,77,335 cases registered across India.

Key Highlights of the NCRB Report

Overall Trends:

- Total cases in 2023: 1,77,335
- Increase over 2022: 9.2%
- Crime rate: 39.9 per one lakh child population (up from 36.6 in 2022)

Major Categories of Crime

- Kidnapping and Abduction: 79,884 cases (45%)
- POCSO Act Cases: 67,694 cases (38.2%)
    - Including 40,434 cases of penetrative sexual assault affecting 40,846 victims
    - In 39,076 such cases, offenders were known to victims
        - Family members: 3,224 cases
        - Neighbours/employers/ others: 15,146 cases
        - Friends or online friends (pretext of marriage): 20,706 cases

Victim Demographics (Age-wise)

Age Group	Number of Victims
Below 6 years	762
6–12 years	3,229
12–16 years	15,444
16–18 years	21,411
Total	40,846

Most victims under sexual offences were girls.

Nature and Extent of Crimes

- Victims of Kidnapping/Abduction: 82,106 children (rate: 18 per one lakh)
    - General abductions: 58,927
    - Missing deemed kidnapped: 37,844
    - Abduction to compel marriage: 14,637
- Murders: 1,219 (including 89 under rape/ POCSO)
- Simple hurt: 3,050 cases
- Abetment to suicide: 373 cases

Crimes Under Special and Local Laws

- Prohibition of Child Marriage Act: 6,038 cases
- Child Labour Act: 1,390 cases

State/UT-Wise Trends

State/UT	Total Cases	Remarks
Madhya Pradesh	22,393	Highest in the country
Maharashtra		Among top three
Uttar Pradesh		Among top three
Assam	10,174	Sharp increase
Bihar	9,906	High volume
Delhi	7,769	Highest among UTs
Andaman & Nicobar Islands		High rate relative to population

Police and Judicial Response

Indicator	Data (2023)
Cases investigated	2,57,756
Cases chargesheeted	1,12,290
Chargesheeting rate	64.3%
Pending cases (end of year)	80,198
Regional variation	High in Tamil Nadu and Andhra Pradesh; low in Delhi and Haryana

Significance

- Social Impact: Highlights the growing vulnerability of children, particularly girls.
- Policy Concern: Urgent need to strengthen child protection mechanisms and fast-track legal processes.
- Regional Insight: Concentration of crimes in states like Madhya Pradesh and Uttar Pradesh indicates deeper socio-economic factors at play.

NCRB Data on Road Accidents

Why in News

- The National Crime Records Bureau (NCRB) revealed that over 1.73 lakh deaths and 4.47 lakh injuries occurred in road accidents across India in 2023.

Key Data

- Total road accidents in 2023: 4,64,029 (17,261 more than in 2022)
- Fatalities: Over 1.73 lakh
- Injuries: 4.47 lakh

Trend Highlights

- Time of Accidents:
  - Highest rate: 6 p.m. to 9 p.m. (20.7%)
  - 3 p.m. to 6 p.m.: 17.3%
  - 12 noon to 3 p.m.: 15%
- Type of Vehicles:
  - Two-wheelers: 79,533 deaths (45.8%)
  - Pedestrians: 27,586 (15.9%)
  - SUVs/cars/jeeps: 24,776 (14.3%)
- Statewise Patterns:
  - Most two-wheeler deaths: Tamil Nadu (11,490), Uttar Pradesh (8,370)
  - SUV/car/jeep fatalities: Highest in Uttar Pradesh (19.2% of total)
  - Truck/lorry/mini truck deaths: Highest in Uttar Pradesh (29.9% of total)
- Unusual Injury-Death Trend:
  - In Andaman and Nicobar Islands, Jharkhand, Punjab, Bihar, and Uttar Pradesh, deaths outnumbered injuries from road accidents.

Causes of Fatal Accidents

- Speeding: 58.6% (1,01,841 deaths)
- Dangerous/careless driving or overtaking: 23.6% (41,035 deaths)
- Other causes (weather, alcohol, drugs, animal crossings): 4,952 deaths

Road Categories

- Highest fatalities: National Highways (34.6%)
- Next highest: State Highways (23.4%)
- Uttar Pradesh led National Highway deaths, followed by Tamil Nadu, Maharashtra, Karnataka, and Madhya Pradesh

Urban Accident Statistics

- Megacities reported 69,910 traffic accidents in 2023:
  - Delhi: 5,715 crashes (8.2% of total), 1,457 fatalities
  - Bengaluru: 4,980 crashes, 915 fatalities
  - Chennai: 3,653 crashes
  - Jaipur: 848 deaths (third highest among cities)

Mutual Legal Assistance Treaty (MLAT)

Why in News?

The central government recently **invoked the Mutual Legal Assistance Treaty (MLAT) with Singapore** to obtain formal assistance in the investigation surrounding the death of a prominent singer.

About Mutual Legal Assistance Treaties

- **Definition:** An MLAT is a formal mechanism that establishes bilateral cooperation between two countries to **provide and obtain assistance** in the **prevention, suppression, investigation, and prosecution of crime.**
- **Goal:** The primary aim is to ensure that criminals cannot **escape justice** or sabotage the legal process simply because evidence is located in a different country.
- **Basis for Cooperation:** India provides mutual legal assistance in criminal matters based on:
    - **Bilateral Treaties/Agreements** (MLATs).
    - **Multilateral Treaties/Agreements** or International Conventions.
    - Assurance of **reciprocity** (treating foreign requests as they would treat a similar request from that country).
- **Extent:** India has signed Mutual Legal Assistance Treaties with **more than 45 countries.**
- **Nodal Ministry:** The **Ministry of Home Affairs (MHA)** is the designated nodal ministry for MLATs in India.

Common Forms of Assistance

Assistance commonly provided or sought by India under these treaties includes:

- Identifying and **locating persons and objects.**
- **Taking evidence** and obtaining statements.
- Assisting in the availability of persons in custody or others to give evidence or appear as a witness.
- **Effecting service of judicial documents.**
- Executing **searches and seizures.**
- Providing **information, documents, records, and other evidentiary items.**
- Taking measures to identify, locate, attach, freeze, restrain, confiscate, or **forfeit the proceeds and instrumentalities of crime.**

The Clean Slate Doctrine under the Insolvency and Bankruptcy Code (IBC)

Why in News?

- The **Delhi High Court** recently reinforced the "clean slate" doctrine under the IBC.
- The court held that a **successful resolution applicant** (the new buyer/owner of the company) **cannot be burdened with the criminal liabilities** of the corporate debtor's past management. This provides statutory finality and a fresh start to the company after the resolution process.

About the Clean Slate Doctrine under the Insolvency and Bankruptcy Code

The Clean Slate Doctrine is a fundamental legal principle of the **Insolvency and Bankruptcy Code, 2016**

(IBC), designed to give a financially distressed company a true **fresh start** and encourage its revival.

- **Core Principle:** Once a company successfully undergoes the Corporate Insolvency Resolution Process (CIRP) and a resolution plan is approved by the National Company Law Tribunal (**NCLT**), the new owner (successful resolution applicant) **should not be held accountable** for any of the company's pre-existing debts, penalties, or liabilities.
- **Purpose:** It essentially wipes the slate clean, freeing the company from the financial and legal baggage of its prior management and past troubles. This is crucial for attracting new investors and ensuring the viability of the revival plan.
- **Legal Basis:** The finality of the process, which gives rise to this doctrine, is primarily rooted in **Section 31** of the IBC, which states that an approved resolution plan is **binding on all stakeholders**.

Key Judicial Affirmations

The Supreme Court and other High Courts have consistently upheld and reinforced this doctrine in several landmark rulings:

- **Essar Steel India Case:**
  - The Supreme Court emphasized that a primary objective of the IBC is to streamline insolvency and bring all claims under a unified system.
  - It ruled that once the resolution plan is approved by the NCLT, **any and all previous liabilities, including debts and penalties, are extinguished**.
  - This prevents a "hydra-head" of undecided claims from emerging post-resolution.
- **Edelweiss Asset Reconstruction Case:**
  - The Supreme Court clarified that **government dues**, such as taxes and duties, are also **extinguished** if they are not included as part of the approved resolution plan.
- **Surya Exim Case:**
  - Following the SC's lead, the Gujarat High Court held that any **tax demands** issued ***after*** the NCLT's approval of a resolution plan should be **cancelled**, reinforcing the invalidity of claims not covered in the plan.
- **Delhi High Court Recent Ruling (as mentioned in the News):**
  - Confirms the "clean slate" extends to **criminal liabilities** of the corporate debtor's past management, providing protection to the new resolution applicant under Section 32A of the IBC.

National Dam Safety Authority (NDSA) : Ensuring Structural Integrity of Dams

Why in News?

The government recently announced its decision to repair the three barrages of the **Kaleshwaram project** following two years of political and administrative controversy regarding their structural integrity. This decision is based on the technical suggestions and recommendations provided by the **National Dam Safety Authority (NDSA)**.

About the National Dam Safety Authority (NDSA)

The NDSA is a key regulatory institution established to ensure the safe functioning and structural soundness of specified dams across India.

- **Nature:** It is a **statutory body** created by the Central Government under the provisions of the **Dam Safety Act, 2021**.

- **Mandate:** The authority's core function is to regulate, oversee, and inspect dams to prevent dam failures and ensure their long-term safety.
- **Leadership and Structure:** The NDSA is headed by a **Chairman** and is supported by **five members**, each leading a specific wing:
    - Policy and Research
    - Technical
    - Regulation
    - Disaster and Resilience
    - Administration and Finance
- **Headquarters:** The central office of the NDSA is located in **New Delhi**.

Key Functions of the NDSA

The authority plays a multifaceted role in enforcing comprehensive safety protocols and resolving disputes related to dam safety.

- **Policy Implementation:** It is responsible for implementing the policies and guidelines formulated by the **National Committee on Dam Safety (NCDS)**.
- **Dispute Resolution:** The NDSA acts as an impartial body to resolve conflicts and issues that may arise between **State Dam Safety Organisations (SDSOs)**, or between an SDSO and any dam owner within that respective state.
- **Regulation Specification:** It sets the precise **regulations and technical standards** that must be followed for the inspection, investigation, design, and repair of dams.
- **Accreditation:** It provides formal **accreditation** to specialized agencies involved in the construction, design review, and structural alteration of dams, ensuring a high standard of professional competence.
- **Safety Standards:** A key focus is establishing and enforcing comprehensive safety standards covering **structural integrity, environmental impact assessment, and emergency response protocols**.
- **Awareness and Preparedness:** The NDSA actively engages in nationwide awareness programs and ensures that dam owners have **comprehensive emergency response plans** in place for natural calamities or unforeseen events.

Income Tax Appellate Tribunal (ITAT)

Why in News?

- The **Chief Justice of India (CJI)** recently praised the **Income Tax Appellate Tribunal (ITAT)** for its significant contribution to the justice delivery system as it marked its **84th anniversary**.
- The CJI's remarks highlighted the critical role of ITAT in the country's tax dispute resolution framework, while also noting the challenge of a high volume of pending tax disputes, urging for continued focus on efficiency and reforms.

About Income Tax Appellate Tribunal (ITAT)

The ITAT is a **quasi-judicial institution** that specializes in dealing with appeals under the Direct Taxes Acts. It is often referred to as the "**Mother Tribunal**" for being the oldest tribunal in the country.

- **Establishment:** It was set up in **January 1941** by virtue of Section 5A of the Income Tax Act, 1922.
- **Initial Setup:** It began with six Members constituting three Benches—one each at **Delhi, Kolkata, and Mumbai**.
- **Current Status:** Presently, ITAT has **63 Benches** at **27 different cities**, covering almost all cities having a seat of the High Court.
- **Nodal Ministry:** It functions under the **Ministry of Law and Justice**, ensuring its impartiality and

independence from the Ministry of Finance (which controls the Income Tax Department).

Composition and Bench Structure

The President of the ITAT constitutes a bench from among the members of the ITAT.

- **Standard Bench:** Each bench generally consists of an **Accountant Member** and a **Judicial Member**. This blend ensures expertise in both legal and financial/accounting aspects of tax matters.
- **Special Bench:** A special bench with **three or more members** (including at least one Judicial Member and one Accountant Member) may be constituted to dispose of complex or conflicting income tax appeals.
- **Single-Member Bench:** A single Member may dispose of an appeal in cases where the total income as computed by the Assessing Officer does not exceed a specified monetary limit (currently **₹ 50 lakh**).

Functions of Income Tax Appellate Tribunal

The ITAT is the **second appellate authority** in the hierarchy of income tax appeals.

- **Adjudication:** It adjudicates appeals concerning orders passed by the **Commissioner of Income-tax (Appeals)**, which is the first appellate authority.
- **Final Fact-Finding Body:** ITAT is the **final fact-finding body** in tax disputes. Its rulings on factual matters are generally conclusive.
- **Dispute Resolution:** It offers a convenient, inexpensive, and specialized platform for both taxpayers and the Income Tax Department to resolve tax disputes.

Jurisdiction and Appeal

- **Subordination:** The ITAT functions under the jurisdiction of the regional **High Court** and is subordinate to both the regional High Court and the **Supreme Court of India**. It must adhere to the precedents (rules of law) set by them.
- **Who can File:** An appeal can be filed by:
    - A **taxpayer** who is dissatisfied with an order passed by the Commissioner of Income-tax (Appeals) or any other specified income-tax authority.
    - The **Income-tax Department** can also file an appeal against an order passed by the Commissioner of Income-tax (Appeals).
- **Finality of Order:** The orders passed by the ITAT are considered **final** on the facts of the case. An appeal lies to the High Court **only if a substantial question of law** arises for determination.

Surrogacy (Regulation) Act, 2021

- **Why in News?** The Supreme Court of India recently delivered a significant ruling on the Surrogacy (Regulation) Act, 2021, holding that the prescribed **age limits** under the Act **do not apply retrospectively** to couples who had already taken crucial steps, such as **freezing their embryos**, before the law came into force on **January 25, 2022**.
- This decision affirms the reproductive rights and personal liberty of intending parents whose process was initiated under the previous legal framework.

Supreme Court's Latest Interpretation

The Supreme Court ruling focused on the **retrospective application** of the Act's age restrictions.

- The Court ruled that the age restrictions under Section 4(iii)(c)(I) of the Act **would not apply** to couples who had:

- Commenced the surrogacy procedure (e.g., extracted gametes, fertilized, and **frozen embryos**) **before** the Act's commencement on January 25, 2022.

- The creation and freezing of embryos were seen as the **'crystallisation'** of the surrogacy process, demonstrating the couple's clear intention to pursue parenthood.
- The bench observed that the **right to make reproductive choices** is a facet of **personal liberty and privacy** protected under **Article 21** of the Constitution, and applying the age bar retrospectively would unfairly frustrate these rights.

About Surrogacy (Regulation) Act, 2021

The Surrogacy (Regulation) Act, 2021, is the legislative framework in India aimed at regulating the practice of surrogacy to prevent exploitation of surrogate mothers and ensure ethical procedures.

Key Provisions of the Act

- **Ban on Commercial Surrogacy:** The Act strictly **prohibits commercial surrogacy** (where money is paid for the service) and makes it a punishable offense.
- **Permitted Surrogacy:** Only **Altruistic Surrogacy** is allowed.
  - **Altruistic Surrogacy:** This involves a surrogate mother carrying a child for an intending couple without receiving any monetary benefit other than the **medical expenses** and **insurance coverage** incurred during the pregnancy.
- **Regulation of Clinics:** It mandates the registration of all surrogacy clinics, which are prohibited from conducting or assisting in surrogacy procedures without being registered under the Act.
- **Prohibition on Certain Practices:** It prohibits commercial surrogacy, selling or buying of human embryos or gametes, and sex selection.
- **Abortion:** Abortion during surrogacy is prohibited without the **written consent** of the surrogate mother and approval of the Registered Medical Practitioner (RMP), in compliance with the Medical Termination of Pregnancy Act.
- **Child's Rights:** A child born out of the surrogacy procedure is deemed to be the **biological child of the intending couple** and is entitled to all the rights and privileges available to a natural child.

Eligibility Criteria Under the Act

The Act sets strict eligibility criteria for both the intending couple/woman and the surrogate mother to avail of altruistic surrogacy.

Intending Couple

- **Marital Status:** Must be a legally married Indian couple.
- **Duration of Marriage:** Must have been married for at least **five years**.
- **Age Limits:**
  - **Woman:** Between **23 and 50 years** of age.
  - **Man:** Between **26 and 55 years** of age.
- **No Surviving Child:** The couple should not have any surviving biological, adopted, or surrogate child, except if the surviving child is **mentally or physically disabled** or suffers from a **life-threatening condition**.
- **Certification:** Must obtain a **Certificate of Essentiality** (proof of infertility, etc.) and a **Certificate of Eligibility** from the appropriate authority.

Note: The Act also allows an **'Intending Woman'** who is an Indian citizen, either a **widow or a divorcee** between the age of **35 and 45 years**, to opt for surrogacy.

Surrogate Mother

- **Relationship:** Must be a **close relative** of the intending couple.
- **Marital Status & Children:** Must be an **ever-married woman** who has at least **one child of her own**.
- **Age Limit:** Must be between **25 and 35 years** on the date of implantation.
- **Limitations:**
    - Can act as a surrogate **only once** in her lifetime.
    - Is **prohibited from providing her own gametes** for surrogacy.
    - Must be medically and psychologically fit.

Live Cases Dashboard of the Legal Information Management and Briefing System (LIMBS)

Why in News?

- The **Live Cases Dashboard** of the Legal Information Management and Briefing System (LIMBS) was recently **inaugurated** by the Union Minister of State for Law and Justice in New Delhi.
- This initiative is a significant step towards enhancing **transparency, accountability, and efficiency** in government litigation management.

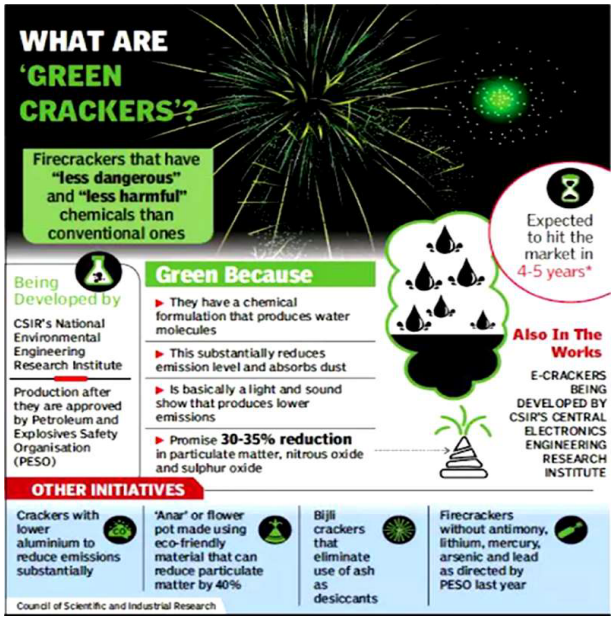
About Live Cases Dashboard of the Legal Information Management and Briefing System

- **Core Function:** It is designed to provide **real-time data visualisation** of court cases involving the Union of India.
- **Key Benefit:** It offers an **overview of upcoming hearings** to enable **proactive decision-making** and **better inter-ministerial coordination** among different government departments that are parties in a case.
- **Information Provided:** It specifically provides details of all cases scheduled to be heard in the **next seven days** in the Supreme Court, High Courts, or any other courts involving various ministries of the Government of India.

Key Facts about Legal Information Management and Briefing System (LIMBS)

Feature	Details
Nature	A **web-based application** and a centralised litigation management platform.
Purpose	To **monitor all court cases** where the **Union of India** is one of the parties, in line with the vision to reduce government litigation.
Launch Timeline	Came into existence for all ministries/departments/autonomous organizations/CPSUs in **2016**, with an advanced version launched in **January 2020**.
Nodal Ministry	**Department of Legal Affairs**, Ministry of Law and Justice.
Accessibility	An innovative and easy-to-access **online tool available 24x7** to all stakeholders (government officials, nodal officers, advocates, arbitrators, etc.).
Functionality	It is a **dashboard-based system** that allows user Ministries/Departments to see their legal matters at a glance, helping in systematic and efficient monitoring.

National Environmental Engineering Research Institute (NEERI) & Green Crackers: A Judicial Balance



Why in News?

- The **National Environmental Engineering Research Institute (NEERI)** is in the news because the **Supreme Court of India (SC)** recently gave a conditional go-ahead for the limited sale and use of **green crackers**—the less-polluting fireworks developed by NEERI—in the Delhi-National Capital Region (NCR) for Diwali 2025.
- This ruling acts as a **"test case"** aimed at balancing the fundamental right to a clean environment (Article 21) with cultural and traditional practices, underscoring NEERI's role in providing a **scientific-technological solution** to a persistent social and environmental problem.

About National Environmental Engineering Research Institute (NEERI)

NEERI is India's premier institution for environmental research and engineering solutions, established to address various environmental challenges including pollution control and sustainable development.

- **Parent Body:** It is a constituent laboratory of the **Council of Scientific and Industrial Research (CSIR)**, operating under the **Ministry of Science and Technology**, Government of India.
- **Primary Mission:** To conduct research and development related to environmental management, pollution control, and sustainable development.
- **Formation & Naming:**
  - Established in **Nagpur** in 1958 as the **Central Public Health Engineering Research Institute (CPHERI)**.
  - It was **rechristened NEERI** in 1974, reflecting an expanded mandate to address regional and global environmental contamination beyond public health engineering.
- **Headquarters: Nagpur**.
- **Zonal Laboratories:** NEERI maintains five regional centers in major metropolitan areas to ensure a pan-India presence: **Chennai, Delhi, Hyderabad, Kolkata**, and **Mumbai**.

NEERI's Green Crackers: The Scientific Edge

NEERI developed specific formulations to create **Green Crackers** (variants include **SWAS, STAR,** and **SAFAL**) that are scientifically engineered to reduce pollution compared to traditional fireworks.

Feature	Conventional Crackers	NEERI Green Crackers
Pollutant Reduction	Baseline	**30 to 50** percent reduction in Particulate Matter (PM) emissions.
Barium Content	Used as colorant; highly toxic	Toxic chemicals like **barium** are eliminated or significantly reduced.
Chemicals Used	High amounts of Sulphur and Potassium Nitrate	Substitutes like **potassium nitrate** or **strontium salts** are used, and **dust-suppressant additives** like zeolite are included.
Identification	None	Must carry the **CSIR-NEERI green logo** and a **QR code** for consumer verification of authenticity.

Judicial Directives (SC Ruling, Oct 2025)

The Supreme Court allowed the use of these certified crackers subject to stringent conditions:

- **Time Limit:** Bursting of crackers is allowed only during a restricted timeframe on the days of the festival (e.g., typically a 2-hour window in the evening).
- **Certification:** Only green crackers certified by NEERI and approved by **PESO** (Petroleum and Explosives Safety Organisation) are permitted for sale.
- **Prohibition:** The ban remains absolute on conventional fireworks, series crackers (**'Laris'**), and crackers containing hazardous metals like Barium, Lead, and Arsenic.
- **Enforcement:** State authorities are directed to strictly enforce the regulations, ensure QR code verification, and conduct real-time Air Quality Index (AQI) monitoring.

Public Trust Doctrine (PTD)

Why in News?

- The **Supreme Court of India** recently delivered a landmark judgment in the case of *Swacch Association, Nagpur v. The State of Maharashtra* (October 2025).
- The ruling significantly expanded the scope of the **Public Trust Doctrine (PTD)**, holding that its protective mandate is **not confined only to natural waterbodies** (like rivers and natural lakes) but also **extends to man-made or artificially created waterbodies** that are drawn from natural resources and serve ecological or environmental purposes.

Key Elements of the Supreme Court Ruling

The judgment, delivered concerning the redevelopment of the historic **Futala Lake in Nagpur** (a man-made waterbody), laid down a progressive principle for Indian environmental jurisprudence.

- **Extension of the Doctrine:** The Court explicitly ruled that the Public Trust Doctrine applies to: "even **man-made or artificially created natural objects, waterbodies, lakes, and wetlands** which are drawn and created from nature or natural resources."
- **Constitutional Mandate:** The expanded scope is rooted in the constitutional provisions of **Article 21** (Right to a Healthy Environment is part of the Right to Life), **Article 48-A** (Duty of the State to protect and improve the environment), and **Article 51-A(g)** (Fundamental Duty of citizens to protect the natural environment).
- **Functional Test over Origin:** The ruling shifts the focus from the **natural origin** of the waterbody to its **ecological function** and **collective public good**. Any waterbody, whether natural or artificial, that maintains the ecological balance and benefits the public falls under the PTD.
- **Distinction from 'Wetlands':** The Court clarified that while Futala Lake, being a man-made tank for irrigation, does not strictly qualify as a 'wetland' under the **Wetlands (Conservation and Management) Rules, 2017** (which excludes such structures), it must still be protected under the broader Public Trust and Precautionary Principles.
- **Balancing Development:** While emphasizing protection, the Court allowed the beautification and recreational projects around the lake to proceed, striking a balance with **sustainable development**. However, it reiterated the Bombay High Court's directive to ensure **no permanent constructions** are undertaken within the main water body.

About Public Trust Doctrine

The Public Trust Doctrine is a fundamental principle of environmental law that prevents the privatization and misuse of common natural resources.

- **Core Principle:** It asserts that certain resources vital to the public, such as air, water, seas, and forests, are **gifts of nature** and must be held in **trust** by the government for the benefit and use of the **general public** now and in the future.
- **Origin:** The doctrine is rooted in ancient **Roman law** and developed through **English common law**.
- **Government's Role:** The government acts as a **trustee** (or custodian) of these resources. Its duty is to protect and maintain them for collective use, preventing their alienation for private or commercial exploitation.
- **Three Key Restrictions on Government Authority:**
    1. The property must be used for a **public purpose** and held available for use by the general public.
    2. The property may **not be sold or alienated** (transferred to private ownership), even for fair compensation.
    3. The property must be **maintained for its particular types of uses** (e.g., a lake must remain a waterbody).

Revival of the Darbar Move in Jammu and Kashmir

Why in News?

- After a four-year hiatus, the **Darbar Move**—the 150-year-old **biannual transfer** of the Civil Secretariat and government offices between **Srinagar (summer capital)** and **Jammu (winter capital)**—is set to resume this winter.

Historical and Administrative Context

- **Origin:** The practice was started in **1872** by **Maharaja Gulab Singh**, the first Dogra ruler of the erstwhile J&K State.
- **Purpose:** The original intent was to **bring the administration closer to the people** in both regions, mitigating the difficulties posed by poor road connectivity at the time.
- **Significance:** Post-independence, the move became a significant **symbol of regional integration** and unity between the Jammu and Kashmir divisions.
- **Founder:** Maharaja Gulab Singh founded the princely state of J&K in **1846**. He was a prominent military commander in **Maharaja Ranjit Singh's** court.

Interruption and Implications

- **Interruption:** The practice was initially ended by the Lieutenant Governor's administration in **2021** following a **2020 J&K High Court ruling** which stated there was "no legal justification or Constitutional basis" for the move. The decision was projected to save the government **₹ 200 crore** annually.
- **Implications of Revival:**
    - **Regional Parity:** The revival can help reinforce **regional parity** in governance, especially in the post-Article 370 era.
    - **Local Economy:** It provides a significant **boost to local economies** in both Srinagar and Jammu during the administrative shift.
    - **Challenges:** The move still faces challenges related to **logistical strain**, disruption of administrative work, and persistent environmental and security concerns.

EDITORIALS

Crux of The Hindu & Indian Express

Indian Polity & Governance

Gorkhaland Demand : Federal Tensions and Identity Politics

Why in News?

- The Union Government has appointed a former **Deputy National Security Adviser (NSA)** as an interlocutor to engage with Darjeeling hill leaders regarding key demands, notably **Gorkhaland statehood** and the grant of **Scheduled Tribe (ST) status for 11 Gorkha sub-tribes**.
- This move aims to find a political solution to the long-standing identity and autonomy issues in the region, but it has been criticized by the West Bengal government as "unilateral," raising concerns about **cooperative federalism**.

The Gorkhaland Movement and Its Demands

The demand for Gorkhaland has been the central plank of Gorkha identity politics since the 1980s, driven by aspirations for self-governance and recognition.

- **Demand for Separate State:** Proposing the inclusion of the **Darjeeling, Terai, and Dooars** regions of West Bengal into a separate Gorkhaland state.
    - *Origins:* First raised by **Subhash Ghising** of the **Gorkha National Liberation Front (GNLF)** in the 1980s, it later saw renewed, widespread agitation in **2017** under the **Gorkha Janmukti Morcha (GJM)**.
- **Demand for ST Status: 11 Gorkha sub-tribes** (including Rai, Limbu, Gurung, and Tamang) seek ST recognition to gain access to **reservation benefits**, education, and government jobs. This demand remains pending despite repeated assurances.

Gorkhas: Origin and Identity

- **Origin:** Gorkhas (or Gurkhas) are a **martial community** originally from **Nepal**, known for their courage and loyalty. Their name derives from the **Gorkha Kingdom** founded by **Prithvi Narayan Shah**.
- **Military Link:** Following the Anglo-Nepal War (1814–1816), the British began recruiting Gorkhas, who later became an **integral part of the Indian Army** post-independence.
- **Ethnic Composition:** They comprise multiple ethnic groups, making the demand for a unified ST status complex.

Constitutional and Geopolitical Complexity

- **Federal Strain (Article 3):** The demand tests India's federal harmony. While **Article 3** empowers Parliament to unilaterally form new states, bypassing the state legislature's opinion, frequent demands like Gorkhaland strain **Centre–State relations**.
- **Geopolitical Sensitivities:** The region's proximity to Nepal and China introduces strategic complexity.
    - Concerns regarding the **Agnipath Scheme** were raised by Nepal, potentially violating the **1947 Tripartite Agreement** on Gorkha military service.
    - Maintaining **robust India–Nepal–Darjeeling coordination** is vital for border stability and preventing external influence.

Institutional and Corrective Measures

The government has attempted to address the issue through limited autonomy, but calls for greater empowerment persist:

Institutional Attempts	Corrective Measures Needed
Gorkhaland Territorial Administration (GTA) - 2011: Replaced the Darjeeling Gorkha Hill Council (1988), granting **limited autonomy** in local governance.	**Strengthen GTA:** Empower it with **greater fiscal and legislative powers**, similar to the Bodoland Territorial Region.
Dialogue & Peace Initiatives: Periodic **tripartite talks** between Centre, State, and Gorkha leadership.	**Expedite ST Status:** Finalize the inclusion of eligible Gorkha sub-tribes to ensure access to benefits like the **Vanbandhu Kalyan Yojana**.
Cultural Recognition: Inclusion of the **Nepali language in the Eighth Schedule (1992)**.	**Promote Inclusive Development:** Invest heavily in the tea industry, horticulture, and eco-tourism using schemes like **PM-DevINE** to reduce dependence on protest politics.

Fiscal Crisis in Urban India: The Need for Municipal Reform

Why in News?

- Despite urban India contributing nearly **two-thirds of the nation's GDP**, its municipalities control **less than 1% of the national tax revenue**.
- This severe fiscal imbalance has reignited the debate over the **flawed fiscal architecture of Indian urban governance** and the urgent need to empower cities through structural financial reforms.

Structural Issues Undermining Municipal Fiscal Effectiveness

The disparity between urban responsibilities and financial resources is termed an **"inversion of democracy,"** severely limiting the ability of Urban Local Bodies (ULBs) to deliver critical services like waste management and climate resilience.

- **Over-reliance on Grants:** Municipal finance is heavily dependent on **discretionary and tied grants** from the Central and State governments. These intergovernmental transfers are often **delayed or bypass municipal accounts**, disrupting planning.
- **Impact of GST:** The introduction of the **Goods and Services Tax (GST) in 2017** eroded municipal fiscal autonomy by subsuming key local taxes (**octroi, entry tax, local surcharges**), leading to an estimated **19% revenue loss**.
- **Political Hesitation:** Local representatives often display a reluctance to impose new taxes or charges for fear of **losing voter support**, further weakening the tax base.
- **Weak Institutional Capacity:** Fragmented governance, lack of **trained staff**, and poor data systems hinder the implementation of effective fiscal reforms, such as improving property tax collection.
- **Creditworthiness Issues:** Existing credit rating mechanisms focus narrowly on **"own revenue"** performance (e.g., property tax), ignoring the predictability and regularity of essential state/ central transfers.

Constitutional Status of Urban Local Bodies (ULBs)

The foundation for democratic urban governance was laid by the **74th Constitutional Amendment Act, 1992**:

- **Constitutional Status:** It introduced **Part IXA (Articles 243P–243ZG)**, giving constitutional status to ULBs (Nagar Panchayats, Municipal Councils, Municipal Corporations).
- **Municipal Functions:** The **12th Schedule** lists 18 key functions devolved to municipalities, including urban planning, water supply, sanitation, and waste management.
- **Sources of Funds:** Municipal revenues are broadly categorized into:
    - **Own Revenue Sources: Property tax** (the most critical), user charges, advertisement tax, and parking fees.

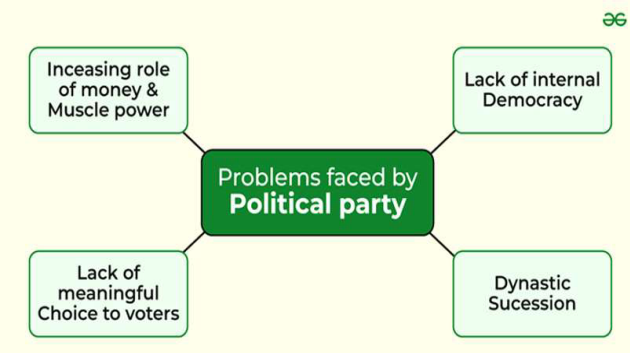
- **Transfers:** Grants from the **Central and State Finance Commissions**, revenue sharing, and transfers under schemes like **AMRUT** and **Smart Cities Mission**.
- **Innovative Financing: Municipal bonds** (used by cities like Pune and Lucknow) and Public-Private Partnerships (PPP).

Key Reforms to Strengthen Fiscal Architecture

To realize **Sustainable Development Goal 11** (Sustainable Cities and Communities) and create resilient urban centers, structural reforms are required:

Reform Area	Proposed Action	Current/Past Steps Taken
Funding Reliability	**Recognise Grants & Shared Taxes** as legitimate, stable income sources to ensure predictable transfers.	**Finance Commission Recommendations** (e.g., 14th FC to empower municipalities to levy vacant land tax).
Tax Efficiency	**Strengthen Property Tax Reforms** through **GIS mapping**, digital revaluation, and improved online collection mechanisms.	**12th Finance Commission** recommended GIS mapping; **Digital Reforms** promote online payments.
Access to Finance	**Use GST Compensation as Collateral** for municipal borrowing to improve credit access.	**AMRUT 2.0** continues incentives for Municipal Bond issuance.
Incentives & Credit	**Revise Credit Rating Norms** to include governance quality and fiscal management alongside own revenue.	**SASCI Scheme** (Part-IV) provides incentives to states for property tax reforms and for ULBs to issue Municipal Bonds.
Governance	Promote **Cooperative Federalism** via predictable, formula-based transfers to encourage autonomy.	**Smart Cities Mission** encourages revenue generation via user charges and service improvements.

Eroding Internal Party Democracy in India



Why in News?

- **Internal party democracy** in India is facing significant challenges due to the widespread growth of **dynastic politics and the heavy concentration of power** within a few political families.
- This trend is visible across both major national and regional parties, undermining meritocracy and fair representation.

What is Internal Party Democracy?

Internal Party Democracy refers to the way a political party is organized, structured, and run, ensuring its functions align with **democratic values**. It fundamentally affects how **candidates are chosen**, **leaders are elected**, **policies are made**, and **finances are managed**.

Key Components of the Legal Framework

- **Representation of the People Act, 1951 (Section 29A):** This section requires all political parties to commit to the principles of **secularism, socialism, and democracy**. The term "democracy" is understood to imply **internal democracy**, although the concept itself is not formally defined in the Act.
- **Election Symbols (Reservation and Allotment) Order, 1968:** The **Election Commission of India (ECI)** primarily uses this to resolve disputes during party splits. It typically awards the **party symbol** to the faction that demonstrates the most support from **elected legislators** and **office-bearers**, rather than automatically to dynastic heirs.
- **Law Commission Report (255th):** This report strongly emphasized the need for **internal democracy** through formal rules on party structure, internal elections, and candidate selection. It recommended empowering the **ECI to de-register parties** that fail to comply.
- **National Commission to Review the Working of the Constitution (NCRWC):** This commission called for a **specific, comprehensive law** to regulate both the registration and the day-to-day functioning of all political parties and alliances in India.

The Need for Internal Party Democracy in India

Strengthening internal democracy is essential for the health and vitality of India's larger democratic system.

- **Checks Dynasticism & Nepotism:** It reduces the **concentration of power** within a single family or small group. **Dynastic politics**, where leadership is inherited across generations, is controlled, ensuring that relatives of top leaders don't automatically dominate key positions. A study found **1,174 dynasts** from 989 families among India's current legislators (MPs, MLAs, MLCs).
- **Strengthens Democracy:** Parties act as a crucial **"school for democracy,"** helping to foster a democratic culture among citizens and political leaders alike.
- **Promotes Meritocracy:** It provides a clear path for dedicated **grassroots workers** to rise through the ranks based on their **merit** and the support of party members, rather than lineage or personal loyalty.
- **Enhances Representation:** By ensuring inclusive decision-making, the party remains closely connected to the **aspirations** of its diverse membership and the general public, making it more **representative**.
- **Promotes Party Unity:** Inclusive decision-making and genuine internal debate can build **consensus** and significantly reduce disruptive **factional fights**.

Factors Leading to Lack of Internal Democracy

The erosion of internal democracy is caused by institutional weaknesses, legal gaps, and cultural factors.

- **Concentration of Power:** Power is often **centralized** in a single dominant **leader** or a small **"High Command."** This undermines local units, fosters a culture of **loyalty over ideology**, and effectively suppresses internal dissent and debate.
- **Nepotism & Favouritism:** Many parties effectively operate as **family enterprises**, where **leadership is inherited**, and party access and resources are controlled by established dynasties.
- **Legal Loopholes:** There is a crucial **legal gap**—India **lacks a clear legal framework** mandating internal democracy. Crucially, there is no legal requirement for transparent, democratic **internal elections** for candidate selection.
- **Electoral Considerations:** Parties often defend centralized control by arguing that strong, dynastic leaders offer a **clear brand identity and unity**, which is considered beneficial for **electoral prospects** and avoids internal factionalism.
- **Lack of Internal Demand:** A deep-rooted **feudal culture** often reinforces loyalty to dominant families. Furthermore, members who advocate for reform risk **suspension or expulsion**, discouraging internal demands for democracy.

How to Foster Internal Party Democracy in India

Achieving genuine internal democracy requires changes in law, party structure, and public behavior.

- **Institutional Reforms within Parties:**
  - Parties must adopt a **transparent constitution** and ensure **regular internal elections** are conducted with **independent oversight**.
  - They should promote **deliberative forums** for genuine, meaningful **member participation** in all decision-making processes.

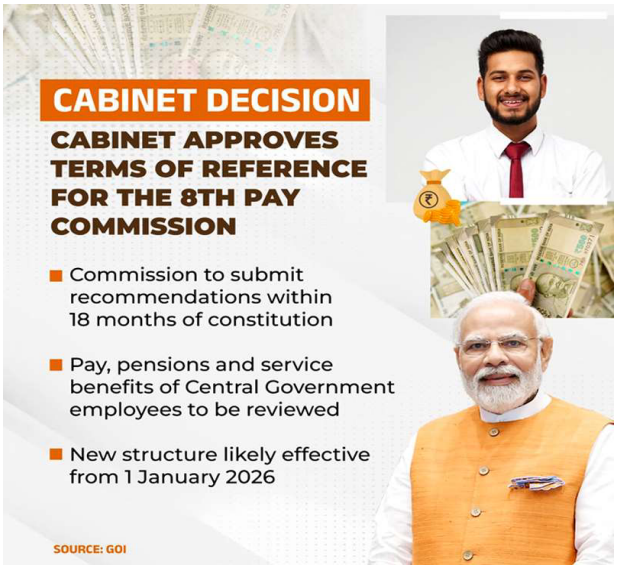
- Committees like the **Dinesh Goswami (1990)** and **Indrajit Gupta (1998)** have previously urged greater transparency in party operations.

- **Legislative Reforms:**
  - Amend the **Representation of the People Act, 1951** to **mandate transparent, democratic candidate selection** through internal elections.
  - Establish **graded penalties** for non-compliance, such as fines, **de-recognition**, or the **withdrawal of the party symbol**.
- **Civil Society Interventions:**
  - Civil society organizations must regularly **track and rank parties** based on their adherence to internal democracy.
  - They need to **raise public awareness** and **leverage voter opinion** to make party democracy a central **electoral issue**.
- **Behavioral Shifts:**
  - Parties must actively **reward grassroots workers** based on their **performance and member support**, not their family lineage.
  - Members must be **empowered** to **demand their democratic rights** and ensure leadership accountability.

Conclusion

The persistence of **dynastic politics**, fueled by **weak intra-party democracy**, significantly harms **meritocracy** and **equitable representation** in India's political life. Strengthening it requires a combination of **robust legislative mandates**, enhanced **institutional accountability** within the parties themselves, and **sustained civil society pressure** to cultivate a truly democratic political culture.

Union Cabinet Approves Terms of Reference for the 8th Central Pay Commission



Why in News?

- The Union Cabinet has officially approved the **Terms of Reference (ToR)** for the **8th Central Pay Commission (CPC)**.
- This body is established every ten years to review and recommend revisions in the salary, allowances, and pensions of Central government employees.

Key Details of the 8th Pay Commission

- **Chairperson:** The 8th Pay Commission will be chaired by **Justice Ranjana Prakash Desai**.
- **Mandate (ToR):** The ToR acts as the **blueprint** that outlines the **mandate, scope, and timelines** for the Commission's work.
- **Timeline:** The Commission is expected to **submit its report within 18 months** and is also empowered to issue **interim recommendations** on specific issues before the full report is complete.
- **Implementation Date:** The recommendations of the 8th CPC are typically expected to take effect **retrospectively from January 1, 2026**, continuing the established 10-year pay revision cycle.

Central Pay Commission (PC): Role and Function

A Pay Commission is a vital institutional body that manages the compensation framework for government personnel.

- **Establishment:** A new PC is set up approximately every 10 years under the **Department of Expenditure, Ministry of Finance**. The Commission is usually headed by a **retired Supreme Court judge**.
- **Core Function:** The PC's primary role is to determine the **salary, allowances, and pensions** of Central government employees. It assesses both **monetary and non-monetary benefits**.
- **Assessment Criteria:** The assessment takes into account several critical factors:
    - The prevailing **inflation** rate.
    - The **cost of living**.
    - The need to maintain **parity and fairness** in compensation compared to the private sector and other organizations.
- **Impact on Other Entities:** The Commission's recommendations are frequently **adopted by state-owned organizations** across the country as well.

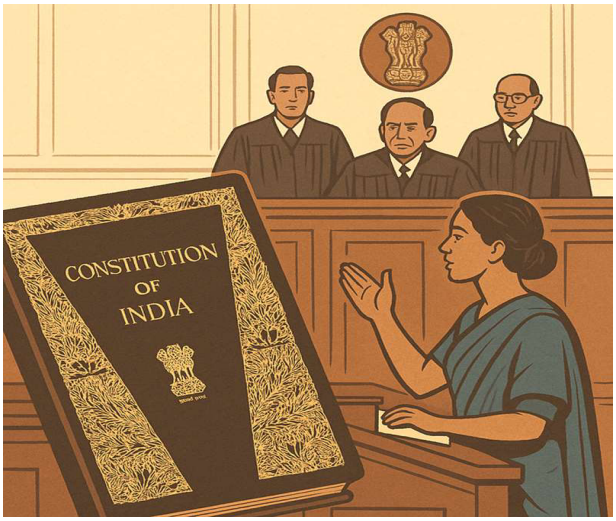
Economic and Social Impact

The implementation of a Pay Commission's recommendations has a substantial impact on the national economy and society:

- **Beneficiaries: Over 49 lakh Central government employees** and **65 lakh pensioners** are expected to directly benefit.
- **Economic Growth:** The resulting increase in pay and pensions often leads to **higher consumption and demand**, thereby boosting **economic growth**.
- **Quality of Life:** It plays a crucial role in improving the **quality of life** of employees and pensioners.

Past Precedent	7th Pay Commission
Chairperson	Justice Ashok Kumar Mathur
Key Recommendation	Recommended an overall hike of **23.55%** in pay, allowances, and pensions.

Constitutional Morality: Upholding the Spirit of India's Constitution



Why in News?

- **Constitutional morality** has garnered renewed public attention in India amidst continuous national debates concerning **institutional independence, the rule of law, and ethical governance**.
- The concept's critical role in guiding democratic conduct and ensuring adherence to core constitutional values is being highlighted in various recent political and judicial developments.

What is Constitutional Morality?

Constitutional morality represents the deepest commitment to the principles and ethos embedded in the Constitution.

- **About:** It is defined as a **"paramount reverence for the forms of the Constitution"** that

mandates **obedience to lawful authority** while simultaneously protecting the **freedom of expression and dissent**. It requires adherence to the Constitution not just in its **letter** (the written rules) but, crucially, in its **spirit** (the underlying values).

- **Origin:** The idea was first introduced by the British historian **George Grote** as a necessary **balance between freedom and restraint**, where citizens uphold constitutional authority while retaining the right to openly critique those in power.
- **Dr. Ambedkar's Insight: Dr. B.R. Ambedkar** invoked Grote's idea to underscore the need to cultivate a deep respect for constitutional processes. He observed that **"constitutional morality is not a natural sentiment—it has to be cultivated."**

Pillars of Constitutional Morality

Constitutional morality rests on foundational democratic principles:

- **Constitutional Values & Rights:** Upholding core values like **justice, liberty, equality, fraternity, secularism**, and the resolute protection of **fundamental rights**.
- **Rule of Law & Accountability:** Ensuring that everyone, including the government and those in power, is **bound by law** through effective checks, balances, and democratic participation.
- **Ethical & Transparent Governance:** Promoting **integrity, responsibility, and transparency** in all public affairs.

Judicial Application of Constitutional Morality

The Indian Judiciary, particularly the Supreme Court (SC), has invoked constitutional morality to drive significant social and legal reform.

Case	Year	Principle Applied	Key Ruling
Kesavananda Bharati Vs. State of Kerala	1973	Preservation of Constitutional Values	Established the **Basic Structure Doctrine**, preventing Parliament from altering the essential democratic and secular features of the Constitution.
Justice K.S. Puttaswamy Vs. UoI	2017	Protection of Privacy and Dignity	Recognized the **Right to Privacy as a Fundamental Right**, affirming that dignity, autonomy, and liberty are essential to constitutional morality.
Navtej Singh Johar Vs. UoI	2018	LGBTQ+ Rights	Decriminalized consensual same-sex relations, stating that **constitutional morality must prevail over societal prejudice** and outdated penal laws.
Indian Young Lawyers Association Vs. State of Kerala (Sabarimala)	2018	Gender Equality and Religious Reform	Struck down the ban on women's entry into the Sabarimala Temple, holding that **gender equality and liberty outweigh discriminatory religious customs**.
Joseph Shine Vs. Union of India	2018	Gender Equality and Marital Autonomy	**Decriminalized adultery** (Section 497 of the IPC), reaffirming **gender equality** and recognizing women's autonomy within marriage.

Challenges to Constitutional Morality in India

The concept faces resistance and challenges from political and societal structures.

- **Political Interference:** Increased political influence over independent constitutional and statutory bodies raises concerns about institutional autonomy, as seen in ongoing debates regarding the **Governor's role in withholding assent to state bills**.
- **Judicial Activism vs. Restraint:** While judicial intervention is sometimes necessary (e.g., *Vishaka v. State of Rajasthan*, 1997), excessive judicial overreach can risk upsetting the delicate balance of the **separation of powers**.
- **Societal Resistance:** Deep-rooted issues like **caste hierarchies, gender discrimination, and religious orthodoxy** actively obstruct the constitutional ideals of equality and fraternity.

- **Weak Enforcement:** Delays in implementing key judicial rulings (e.g., the *Vineet Narain* (1998) judgment on institutional accountability) and poor awareness of rights erode the practical force of constitutional morality.

Upholding Constitutional Morality in Public Institutions

To ensure the Constitution remains a **living charter** of rights and justice, institutions must actively foster a constitutional culture.

- **Strengthening Institutions:** Bodies like the Election Commission, CBI, and NIA must operate with **complete autonomy and without political interference** to uphold constitutional values and public trust.
- **Enhancing Access to Justice:** Simplifying legal procedures, reducing judicial backlog, and improving legal aid ensures the principle of **equality before the law** is realized for all citizens.
- **Promoting Civic Education:** Educating citizens, especially the youth, about their constitutional rights and responsibilities is essential to **cultivate constitutional culture**, as Dr. Ambedkar advocated.

Justice Surya Kant Appointed as the 53rd Chief Justice of India

Why in News?

- **Justice Surya Kant** has been officially appointed as the **53rd Chief Justice of India (CJI)**, succeeding the outgoing CJI, **Justice Bhushan Ramkrishna (B.R.) Gavai**.

Details of the Appointment

The appointment follows the constitutional and customary procedure for selecting the head of India's judiciary.

- **Appointing Authority:** The appointment was made by the **President of India** after the notification was issued by the **Department of Justice in the Union Law Ministry**.
- **Constitutional Basis:** The appointment is made under **Article 124(2) of the Constitution of India**.
- **Succession Custom:** The selection follows the long-standing convention where the **outgoing CJI recommends the senior-most Supreme Court judge** (based on the length of service) as the next CJI.

The Office of the Chief Justice of India (CJI)

The CJI is the head of the judiciary and the Supreme Court of India.

- **Appointment Process:** A judge of the Supreme Court, including the CJI, is appointed by the **President** under **Article 124(2)** of the Constitution.
- **Qualifications:** To be eligible for the position of a Supreme Court Judge (and thus CJI), a person must:
    - Be a **citizen of India**.
    - Have served as a **High Court judge for at least five years**, *or*
    - Have been an **advocate of a High Court for at least ten years**, *or*
    - Be a **distinguished jurist** in the opinion of the President.

- **Tenure:** The CJI holds office until the **age of 65 years**. Since the retirement age is fixed but the appointment date varies, the CJI does **not have a fixed tenure**.
- **Removal:** The CJI can only be removed from office by the President after an address by **Parliament**, supported by a **special majority** in both Houses, on grounds of proven misbehaviour or incapacity.

FCRA Licence of SECMOL Cancelled

Context:

- The **Union Home Ministry** has **revoked the FCRA (Foreign Contribution Regulation Act) license** of the **Students Educational and Cultural Movement of Ladakh (SECMOL)**, an NGO founded by renowned Ladakh-based climate activist **Sonam Wangchuk**.
- The Ministry cited **multiple FCRA violations**.
- Simultaneously, the **CBI is investigating** another NGO associated with Wangchuk — the **Himalayan Institute of Alternatives, Ladakh (HIAL)** — for similar issues.

What is FCRA?

Feature	Description
Full Form	Foreign Contribution (Regulation) Act
Purpose	Regulates the acceptance and use of foreign contributions by individuals, associations, and NGOs to prevent activities detrimental to national interest.
Authority	Ministry of Home Affairs (MHA), Government of India
Key Provisions	- All NGOs receiving foreign funds must register under FCRA. - Strict accounting and usage protocols. - Misuse or procedural lapses can lead to suspension/cancellation of registration.

Why Was SECMOL's FCRA Licence Cancelled?

1. Unaccounted Foreign Donation – ₹ 3.5 Lakh
   - SECMOL received ₹ 3.5 lakh in 2021-22 from Mr. Sonam Wangchuk (sale proceeds of an old bus bought using FCRA funds).
   - Organisation declared it as a **foreign donation**.
   - MHA found the explanation **"not tenable"**, as the origin of the fund wasn't properly documented.
2. Mixing of Local and Foreign Funds
   - ₹ 54,600 in **local contributions** (from 3 individuals) was **deposited into the FCRA account** in 2020-21.
   - Mixing of domestic funds with FCRA accounts is a **clear violation** of the Act.
3. Questionable Funding Purpose – ₹ 4.93 Lakh
   - In 2021-22, SECMOL received funds from Swedish org. **Framtidsjorden** for studies on:
     - **Youth migration**
     - **Food security**
     - **Sovereignty**
   - MHA held that accepting foreign funds for work related to **"national sovereignty"** was **against FCRA norms**.
4. Improper Refund of Volunteer Payment – ₹ 19,600
   - Volunteer fee was **refunded** due to COVID-related disruptions.

- MHA said FCRA law does **not permit refunding foreign contributions** once received.

5. Discrepancy in Annual Return (2020-21)

- Reported ₹ 79,200 as foreign contribution.
- However, no matching bank credit found.
- Funds were deducted from staff stipends for food — seen as **poor financial discipline**.

CBI Inquiry: HIAL Under Scanner

- HIAL, also founded by Wangchuk, is being investigated by the **CBI**.
- No registered FCRA license, but suspected to have received foreign funds.
- CBI team recently visited **SECMOL and HIAL** campuses to investigate records from **2020–2024**.
- **No FIR** filed yet.

Recent Context – Leh Violence

- Just **a day before the revocation**, **protests turned violent** in Leh over:
  - Demand for **Statehood**.
  - Demand for **Sixth Schedule (tribal status)**.
- Resulted in **4 deaths and injuries**.
- Home Ministry alleged the violence was incited by **"provocative statements" by Sonam Wangchuk**.

Wangchuk's Response:

- Clarified he is **no longer involved in SECMOL's management**, only occasionally teaches there.
- Called the ₹ 3.5 lakh allegation **baseless**, said: "I donated ₹ 17 lakh for a new bus and did not take back ₹ 3.5 lakh from the old bus sale. The amount remained in the account with a note. The Ministry is treating it as a foreign donation from me."

Broader Significance & Analysis

Aspect	Implication
Regulatory Scrutiny	Shows increased government oversight on NGOs, especially those involved in activism or receiving foreign funds.
Civil Society Impact	Might cause concern in the NGO sector about overregulation and reduced operational freedom.
Political Sensitivity	The move comes amid rising tensions in Ladakh; timing could be seen as politically sensitive.
Legal Precedent	Highlights need for strict compliance with FCRA norms — both technical and substantial.

US Government Shutdown

Why in News?

- On **October 1, 2025**, at **12:01 AM**, the **United States federal government officially shut down** for the **first time since 2018**.
- This happened because **Republicans and Democrats in the US Senate failed to agree** on a bill to **fund government operations**.
- The shutdown affects **federal employees**, **public services**, **economic activity**, and the **global financial system**.

What is a US Government Shutdown?

- Every year, by **October 1**, the US Congress must **pass budget bills** to **fund government departments and programs**.

- If the **Congress fails to pass these bills**, or **the President refuses to sign them**, the government **runs out of money** and must **stop non-essential activities**.

Key Points:

Term	Explanation
Fiscal Year	Starts on **October 1** every year in the US.
Appropriations Bills	These are bills passed by Congress to provide money to government departments and agencies.
Continuing Resolution (CR)	A temporary measure to continue funding the government at existing levels.
Omnibus Bill	A single bill that includes funding for many programs and departments.
Shutdown	A condition when the government can't spend money due to lack of legal authority.

What Caused the 2025 Shutdown?

Main Reasons:

1. **Disagreement Over Budget Priorities:**
   - Republicans supported **Trump's "Big, Beautiful Bill"**, passed 3 months earlier.
   - It included:
     * **Tax cuts** for the wealthy.
     * **Increased defense spending.**
     * **Funding for mass deportation efforts.**
     * **Cuts to Medicaid** (a health program for the poor).
2. **Democrats' Opposition:**
   - Demanded:
     * **Extension of expiring healthcare subsidies**.
     * **Restoration of Medicaid funding**.
     * **Restrictions on Trump's powers** to block funding for welfare programs.
3. **Breakdown of Talks:**
   - Republicans offered a **"clean" Continuing Resolution** (funding without changes).
   - Democrats refused, demanding healthcare protections.
   - No compromise was reached by **September 30**—leading to the shutdown.

What Happens in a Shutdown?

Under the **Antideficiency Act**, government departments must **stop spending money** they haven't received approval for.

Who Gets Affected:

1. Federal Employees:

Status	Details
Furloughed (non-essential)	Around **750,000 workers** sent home without pay.
Essential Services	Police, military, border patrol, etc., continue to work **without pay** during the shutdown.
Back Pay Cost	Estimated at **$400 million/day** (CBO estimate).

2. Public Services:

Service	Impact
Social Security, Medicare, Medicaid	Continue (automatically funded), but **new enrollments are delayed**.
Airports & Travel	Possible delays if **air traffic controllers or TSA workers** refuse to work unpaid.
Public Attractions	**Museums, national parks, and monuments** closed.
Visa/Passport Processing	Slows down or stops entirely.

3. US Economy:

Aspect	Impact
Private Sector	Contractors, businesses that work with the government face losses.
GDP Loss	A **multi-week shutdown** could cause **billions in economic losses**. In 2018-19, the shutdown caused a **$11 billion hit**, with **$3 billion never recovered**.
Jobs Report Delay	No data from the **Bureau of Labor Statistics**, making it hard for the **Federal Reserve** to assess the economy.
Global Markets	Investors become nervous; can affect the **US dollar**, **stock markets**, and **interest rates worldwide**.

Why This Shutdown is Different (in 2025)

Feature	Details
Department of Government Efficiency	New agency created by Trump to **reduce the size of government**.
Push for Permanent Layoffs	Instead of sending employees on temporary leave (furlough), the Office of Management and Budget (OMB) encouraged **"Reduction in Force"** (permanent job cuts).
Selective Funding	Some departments like **Defense and Homeland Security** are already funded—so they keep operating even during the shutdown.
Intentional Strategy?	Critics say the shutdown may be used as a **strategy to downsize federal agencies** permanently, under the guise of budget cuts.

White House's Stance

- Unlike previous shutdowns, the **Trump administration is embracing the shutdown** as an opportunity to **shrink the size of the federal government**.
- President Trump stated on September 30:
- "We'll be laying off a lot of people."
- Reports suggest that the **Office of Management and Budget (OMB)** has directed agencies to treat the shutdown as a chance to **identify and permanently cut 'non-essential' workers**.
- In previous shutdowns, workers were rehired once funding was restored. This time, there is a real possibility of **permanent job loss**.

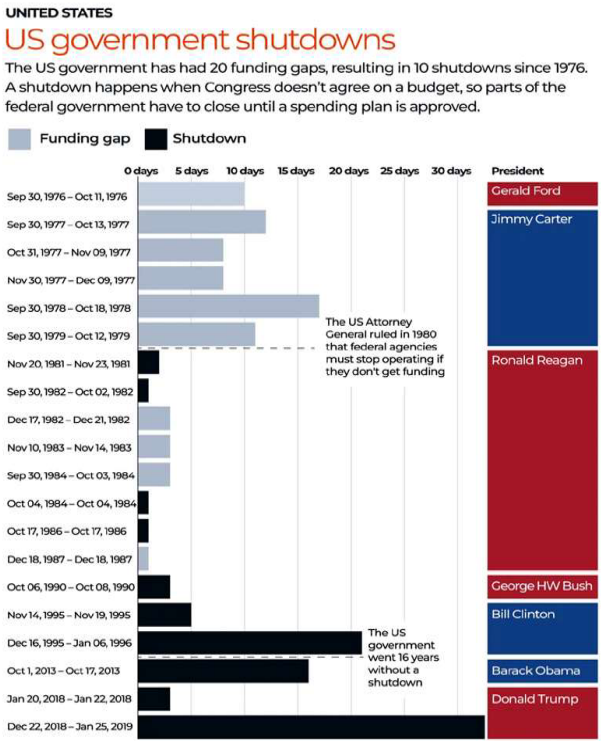
How Long Will the Shutdown Last?

- The duration is uncertain. It depends on:
  - Whether Republicans are willing to compromise on healthcare funding.
  - Whether Democrats agree to temporarily fund the government without securing their demands.
  - Public opinion and pressure on both parties.
- So far, the Trump administration has refused to offer significant concessions, believing Democrats will be blamed for the impasse.
- On the other hand, Democrats argue that defending affordable healthcare is popular with voters and worth the fight.

How Can the Shutdown End?

- **Only Congress can end a shutdown** by passing funding bills.
- President can **only sign or veto**, not unilaterally end it.
- Requires **bipartisan agreement** between House and Senate '! then **presidential approval**.

Historical Context



Shutdowns are not new in US politics, especially in the last few decades.

- The **last shutdown** (2018–2019) lasted **35 days**, the longest in US history. It was triggered by a dispute over **funding a wall on the Mexico border**.
- It ended after **air traffic controllers began calling in sick**, disrupting flights.
- The **2013 shutdown** lasted 16 days under President Obama, due to fights over **Obamacare**.
- President **Bill Clinton** oversaw a 21-day shutdown in 1995.
- President **Ronald Reagan** had 8 brief shutdowns during the 1980s.

The **Congressional Budget Office (CBO)** estimated that the 2018–19 shutdown cost the US economy **$11 billion**, including **$3 billion in permanent losses**.

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Indian Society & Social Justice

PM-KUSUM Scheme : Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan

Why in News?

The **PM-KUSUM (Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan) programme** is being actively promoted by the Union government on the international stage.

- The government is looking to **showcase the scheme to several African countries and island nations** by using the platform of the **International Solar Alliance (ISA)**.
- This initiative highlights the scheme's **success in decentralized solar energy deployment** in the agricultural sector, which can serve as a model for countries with similar energy and irrigation challenges, especially in Africa where a very small percentage of arable land is irrigated.

About PM-KUSUM Scheme

Feature	Details
Launch Year	**2019**
Nodal Ministry	**Ministry of New and Renewable Energy (MNRE)**
Objectives	To provide **energy and water security** to farmers, enhance their **income**, **de-dieselize** the farm sector, and **reduce environmental pollution**.
Revised Target	To add **Solar capacity of about 34,800 MW** by **March 2026**. (The scheme's deadline has been extended due to implementation challenges, notably the COVID-19 pandemic).
Eligible Categories	* Individual farmer * Group of farmers * FPO or Farmer Producer Organization * Panchayat * Co-operatives * Water User Associations

Components of PM-KUSUM Scheme

The scheme has three primary components aimed at integrating solar energy into the agricultural ecosystem:

Component	Target/Focus	Mechanism and Benefit
Component A	Setting up of **10,000 MW** of **Decentralized Grid Connected Renewable Energy Power Plants** (REPP).	**Capacity:** 500 kW to 2 MW plants set up by farmers/groups on barren/fallow land within a 5 km radius of sub-stations. **Benefit:** Farmers become Renewable Power Generators (RPGs) and earn income by **selling the generated power to the local DISCOMs** at a pre-fixed tariff.
Component B	Installation of **20 lakhs (revised to 14 lakh) of standalone Solar Powered Agriculture Pumps**.	**Focus:** Replacement of existing diesel pumps/irrigation systems in **off-grid areas** where grid supply is unavailable. **Capacity:** Up to 7.5 HP. **Benefit:** Provides farmers with a **reliable, pollution-free, and expenditure-saving** source of irrigation.
Component C	For **Solarisation of 15 Lakh (revised to 35 lakh) Grid Connected Agriculture Pumps** (Individual Pump Solarisation & Feeder Level Solarisation).	**Focus:** Farmers with existing grid-connected pumps are supported to solarise them. **Benefit:** Farmers meet irrigation needs with solar power, and the **excess solar power generated can be sold to DISCOMs** at a pre-fixed tariff, enhancing farmer income and incentivizing water-saving.

Financial Assistance

Under Component B and Component C (Individual Pump Solarisation), a common funding pattern exists:

- **Central Financial Assistance (CFA): 30%** of the benchmark cost or tender cost.
- **State Government Subsidy:** At least **30%**.
- **Farmer's Contribution:** The remaining **40%** (bank finance can be availed to reduce the initial farmer payment).

Note: *For North Eastern States, J&K, Ladakh, Himachal Pradesh, Uttarakhand, and Island UTs, the CFA is generally higher at 50%, reducing the farmer's share to 20%.*

Pradhan Mantri Dhan-Dhaanya Krishi Yojana

Why in News?

- Prime Minister Narendra Modi recently launched two major initiatives in the agriculture sector: the **Pradhan Mantri Dhan-Dhaanya Krishi Yojana (PMDDKY)** and the **Mission for Aatmanirbharta in Pulses**, with a combined total outlay of over **₹ 35,440 crore**.
- The PMDDKY itself has an outlay of **₹ 24,000 crore** per year.

About Pradhan Mantri Dhan-Dhaanya Krishi Yojana

- The PMDDKY is a landmark initiative designed to revolutionize India's agricultural sector by making it more productive, sustainable, and financially rewarding for farmers.
- It is modelled after the successful **Aspirational Districts Programme** of NITI Aayog but focuses exclusively on agriculture and allied sectors.
- **Launch and Duration:** First announced in the Union Budget 2025-26, the scheme was approved by the Union Cabinet on July 16, 2025, and formally launched by the Prime Minister on **October 11, 2025**. It will run for six years, from **FY 2025-26 to 2030-31**.
- **Total Outlay:** The scheme has an annual budget of **₹ 24,000 crore** for six years, totaling **₹ 1.44 lakh crore**.
- **Target:** It targets **100 underperforming districts** identified based on three key parameters:
    - Low crop yield/productivity.
    - Moderate cropping intensity (fewer than 1.55 crop cycles per year).
    - Limited access to agricultural credit/ bank loans.
- **Consolidation:** The scheme consolidates **36 existing agricultural schemes** across **11 ministries** (including PM-KISAN, PMFBY, PMKSY, and RKVY) into a single, unified program to

streamline efforts and maximize impact in the target districts.

- **Beneficiaries:** It is aimed at supporting **1.7 crore farmers**, especially the **small and marginal farmers** who own less than 2 hectares of land.
- **Implementation Structure:** The scheme has a three-tier structure with a National Steering Committee, State-level nodal committees, and District Dhan Dhaanya Samitis led by the District Collector. **District-specific Agriculture Plans** will be prepared to ensure local needs are addressed.
- **Monitoring:** Progress in each district will be tracked on a central dashboard using **117 Key Performance Indicators (KPIs)**.

PMDDKY's Core Objectives

The scheme's objectives are comprehensive and designed to drive structural reform in the targeted districts:

- **Productivity:** Increase crop yields by **20-30%** using high-quality inputs, certified seeds, and technology.
- **Income:** Double farmer incomes by **2030** through better loans, direct market access (via platforms like e-NAM and new apps), and crop diversification into high-value produce.
- **Sustainability:** Promote climate-resilient and sustainable farming practices, including organic farming and efficient **micro-irrigation** (drip and sprinkler systems), to reduce reliance on monsoons.
- **Infrastructure:** Build village and block-level **storage facilities** to cut post-harvest losses to under **5%**.
- **Self-Sufficiency:** Achieve **self-sufficiency** in food grains, pulses, and oilseeds to reduce import dependence.

Key Benefits and Support

Area of Support	Description of Benefit
Financial Support	Subsidies of **50-80%** on modern inputs and tools. Short-term loans (₹50,000 to ₹1 lakh) and long-term credit (₹1–10 lakh) through Kisan Credit Cards.
Technology & Inputs	Access to high-yielding/hybrid seeds, bio-fertilizers, and mechanized equipment like seed drills and **drones** for efficient farming.
Market Linkage	Digital platforms (**e-NAM and new PMDDKY apps**) to connect farmers directly to buyers, ensuring better price realization.
Training	Free workshops by Krishi Vigyan Kendras (KVKs) on modern farming, allied sectors (dairy, poultry), and technology use.
Special Focus	Support for **10,000 women producer groups** and allied sectors like dairy and fisheries to diversify income.

Siddi Tribal Community : An Indo-African Success Story

Why in News?

The President of India recently commended the **Siddi tribal community**, which is classified as a **Particularly Vulnerable Tribal Group (PVTG)**, for achieving a literacy rate of **over 72 per cent**. This is hailed as a major milestone for a PVTG, demonstrating the positive impact of focused educational and welfare schemes on marginalized communities. The President encouraged them to continue prioritizing education for empowerment and progress.

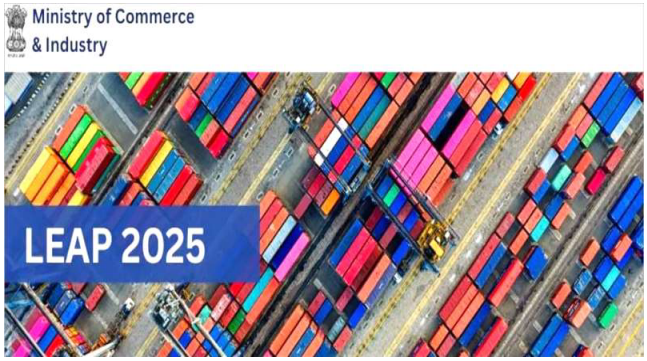
About Siddi Tribal Community

Characteristic	Detail
Origin	An **Indo-African tribal community** descended primarily from the **Bantu community of East Africa** .
Arrival in India	Believed to have first arrived in the **7th century** with Arab merchants, and later in the **16th century** with the Portuguese and British, largely as slaves, servants, and craftsmen.
Distribution	Concentrated in the west and southwest of India, primarily in **Gujarat** (Junagadh, Gir Forest), **Karnataka** (Uttara Kannada), **Maharashtra**, and **Telangana**.
Present Status	Classified as a **Scheduled Tribe (ST)** by the Union government since 2003, and included in the Centre's list of **Particularly Vulnerable Tribal Groups (PVTGs)**.
Occupation	Traditional dependence on **agriculture**, manual labor, and collection of **minor forest produce**.
Language	They speak regional languages such as **Konkani, Urdu,** or **Marathi**, depending on their geographical location.

Culture and Government Initiatives

- **Culture:** The Siddis are famous for their vibrant **folk music and dances**, which are infused with their African heritage.
    - **Dhamal Dance:** A high-energy, rhythmic dance performed primarily by men, often involving the *dammam* (a drum).
    - **Rasda:** A community celebration dance.
- **Literacy Achievement Significance:** Achieving over 72% literacy for a PVTG is remarkable, indicating successful educational outreach, higher school enrollment, and greater access to government benefits.
- **Welfare Schemes:** As a PVTG, the community is a key beneficiary of the Central government's focused welfare programs, including:
    - **Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN):** A major mission launched in 2023 to saturate PVTG households and habitations with basic facilities (housing, clean water, education, health) and sustainable livelihood opportunities.
    - **Eklavya Model Residential Schools (EMRS):** Provides quality residential education for tribal children, including special provisions for PVTGs.
    - **Van Dhan Vikas Yojana (VDVY):** Promotes livelihood generation by helping tribal gatherers add value to Minor Forest Produce (MFP) and transform into entrepreneurs.

LEAPS 2025 : Logistics Excellence, Advancement, and Performance Shield



Why in News?

- The **Logistics Excellence, Advancement, and Performance Shield (LEAPS) 2025** was recently launched by the **Union Minister for Commerce and Industry**, Shri Piyush Goyal, in New Delhi.
- The launch took place during the event marking the fourth anniversary of the **PM GatiShakti National Master Plan**.

About LEAPS 2025

Feature	Details
Nodal Body	**Department for Promotion of Industry and Internal Trade (DPIIT)** under the Ministry of Commerce and Industry.
Core Objective	To **benchmark logistics excellence**, acknowledge and celebrate **best practices, innovation, and leadership** across the entire logistics ecosystem in India.
Strategic Alignment	The initiative is aligned with the goals of the **National Logistics Policy (NLP) 2022** and the **PM GatiShakti** vision for creating a cost-efficient, integrated, and resilient logistics infrastructure.
Scope of Coverage	It covers a wide range of stakeholders, including: **Core Logistics** (Air, Road, Sea, and Rail freight operators; Multimodal Transporters; Warehousing), **MSMEs**, **Startups** (Logistics Technology & Operations), and **Academia**.
Key Focus Areas	A strong emphasis is placed on **Sustainability, ESG (Environmental, Social, and Governance) practices**, and **Green Logistics** to guide responsible and efficient operations.
Award Categories	The awards are spread across **13 distinct categories** to ensure recognition of various contributions, including a special category for **Logistics Service Delivery for e-Commerce Operations**.
Timeline	The launch was in October 2025, and registrations for the awards were open with a submission deadline set for **November 15, 2025**.

Nexus with National Policies (NLP & PM GatiShakti)

LEAPS 2025 serves as a crucial recognition mechanism that reinforces the vision of India's two major logistics and infrastructure initiatives:

- **National Logistics Policy (NLP) 2022:** The NLP's main goal is to **reduce India's logistics costs** (which are currently high at 13-14% of GDP) to align with global benchmarks and improve the country's ranking in the **World Bank's Logistics Performance Index (LPI)**. By rewarding efficiency and best practices, LEAPS encourages the private sector to adopt measures that directly contribute to these NLP goals.
- **PM GatiShakti:** This **$100 trillion** program focuses on **integrated infrastructure planning and multimodal connectivity** to bridge existing logistics gaps. LEAPS complements this by highlighting and incentivizing logistics operators who make optimal use of this new integrated infrastructure, drive digital transformation, and foster a competitive and resilient logistics ecosystem to support campaigns like **'Make in India'** and **'Atmanirbhar Bharat'**.

Number of Births and Deaths in India (CRS Report 2023)

Why in News?

- The **Registrar General of India (RGI)** recently released the **'Vital Statistics of India based on the Civil Registration System (CRS) report for the year 2023'**.
- This report is in the news because it provides the latest official nationwide data on **birth and death registrations**, offering crucial insights into India's demographic trends, including a decline in registered births and regional variations in the Sex Ratio at Birth (SRB).
- The data helps policymakers assess the effectiveness of health and social schemes.

Number of Births and Deaths in India (CRS Report 2023)

Latest News on Births and Deaths

- **Registered Births:** India registered **2.52 crore births** in 2023, which is around **2.32 lakh fewer** than the number registered in 2022. This marks a continued trend of declining birth registrations, signaling India's ongoing fertility transition.
- **Registered Deaths: 86.6 lakh deaths** were registered in 2023, a **marginal increase** from the 86.5 lakh deaths registered in 2022.

- **COVID-19 Impact:** The report confirms a post-pandemic stabilization in mortality figures for 2022 and 2023. This is in contrast to the significant rise in 2021, the second year of the COVID-19 lockdown, which recorded **102.2 lakh deaths**—an excess of over 21 lakh deaths from the 2020 count (81.2 lakh).

Key Findings on Demographics and Registration

Indicator	Finding (2023)	Key States
Institutional Births	**74.7%** of total registered births.	Reflects continued improvement in maternal and child healthcare access (data from Sikkim not included).
Overall Birth Registration	**98.4%**	Indicates near-universal coverage for birth registration across the country.
Highest Sex Ratio at Birth (SRB) (Females per 1000 Males)	**Arunachal Pradesh** (1,085), followed by **Nagaland** (1,007), and **Goa** (973).	Reflects better gender equity at the time of birth in these regions.
Lowest Sex Ratio at Birth (SRB) (Females per 1000 Males)	**Jharkhand** (899), followed by **Bihar** (900), and **Telangana** (906).	Highlights persistent concerns regarding gender-biased sex selection in these regions.

Timeliness of Registration (Within 21 Days)

- **High Timely Registration (>90%):** 11 States/ Union Territories (UTs), including **Gujarat, Puducherry, Chandigarh, Tamil Nadu, Haryana, Goa, and Punjab**, achieved more than 90% registration of births within the prescribed time limit of 21 days.
- **Moderate Timely Registration (80-90%):** Five States—**Odisha, Mizoram, Maharashtra, Chhattisgarh, and Andhra Pradesh**—reported 80-90% timely registration.
- **Lower Timely Registration (50-80%):** 14 States, including **Assam, Delhi, Madhya Pradesh, Tripura, Telangana, Kerala, Karnataka, Bihar, Rajasthan, Jammu & Kashmir, Jharkhand, West Bengal, Meghalaya, and Uttar Pradesh**, had registration rates between 50-80%.

Scheme for Innovation and Technology Association with Aadhaar (SITAA)

Why in News?

- The **Unique Identification Authority of India (UIDAI)** recently launched the **Scheme for Innovation and Technology Association with Aadhaar (SITAA)** (October 2025).
- This initiative is a major strategic move to strengthen India's digital identity ecosystem by leveraging domestic expertise to combat sophisticated emerging security threats like **deepfakes** and **spoofing attacks** on Aadhaar authentication systems.

About Scheme for Innovation and Technology Association with Aadhaar (SITAA)

SITAA is a structured program designed to promote innovation and indigenization in the Identity Technology (IDTech) space, ensuring Aadhaar remains a secure, future-ready, and globally benchmarked digital public infrastructure.

- **Objective:** To co-develop **secure, scalable, and globally benchmarked solutions** that enhance the security, reliability, and efficiency of Aadhaar authentication.
- **Target Threats:** Specifically created to counter emerging security threats like:

    - **Deepfakes**
    - **Spoofing** (using photos, videos, masks, etc.)
    - **Presentation Attacks (PAD)**
- **Collaboration Model:** It serves as a catalyst for collaboration, bringing together **startups, academic institutions, and industry players** to work closely with UIDAI.
- **Focus Areas:** The program is centered on advanced technologies, including:
    - Advanced **Biometric Technologies**
    - **Artificial Intelligence (AI)** and **Machine Learning (ML)**
    - Authentication Frameworks and **Data Privacy**
- **Strategic Partners:** The initiative is supported by strategic partners, including the **MeitY Startup Hub (MSH)** (for mentoring and incubation) and **NASSCOM** (for industry linkages and global outreach).
- **National Alignment:** The scheme aligns with national priorities like **Digital India**, **Digital Public Infrastructure (DPI)**, and **Atmanirbhar Bharat** (Self-Reliant India) by encouraging indigenous technology development.

SITAA Pilot Phase: Three Targeted Challenges

The initial phase of SITAA is launched through three distinct challenges aimed at solving critical security and technological gaps in Aadhaar's biometric authentication:

Challenge Focus	Target Participants	Key Requirement & Deliverable
1. Face Liveness Detection	Startups	Develop **Software Development Kits (SDKs)** for passive and active liveness detection. Must prevent spoofing from photos, videos, masks, **deepfakes**, and adversarial inputs across various devices and demographics.
2. Presentation Attack Detection (PAD)	Academic and Research Institutions	Submit proposals for **advanced AI/ML-driven PAD solutions** to detect a wide range of attacks (print, replay, masks, morphs, deepfakes) in **real-time or near real-time**. Solutions must be privacy-compliant and scalable.
3. Contactless Fingerprint Authentication	Open to Innovators	Develop **SDKs** for fingerprint authentication using **standard smartphone cameras** or low-cost imaging devices. Must ensure high-quality image capture, real-time spoof detection, and compatibility with the existing Aadhaar ecosystem.

Ayushman Bharat: Expanding Coverage, Confronting the Health Equity Challenge

Why in News?

The **Ayushman Bharat–Pradhan Mantri Jan Arogya Yojana (AB-PMJAY)** continues to be a central part of India's healthcare strategy, with recent government announcements and the **Economic Survey 2024–25** highlighting its expanding reach and financial impact. The scheme's scope has recently been significantly broadened to include all **senior citizens aged 70 and above** and **gig workers**, demonstrating a major policy push toward broader social security coverage. Concurrently, data on treatment trends and the digital ecosystem's growth, alongside persistent implementation challenges like the dominance of private sector expenditure and instances of fraud, keep the scheme at the forefront of policy discourse on Universal Health Coverage (UHC).

What are the Key Findings and Recent Developments Regarding AB-PMJAY?

Scheme Expansion and Growing Reach

- **Senior Citizen Coverage:** The scheme was expanded in late 2024 to provide free healthcare benefits of up to **₹ 5 lakh per year** to **all Indian citizens aged 70 and above** (**Ayushman Vay Vandana Cards**), irrespective of their income. This new segment accounts for over **86 lakh** beneficiaries as of October 2025. Families with members over 70 can now avail a combined coverage of up to **₹ 10 lakh**, though the extra ₹ 5 lakh is exclusively for the senior citizen member(s).
- **Inclusion of Gig Workers:** The **Budget 2025** extended AB-PMJAY benefits to over **1 crore gig workers**, recognizing their lack of income security and health benefits. This aims to address the financially vulnerable **"missing middle"** population.
- **Total Beneficiary Cards:** As of October 2025, more than **42 crore Ayushman cards** have been issued for AB-PMJAY beneficiaries.

- **Financial Impact:** The scheme has reportedly saved families over **₹ 1.52 lakh crore** in out-of-pocket healthcare expenses since its launch (Economic Survey 2024–25).

Hospital and Treatment Trends

- **Private Sector Dominance Persists:** The trend reported earlier continues: private hospitals, despite being only **45%** of the empanelled institutions, account for **52% of hospitalisations** and receive approximately **66% of the total treatment expenditure** of **₹ 1.29 lakh crore**, underscoring patients' preference for private care.
- **Top Treatments: Haemodialysis** remains the most frequently availed treatment since 2018 (14% of all treatments), reflecting the significant and recurring burden of chronic kidney disease.

Digital and Infrastructure Progress

- **Digital Ecosystem:** The **Ayushman Bharat Digital Mission (ABDM)** is rapidly progressing:
  - Over **79 crore ABHA accounts** created.
  - Over **67 crore health records** linked with ABHA.
  - Over **4.1 lakh health facilities** registered.
- **Primary Care: Ayushman Arogya Mandirs (AAMs)** (formerly Ayushman Bharat Health and Wellness Centres) are key to primary care, with over **39 crore teleconsultations** conducted as of September 2025.
- **PM–Ayushman Bharat Health Infrastructure Mission (PM-ABHIM):** This massive **₹ 64,180 crore** mission (2021-2026) continues to drive the upgrade of hospitals, clinics, and research facilities to build robust public health capacity.

What are the Key Issues Hindering Universal Health Coverage in India?

- **Persistent Underfunding:** India's public health expenditure remains low at **1.84% of GDP**, falling short of the National Health Policy 2017 target of 2.5%, which critically underfunds public infrastructure and human resources.
- **Financial Leakage and Fraud:** Recent incidents, such as the reported **cyber fraud and data manipulation** in the scheme's operations in states like Uttar Pradesh, along with ongoing concerns about overcharging and submission of fake bills by some private hospitals, threaten the scheme's integrity and financial sustainability.
- **The "Missing Middle" Challenge:** Despite the new inclusion of gig workers, a vast portion of the population that is above the poverty line but cannot afford private insurance remains uncovered.
- **Focus Skewed to Hospitalization:** AB-PMJAY primarily covers secondary and tertiary hospital care, neglecting **outpatient care, diagnostics, and medicines**, which constitute a significant part of a household's **Out-of-Pocket Expenditure (OOPE)**.
- **Rural-Urban and Public-Private Imbalance:** The urban concentration of healthcare professionals and the reliance on the private sector for treatment highlight the structural weakness and capacity gap in the public health system, especially in rural areas.

What Measures can be Adopted to Achieve Universal Health Coverage in India?

1. **Financial and Capacity Strengthening:**
   - **Increase Public Health Funding:** Urgently raise public health spending to the **2.5% of GDP** target, with priority given to upgrading and staffing **Ayushman Arogya Mandirs (AAMs)** to create a strong **gatekeeping system** for primary care.
   - **Public Hospital Incentives:** Introduce stronger performance incentives for public hospitals to attract patient flow and improve their quality of service and infrastructure to match private facilities.

2. **Addressing the Gaps:**
    - **Broader Coverage Model:** Develop specific, affordable insurance or subsidized packages to cover the remaining **"missing middle"** population.
    - **Outpatient Coverage:** Gradually expand AB-PMJAY's scope to include high-frequency and high-cost outpatient services, essential diagnostics, and medicines to significantly reduce OOPE.
3. **Governance and Regulation:**
    - **Combat Fraud:** Implement more stringent real-time data monitoring, stronger regulatory enforcement, and harsh penalties against hospitals involved in fraud to protect the scheme's resources and integrity.
    - **Digital Security:** Strengthen the security protocols for the digital ecosystem and Aadhaar-linked systems to prevent data manipulation and cyber fraud.
    - **Enforce Standards:** Rigorously enforce the **Clinical Establishments Act, 2010** to standardize quality and pricing across all public and private empanelled hospitals.
4. **Workforce and Technology:**
    - **Rural Incentives:** Provide greater incentives (e.g., higher pay, housing, specialist bonds) to medical professionals to serve in underserved and rural areas.
    - **Leverage Telemedicine:** Fully utilize the **ABDM** and **AAMs** network to expand specialist care access in remote areas via teleconsultation.

Pradhan Mantri Formalisation of Micro Food Processing Enterprises (PM-FME) Scheme

Why in News?

- The Union Finance Minister of India recently approved the release of **₹ 3,791.1 crore** to States and Union Territories for the **PM-FME Scheme**.

What is the PM-FME Scheme?

The PM-FME is a **Centrally Sponsored Scheme** launched in 2020 under the **Atmanirbhar Bharat Abhiyan** with a total outlay of **₹ 10,000 crore** (2020–21 to 2025–26).

- **Objective:** To **strengthen micro food enterprises**, promote **'Vocal for Local'** products, and formally integrate rural entrepreneurs into the organized economy.

Key Features of the Scheme

The scheme provides comprehensive support through various financial and developmental features:

Feature	Description	Subsidy/Support
Credit-Linked Subsidy	For individuals and firms to upgrade or set up **new food processing units**.	**35% subsidy**, capped at **₹10 lakh per unit**.
Common Infrastructure	For Farmer Producer Organizations (FPOs), Cooperatives, etc., to set up **shared processing facilities**.	**35% credit-linked subsidy**, capped at **₹3 crore**.
One District One Product (ODOP)	Focuses on promoting one product per district to achieve **scale, value chain development, and marketing support**.	Covers **713 districts** with **137 unique products**.
Seed Capital for SHGs	Provided to Self Help Group (SHG) members for working capital and small tool purchases.	**₹40,000 per member**, up to **₹4 lakh per SHG**.
Marketing & Branding	Financial support for collective branding initiatives.	**50% grant** for branding and marketing.
Capacity Building	Training under the **Food Processing Entrepreneurship Development Programme** to enhance technical and business skills.	N/A

Funding Pattern: The cost is shared between the Centre and States, typically in a **60:40 ratio** (90:10 for North Eastern/Himalayan States and 100% for UTs without a legislature).

Other Government Initiatives for the Food Processing Sector

The PM-FME scheme is part of broader government efforts, which include:

- **Pradhan Mantri Kisan Sampada Yojana**
- **Production Linked Incentive (PLI) Scheme** for the industry.
- **Priority Sector Lending (PSL):** Food and agro-processing units are now recognized as priority sectors for credit.
- **Foreign Direct Investment (FDI):** Allows **100% FDI** under the Automatic Route.
- **Special Food Processing Fund:** A **₹ 2,000 crore** fund established with NABARD.
- **Mega Food Park Scheme:** Provides integrated infrastructure with grants up to **₹ 50 crore** per project.

India's Food Journey and the India-FAO Partnership

Why in News?

- On **World Food Day** (marking the 80th anniversary of the **Food and Agriculture Organization - FAO**), the Ministry of Agriculture & Farmers Welfare highlighted India's successful journey from being a **food-deficient** nation to achieving **food self-sufficiency** over eight decades of partnership with the FAO.

World Food Day and FAO

- **World Food Day:** Celebrated annually on **October 16th** (since 1981) to mark the founding of the UN's **FAO in 1945**. It aims to raise global awareness of hunger issues.
- **2025 Theme:** The theme for 2025 is **"Hand in Hand for Better Foods and a Better Future,"** which stresses the need for global cooperation to transform agrifood systems.
- **FAO:** Headquartered in **Rome** with 194 members, the FAO's core mission is to achieve **food security for all**. It provides governments with **research, technical assistance, training, and data collection** in agriculture, forestry, and fisheries.
    - *Flagship Publications: The State of Food and Agriculture* and *The State of Food Security and Nutrition in the World*.

India-FAO Partnership: Eight Decades of Collaboration

India has been a member of the FAO **since 1945**, demonstrating a long and successful history of international collaboration.

- **Transformation Success:** The FAO played a key role in supporting India's transformation from a country heavily dependent on food imports to one that is **food-surplus** and able to feed its **1.4 billion people**. India is now recognized as a **global agricultural leader**.
- **Alignment with National Goals:** The FAO's **Country Programming Framework (CPF) 2023–2027** is directly aligned with India's national

goals, particularly the **UN Sustainable Development Cooperation Framework** and the vision for **Viksit Bharat 2047**.

- **Priority Areas:** The CPF identifies **four priority areas** for technical assistance, focusing on supporting India in transforming its agrifood systems by leveraging **global best practices** and national expertise.

Generation Alpha and the 'Six-Pocket Syndrome'

Why in News?

- A recent **Kaun Banega Crorepati** episode, which featured a child exhibiting overconfident behavior toward Amitabh Bachchan, sparked a wider debate among experts regarding **overindulgent parenting** practices within **Generation Alpha** (those born from 2010 onwards), often linked to the psychological concept known as the **"Six-Pocket Syndrome."**

What is the Six-Pocket Syndrome?

The term "Six-Pocket Syndrome" originated during **China's one-child policy era (1979-2015)** to describe the dynamics of a small, focused family:

- **Mechanism: One child** is excessively doted upon by **six adults** (two parents and four grandparents) who concentrate all their affection, financial resources, and emotional focus on the single child.
- **Effect of Overindulgence:** This fosters a powerful sense of **entitlement**—a belief that every demand must be met instantly, leaving little room for discipline, patience, or empathy.
- **Indian Context:** The syndrome is increasingly observed in **urban middle-class families** where busy working parents and indulgent grandparents compensate for time or guilt by showering children with gifts and leniency, reinforcing a belief in the **"right to demand"** without understanding consequences.
- **Sociological View:** It reflects a shift from a **responsibility-based society** (where children adapt and contribute) to a **right-based society** (where children feel entitled to comfort and attention).

Psychological and Behavioural Effects

Children raised under this syndrome often exhibit:

- **Low Frustration Tolerance:** Inability to cope with rejection, denial, or criticism.
- **Emotional Immaturity:** Limited capacity for **patience, empathy, and self-control**.
- **Reward-Demanding Behavior:** Associating affection with **material rewards** and expecting **instant gratification**.
- **Dependency and Fragility:** Struggling with autonomy and resilience, which, in the long term, can increase their vulnerability to **aggression, substance abuse, and mental health challenges**.

Challenges Facing Generation Alpha

Generation Alpha, the first fully datafied generation, faces unique challenges due to their digitally saturated environment:

- **Instant Gratification:** Constant exposure to one-click, fast-content solutions erodes their ability to handle **delayed gratification**, persistence, or failure.
- **Overconfidence and Entitlement:** Continuous validation from family and online platforms breeds **excessive self-assurance without competence**, leading to low humility and difficulty accepting criticism.

- **Erosion of Norms:** Screen-mediated interactions often result in a decline in **respect** for elders, authority, and social etiquette.
- **Emotional Fragility:** Overprotection combined with social media comparison weakens emotional resilience, contributing to rising levels of **anxiety and self-esteem issues**.
- **Overdependence on Technology:** Early digital exposure can lead to **reduced creativity, shorter attention spans**, and the diminishing ability to think critically or solve problems independently.

Corrective Model for Parenting

A balance between affection and discipline is key to fostering healthy development, aligning with frameworks like the **UN Convention on the Rights of the Child (UNCRC)**:

- **Link Rewards to Effort:** Children must **earn privileges** through achievements or responsibilities, countering the "right-to-reward" mindset.
- **Instill Emotional Resilience:** Expose children to **controlled failure, constructive criticism, and problem-solving** to build patience and adaptability.
- **Promote Responsibility:** Assign **chores, community engagement, and peer group activities** to teach empathy, cooperation, and civic responsibility.
- **Balance with Boundaries:** Parents and grandparents must collaboratively **reinforce discipline** and set firm boundaries to prevent overindulgence and impulsive entitlement.
- **Regulate Digital Exposure:** Monitor online activity and social media use. **NCPCR guidelines** and **IT Rules, 2021** stress the protection of children from cyberbullying and exploitative content, demanding collaboration from schools and digital platforms.

EDITORIALS

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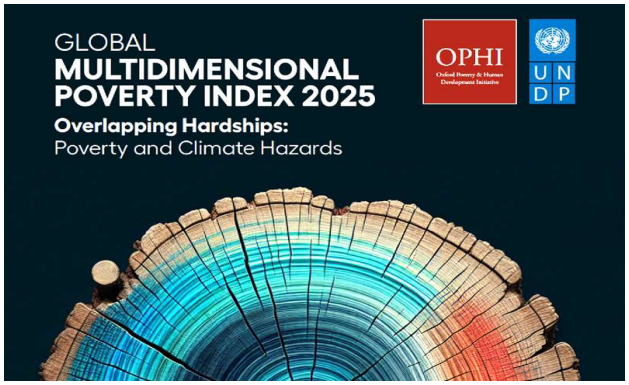
Global Multidimensional Poverty Index (MPI) 2025: Overlapping Hardships



Why in News?

- The **United Nations Development Programme (UNDP)** and the **Oxford Poverty and Human Development Initiative (OPHI)** have released the **Global Multidimensional Poverty Index** (MPI) 2025, titled *"Overlapping Hardships: Poverty and Climate Hazards."*
- For the first time, the report overlays **climate hazard data** (specifically high heat, drought, floods, and air pollution) with multidimensional poverty to assess poor people's **exposure to climate shocks**.

Key Findings of the Global MPI Report 2025

The report highlights the severe and overlapping challenges faced by the world's most vulnerable populations:

- **Global Poverty Snapshot:** Out of 6.3 billion people surveyed across 109 countries, **1.1 billion (18.3%)** live in **acute multidimensional poverty**. These individuals are predominantly **young, rural**, and reside in countries with **low human development**.
- **Poverty and Climate Interlinkages:**
  - **Triple/Quadruple Burden: 309 million poor people** live in areas facing a "triple

or quadruple burden" of **severe poverty** and **three or four overlapping climate hazards**.

- **Risk Amplification:** Climate shocks are increasing in frequency and intensity, causing massive displacement (32 million people in 2022). Without strong climate mitigation efforts, **extreme poverty could nearly double by 2050**.

- **India's Progress and Challenges:**
  - **MPI Reduction:** India saw a substantial decline in multidimensional poverty, falling from **55.1% (2005–2006) to 16.4% (2019–2021)**.
  - **Climate Exposure:** Large areas of India still grapple with a severe combination of **poverty, high heat, flooding, and air pollution**.
- **Deprivations and Income:**
  - **Common Deprivations:** The most frequent deprivations include a lack of **clean cooking fuel (970 million)**, **adequate housing (878 million)**, and **sanitation (830 million)**.
  - **Income Levels:** About **two-thirds (64.5%)** of the world's poor reside in **middle-income countries**.
- **Progress Rate: Benin** recorded the fastest absolute reduction in MPI (2017–2018 to 2021–2022), followed by Cambodia and Tanzania.

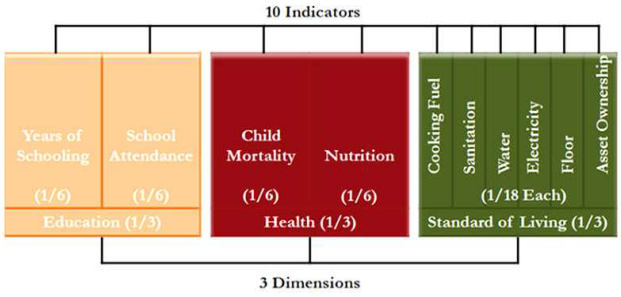
What is the Multidimensional Poverty Index (MPI)

The MPI is a crucial tool that goes beyond income to capture multiple, overlapping deprivations. It is a product of two components: **Incidence (H)** and **Intensity (A)**.

{MPI} = H*A

- **H (Incidence of Poverty):** The proportion (headcount ratio) of the population who are multidimensionally poor.
- **A (Intensity of Poverty):** The average proportion of weighted deprivations poor people experience.

Dimensions, Indicators, and Weighting



The index is built on three core **dimensions** and 10 specific **indicators**:

Dimension (Weight: 1/3 each)	Indicators	Indicator Weight	Deprivation Threshold
Health (2 Indicators)	**Nutrition, Child Mortality**	1/6 each	Undernourishment (under 70 yrs); Child death in the past 5 years.
Education (2 Indicators)	**Years of Schooling, School Attendance**	1/6 each	No household member completed 6 years of education; Any child not enrolled up to Class 8.
Standard of Living (6 Indicators)	**Cooking Fuel, Sanitation, Drinking Water, Electricity, Housing, Assets**	1/18 each	Lacking basic standard in any of the six indicators.

- **Identification:** A person is identified as **multidimensionally poor** if their total weighted deprivation score is **one third (33.3%) or higher**.

Poverty Alleviation in India: Challenges and Solutions

Key Challenges	Required Measures	Government Initiatives
Vulnerability to Climate Shocks	**Climate-Resilient Agriculture & Insurance:** Expand **PM Fasal Bima Yojana**; promote climate risk insurance.	PM-KISAN, Agriculture Infrastructure Fund
Multidimensional Deprivations	**Convergence of Welfare Schemes:** Integrate programs for health (**POSHAN Abhiyan**), education (**Samagra Shiksha**), and housing (**PM Awas Yojana**).	NRLM, Lakhpati Didi Initiative
Large Informal Workforce	**Universal Social Security & Skill Development:** Implement **e-Shram** for social security and utilize the **Skill India Mission**.	MGNREGA, Pradhan Mantri Kaushal Vikas Yojana (PMKVY)
Regional & Social Disparities	**Targeted Interventions:** Strengthen the **Aspirational Districts Programme** and ensure effective implementation of **SC/ST sub-plans**.	National Social Assistance Program (NSAP)

State Milestone: Kerala

On November 1, 2025, **Kerala** is set to become the **first state in India** to be officially declared **free from extreme poverty**. This achievement is based on the World Bank's definition of extreme poverty (living on less than **USD 3.00 per person per day** at 2021 PPP). The state achieved this through micro-plans targeting around 64,000 extremely poor families and addressing their deprivations in food, health, livelihood, and shelter.

Kerala Seeks Aid under PM-SHRI Scheme for Education Sector

Why in News?

The **Kerala Government** has requested financial assistance under the **Pradhan Mantri Schools for Rising India (PM-SHRI) Scheme** to help support the State's cash-strapped education sector.

What is the PM-SHRI Scheme?

The **PM-SHRI Scheme**, launched in 2022, is a **Centrally Sponsored Scheme** aimed at transforming over **14,500 existing schools** into model institutions that fully implement the goals and features of the **National Education Policy (NEP) 2020**.

- **Timeline:** The scheme runs from **2022–23 to 2026–27**, after which the maintenance responsibility transfers to the respective states and Union Territories (UTs).
- **Key Features of PM-SHRI Schools:**
  - **Modern Infrastructure:** Includes **Smart Classrooms, Computer Labs, Integrated Science Labs, and Atal Tinkering Labs**.
  - **Pedagogy:** Focuses on **competency-based learning**, **real-life application** of knowledge, and an experiential, inquiry-driven approach.
  - **Green Initiatives:** Promotes environmental awareness through water conservation, solar energy use, and waste recycling.
- **Funding Pattern (Centre: State/UT):**
  - General States/UTs with legislature: **60:40**
  - Northeastern and Himalayan States, J&K: **90:10**
  - UTs without legislature: **100%** Central funding
- **Selection Process:** Schools are chosen through a three-stage competitive **"Challenge Mode."** This involves states signing an **MoU** with the Centre, identifying eligible schools via **UDISE+ data**, and a final physical inspection and selection by an expert committee.
- **Controversy:** The Centre has reportedly **stopped funding under the Samagra Shiksha Abhiyan (SSA)** to states that refuse to sign the PM-SHRI MoU, a measure impacting states like Punjab and West Bengal, while Kerala and Tamil Nadu have shown conditional willingness.
- **Monitoring:** Accountability is ensured through the **School Quality Assessment Framework (SQAF)**.

Other Key Government Initiatives in Education

India's education sector is supported by a holistic framework of policies and schemes:

Initiative	Core Focus	Key Feature/Goal
National Education Policy (NEP) 2020	Comprehensive reform to make India a global knowledge superpower.	New **5+3+3+4 curricular structure**, multidisciplinary learning, holistic assessment via **PARAKH**.
Samagra Shiksha Abhiyan (SSA)	Integrated school education scheme (pre-school to Class XII).	Merges Sarva Shiksha Abhiyan and others; focuses on **Teacher and Technology** for equitable quality education.
Mid-Day Meal Scheme	Provides free lunches to children.	Improves **nutrition**, increases school **enrollment**, and reduces **dropout rates**.
PM e-VIDYA	Multi-mode access to digital/online teaching-learning content.	Unique innovative venture to facilitate digital content for students and teachers.
SWAYAM	Massive Open Online Course (MOOC) platform.	Aims to achieve the three cardinal principles of education policy: **Access, Equity, and Quality**.

International Convention Against Doping in Sport

Why in News?

India was **re-elected as Vice-Chairperson** of the Bureau for the **Asia-Pacific** region for the **2025–2027 term** at the **10th Session of the Conference of Parties (COP10)** to the UNESCO **International Convention against Doping in Sport**, held at UNESCO Headquarters in Paris (October 20-22, 2025).

International Convention Against Doping in Sport

- **About:** It is a **UNESCO multilateral treaty** adopted on **19th October 2005** to prevent and eliminate doping in sport. It entered into force on **1st February 2007**.
- **Ratification:** It is ratified by **192 States Parties** (including India), making it UNESCO's **2nd most ratified treaty** (second only to the World Heritage Convention).
- **Objective:** It is the **only legally binding international instrument** designed to **harmonize and strengthen national and global measures** to prevent and eliminate doping in sport, thereby ensuring a level and safe playing field.
- **Governance:** The **Conference of Parties (COP)** is the sovereign body responsible for the Convention's implementation, meeting **biennially**.
- **Financial Mechanism:** The **Fund for the Elimination of Doping in Sport** provides financial support for education, awareness, and capacity building, having invested over **USD 5 million** in more than 200 projects.
- **Educational Role:** The Convention promotes the **Values Education through Sport (VETS)** programme, which uses sport as a tool for teaching cross-curricular values and reinforcing the ethical foundation of anti-doping efforts.

India's National Anti-Doping Framework

- **National Anti-Doping Agency (NADA):**
  - **Establishment:** Formed in **2005** as a registered society.
  - **Mandate:** Tasked with promoting dope-free sports in India by planning, implementing, and coordinating the country's anti-doping activities in accordance with the **World Anti-Doping Agency (WADA) code and regulations**.
- **Legislation:**
  - **National Anti-Doping Act, 2022:** Provides the **legal authority** to NADA for regulating anti-doping activities and implementing the UNESCO International Convention against Doping in Sport.
  - **National Anti-Doping (Amendment) Act, 2025:** Further **strengthened** this framework by enhancing enforcement mechanisms, ensuring greater accountability, and aligning India's anti-doping regime with evolving global standards (including integrating key provisions of the WADA Code, such as Article 2 on Anti-Doping Rule Violations, into the Act's Schedule).

Foreign Universities Enter India: A Major Shift in Higher Education

Why in News?

A total of **17 international universities**, mostly from the **UK and Australia**, have been given permission to set up their branch campuses in **India** under the new **UGC guidelines issued in 2023**. This move is a direct step towards fulfilling the goal of the **National Education Policy (NEP) 2020** to globalize Indian education and meet the country's huge demand for world-class learning.

How India is Promoting Global Education Partnerships

India's new policy framework is designed to integrate international standards and collaboration into its higher education system.

- **NEP 2020 Goal:** The policy is guided by the five key ideas of **Access, Fairness, Quality, Affordability, and Accountability**. Its aim is to establish India as a **global education** destination.
    - It welcomes **top 100 universities worldwide** to operate in India, encouraging **international exchange** for students and professors, and allowing **academic credits to be transferred** across institutions.
- **UGC's 2023 Rules:** The University Grants Commission (UGC) released detailed regulations in 2023 to enable top-ranked Foreign Higher Educational Institutions (FHEIs) to start campuses in India.
    - **Eligibility:** Universities must be ranked within the **top 500 globally** (QS World University Rankings are often used) to qualify.
    - **Operational Freedom:** These foreign campuses are granted the **power to run independently**. They can decide their own **fee structures** (unlike most Indian universities) and have flexibility in **hiring faculty** (both local and international).
    - **Quality Mandate:** They must guarantee that the **curriculum and degrees** offered in India are **equal in quality and recognition** to those provided at their main international campus.

Why are Foreign Universities Setting Up in India?

Several strong market and regulatory reasons are making India a favored choice for global universities.

- **Huge Market Demand:** India has a massive and rapidly growing **young population (over half under 30)**. With current university enrollment being under 30%, there is a vast need for more educational spaces. Rising **middle-class wealth** and a preference for **English-speaking, global education** make the country highly appealing.
- **Favorable Policy:** The **NEP 2020** actively pushes for the **internationalisation of education**, and the specific **UGC 2023 rules** provide a clear, supportive framework for entry.
- **Declining Overseas Students:** Universities in the **UK, US, and Canada** have seen a recent drop in Indian students due to **stricter visa and immigration rules** (like those restricting foreign students from bringing family). This makes selling education *in* India a better option.
- **Financial Stability:** With **flat enrollments** and **less public funding** in their home countries,

institutions (especially in the UK and Australia) see India as a **strategic market to diversify their income** and achieve financial security.

Benefits of Globalizing India's Higher Education

Bringing international campuses to India is expected to have deep, transformative effects.

- **Boosted Global Standards:** The presence of foreign universities introduces **world-class curriculum** and **quality control methods**, immediately raising the standards of the entire Indian academic system.
- **Reduction in Brain Drain:** Talented Indian students can now get a foreign qualification without leaving the country. This saves the **billions of dollars** currently spent on education abroad and helps **retain skilled individuals** in India.
- **Systemic Quality Improvement:** Competition from foreign campuses will encourage local Indian institutions (like IITs and IIMs) to **innovate and enhance their own quality and competitiveness**. Their modern **governance models** can serve as examples for Indian universities.
- **Support for National Goals:** The new institutions will offer specialized courses in fields like **AI, Data Science, and Finance**, creating a highly skilled workforce that aligns with the **Make in India** and **Digital India** missions.
- **Affordable Degrees:** Students can gain a foreign degree at a much lower cost. For example, some programs from **Southampton University** in India have fees that are nearly **half** of what students would pay at the UK campus.

Main Challenges and The Path Forward

For the initiative to succeed long-term, policymakers must address operational hurdles and quality concerns.

Challenge	Path Forward
Operational Control Issues	**Stable Policy Framework:** Implement **quick, single-window approval** processes and ensure **clear, transparent rules** regarding financial autonomy and taxation.
Financial Viability	**Sustainable Models:** Require **phased investments** and permit the return of surplus funds while making sure there are **clauses for re-investment** in the Indian campus.
Market Competition	**Strategic Alliances:** Promote **joint degrees and credit transfers** to enhance student trust in the value of the degree and encourage shared research.
Quality Control	**Robust Oversight:** Define success based on **measurable outcomes** like research output, student employability, and community impact, not just enrollment numbers.
Logistics and Culture	**Local Integration: Simplify processes** for acquiring land and dealing with local regulations. Encourage the universities to **adapt their teaching to fit the Indian context** and culture.

Conclusion

The new framework for welcoming foreign universities, guided by **NEP 2020 and UGC 2023**, is set to **transform India's higher education** by improving quality and reducing the outflow of talent. Its ultimate success depends on balancing the **freedom of foreign institutions** with the need to ensure **affordability** and build **lasting, beneficial academic partnerships**.

Rashtriya Vigyan Puraskar (RVP) 2025: India's Top Science Recognition

Why in News?

The Government of India has announced the **Rashtriya Vigyan Puraskar (RVP) 2025**, which is the nation's highest honor recognizing exceptional achievements in various fields of **science, technology, and technology-led innovation**.

Prominent Awardee of 2025

- **Vigyan Ratna (Posthumous): Prof. Jayant Vishnu Narlikar**
    - He was a noted astrophysicist, primarily known for **co-developing the Hoyle–Narlikar theory of gravity**.
    - This theory serves as an **alternative to Einstein's general relativity** and provides theoretical support for the **steady-state model of the universe**.

About the Rashtriya Vigyan Puraskar

The award scheme aims to inspire and recognize scientific excellence that directly contributes to India's national progress.

- **Institution:** The award has been established by the **Ministry of Science and Technology**.
- **Objective:** To promote innovation, inspire excellence in Indian science and technology, and honor contributions that lead to **national development**.
- **Disciplinary Coverage:** The awards cover a wide range of **13 scientific fields**, including Physics, Chemistry, Engineering, Agriculture, Environment, Atomic Energy, and Space.

Categories of Awards

The Rashtriya Vigyan Puraskar is conferred across four distinct categories:

- **Vigyan Ratna (VR):** The highest honor, recognizing **lifetime achievement** and contributions.
- **Vigyan Shri (VS):** Given for **distinguished contributions** made in a specific field.
- **Vigyan Yuva–Shanti Swarup Bhatnagar (VY–SSB):** Specifically for scientists **below the age of 45 years** to encourage young talent.
- **Vigyan Team (VT):** Recognizes an entire team for **exceptional collaborative work** in scientific endeavors.

Multilingual India: Leveraging AI for Linguistic Inclusion and Preservation

Why in News?

India is making significant progress toward **digital multilingual inclusion** by deploying advanced technologies like **Artificial Intelligence (AI), Natural Language Processing (NLP), and machine learning**. Platforms such as **Bhashini, BharatGen, and Adi-Vaani** are actively working to preserve, digitize, and promote the use of **22 Scheduled Languages** and hundreds of regional and tribal dialects across key areas like governance, education, and communication.

How is India Integrating Technology with Language Preservation and Digital Inclusion?

India is employing a diverse suite of AI-powered platforms and tools to break down language barriers and digitize linguistic heritage.

Platform/Tool	Sponsoring Ministry/Body	Core Function and Impact
Bhashini	MeitY (under NLTM)	Provides **real-time, AI-driven translation**, speech recognition, and language understanding for **22 Scheduled Languages** and several tribal languages. It enables multilingual access for governance and digital communication.
BharatGen	MeitY	A multilingual **AI model suite** for Indian languages that creates advanced **Text-to-Text (T2T)** and **Text-to-Speech (TTS)** translation systems, leveraging existing data repositories.
Adi-Vaani	Ministry of Tribal Affairs (MoTA)	**India's first AI-driven platform for tribal language translation and preservation**, supporting languages like Santali, Bhili, and Gondi through **NLP and Speech Recognition**.
GeMAI	Ministry of Commerce and Industry	An **AI Assistant** for the Government e-Marketplace (GeM) that provides voice and text support in multiple Indian languages, helping small vendors and local entrepreneurs transact easily.
Anuvadini	AICTE	Uses **AI-based translation** to convert technical and professional textbooks (engineering, law, medicine) into Indian languages, supporting the **NEP 2020** vision of mother-tongue learning.
e-KUMBH	AICTE	An **AICTE-hosted digital platform** offering **free access** to higher and technical education books in Indian languages.
Sanchika	CIIL	A **digital archive** of resources like dictionaries, primers, and audiovisual content for Indian languages, serving as a key dataset source.
SWAYAM	Ministry of Education (MoE)	A **Massive Open Online Course (MOOC)** platform providing **multilingual online courses** to millions of learners, enhancing linguistic inclusivity in digital higher education.

National and Institutional Initiatives Supporting Language Preservation

These initiatives focus on long-term strategy, research, documentation, and academic translation.

- **SPPEL (Scheme for Protection and Preservation of Endangered Languages):** Launched in 2013 by the MoE (implemented by CIIL), it **documents and digitally archives** languages spoken by fewer than **10,000 people**, creating corpora for AI/NLP research.
- **TRI-ECE (Tribal Research, Information, Education, Communication and Events) Scheme:** Implemented by MoTA, it specifically promotes **AI-based translation tools** for converting English/Hindi content into **tribal languages** and vice versa, collaborating closely with Tribal Research Institutes (TRIs).
- **NTM (National Translation Mission):** A flagship MoE program that aims to **translate knowledge and academic texts** into all Indian languages to democratize education and research.
- **NMM (National Mission on Manuscripts):** Run by the Ministry of Culture, its work focuses on the **preservation, digitization, and dissemination of ancient Indian manuscripts** in Sanskrit, Pali, Prakrit, and regional languages.

Broader Impact of Technology-Led Multilingual Platforms

The digital multilingual revolution has far-reaching consequences for India's socio-economic landscape.

- **Governance and Public Service Delivery:** Platforms like Bhashini and GeMAI make it possible for citizens, especially in rural areas, to access government services and digital portals in their **native languages**, boosting **transparency, participation, and trust**.
- **Education and Skill Development:** By providing technical content and online courses in regional languages (e-KUMBH, Anuvadini, SWAYAM), the digital education divide is bridged, supporting **improved comprehension** and the **NEP 2020** mandate.
- **Cultural and Linguistic Preservation:** Initiatives like **Adi-Vaani** and **SPPEL** digitally document endangered oral traditions and knowledge systems, ensuring that the country's vast linguistic heritage remains **vibrant and accessible** in the digital age.

- **Economic and Social Inclusion:** Language-inclusive platforms simplify interactions with **e-commerce, financial services, and government schemes** for local entrepreneurs, farmers, and small businesses, fostering **equitable participation** in the digital economy.

Jal Jeevan Mission Pipelines to be Mapped on PM Gati Shakti Portal

All Jal Jeevan mission pipelines to be mapped on PM Gati Shakti portal

Why in News

On *October 7, 2025,* The **Union Government** has announced that **all drinking water assets**, including pipelines created under the **Jal Jeevan Mission (JJM)**, will now be **mapped and geo-tagged** on the **PM Gati Shakti portal** — a **Geographic Information System (GIS)-based platform** developed by **BISAG-N**. This move is aimed at improving the planning, monitoring, and management of rural water infrastructure.

Key Highlights

Feature	Details
What's Being Mapped	All pipelines and water assets built under JJM
Platform	**PM Gati Shakti** – GIS-based infrastructure platform
Executed By	**Department of Drinking Water & Sanitation (DDWS)** under **Ministry of Jal Shakti**
Tech Partner	**BISAG-N** – Bhaskaracharya National Institute for Space Applications and Geo-informatics
MoA Signed By	Senior officials including DDWS Secretary Ashok K.K. Meena, JJM Mission Director Kamal Kishore Soan, and BISAG-N's Vinay Thakur

Significance of the Move

1. Enhanced Monitoring & Planning

- Real-time, **granular tracking** of water supply systems at **household level**
- Identification of **gaps, overlaps, or delays** in pipeline coverage

2. Data-Driven Decision-Making

- Facilitates **scheme-level IDs** for each Rural Piped Water Supply Scheme (RPWSS)
- Enables **informed policy decisions** and prioritization

3. Infrastructure Convergence

- Aligns JJM with **PM Gati Shakti National Master Plan**
- Integrates water pipelines with other infrastructure like roads, power, telecom, etc.

4. Technical Advancements

- BISAG-N to provide:
  - **Database design**
  - **Map creation & migration**
  - **Digital photogrammetry**
  - **Ground control surveys**
  - **Vector data capture and thematic mapping**

5. Asset Management

- Several lakh kilometres of pipelines laid under JJM will now be centrally managed
- Geo-tagging ensures **maintenance efficiency** and **lifecycle tracking**

About Jal Jeevan Mission (JJM)

Parameter	Details
Launched	August 2019
Objective	Tap water to every rural household by 2024
Target	55 litres per capita per day (lpcd) of safe drinking water
Initial Coverage	18.33% (3.27 crore households had tap connections)
Current Progress	12.74 crore households covered with tap water
Schemes Approved	6.41 lakh
Total Cost Approved	₹8.29 lakh crore
Funds Spent So Far	₹3.91 lakh crore
Total Allocation (2019–24)	₹3.6 lakh crore (₹2.08 lakh crore Centre + ₹1.52 lakh crore States)

Mission Extension (2025–2028)

Aspect	Details
Extension Announced	In Budget 2025 by FM Nirmala Sitharaman
JJM Extended Till	2028 (Pending Union Cabinet approval)
Funds Requested	₹2.79 lakh crore (additional)
EFC Recommended	₹1.51 lakh crore (46% less than requested)
Reason for Extension	To complete household coverage and ensure system sustainability

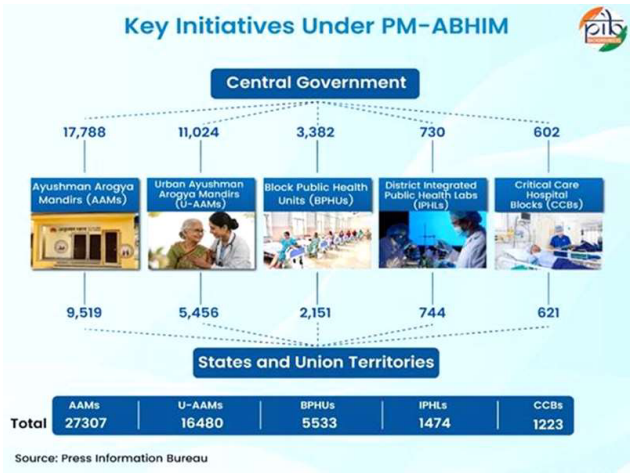
About PM Gati Shakti Platform

Parameter	Details
Launched	October 2021
Platform Type	GIS-based National Infrastructure Planning Tool
Developed By	BISAG-N (Ministry of Electronics & IT)
Contains	200+ GIS data layers (railways, roads, ports, airports, power, telecom, logistics, etc.)
Objective	Reduce infrastructure gaps, ensure multimodal connectivity, and improve coordination among Ministries

Conclusion

This initiative reflects a **forward-thinking approach** to rural development by combining **technology, transparency, and coordination**. By mapping Jal Jeevan Mission assets on the PM Gati Shakti platform, the government is empowering data-driven planning and efficient public service delivery. The move holds the potential to significantly improve **rural water infrastructure management** and ensure the **sustainability of tap water supply systems** across India.

PM–Ayushman Bharat Health Infrastructure Mission (PM-ABHIM) Enhanced India's Health Surveillance Systems



Why in News

The Government of India announced that in the **four years since its launch (2021–2025)**, the **Pradhan Mantri Ayushman Bharat Health Infrastructure Mission (PM–ABHIM)** has **significantly strengthened India's pandemic preparedness** by expanding an **IT-enabled, real-time disease surveillance network**, improving **critical healthcare infrastructure**, and enhancing **public health research and coordination**.

Key Highlights

- **Launched on:** 25 October 2021 (during the COVID-19 pandemic wave)
- **Mission Period:** 2021–26
- **Total Investment:** ₹ 64,180 crore
- **Implementing Agency:** Ministry of Health and Family Welfare
- **Nature:** Centrally Sponsored Scheme (CSS)
- **Primary Goal:** Build a resilient, accessible, and self-reliant **public health infrastructure** to prepare for **future pandemics and health emergencies**.

Background and Need

- The **COVID-19 pandemic** exposed serious gaps in **health infrastructure, testing capacity, and disease surveillance** across India.

- PM–ABHIM was launched as part of the **Ayushman Bharat framework** to address these gaps through **systemic infrastructure reforms**.
- The mission complements the **National Health Policy 2017**, **National Health Mission (NHM)**, and the **Ayushman Bharat Scheme**.

Policy Framework

1. National Health Policy (NHP) 2017

- Emphasises **community-based health systems**, trained first responders, and **local self-government collaboration** for disaster and public health emergency preparedness.

2. National Health Mission (NHM) – 2005

- Aims to establish **community-owned, decentralised health systems** providing affordable, quality healthcare to vulnerable populations.

3. Ayushman Bharat Scheme (2018)

Strengthens health delivery across all three levels:

1. **Ayushman Bharat – Pradhan Mantri Jan Aarogya Yojana (AB-PMJAY)** – Secondary & Tertiary care
2. **Ayushman Arogya Mandirs (AAMs)** – Primary healthcare
3. **Ayushman Bharat Digital Mission (ABDM)** – Digital health records & e-health governance
4. **PM–ABHIM** – Health infrastructure & pandemic preparedness

Together, these pillars aim to achieve **Universal Health Coverage (UHC)** and align with **SDG-3: Good Health and Well-being**.

Objectives of PM–ABHIM

- Strengthen **public health infrastructure** from grassroots to district levels.
- Build an **integrated disease surveillance network** (real-time, IT-enabled).
- Promote **health research and innovation** using the **One Health approach**.
- Enhance **critical care infrastructure** in districts and urban centres.
- Reduce regional disparities in healthcare access.
- Strengthen India's preparedness for **future pandemics and biological threats**.

One Health Approach

- Recognises the **interdependence of human, animal, and environmental health**.
- Encourages cross-sectoral research and response to zoonotic diseases and environmental health hazards.

Key Infrastructure Initiatives under PM–ABHIM (as of Oct 2025)

Infrastructure Component	Purpose / Focus Area	Progress / Approvals (2021–25)
Ayushman Arogya Mandirs (AAMs)	Upgradation of Sub-Health Centres for primary healthcare delivery	17,788 rural AAMs approved
Urban Ayushman Arogya Mandirs (U-AAMs)	Extend primary care in slum & underserved urban areas	11,024 U-AAMs being established
Block Public Health Units (BPHUs)	Strengthen block-level public health administration	3,382 BPHUs under establishment
Integrated Public Health Laboratories (IPHLs)	District-level disease surveillance & diagnostics	730 IPHLs (one per district)
Critical Care Hospital Blocks (CCBs)	Tertiary care in districts with >5 lakh population	602 CCBs under development

Global Context: WHO Pandemic Agreement (May 2025)

- Adopted by **WHO Member States** after three years of negotiation post-COVID-19.
- Aims to ensure **equitable pandemic preparedness and response**, promoting **fair access to vaccines, diagnostics, and therapeutics**.
- Establishes mechanisms like:
  - **Pathogen Access and Benefit-Sharing (PABS)** system
  - **Coordinating Financial Mechanism (CFM)** for global pandemic funding

- **Global Supply Chain & Logistics Network (GSCL)** for affordable and timely access to health products

Complements the **amended International Health Regulations (IHR 2024)** for global outbreak detection and response.

Achievements (2021–2025)

Parameter	Status / Outcome
Infrastructure Expansion	Thousands of AAMs, U-AAMs, BPHUs, IPHLs, and CCBs approved/operational
Disease Surveillance	Real-time IT-enabled network integrating national, state, and district labs
Pandemic Preparedness	Enhanced rapid outbreak detection and response mechanisms
Research Capacity	Strengthened through "One Health" & infectious disease innovation
Accessibility	Wider primary healthcare coverage in both rural & urban India
Financial Outlay	₹64,180 crore investment for 2021–26

Alignment with Sustainable Development Goals (SDGs)

- **SDG 3:** Ensure healthy lives and promote well-being for all at all ages.
  - Targets:
    * End epidemics of communicable diseases by 2030.
    * Achieve Universal Health Coverage (UHC).
    * Provide access to safe, effective, affordable medicines and vaccines.
- **PM–ABHIM directly supports these SDG-3 goals.**

Significance

Public Health Significance

- Builds India's **pandemic-resilient** infrastructure.
- Enables **rapid outbreak detection** and **data-driven responses**.
- Strengthens **lab networks** from block to national levels.

Governance Significance

- Demonstrates **federal collaboration** between Centre and States.
- Converges multiple health programmes for a unified policy approach.
- Institutionalises **disaster preparedness** in health planning.

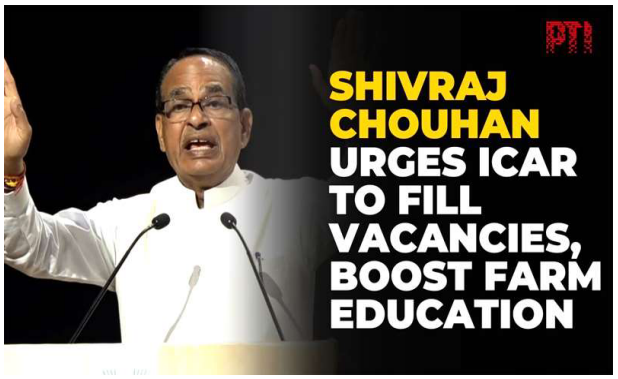
Social Significance

- Expands healthcare access to **urban poor and rural populations**.
- Reduces health inequities through **infrastructure decentralisation**.
- Enhances **community trust** in public healthcare systems.

Way Forward

- Ensure **timely completion** and **quality monitoring** of ongoing projects.
- Strengthen **data integration** with the **Ayushman Bharat Digital Mission (ABDM)**.
- Expand **One Health initiatives** for zoonotic and climate-related disease surveillance.
- Promote **research-industry collaboration** in health innovations.

Fill Vacant Posts in Agricultural Institutes: Chouhan Tells ICAR, States



Why in News

- **Union Agriculture Minister Shivraj Singh Chouhan** has directed the **Indian Council of Agricultural Research (ICAR)** to **immediately fill all vacant posts** in agricultural institutions across the country.

- The Minister expressed **concern over the large number of vacancies** in agricultural universities and colleges, stating that the **future of agricultural students must not be compromised.**
- He also announced that he will write to **Chief Ministers of all States** urging them to **expedite recruitment** in state-level agricultural institutions.

Focus on Improving Agricultural Education

- **Quality Education:**
  - Stressed that **high-quality agricultural education** is crucial for national development and food security.
- **Adopt Global Best Practices:**
  - Directed **ICAR** to study **international models** in agricultural education and implement the best practices in India.
- **Student Involvement:**
  - Asked ICAR to form a **student coordination team** to collect **innovative suggestions** for improving education and institutional systems.
- **Performance-Based Grading:**
  - Proposed **grading agricultural universities and colleges** to foster **healthy competition** and improve academic standards.

Vision for Rural and Agricultural Development

- **Integrated Growth:**
  - He highlighted that the **development of agriculture and villages together** is essential to **curb rural migration**.
- **Self-Reliant India:**
  - He Emphasized that **India cannot become self-reliant or developed** without strengthening its **agricultural foundation**.
- **Nation-Building through Agriculture:**
  - He Linked agricultural development with the larger goal of **nation-building and economic independence**.

About the Indian Council of Agricultural Research (ICAR)

Particulars	Details
Full Form	Indian Council of Agricultural Research
Established	16 July 1929 (as the *Imperial Council of Agricultural Research*)
Legal Status	Autonomous organization under the **Department of Agricultural Research and Education (DARE)**, Ministry of Agriculture & Farmers Welfare
Headquarters	New Delhi
Structure	101 ICAR Institutes and 71 Agricultural Universities — one of the largest national agricultural research systems in the world
Mandate Areas	Crop Science, Horticulture, Natural Resource Management, Agricultural Engineering, Animal Science, Fisheries, Agricultural Education, and Extension
Historical Contribution	Played a **pioneering role in the Green Revolution** and in **advancing agricultural research, innovation, and education** across India.

Significance of the Issue

1. **Educational Impact:** Vacant posts weaken the quality of teaching, research, and field extension in agricultural education.
2. **Research Productivity:** Lack of manpower affects innovation and technology dissemination to farmers.
3. **Food Security & Rural Development:** Strengthening agricultural education directly contributes to better productivity and sustainable farming practices.
4. **Youth Empowerment:** Improves employability and practical exposure for agricultural students.
5. **National Priority:** Ensuring an efficient agricultural research system aligns with the goals of **Atmanirbhar Bharat (Self-Reliant India)**.

❐❐❐

Economics

Remission of Duties and Taxes on Exported Products (RoDTEP) Scheme

1. Background — Recent Development

The Government of India has recently **extended the RoDTEP scheme for exporters until March 31, 2026**. This extension continues the support to exporters by reimbursing embedded taxes and duties in exported goods, ensuring stability in export policy.

2. What is the RoDTEP Scheme?

The RoDTEP scheme was introduced as part of the Foreign Trade Policy 2015-20 amendment, effective from **January 1, 2021**.

- **Key Objective:** To **refund taxes and duties embedded in exported goods** that are not otherwise credited or reimbursed through any other system.
- **WTO Compliance:** This scheme is fully **compliant with World Trade Organization (WTO) rules**.
- **Predecessor:** It **replaced the earlier Merchandise Export Incentive Scheme (MEIS)** after the MEIS was challenged at the WTO by the United States.

3. Tax Reimbursement Under RoDTEP

The scheme provides a mechanism to reimburse indirect taxes, duties, and levies levied at **central, state, and local levels** that exporters incur in manufacturing and distributing exported products.

- This reimbursement covers direct costs to exporters as well as cumulative indirect taxes paid at previous stages of production (e.g., local levies, mandi tax, coal cess, etc.).

4. Eligibility Criteria for RoDTEP

- **Applicability:** Applicable to **all export sectors**, with special priority to labour-intensive sectors.
- **Exporters:** Both **manufacturer exporters** and **merchant exporters (traders)** can avail benefits.
- **Turnover: No minimum turnover requirement** to qualify for the scheme.
- **Origin:** Exported goods must have **India as the country of origin**.
- **Channels Covered:**
    - Includes exports through SEZ (Special Economic Zones) and EOUs (Export Oriented Units).
    - Covers goods exported via courier and e-commerce platforms.
- **Exclusions: Re-exported goods** are excluded from this scheme.

5. Process of Refund

Exporters receive rebates as a **percentage of the Freight on Board (FOB) value** of their exports.

- **Form of Refund:** Refunds are issued as **transferable e-scrips**—digital certificates recorded in an electronic credit ledger managed by the Central Board of Indirect Taxes and Customs (CBIC).
- **Usage of E-scrips:** These e-scrips can be used to pay basic customs duty on imported goods or can be transferred (sold) to other importers.
- **Mechanism:** The scheme emphasizes a speedy clearance process enabled by **digitalization** and IT-supported risk management and audit systems.

6. Significance of RoDTEP

- **Global Competitiveness:** The scheme aims to **lower the export costs** by eliminating embedded taxes, thus making Indian goods **more competitive globally**.
- **Export Growth:** It encourages exports by ensuring exporters are not burdened with non-refundable taxes, enhancing overall export growth in India.

Payments Regulatory Board (PRB) : Governing India's Payment Systems

The **Reserve Bank of India (RBI)** recently constituted the **six-member Payments Regulatory Board (PRB)**, a statutory body aimed at strengthening the regulation and supervision of all payment and settlement systems in India.

1. Statutory Mandate and Authority

Feature	Details
Status	Statutory Body
Enacting Legislation	Derives authority from the **Payment and Settlement Systems Act, 2007**.
Predecessor	Replaces the **Board for Regulation and Supervision of Payment and Settlement Systems (BPSS)**, which was a committee of the RBI's Central Board.
Core Function	Responsible for the **regulation and supervision of all payment systems** in the country.
Scope of Regulation	Includes **electronic and non-electronic, domestic and cross-border** systems.
Support Structure	Supported by the RBI's **Department of Payment and Settlement Systems (DPSS)**, which reports directly to the PRB.

2. Composition and Decision Making

The PRB is designed with a balanced composition, ensuring representation from both the RBI and the Central Government.

Position	Member Count	Selection/Role
Ex officio Chairperson	**1**	**RBI Governor**
Ex officio Members	**2**	**Deputy Governor** in charge of Payment and Settlement Systems and the **Executive Director** in charge of Payment and Settlement Systems.
Government Nominees	**3**	Nominated by the **Central government**.
Total Strength	**6**	(3 from RBI + 3 from Government)

Decision Making Protocol:

- Decisions are made by a **majority of members** present and voting.
- In the event of a tie, the **Chairperson** (RBI Governor) or, in their absence, the **Deputy Governor** will have a **second or casting vote**.
- The Board is required to meet at least **twice a year**.

Permanent Invitee:

- The principal legal adviser of the RBI is a permanent invitee to the meetings of the board.

3. Significance

The constitution of the PRB under the Payment and Settlement Systems Act, 2007, solidifies a high-level, dedicated body to oversee India's rapidly evolving digital and non-digital payment ecosystem, ensuring its safety, efficiency, and robustness.

Electronics Components Manufacturing Scheme (ECMS)

Why in News?

- The **Union Minister of Electronics & IT** recently announced that the **Electronics Components Manufacturing Scheme (ECMS)** has received an **overwhelming response**, with the value of proposals submitted exceeding the initial targets.
- PThe government also approved the first batch of projects under the scheme, marking a significant step towards deepening India's domestic electronics value chain.

About the Electronics Component Manufacturing Scheme

The ECMS is a strategic Production-Linked Incentive (PLI) scheme designed to strengthen the manufacturing base of critical electronic components in India.

- **Nature:** It is the **first dedicated PLI scheme** to promote the manufacturing of select **passive electronic components**.
- **Objective:**
  - To develop a **robust component manufacturing ecosystem** by attracting large-scale **global and domestic investments**.
  - To increase **Domestic Value Addition (DVA)** and integrate the domestic electronic industry with **Global Value Chains (GVCs)**.
- **Target Components (Passive):** The scheme focuses on components that do not control or generate electrical signals, such as:
  - **Resistors, Capacitors, and Inductors.**
  - Speakers, Microphones, Special Ceramics, Relays, Switches, and Connectors.
  - *Note: Active components (like Integrated Circuits/Chips and Transistors) fall under the purview of the **India Semiconductor Mission (ISM)**.*
- **Beneficiary Industries:** Automobiles, consumer electronics, telecommunications, and defence sectors.

Incentive and Employment Structure

The scheme is structured to offer flexible and performance-based financial incentives over its tenure.

Incentive Model	Description	Incentive Range
Turnover-linked Incentive	Based on the **net incremental sales** of manufactured components (similar to the PLI model).	1–10% of incremental turnover (varies by year and component type).
Capex-linked Incentive	Provides a financial incentive for **eligible investments** made in plants, machinery, and equipment.	Up to **25%** of the Capital Expenditure for supply chain/capital goods segments.
Hybrid Incentive Model	A **combination** of both the Turnover-linked and Capex-linked benefits.	
Employment Requirement	**Mandatory** employment generation is a key requirement for all applicants, boosting the creation of skilled jobs.	

- **Tenure:** The scheme has a tenure of **six years**, with an additional **one-year gestation period** allowed for setting up the manufacturing unit.
- **Total Outlay:** The scheme was approved with a total outlay of over **₹ 22,919 crore**.

India's First Defence Unicorn

Why in News?

- The Defence Minister recently called upon young entrepreneurs to set new benchmarks and **create India's first defence unicorn**, highlighting startups as the new driving force for India's defence innovation ecosystem. The term "Unicorn Company" refers to a **privately owned start-up valued at over $1 billion**.

What is a Unicorn Company?

- A unicorn company is a term commonly used in the venture capital industry to describe a **privately held start-up** that has achieved a market **valuation of $1 billion or more**.
- The term was first popularized by venture capitalist **Aileen Lee in 2013** to denote the rarity and mythical nature of such companies at the time, referencing the 39 startups that had a valuation of over $1 billion. As of July 2025, there are over 1,200 unicorns globally.

Key Characteristics of a Unicorn Startup

- **Valuation:** Must have a private valuation of **$1 billion** or more.
- **Private Ownership:** They are not publicly traded on a stock exchange (unlike companies like Apple or Google).
- **High Growth Potential:** They demonstrate rapid growth, scalability, and strong potential for future expansion.
- **Disruptive Technology:** They often introduce innovative products or services that significantly disrupt existing industries, typically leveraging technology.
- **Attracts Significant Investment:** They secure substantial funding from venture capitalists (VCs) and other private investors.

The valuation of a unicorn is often based on the **future growth potential** as perceived by investors, rather than strictly on current revenue or profits.

Path of Unicorns:

- Some unicorns eventually go public by launching an Initial Public Offering (IPO), others opt to remain private through continued funding rounds, and some are acquired by larger corporations.

Gazelles and Cheetahs in the Startup Ecosystem

Within the startup ecosystem, there are also terms to describe companies with significant growth potential that are on the path to becoming unicorns:

Startup Category	Definition	Estimated Valuation Range
Gazelle	A startup founded after 2000 with the potential to reach unicorn status (>$1 billion) within **two years**.	**$500 million to $1 billion**
Cheetah	A startup expected to reach unicorn status (>$1 billion) in the next **four years**.	**$200 million to $500 million**

These terms emphasize the **speed** and **aggressiveness** of their anticipated growth trajectory.

India's Defence Unicorn Push

The Defence Minister's call is a part of India's larger push towards **'Aatmanirbhar Bharat'** (Self-Reliant India) in the defence sector.

- **Goal:** To foster an ecosystem where indigenous startups can develop cutting-edge, mission-critical defence technologies (like AI, drones, and autonomous systems) and achieve the **$1 billion valuation** mark.

- **iDEX Initiative:** The government's **Innovations for Defence Excellence (iDEX)** framework is a cornerstone of this effort, providing financial support, mentorship, and a platform for startups to work directly with the Indian Armed Forces.
- **Notable Defence Startups:** Several Indian defence-tech startups are currently active and showing high growth potential in areas like drone technology (e.g., **ideaForge**, which is publicly listed, and **Garuda Aerospace**), underwater robotics (**EyeROV**), and advanced electro-optics (**Tonbo Imaging**). The goal is to elevate one of these or a new entrant to the full unicorn status.

Foreign Currency Settlement System (FCSS) at GIFT City

Why in News?

The **Foreign Currency Settlement System (FCSS)** was launched by the Union Finance Minister at the **International Financial Services Centre (IFSC)** in **Gujarat International Finance Tec-City (GIFT City)**.

- The launch signifies the operational readiness of a system designed to drastically **reduce the time, cost, and risk** of cross-border financial transactions conducted through the **GIFT City IFSC**.
- This move places **GIFT IFSC** among an exclusive group of global financial centers, including **Hong Kong** and **Tokyo**, that have the local infrastructure to settle foreign currency trades.

About Foreign Currency Settlement System

Feature	Details
Objective	To enable **local and near real-time settlement** of foreign currency transactions between **IFSC Banking Units (IBUs)** in GIFT City.
Legal Basis	Established under the **Payment and Settlement Systems Act, 2007**; authorised by the **International Financial Services Centres Authority (IFSCA)**.
Key Mechanism	Enables foreign currency transactions between IBUs to be settled **locally** instead of routing through the traditional **correspondent banking route** (multiple Nostro account relationships).
Initial Currency	Supports **US dollar (USD)** transactions initially, with scope to add other foreign currencies over time.
System Operator	**CCIL IFSC Limited (CCIL IFSC)**, a subsidiary of the Clearing Corporation of India Limited.
Impact on Time	Reduces the settlement lag from the traditional **36 to 48 hours** to near real-time, providing greater speed, reliability, and legal certainty.

What is the International Financial Services Centres Authority (IFSCA)?

- **Role:** The IFSCA is a **unified authority** for the development and regulation of financial products, financial services, and financial institutions in the **International Financial Services Centre (IFSC)** in India.
- **Status:** It is a **statutory authority** established under the **International Financial Services Centres Authority Act, 2019**.
- **Aim:** To develop a strong global connection and focus on the needs of the Indian economy while serving as an international financial platform.
- **Headquarters: GIFT City**, Gandhinagar, in Gujarat.

RBI Updates Rangarajan Poverty Line : State-Wise Poverty Decline

Why in News?

- Economists from the **Reserve Bank of India's (RBI) Department of Economic and Policy Research** published a paper utilizing data from the **Household Consumption Expenditure Survey (HCES) 2022-23** to 'update' the non-official **Rangarajan Poverty Line** for 20 major Indian states.

Key Findings of the RBI Paper

The updated analysis highlights significant state-wise variations in poverty reduction since 2011-12:

- **Largest Improvements: Odisha** and **Bihar** showed the most remarkable decline in poverty levels:
    - Rural poverty in Odisha fell sharply from 47.8% to **8.6%**.
    - Urban poverty in Bihar plummeted from 50.8% to **9.1%**.
- **Smallest Declines: Kerala** and **Himachal Pradesh** recorded the least decline in poverty percentages, largely because their poverty levels were already among the lowest in 2011-12.
- **Poverty Extremes (2022-23):**
    - **Rural:** Lowest in Himachal Pradesh (**0.4%**); highest in Chhattisgarh (**25.1%**).
    - **Urban:** Lowest in Tamil Nadu (**1.9%**); highest in Chhattisgarh (**13.3%**).
- **Methodology Note:** The paper acknowledges that the significant changes in **consumption patterns** between 2011-12 and 2022-23 may necessitate further updates to poverty baskets and poverty lines in the future.

What is Poverty Measurement in India

- **Poverty** is defined by the World Bank as **"pronounced deprivation in well-being,"** referring to individuals who lack sufficient income or consumption to rise above a minimum threshold.

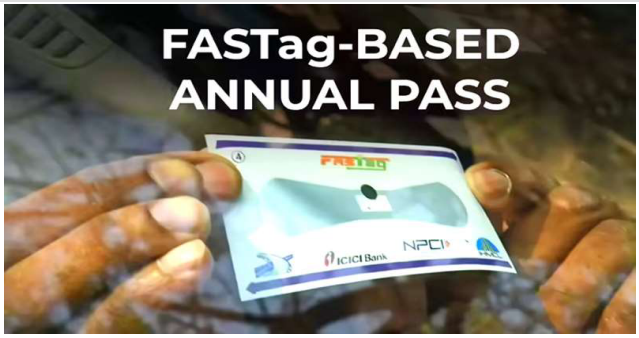
Committee/ Index	Year	Methodology	Key Feature
Tendulkar Committee	2009	Uniform all-India Poverty Line Basket (PLB) based on **Mixed Reference Period (MRP)** consumption data.	Shifted away from purely calorie-based norms.
Rangarajan Committee	2014	Reverted to **separate rural (₹972)** and **urban (₹1,407)** PLBs per capita per month.	Its recommendations were **not officially adopted** by the government.
National MPI (NMPI)	2022-23	Based on **National Family Health Survey (NFHS)** data, measuring deprivations in health, education, and living standards.	Shows that multidimensional poverty in India declined from 29.17% in 2013-14 to **11.28%** in 2022-23.

- **Global Context:** The **Global Multidimensional Poverty Index (MPI)**, launched by **UNDP** and **OPHI**, provides a non-income-based measure. In 2025, it showed that 1.1 billion people globally live in acute multidimensional poverty.
- **Inequality:** The **Gini index** (a measure of income inequality) in India declined from 28.8 in 2011-12 to **25.5 in 2022-23**, indicating reduced inequality.

Significance of Measurement

Measuring poverty is essential to **compare deprivation** across households and regions, **track changes over time**, and effectively **design, implement, and evaluate** poverty-reduction strategies. Early efforts date back to **Dadabhai Naoroji's** book, *"Poverty and Un-British Rule in India."*

New Compensation Portal for FASTag Annual Pass Scheme



Why in News?

- The **Ministry of Road Transport and Highways** has launched a new **compensation portal** aimed at streamlining toll operations.
- This platform will enable dedicated officials to manage the **revenue sharing** for the **FASTag Annual Pass scheme**, which is intended to significantly reduce conflicts arising from revenue losses reported by toll operators (concessionaires).

FASTag Annual Pass Scheme

The Annual Pass scheme was jointly introduced by the **National Highways Authority of India (NHAI)** and the **National Payments Corporation of India (NPCI)** in August 2025.

- **Key Feature:** It allows **private, non-commercial vehicles** (cars, jeeps, and vans) to travel seamlessly on **National Highways and Expressways** for one year or 200 crossings (whichever comes first) through a **one-time payment of ₹ 3,000**.
- **Purpose:** The scheme aims to promote **smooth digital commuting** by reducing the need for frequent recharges and ensuring **transparent NPCI-backed transactions**.
- **Eligibility:** The pass is **non-transferable** and its validity is confirmed via the **VAHAN database**.
- **Current Scope:** It is currently valid only for **National Highways** and **Expressways**, though regular FASTag is still applicable on State Highways.

FASTag Technology

FASTag is the foundational electronic toll collection system that powers the Annual Pass:

- **Technology:** It utilizes **Radio Frequency Identification (RFID)** technology for automatic, cashless payments.
- **Integration:** It is integrated with the **NPCI** and links directly to a user's bank account or prepaid wallet.
- **Compliance:** NHAI has also launched the **'One Vehicle, One FASTag'** initiative to prevent the misuse of a single FASTag across multiple vehicles.

India's Digital Public Platforms (DPPs) as Global Public Goods

Why in News?

- The **RBI Governor** emphasized India's vision to transform its successful digital innovations, such as **UPI** and the **Modular Open-Source Identity Platform (MOSIP)**, into **global public goods**. This reaffirms India's commitment to international collaboration on **Digital Public Platforms (DPPs)**.

What is Digital Public Platforms (DPPs)

DPPs are essential, **open, and interoperable digital infrastructure solutions** that provide key public services:

- **Key Services:**
  - **Digital Identity:** For example, **Aadhaar**.
  - **Digital Payments:** For example, **UPI** (Unified Payments Interface).

- **Data Exchange Frameworks:** For example, **DigiLocker** and **Account Aggregator**.

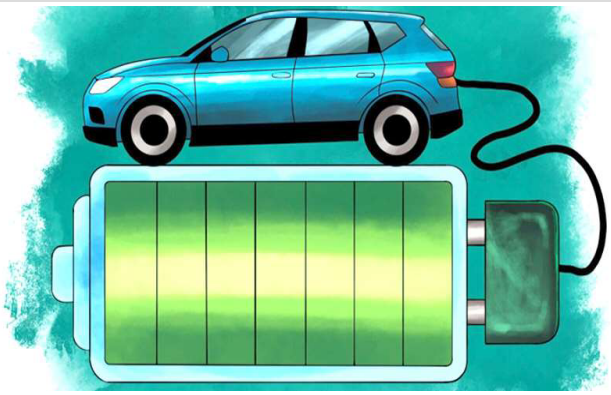
- **Core Features:**
  - **Open Architecture:** Allows **innovation** by both private and public sectors.
  - **Interoperability:** Enables **seamless integration** across different sectors and platforms.
  - **Scalability:** Efficiently and cost-effectively handles **large user volumes**.

India's Global Leadership

India is recognized as a **global leader** in the development and deployment of DPPs.

- **UPI's Global Reach:** India's digital payments system, **UPI**, is being studied or adopted by several countries, including **France, Singapore, and Sri Lanka**.
  - *Economic Impact:* A 1% increase in UPI transaction volume is linked to an estimated **0.03% rise in GDP growth**.
- **MOSIP (Modular Open-Source Identity Platform):** Developed at IIIT-Bangalore, MOSIP is a **free, secure, and scalable** system for building national digital identity systems. It is currently being **adopted or explored by 27 countries** to design and manage their sovereign digital identity infrastructure.

WTO Dispute: China Challenges India's EV Subsidies



Why in News?

- **China** has filed a complaint against **India** with the **World Trade Organization (WTO)**. China alleges that India's extensive **electric vehicle (EV) and battery subsidies** create an **"unfair competitive advantage"** for domestic manufacturers, thereby breaching international trade rules.

China's Allegations Against India

China claims that India's subsidy programs violate key WTO obligations:

- **Breach of National Treatment Principle:** This principle mandates that imported goods must be treated **no less favorably than domestic goods** once they enter a market. China argues that by heavily subsidizing domestic EV makers, India is discriminating against foreign competitors.
- **Agreement on Subsidies and Countervailing Measures:** China asserts that India's substantial subsidies—estimated to be around **46% cost aid** for best-selling EVs (including GST cuts, tax waivers, and Production-Linked Incentive support)—are far higher than those in other major economies (10–26%) and are **distorting fair competition**.
- **Prohibited Import Substitution Subsidies:** China claims the subsidies are conditional on using **domestic goods instead of imported ones**. This practice, which favors domestic EV industries over foreign competitors, is considered a form of financial aid that unfairly distorts international trade.

Key EV Subsidy Schemes in India

The Indian government has implemented several central and state-level schemes to promote the domestic EV and battery manufacturing ecosystem:

- **FAME India Scheme** (Faster Adoption and Manufacturing of Electric Vehicles).

- **PM e-Drive Scheme**.
- **Production-Linked Incentive (PLI) Scheme** for Advanced Chemistry Cell (ACC) Batteries.
- **State-Level Incentives:** Many states, like Karnataka, offer additional support through tax exemptions or reduced registration fees for EVs.

EPFO Eases Withdrawal Rules to Enhance 'Ease of Living'

Why in News?

- The **Central Board of Trustees (CBT)** of the **Employees Provident Fund Organisation (EPFO)** has approved new guidelines for partial and premature withdrawal of Provident Fund (PF) funds.
- These reforms aim to **enhance the "ease of living"** for subscribers by simplifying processes, liberalizing withdrawal limits, and ensuring a financial safety net.

EPF New Withdrawal Provisions 2025

The new rules focus on streamlining access to PF funds while protecting the long-term retirement corpus of the employee.

1. Simplified Partial Withdrawal Rules

- **Categories: 13 complex withdrawal provisions** have been merged into **three simplified categories** for partial withdrawal:
    - **Essential Needs** (Illness, Education, Marriage).
    - **Housing Needs**.
    - **Special Circumstances** (e.g., natural calamity, lockouts, continuous unemployment, without needing to specify a detailed reason).
- **Withdrawal Limits Liberalized:** Withdrawals for **education** are now allowed up to **10 times** and for **marriage** up to **5 times**, a significant increase from the previous combined limit of three for both purposes.
- **Minimum Service:** The requirement of minimum service has been uniformly reduced to just **12 months** for all partial withdrawals.
- **Contribution Access:** Members can now withdraw from **both the employee and employer contributions**.

2. Premature and Final Settlement Changes

- **Unemployment Withdrawal:**
    - **Immediate Withdrawal: 75% of the PF balance** can be withdrawn immediately after one month of leaving a job.
    - **Full Withdrawal:** The full **100% withdrawal** (final settlement) is now allowed only if the member remains unemployed for **12 months** (extended from the previous 2 months).
- **Minimum Balance Rule:** Members must maintain **at least 25% of their contribution balance** at all times. This aims to ensure a financial cushion and preserve a minimum retirement corpus, allowing the member to continue earning the high rate of interest and compounding benefits.
- **Pension Withdrawal Timeline:** The final **pension amount** (under EPS-95) can be withdrawn only after **36 months** of exit, extended from the earlier 2 months. This change is designed to discourage early full withdrawals, especially since many members had small balances, and to help them accumulate a sufficient pension corpus.

WHAT is the Employees Provident Fund (EPF)

The EPF is the cornerstone of social security for organized sector employees in India.

- **About:** EPF is a **social security and retirement savings scheme** for salaried employees,

governed by the **Employees' Provident Funds & Miscellaneous Provisions Act, 1952**.

- **Administration:** It is administered by the **Employees' Provident Fund Organisation (EPFO)** under the Ministry of Labour and Employment.
- **Membership:** Mandatory for employees in establishments with **20 or more persons** from the date of joining.
- **Contribution:** Both **employers and employees** contribute around **12% of the employee's wages** (Basic + Dearness Allowance) to the contribution accounts. The funds earn interest, which is declared annually by the Government of India.
- **EPFO's Three Schemes:** EPFO administers:
    1. **Employees' Provident Fund (EPF), 1952** (Retirement Savings).
    2. **Employees' Pension Scheme (EPS), 1995** (Pension after 58 years of age, subject to minimum 10 years of service).
    3. **Employees' Deposit Linked Insurance (EDLI), 1976** (Insurance benefits).

EDITORIALS

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Economics

Restoring Fiscal Autonomy: Challenges in Centre-State Fiscal Relations After GST Reforms

Why in news

- The way the Centre and States share money in India is changing. The **Goods and Services Tax (GST)** system has been updated with **simpler tax rates**, and a special fund (**GST compensation cess**) that helped States is now gone.
- This change is expected to put about **₹ 2 lakh crore** back into people's pockets, helping to **increase buying and selling**.
- However, many **States are worried** that they will **lose money** and that the Central government is getting **too much financial power**. They want the rules for sharing taxes to be reviewed to keep the spirit of **cooperation** (called cooperative federalism) alive.

Key Challenges in Centre-State Fiscal Relations

The main issues come from the Central government holding most of the money-making power, making States rely on them too much:

- **End of GST Compensation Cess:** The special tax (**cess**) that guaranteed States a certain amount of revenue growth is **removed**. States that don't have many factories and mainly just buy things are finding this difficult because they will now have to manage with less guaranteed money.
- **Erosion of Fiscal Autonomy:** Before GST, State governments could decide on many tax rates. Now, almost all tax decisions are made by the **GST Council**, where the **Centre holds the most power**, reducing the States' ability to raise their own money.
- **Skewed Revenue Sharing:** Even though the rules say States should get a big share of Central taxes (**41%**), the actual money they receive from the total taxes collected by the Centre is going down.

Finance Commission	Recommended share on shareable pool (in %)	Actual share on GTR (in %)
13Th FC	32	28
14th FC	42	32
15th FC up to 2023-24	41	31

- **Cess and Surcharge Mechanism:** The Central government uses **special extra taxes and fees** (like Cesses and Surcharges) that, by law (**Article 270**), it doesn't have to share with the States. In 2025–26, this money was a large amount (**₹ 4.23 lakh crores**), which reduces the effective share for States.
- **Heavy Dependency on Central Transfers:** States rely on the Central government for nearly half (**44%**) of their income, and some poor States like Bihar rely on it for as much as **72%**. This makes them financially weak.
- **Vertical Fiscal Imbalance:** The Central government has the power to collect most of the money, but State governments have to pay for most of the services (**like health, police, and education**). States spend **52% of the total public money** but only collect **33% of the tax revenue**, creating a big gap.
- **Political and Administrative Frictions:** The system of Central transfers (including grants) is seen as not always being **fair or transparent**, leading to fears of **political bias**.

How does the Indian Constitution Regulate Central-State Fiscal Relations?

The rules for financial relations are set out in the Indian Constitution:

- **Part XII (Articles 264–300A):** This section contains all the rules about taxes, funds, and borrowing power for both the Central and State governments.
    - **Article 275** allows the Centre to give **Grants-in-aid** (financial help) to States for special programs.
- **Article 269A (GST Rule):** Says that GST collected on trade between States will be collected by the Central government but **shared** with the States based on the advice of the **GST Council**.
- **Division of Taxation Powers:** The Constitution defines who can tax what in the **Seventh Schedule**:
    - **Union List:** Includes Income Tax, Corporate Tax, Customs, and Excise on most goods.
    - **State List:** Includes taxes on farm income, land, buildings, and excise on alcohol.
- **Finance Commission (Article 280):** A committee that meets every five years to tell the President:
    - How to divide the taxes collected by the Centre between the **Centre and the States**.
    - The rules for giving special grants to States.

What Measures can be Taken to Restore the Fiscal Autonomy of States?

To make the system fairer, experts suggest these changes:

- **Reviewing Finance Commission Mandates:** Make the rules for sharing money clearer and reward States that manage their finances well, not just those that are financially backward.
- **Sharing Personal Income Tax (IT) Base:** Propose splitting the tax collected on people's incomes (Personal Income Tax) **50:50** between the Centre and the States. This would give high-income States more money and reduce their need for Central transfers.
- **Surcharge on Central Taxes:** Allow States to add a **small extra tax** (surcharge) on the Central Income Tax. This would let them raise their own money quickly if they need it.
- **Strengthening Institutional Mechanism:**
    - Add **Petrol, Alcohol, and Property** under the GST umbrella to create one unified market and increase overall tax income for states.
    - Make the **Inter-State Council** stronger (under **Article 263**) to better solve financial disagreements between the Centre and States.

- **Adopt International Models:** Consider copying a model like **Canada's**, where the local governments collect and spend more of the total tax money, giving them greater freedom.

Conclusion

The recent GST changes are a step towards boosting economic growth, but they highlight the urgent need to rebalance the financial relationship. Giving **States more financial power** is essential for a healthy and **cooperative federalism** in India.

CPSEs Reclassification: Modernizing Public Sector for Vision 2047

Why in News?

- The Government of India is planning to **overhaul the system for classifying and assessing** Central Public Sector Enterprises (**CPSEs**) by introducing **two new 'Ratna' categories**. These will be added to the existing designations of **Maharatna, Navratna, and Miniratna** to better reflect modern economic priorities.
- The **Department of Public Enterprises** (under the Ministry of Heavy Industries and Public Enterprises) is responsible for granting these statuses based on a CPSE's financial performance.

Key Aspects of the CPSEs' Reclassification

The planned changes are focused on making CPSEs more competitive and aligning them with India's long-term national economic goals.

- **New Evaluation Parameters:** The assessment will move beyond simple financial metrics to include:
  - **Corporate Governance** standards.
  - **Succession Planning** and leadership development.
  - **Capital Expenditure** and **Dividend Payout** performance.
  - Commitment to **Sustainable Business Practices**.
  - **Alignment with India's Vision 2047** (the goal of becoming a developed nation by 2047).
- **Re-evaluation Committee:** A **10-member committee**, headed by **Cabinet Secretary T.V. Somanathan**, is conducting this comprehensive review. Its report is expected before the **Union Budget 2026–27**.
- **Objective of Revision:** The primary goal is to **modernize the public sector** and develop **next-generation CPSEs** capable of **global competitiveness**. The focus is on increasing **accountability, efficiency**, and using resources strategically in sectors crucial for India's future economic security.

What are CPSEs?

A **Central Public Sector Enterprise (CPSE)** is a company **majority-owned and controlled by the Government of India**.

- **Ownership Criterion:** At least **51% of its shares** must be held by the **Central Government**, either directly or indirectly through other CPSEs. This definition also includes their subsidiaries.
- **Formation:** They are legal entities that are either **incorporated under Indian company law** (like the Companies Act, 2013) or **created 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.

Current Ratna Categories

The existing 'Ratna' status grants greater autonomy and financial power to these government-owned companies.

- **Current Status:** India currently has **14 Maharatna, 26 Navratna, and 74 Miniratna** firms.
- **Significance:** This status provides firms with **financial and operational independence** in key areas like:
    - **Capital Spending** limits.
    - Forming **Joint Ventures**.
    - Making **Investments**.

Nutrient Based Subsidy (NBS) Rates Approved for Rabi Season

Why in News?

- The **Union Cabinet**, led by Prime Minister Narendra Modi, has approved the new **Nutrient Based Subsidy (NBS) rates** for **Phosphatic and Potassic (P&K) fertilizers** for the upcoming **Rabi season 2025–26** (effective from **October 1, 2025 to March 31, 2026**). This decision aims to keep fertilizers **affordable** for farmers while adjusting the subsidy to reflect the latest **global price trends** of input materials.

What is the Nutrient Based Subsidy (NBS) Scheme?

The NBS Scheme is a critical policy tool used by the Government of India to manage fertilizer costs and promote balanced crop nutrition.

- **About:** It is a **central sector scheme** launched in **2010** by the **Department of Fertilizers, Ministry of Chemicals and Fertilizers**. Its core objective is to ensure that **P&K fertilizers** are available at **affordable prices** to farmers and to encourage the **balanced application** of nutrients for sustainable agriculture.
- **Coverage:** The scheme covers **28 grades of P&K fertilizers**, including key products like **Di-Ammonium Phosphate (DAP)** and various **NPKS grades**.
- **Subsidy Mechanism:**
    - The government fixes a **specific, fixed amount of subsidy per kilogram** for each nutrient: **Nitrogen (N), Phosphorus (P), Potash (K), and Sulphur (S)**. This is decided on an annual or bi-annual basis.
    - The subsidy is paid directly to the manufacturers/importers based on the nutrient content in the fertilizer.
- **Pricing:** P&K fertilizers are **decontrolled** under NBS, allowing companies to fix the **Maximum Retail Price (MRP)**, which the Government monitors to ensure it remains reasonable and affordable.

- **Urea Exclusion: Urea is not covered** under the NBS Scheme; its MRP remains fixed by the government at **₹ 242 per 45-kg bag** since 2018.

Challenges with the Nutrient Based Subsidy (NBS) Scheme

Despite its benefits, the NBS framework faces several challenges that impact its effectiveness and sustainability.

- **Imbalanced Fertilizer Use:** The fixed, low MRP of Urea (excluded from NBS) heavily incentivizes its overuse. This leads to an **imbalance** in nutrient application (too much nitrogen and too little P&K), causing **long-term soil degradation** and threatening food security.
- **Fiscal Strain:** The fertilizer subsidy is one of India's largest government expenditures after food, placing a significant burden on the **fiscal deficit**. Rising global prices for inputs exacerbate this strain.
- **Import Dependence:** India is highly dependent on imports for key inputs (**25% for urea, 90% for phosphates, and 100% for potash**). This exposes the country to **global price shocks and supply chain disruptions**.
- **Environmental Impact:** The overuse of nitrogen-rich fertilizers contributes to **groundwater pollution** and increased **greenhouse gas emissions**.

Reforms Needed to Strengthen the NBS Scheme

To achieve its goal of sustainable agriculture, the NBS scheme requires key policy adjustments.

- **Bring Urea under NBS:** The **Commission for Agricultural Costs and Prices (CACP)** has recommended including urea in the NBS framework. This would ensure **uniform subsidy treatment** for all major nutrients and promote balanced fertilizer use.
- **Link Subsidies to Soil Health:** Subsidies should be linked to **Soil Health Card data** to encourage farmers to apply nutrients based on region-specific needs and promote **customized fertilizer blends**.
- **Cap Excessive Usage:** Introduce a **limit on the number of subsidized fertilizer bags** per farmer to prevent diversion and misuse. Subsidies should be better targeted using **Aadhaar-linked and Direct Benefit Transfer (DBT) systems**.
- **Encourage Alternatives:** Provide **financial incentives** for the use of **organic, bio, and nano fertilizers** to improve soil health and reduce dependence on chemical inputs.

RBI's Strategic Gold Repatriation: Boosting India's Reserves

Why in News?

- The **Reserve Bank of India (RBI)** has significantly **stepped up its gold repatriation** efforts, bringing back nearly **64 tonnes of gold** from abroad between April and September 2025.
- This move has pushed India's total **gold reserves** to **USD 108 billion**. Over the last decade, the share of gold in India's foreign exchange reserves has almost **doubled**, rising from less than 7% to nearly **15%**.

As of September 2025, the RBI holds a total of **880.8 tonnes of gold**, distributed as follows:

- **In India:** 575.8tonnes
- **Abroad (Bank of England & Bank for International Settlements):** 290.3 tonnes
- **As Deposits:** 14tonnes

Key Reasons Behind the RBI's Increase in Gold Reserves

The surge in gold reserves is a strategic measure driven by global economic and geopolitical considerations.

- **Diversification of Forex Reserves:** India's forex reserves are predominantly held in **US dollars and euros**. Increasing gold holdings provides essential **risk diversification**, protecting the reserves from the impact of **currency volatility** and market fluctuations.
- **Hedge Against Global Uncertainty:** Gold serves as a classic **safe-haven asset** during periods of global stress, such as **wars, high inflation, or financial instability**. Rising **geopolitical tensions** and market uncertainty are prompting the RBI to boost gold holdings as a vital **safety buffer**.
- **De-dollarization Trend:** Central banks worldwide, including those in **China, Russia, Turkey, and Poland**, are actively purchasing gold to reduce their **US dollar dependence**. The RBI's gold accumulation aligns with this global **de-dollarization trend**, aiming to enhance India's **monetary autonomy**.
- **Strong Returns and Reserve Security:** Gold prices generally show **long-term appreciation** and often outperform fiat currencies during uncertainty, ensuring **asset gains** and the overall security of India's reserves.
- **Domestic Factors and Prudent Management:** Part of the accumulation includes gold acquired from **domestic banks** that import it. This strategic move, which adds to reserves **without depleting foreign currency**, reflects a return to **prudent reserve management** lessons learned from past financial crises (e.g., the 1991 crisis and the 2008 Global Financial Crisis).

India's Foreign Exchange Reserve

India's Foreign Exchange Reserves stood at **USD 702.28 billion** as of October 2025. The total reserves are composed of four key components:

Component	Description	Value (October 2025)
Foreign Currency Assets (FCA)	Assets held in currencies like the US dollar, euro, pound sterling, and Japanese yen.	USD 570.411 billion
Gold Reserves	The reserve of gold maintained by the RBI.	USD 108.546 billion
Special Drawing Rights (SDR)	A reserve asset created by the IMF to supplement member countries' reserves.	USD 18.722 billion
Reserve Tranche Position (RTP)	The difference between India's IMF quota and the IMF's holdings of India's currency, withdrawable without stringent conditions.	USD 4.602 billion

Why the RBI Stores Part of India's Gold Reserves Abroad

The RBI strategically diversifies its gold storage locations for security and liquidity purposes.

- **Geopolitical Risk Mitigation:** Diversifying storage across global financial hubs (e.g., **London, New York, and Zurich**) prevents **over-concentration** of assets and ensures access even during severe disruptions or regional crises.
- **International Liquidity:** Storing gold in major global hubs facilitates its **quick conversion to cash** or its use in international markets, ensuring **high liquidity** when the country needs foreign currency access.
- **Economic Resilience:** Overseas gold reserves can be easily **pledged or swapped** with global institutions like the **IMF** or **Bank for International Settlements (BIS)** to quickly raise foreign currency, which is crucial for meeting financial obligations during crises.
- **Trusted Custodians and Security:** Institutions like the **Bank of England** and **BIS** provide **secure, reliable frameworks** and vaults featuring **advanced security measures** (e.g., reinforced structures, biometric access, 24/7 monitoring) for maximum protection of the sovereign asset.

Conclusion

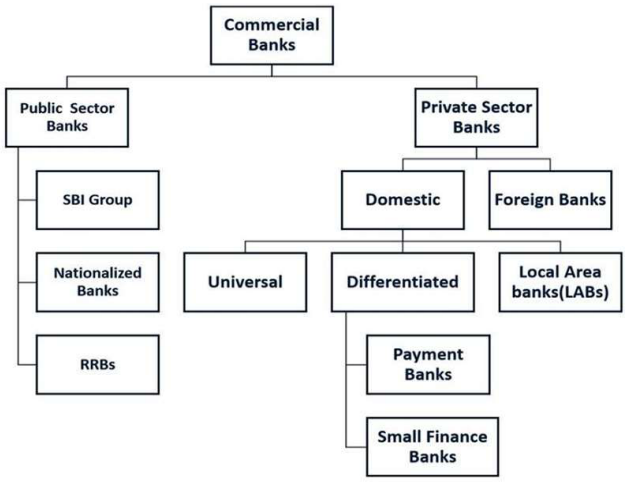
The RBI's accelerated gold repatriation and accumulation represent a **strategic move to de-risk India's sovereign assets** from potential financial and geopolitical threats. By increasing its gold holdings and diversifying its reserves, India is significantly enhancing its **economic sovereignty and financial security** in an increasingly uncertain global environment.

RBI Rejects Jana SFB's Universal Bank Application

Why in News?

The **Reserve Bank of India (RBI)** has **returned Jana Small Finance Bank's (SFB) application** to transition into a **universal bank**. The rejection was based on the bank's **non-fulfilment of eligibility criteria** outlined in the RBI's **2024 guidelines** for Small Finance Banks looking to upgrade their license.

What is a Small Finance Bank (SFB)?



SFBs are a specialized category of private banks established with the core mandate of furthering financial inclusion in India.

About and Origin

- **Role:** SFBs are private institutions created to enhance **financial inclusion** by offering basic banking services—including deposits and credit—to **unserved and underserved groups**. This includes small farmers, micro-industries, and informal sector enterprises.
- **Genesis:** The concept was announced in the **Union Budget 2014–15** and originated from the recommendations of the **2009 Raghuram Rajan Committee's** *A Hundred Small Steps* report.

Eligibility and Capital Requirements

Requirement	Details
Promoter Eligibility	Resident individuals/professionals with 10 years of experience in banking/finance, or existing NBFCs, MFIs, and Local Area Banks (LABs) owned and controlled by residents.
Minimum Net Worth	**₹200 crore** is the minimum paid-up voting equity capital/net worth required. For Primary (Urban) Co-operative Banks converting to SFBs, the initial requirement is ₹100 crore, to be increased to ₹200 crore.
Promoter's Contribution	The promoter's initial contribution must be **40%**, which must be reduced to **26% within 12 years**.

Regulatory and Operational Norms

- **Status:** SFBs are **full-fledged banks**, regulated under the **Banking Regulation Act, 1949**, and supervised by the **RBI**. They must adhere to prudential norms like maintaining **CRR** (Cash Reserve Ratio) and **SLR** (Statutory Liquidity Ratio).
- **Priority Sector Lending (PSL):** SFBs must allocate **75% of their Adjusted Net Bank Credit (ANBC)** to PSL. Furthermore, **at least 50% of their loan portfolio** must be of value **up to ₹ 25 lakh**.
- **Branch Network:** While they have no geographical restrictions, **25% of their branches** must be located in **unbanked rural centres**.
- **Permissible Activities:** They can distribute non-banking products like **mutual fund units, insurance, and pension products** (with regulator approval) and may become a **Category II Authorised Dealer** in foreign exchange. They cannot establish subsidiaries for non-banking activities.

RBI's 2024 Guidelines for Universal Bank Conversion

The RBI sets stringent requirements for SFBs wishing to transition to the status of a Universal Bank.

- **Eligible Applicants:** Only **listed Small Finance Banks (SFBs)** are eligible to apply for conversion.

- **Financial Requirements:** The applicant must possess a **minimum net worth of ₹ 1,000 crore**, must have achieved **scheduled bank status**, and demonstrate a **profitable operational record** for at least **five years**.
- **Asset Quality Criteria:** The SFB must consistently maintain:
    - **Gross NPAs (Non-Performing Assets) below 3%**.
    - **Net NPAs below 1%**.
    - These criteria must be met consistently for the **previous two years**.

The rejection of Jana SFB's application indicates that the bank failed to satisfy one or more of these crucial eligibility benchmarks.

Anusandhan National Research Foundation's SARAL tool

Why in News?

- On **October 1, 2025**, the **Anusandhan National Research Foundation (ANRF)** unveiled its **SARAL tool**.
- It is an **AI-based system** designed to **simplify complex scientific research** and make it accessible to the general public through videos, podcasts, posters, and presentations.

What is SARAL?

- **SARAL** stands for: **Simplified and Automated Research Amplification and Learning**

Key Features:

- **AI-powered tool** developed by ANRF.
- Converts **complex scientific research papers** into **layperson-friendly formats** like:
    - Short **videos**
    - **Podcasts**
    - **Infographics/posters**
    - **Presentations**
- Designed to **democratize science** by making research more understandable and shareable.

Objective of SARAL:

- Bridge the gap between **scientific communities** and the **general public**.
- Promote **science communication** and **public engagement**.
- Encourage wider **public and private sector investment** in R&D by making research outputs more visible and intelligible.

About Anusandhan National Research Foundation (ANRF):

- **India's premier science funding agency**, established to overhaul India's research ecosystem.
- Replaces the **Science and Engineering Research Board (SERB)**.
- Functions as a **single-window clearance system** for funding scientific research across academia and industry.

Major Functions:

- Funding for **deep science and engineering research**.
- Promotion of **deep-tech innovations and start-ups**.
- Building an **AI Science and Engineering Open India Stack** to support:
    - Drug and chemical discovery
    - Aerospace and climate design
    - Advanced materials
    - Weather prediction

Funding & Budget:

- Part of the **₹ 1 lakh crore Research Development and Innovation (RDI) Scheme** approved in **July 2025**.
- Offers **low-interest, long-tenure loans** to private companies to invest in **core R&D**.
- **70% of funding expected from private sector**.
- Governing Council will guide fund allocation to priority sectors.

Significance :

1. Promotes Scientific Temper:

- Makes science more **inclusive and accessible** in line with **Constitutional duties (Art 51A(h))**.

2. Boosts Innovation Ecosystem:

- Encourages **industry-academia collaboration**.
- Supports India's vision of becoming a **global innovation hub**.

3. Enables Evidence-Based Policy Making:

- Easier access to scientific insights can improve **policy interventions** in areas like climate, health, and technology.

4. Empowers Start-ups and MSMEs:

- Facilitates **translation of research into products**, aiding India's **Make in India** and **Digital India** missions.

As US shuts doors, India-UK partnership can be a launch pad for growth

Why in News

- On **8 October 2025**, UK Prime Minister **Keir Starmer** visited India with a large business delegation.
- The visit comes amidst rising **economic tensions with the US**, including **50% tariffs** imposed on Indian exports by **US President Donald Trump**.
- The visit reinforces the importance of the **India–UK Comprehensive Economic and Trade Agreement (CETA)** as a tool for trade diversification and economic cooperation.

Importance of India–UK CETA

Broad Coverage

- **Covers over 99% of tariff lines** in **industrial** and **agri-products**.
- Demonstrates India's capability to conclude comprehensive trade deals.
- **Prepares ground** for future negotiations with the **EU** and **signals to the US** not to push India diplomatically or economically.

Trade Targets

- **Current bilateral trade (2024–25)**:
  - Goods: $23 billion
  - Services: $33 billion
  - **Total**: $56 billion
- **Goal**: Double to **$120 billion by 2030**

India's Trade Surplus with the UK

Trade	India's Exports	India's Imports	Surplus
Goods	$12.9 billion	$8.4 billion	☑
Services	$19.8 billion	$13 billion	☑

India enjoys surplus in both goods and services.

Strategic Opportunity Amid US Tariffs

- With **Trump's tariffs** affecting sectors like **gems, jewellery, textiles**, and **footwear**, the UK becomes a **potential hedge market**.
- CETA can help offset part of the US trade loss by:
  - Opening new markets
  - Reducing dependency on the US
  - Enhancing bargaining power in global trade talks

Key Sectoral Opportunities for India in UK

Sector	UK Imports (2023–24)	India's Share	Potential
Gems & Jewellery (HSN 71)	$92.7 bn	$0.6 bn	High
Textiles & Apparel (HSN 61–63)	$22.3 bn	$1.59 bn	High
Leather & Footwear (HSN 42, 64)	$8.5 bn	$453 mn	Moderate
Pharmaceuticals (HSN 30)	$30 bn	Competitive Edge	Strategic
Machinery & Engineering (HSN 84, 85)	$167.4 bn	Low	Growth Area

Why It Matters:

- UK's top import sources: China, US, Germany.
- India's current share is small — **CETA can level the playing field** by removing high tariffs.
- **Tariff elimination** in CETA helps:
    - Indian textiles compete with **Bangladesh** and **Vietnam**
    - Leather and footwear gain edge over **China** and **Vietnam**

UK Market Access – Tariff Trends

Product	Pre-CETA Tariff	Post-CETA Tariff	Competitive Position
Apparel	9–12%	0%	On par with Vietnam/Bangladesh
Footwear	8.04%	Reduced	Cheaper vs China (13%)
Gems/Jewellery	1.16%	Reduced	Potential gain
Scotch & Gin	150% → 75% → 40%	Gradual	UK export gain

Benefits for the UK

- **Alcoholic beverages**: India to **cut tariffs on Scotch & Gin** to:
    - 75% immediately
    - 40% over 10 years (negotiable to 5 years)
- **Machinery, defence equipment**, **medical devices**, and **clean energy tech** seen as strong UK export prospects.
- India's openness will boost **balanced trade** and **credibility of CETA**.

Key Challenges for India

Structural Barriers

- **Customs delays**: India (17.3 days) vs China (3.3) & Bangladesh (6.7)
- **Regulatory cholesterol** (as termed by Manish Sabharwal)
    - Complex rules
    - Compliance burdens
    - Fragmented approvals

Competitor Advantage

- Many peers have existing FTAs or favourable schemes:
    - **Canada–UK TCA**
    - **Bangladesh – Developing Countries Trading Scheme**
    - **Vietnam, Singapore, Australia – CPTPP**

What India Must Do

Policy Support

- Targeted export incentives
- Boost competitiveness in high-potential sectors

Structural Reforms

- **Improve access to capital**
- **Accelerate trade facilitation**
    - Digitised customs
    - Infrastructure at ports
- **Ease of Doing Business** reforms
- **Integrate industrial clusters**
    - Shared testing facilities
    - Quality assurance labs
    - Logistics & warehousing

Key Points : India–UK Comprehensive Economic and Trade Agreement (CETA)

1. Political & Diplomatic Engagement

- First official visit of UK PM Keir Starmer to India.
- Strong affirmation of the **India–UK Comprehensive Strategic Partnership**.
- Emphasis on:
    - **Global peace**, **stability**
    - **Rules-based international order**
    - **Regional and multilateral cooperation**

2. Economic and Trade Cooperation

CETA (India–UK Comprehensive Economic and Trade Agreement)

- Historic trade agreement signed in July 2025.
- Leaders reaffirmed commitment to its **early ratification**.
- Establishment of **Joint Economic and Trade Committee (JETCO)** to monitor and guide CETA.

Investment Focus Areas

- Infrastructure, construction, clean energy
- Defence, advanced manufacturing
- Education, culture, fintech, science & innovation
- Consumer goods and food industry

Key Initiatives

- **India–UK Infrastructure Financing Bridge (UKIIFB)** between NITI Aayog and City of London Corporation.
- CEO Forum held on sidelines of the summit.

3. Science, Technology & Innovation

Technology Security Initiative (TSI)

- Collaboration on **critical and emerging technologies**:
  - **AI, 6G**, Non-Terrestrial Networks, telecom cybersecurity
  - Critical minerals, health tech, engineering biology

Major Announcements

- **India–UK Connectivity & Innovation Centre**
  Focus: AI-native 6G, NTNs, Cybersecurity | Funding: £24 million (Phase 1)
- **India–UK Joint Centre for AI**
  Focus: Responsible AI in **health, climate, fintech**
- **Critical Minerals Collaboration Guild**
  - Phase 2 of Supply Chain Observatory
  - Satellite campus at **IIT-ISM Dhanbad**
- **Biotech Collaborations**
  Partnerships in Biomanufacturing, 3D Bioprinting, Genomics
  Involved: CPI (UK), BRIC (India), IISc, Henry Royce Institute, Oxford Nanopore

4. Defence & Security Cooperation

Joint Exercises & Maritime Security

- Expansion of **joint military exercises** and **capacity building**
- **Royal Navy's KONKAN exercise** with Indian Navy
- **UK Carrier Strike Group** port call to India
- Creation of **Regional Maritime Security Centre of Excellence (RMSCE)** under IPOI

Strategic Agreements

- **IAF–RAF joint training** (Flying Instructors)
- **Govt-to-govt deal** for **Lightweight Multirole Missiles (LMM)**
  Supports **Atmanirbhar Bharat**
- **Inter-Governmental Agreement (IGA)** on **Electric Propulsion Systems** for Indian Navy

Counter-Terrorism

- Condemnation of terrorism (incl. April 2025 Pahalgam attack)
- Focus on:
  - Radicalisation, terror financing, cross-border terrorism
  - New tech use by terrorists
  - UN & FATF collaboration
  - Joint judicial, intelligence, and anti-terror efforts

5. Climate & Energy

Joint Climate Action

- **India–UK Climate Finance Initiative**
  - Aim: Unlock green finance and green growth
- Joint investment in **Climate Tech Start-up Fund** (UK Govt + SBI)

Renewable Energy

- **Offshore Wind Taskforce** created
- Explore cooperation under **Global Clean Power Alliance (GCPA)**

6. Education, Culture & People-to-People Ties

Higher Education Collaboration

- First batch of Indian students at **University of Southampton (Gurugram)**

- Campuses in India:
    - LoIs issued to:
        * University of Liverpool
        * University of York
        * University of Aberdeen
        * University of Bristol
    - **GIFT City Campuses**:
        * Queen's University Belfast
        * Coventry University
        * Approval: University of Surrey
        * LoI: Lancaster University (Bengaluru)

Cultural Exchanges

- **Programme of Cultural Cooperation** (signed May 2025)
- Focus on youth, creative industries, tourism, sports

Migration & Diaspora

- **Migration and Mobility Partnership (MMP)** to:
    - Address irregular migration
    - Promote legal migration channels
- UK Indian diaspora recognised as a **"living bridge"**.

7. Regional & Multilateral Cooperation

Reform of Multilateral Institutions

- UK reiterated support for **India's permanent membership** in a reformed **UNSC**
- Joint commitment to **reformed multilateralism**

Commonwealth

- Strengthen cooperation on:
    - Climate action
    - Sustainable development
    - Youth engagement

8. Significance of the Visit

- Strengthens India–UK **Comprehensive Strategic Partnership**.
- Boosts cooperation in **trade, defence, technology, education, and climate**.
- Reinforces shared values of **democracy, innovation, and sustainability**.
- Positions both nations as **21st-century partners** in global leadership.

India's Duty-Free Tariff Preference (DFTP) Scheme – WTO Recognition 2025

Why in News

- According to the latest **WTO Report (October 2025)** titled *"Market Access for Products and Services of Export Interest to Least Developed Countries,"* **India has surpassed China and the European Union (EU)** in providing the **widest duty-free market access** to **Least Developed Countries (LDCs)**.
- The WTO has **credited India's DFTP Scheme (2008)** for **boosting exports** from some of the world's poorest economies—particularly in **Asia and Africa**—and strengthening **South-South trade cooperation**.

About Duty-Free Tariff Preference (DFTP) Scheme

Aspect	Details
Launched	2008
Objective	To grant **duty-free or preferential tariff access** to exports from **LDCs** to the Indian market.
Implemented by	Ministry of Commerce & Industry, Government of India
Coverage (2025)	94.1% of all tariff lines are duty-free — among the **broadest market access programmes** globally.
Beneficiaries	35+ LDCs including **Bangladesh, Nepal, Bhutan, Myanmar, Tanzania, Ethiopia** etc.
Key Export Sectors Covered	Coffee, tea, leather, textiles, agricultural products, minerals, processed food, handicrafts.
Preferential Margin	Average 15.1 percentage points across all goods; 29.7 points for agricultural goods.

Global and Trade Context

- **India is now the 5th-largest destination** for LDC exports (6.8% share, $21.5 billion in 2024). Ahead are: **China (25%)**, **EU (17%)**, **UAE (12%)**, and **USA (9%)**.
- LDC exports to India mainly include **minerals, agricultural commodities, and textiles**.
- **Global LDC exports** reached **$277 billion (2024)**, growing at **6.7% annually**, with India's DFTP playing a key enabling role.

Key Features of the DFTP Scheme

1. **Duty-Free Market Access:**
    - 94.1% of tariff lines covered (approx. 98% of trade value).
    - Tariff concessions across sectors like agriculture, textiles, leather, and handicrafts.
2. **Eligibility:**
    - Available to all **UN-recognized LDCs** (48 nations globally).
    - India currently extends benefits to 35+ countries.
3. **Non-Discriminatory Access:**
    - Offered **without political quid pro quo** — purely developmental and trade-facilitating.
4. **Trade Facilitation + Development Focus:**
    - Supports diversification of LDC exports and economic growth.
    - Aligns with **India's "Neighbourhood First"** and **"Act East"** policies.

WTO Findings & Recognition

Parameter	India's Status (as per WTO)
Tariff coverage	94.1% (highest among developing economies)
Preferential margin (avg.)	15.1 percentage points
Agricultural preferential margin	29.7 percentage points
Global standing	India among few developing countries (with Korea & Montenegro) offering >90% duty-free access
Developed countries offering 100% access	Australia, New Zealand, Norway, Switzerland

Significance of India's DFTP Scheme

Dimension	Significance
Trade Integration	Helps LDCs integrate into global value chains and diversify exports.
South-South Cooperation	Reinforces India's commitment to equitable growth among developing nations.
Diplomatic Leverage	Strengthens India's position as a responsible leader of the **Global South**.
Regional Stability	Deepens trade and economic ties with neighboring and African LDCs.
Soft Power Tool	Enhances India's global image as a development-oriented and inclusive economy.
Economic Benefit to India	LDC exports (minerals, textiles) complement India's industrial needs.

Comparison with Major Economies

Country/Region	Coverage of Tariff Lines	Nature of Access
India	94.1%	Broadest among developing nations
China	~97% (selective)	Resource-driven access
EU (EBA)	~92%	"Everything But Arms" initiative
Korea, Montenegro	>90%	Developing country peers
Australia, NZ, Norway, Switzerland	100%	Developed nations offering full coverage

Strategic and Economic Implications for India

- Enhances **regional influence** and credibility in multilateral trade forums.
- Serves as a **counterbalance to China's model** of engagement with LDCs.
- Strengthens India's voice in **WTO reform and Global South cooperation**.
- Encourages **inclusive trade**, fostering trust and stability in South Asia and Africa.

Challenges & Way Forward

Challenge	Suggested Solution
Underutilization by LDCs	Increase awareness, simplify customs procedures.
Complex Rules of Origin	Streamline and digitize certification processes.
Weak Trade Infrastructure	Enhance connectivity, logistics, and port capacity with LDC partners.
Monitoring Effectiveness	Set up regular review mechanisms under Ministry of Commerce.

RBI exempts sovereign-backed SWAMIH Fund from Alternate Investment Fund (AIF) Rules

Why in News

- **On** 24 October**,** The **Reserve Bank of India (RBI)** decided to **exempt the Special Window for Affordable and Mid-Income Housing (SWAMIH) Fund** — a **sovereign-backed real estate rescue fund** — from its **tightened rules for Alternate Investment Funds (AIFs)**.
- The exemption aims to allow **continued debt financing** to **stressed and stalled housing projects**, ensuring liquidity and completion of homes for buyers.

Background

- In **2023**, the **RBI** asked **banks and non-banking financial companies (NBFCs)** to **raise provisions** for their investments in **AIFs**, including sovereign funds, **if they were also lenders to the same underlying projects**.
- This was part of measures to **curb indirect lending risks** and prevent **ever-greening of loans**.
- These rules were **partially eased in March 2024,** but the **government sought a complete exemption** for **sovereign-backed AIFs** citing their **"socio-economic purpose"**.
- The **RBI** accepted this request in **October 2025**, providing a **specific exemption** for the **SWAMIH Fund**.

Current Regulatory Framework for AIF Investments

Parameter	Existing Rule	Exemption for SWAMIH
Single regulated entity's investment in an AIF	Capped at **10%** of the scheme's corpus	**Exempted**
Total combined investment by all lenders	Limited to **20%** of the scheme's corpus	**Exempted**
Provisioning requirement	Higher provisions if banks/NBFCs also lend to the same projects	**Not applicable to SWAMIH**

About Alternate Investment Funds (AIFs)

- **Alternative Investment Funds (AIFs)** are **privately pooled investment vehicles** that collect funds from **Indian or foreign investors** for investing in **non-traditional asset classes** like **private equity, venture capital, real estate, hedge funds, etc.**
- They offer exposure to **alternative investment opportunities**, providing **diversification** and **higher return potential** compared to traditional instruments like mutual funds or equities.

Regulation

- Regulated by the **Securities and Exchange Board of India (SEBI)** under the **SEBI (Alternative Investment Funds) Regulations, 2012**.

Classification of AIFs by SEBI

Category	Investment Focus	Examples & Description
Category I AIFs	Invest in ventures that are **socially or economically beneficial**	**Venture Capital Funds (including Angel Funds)** – early-stage startups with high growth potential. **SME Funds** – financing for small and medium enterprises. **Social Venture Funds** – address social issues, promote sustainability. **Infrastructure Funds** – invest in infrastructure projects like roads, bridges, renewable energy.
Category II AIFs	Funds that do not take excessive leverage; focus on **private equity, debt, or distressed assets**	**Private Equity Funds** – invest in established companies for expansion or restructuring. **Real Estate Funds** – residential, commercial, or industrial projects. **Distressed Asset Funds** – invest in NPAs and turnaround opportunities. **Fund of Funds** – invest in other AIFs for diversified exposure.
Category III AIFs	Use **leverage and complex strategies** for high-risk, short-term returns	**Hedge Funds** – use derivatives, short-selling, and leverage for high returns. **PIPE Funds (Private Investment in Public Equity)** – invest in listed companies through private placements at discounted prices.

AIFs and Economic Growth

- **AIFs fuel India's economic development** by channeling funds into **startups, SMEs, and infrastructure projects**.
- **Category I AIFs** in particular boost **entrepreneurship, innovation, and employment**.
- **Foreign investors** increasingly use AIFs to participate in **India's alternative markets**, contributing to **FDI inflows** and capital market deepening.

About SWAMIH Fund (Special Window for Affordable and Mid-Income Housing Fund)

Particulars	Details
Launched on	**6 November 2019**
Announced by	**Government of India**
Nodal Ministry	**Ministry of Finance**
Managed by	**SBICAP Ventures Ltd**, a unit of **State Bank of India (SBI)**
Investor Base	Government of India, State Bank of India (large investor), LIC, and other institutions
Corpus Raised	Approximately **₹15,530 crore**
Nature	**Sovereign-backed social impact fund**
Objective	To **provide priority debt financing** for **stalled residential projects** in the **affordable and mid-income housing segment**
Key Role	Acts as a **"lender of last resort"** for housing projects that conventional lenders avoid due to risk
Targeted Projects	Includes projects of: - Established developers with poor track record of stalled projects - **NPA accounts** - **Projects with customer complaints or litigation issues** - **First-time developers**
Implementation Approach	One of the **largest domestic real estate private equity teams**, focusing on **monitoring and funding completion** of stressed residential projects
Achievements (as of early 2025)	- **Over 50,000 housing units completed** - Helped revive stalled housing projects across multiple cities - Injected liquidity and restored confidence in the real estate sector

About SWAMIH Fund II

Feature	Details
Announced in	**Union Budget 2025–26 (1 February 2025)**
Allocation/Corpus	**₹15,000 crore**
Objective	To **expedite completion of 1 lakh (100,000) additional housing units** in stressed projects
Model	**Blended finance facility** combining contributions from the **Government**, **banks**, and **private investors**
Target Beneficiaries	**Middle-class homebuyers** who are: - Paying **EMIs on home loans** for delayed apartments - Paying **rent for current dwellings** simultaneously
Sectoral Impact Expected	- Inject liquidity into the housing market - Restore **trust and confidence** in developers and buyers - **Assist completion** of delayed projects - **Stabilize the real estate segment**

Significance of RBI's Exemption

Economic Significance

- Enables **uninterrupted funding** to the affordable housing segment.
- Prevents sudden **liquidity crunch** in sovereign-backed funds.
- Supports **real estate sector recovery**, a key driver of **employment and GDP growth**.
- Avoids **project delays** that could affect middle-income buyers and developers.

Social Significance

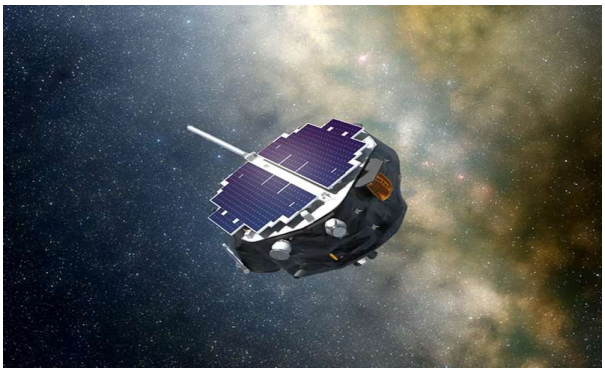
- Helps **families waiting for possession** of homes in stalled projects.
- Reduces **financial stress** for homebuyers paying both **EMIs and rent**.
- Promotes **affordable housing**, aligning with government's *Housing for All* vision.

Governance Significance

- Reflects **coordinated approach** between **RBI** and **Ministry of Finance**.
- Balances **financial prudence** with **public-purpose developmental goals**.
- Strengthens **trust in regulatory flexibility** for socio-economic objectives.

❐❐❐

Interstellar Mapping and Acceleration Probe (IMAP)



Why in news

The Interstellar Mapping and Acceleration Probe (IMAP) was recently launched by NASA to investigate how solar particles are energized and how the heliosphere shields our solar system, with a focus on improving space weather forecasting.

1. Key Facts and Location

Aspect	Detail
Mission Type	Space Physics/Astrophysics Research Satellite
Agency	NASA (National Aeronautics and Space Administration)
Primary Goal	To **map the boundary** of the heliosphere and trace energetic particles.
Mission Location	**First Earth-Sun Lagrange Point (L1)**, approximately one million miles from Earth towards the Sun.
Primary Focus	The **heliosphere**, the protective "bubble" created by the Sun's constant flow of charged particles (**solar wind**).
Output	Real-time observations and data to monitor and predict **space weather**.

2. Mission Objectives

The Interstellar Mapping and Acceleration Probe (IMAP) aims to achieve several fundamental science goals:

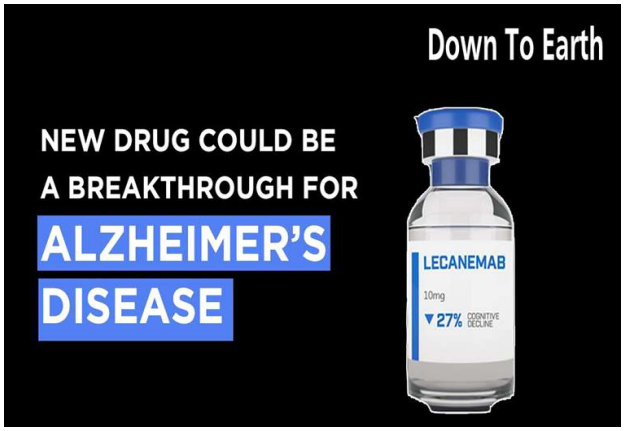
- **Boundary Mapping:** Map the heliosphere's boundary, where the solar wind meets the interstellar medium.
- **Particle Acceleration:** Uncover the fundamental physics of how solar particles and energetic cosmic rays are accelerated to high energies.
- **Shielding Mechanism:** Increase the understanding of how the heliosphere shields life within the solar system from high-energy **cosmic rays**.
- **Space Weather Forecasting:** Support real-time observations of the solar wind and energetic particles to improve the forecasting of solar wind disturbances and particle radiation hazards.
- **Cosmic Neighborhood:** Draw a picture of our nearby galactic neighborhood and help determine some of the basic cosmic building materials of the universe.

3. Components and Instrumentation

IMAP is equipped with **10 scientific instruments**, each designed to detect different particles or phenomena in the space environment:

- **Energetic Neutral-Atom (ENA) Detectors:** Instruments like **IMAP-Lo**, **IMAP-Hi**, and **IMAP-Ultra** capture neutral atoms that were once charged ions but became neutral after acquiring electrons. These ENAs allow scientists to "see" the distant boundaries of the heliosphere.
- **Charged Particle Detectors:** Instruments that detect charged particles directly, providing crucial data on the solar wind and cosmic rays.
- **Ancillary Instruments:** Other components are designed to measure **magnetic fields**, analyze **interstellar dust**, and study the structure of the **solar wind**.

Lecanemab Drug



Why in News

Australia has recently granted approval for the use of Lecanemab in treating early-stage Alzheimer's disease.

About Lecanemab

- Type: Monoclonal antibody drug developed specifically for the early phases of Alzheimer's disease
- Purpose: Targets and slows Alzheimer's progression by acting against amyloid proteins in the brain, aiming to address the root cause rather than just treat symptoms

How Lecanemab Works

- Utilizes antibodies to identify and attach to amyloid, a protein that accumulates in the brain
- Stimulates the brain's immune cells to clear excess amyloid build-up, which is believed to be toxic to nerve cells
- Clearing amyloid deposits may prevent cell death and slow deterioration of memory and cognitive abilities
- Administration: Delivered intravenously (directly into the vein via a drip)

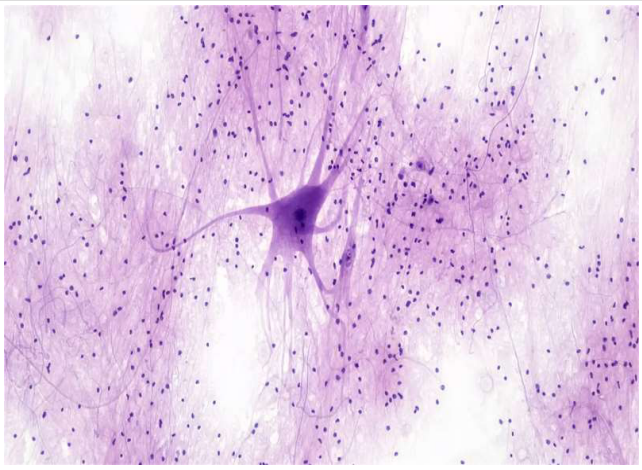
Efficacy and Challenges

- Clinical Trial Data: Shows a 27% reduction in disease progression among patients with early-stage Alzheimer's
- Issues: High cost and possible side effects—such as brain swelling—affect accessibility and create safety concerns

What is Alzheimer's Disease?

- A progressive brain disorder marked by gradual loss of memory and thinking skills, and ultimately an inability to complete everyday tasks
- Leading cause of dementia, which refers to severe loss of memory and cognitive abilities that interfere with daily activities
- Statistics: Responsible for 60–80% of dementia cases
- Impacts regions of the brain that control reasoning, memory, and language
- Generally affects those aged 65+; only 10% of cases are seen in younger individuals

Neurons and Dendritic Nanotubes



Why in News?

A new study (2025) has identified **Dendritic Nanotubes (DNTs)** in the brains of mice and humans, revealing a **new form of neuron-to-neuron connection** that challenges the traditional understanding of brain communication.

About Neurons (Nerve Cells) :

- **Fundamental Units:** Neurons are the **fundamental units** of the brain and nervous system.

- **Core Functions:** They are specialized cells responsible for:
    - **Receiving sensory input** from the environment.
    - **Sending motor commands** to muscles.
    - **Processing and transmitting electrical and chemical signals.**

Structure of a Neuron :

A neuron typically consists of three main parts, which work together to transmit information:

- **Dendrites:** Tree-like structures that **receive incoming signals** from other neurons.
- **Cell Body (Soma):** The central part that contains the nucleus and is responsible for **integrating signals.**
- **Axon:** A long, slender projection that **carries electrical impulses** away from the cell body toward other cells.
- **Axon Terminals:** The ends of the axon that **release neurotransmitters** at synapses.

Neuronal Communication (Traditional Vs. New Discovery)

Feature	Traditional Understanding (Synapses)	New Discovery (Dendritic Nanotubes)
Mechanism	Neurons communicate via **synapses**—tiny gaps where chemical messengers (neurotransmitters) are released.	Neurons may also connect via **Dendritic Nanotubes (DNTs)**, which are long, thin membrane bridges.
Connection Type	**Chemical:** Communication is mediated by neurotransmitters crossing the synaptic cleft.	**Direct Physical:** Allows for direct, physical continuity between the cytoplasm of two neurons.
Function	**Signal Transfer:** Transmits electrical signals chemically across the gap.	**New Functions Identified:** Enables **direct electrical signal transfer** and **protein transport** (including pathological proteins like amyloid-beta, which is linked to Alzheimer's disease).

This discovery of DNTs suggests a previously hidden neural network that may play a role in both normal brain function and the spread of neurodegenerative diseases.

Trichloroethylene (TCE)

Why in News?

A recent study suggests that spending a lot of time exposed to the industrial chemical **Trichloroethylene (TCE)** in the outdoor environment may be linked to a greater chance of developing **Parkinson's disease** later in life.

What is Trichloroethylene (TCE)?

- **What it is:** TCE is a **human-made chemical**—a colorless liquid that evaporates easily into the air. It has a slightly sweet, chloroform-like smell.
- **Where it comes from:** It is made through chemical processes and **does not occur naturally** in the environment.

Uses of Trichloroethylene

TCE is mainly used because it is an excellent **solvent** (a chemical that dissolves things).

- **Industrial Use:** It is primarily used to **remove grease** from metal equipment (called "degreasing"). It is also used to make other chemicals, like **refrigerants**.
- **Household Use:** You might find it in small amounts in some common products like:
    - Cleaning wipes and aerosol cleaners
    - Paint removers and adhesives

- Carpet cleaners and spot removers (it was historically used in dry cleaning).

How People Are Exposed and its Impact

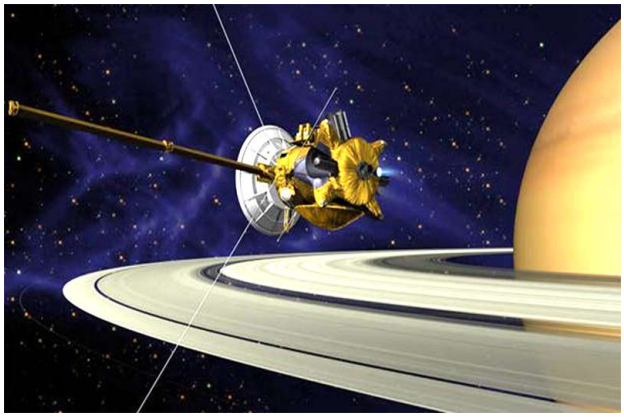
1. Environmental Exposure

- **Stays a Long Time:** TCE breaks down very slowly, so it can remain in the **groundwater** and soil for a long time after a spill or improper disposal.
- **Exposure Paths:** People can be exposed by:
  - **Breathing** it in, either outside or inside homes (it can evaporate from contaminated groundwater into indoor air, known as **vapor intrusion**).
  - **Drinking** contaminated water.
  - **Eating** food that was washed or processed with contaminated water.

2. Health Risks

- **Cancer Risk:** Long-term exposure to TCE may increase the risk of developing **liver or kidney cancer**.
- **Organ and Reproduction:** It can cause **liver problems** and affect the immune system. It has also been linked to issues like **infertility** in both men and women and can cause heart defects in unborn babies.
- **Nervous System:** New evidence strongly suggests a link between TCE exposure and neurological conditions like **Parkinson's disease** and non-Hodgkin lymphoma.

The Cassini-Huygens Mission : Unveiling Saturn's Ocean Worlds



Why in News?

Recent analysis of data collected by **NASA's Cassini spacecraft** has uncovered more compelling evidence that **Saturn's icy moon Enceladus** may possess conditions favorable for life.

Researchers have re-examined data from a 2008 high-speed flyby and identified **complex organic molecules** within the ice plumes erupting from the moon's subsurface ocean. These compounds are precursors to amino acids—the fundamental building blocks of proteins—and strengthen the case that Enceladus contains the essential ingredients for habitability: **liquid water, a source of energy, and carbon-based organic elements**.

Overview of the Cassini Spacecraft

The Cassini-Huygens mission stands as one of the most significant and complex joint projects in deep space exploration.

- **International Collaboration:** It was a cooperative effort between **NASA**, the **European Space Agency (ESA)**, and the **Italian Space Agency (ASI)**.
- **Mission Goal:** To conduct an extensive, detailed study of the planet **Saturn**, its spectacular ring system, and its numerous, diverse moons.
- **Timeline:** Launched in **October 1997**, the spacecraft successfully entered Saturn's orbit in 2004 and operated for 13 years before its mission conclusion.
- **End of Mission:** The mission ended on September 15, 2017, when the **Cassini Orbiter** performed a controlled plunge into Saturn's atmosphere. This "Grand Finale" maneuver was executed to ensure the spacecraft, which carried Earth microbes, would never accidentally contaminate a potentially habitable ocean world like Enceladus or Titan.

- **Components:**
    - **Cassini Orbiter (NASA):** The primary spacecraft and the first to orbit Saturn. It housed 12 sophisticated instruments, including **Radar** for penetrating Titan's haze and a **Magnetometer**.
    - **Huygens Probe (ESA):** A small lander that successfully descended onto **Titan**, marking the first-ever landing on a moon in the outer solar system.

Major Scientific Objectives and Discoveries

The Cassini mission's vast amount of data has fundamentally altered our understanding of the Saturnian system.

Core Objectives

- Investigate the composition, temperature, and dynamics of **Saturn's atmosphere**.
- Map the structure, stability, and processes within the **Ring System**.
- Characterize the atmosphere and surface of **Titan**, searching for complex molecules and seasonal changes.
- Explore the structure and composition of **Saturn's vast magnetosphere**.

Landmark Discoveries

- **Enceladus:** The detection of powerful, icy geysers confirmed the existence of a **global ocean of liquid water** beneath the ice shell and provided evidence for hydrothermal activity on the seabed, identifying it as a major candidate for potential extraterrestrial life.
- **Titan:** Revealed a surprisingly Earth-like geology with a weather cycle driven by **liquid methane and ethane**, forming lakes, rivers, and rain. The Huygens probe sent back images of a solid, icy surface below the thick, nitrogen-rich atmosphere.
- **Saturn:** Captured the first complete views of the persistent, bizarre **North Polar Hexagon**—a huge, six-sided jet stream—and observed gigantic planetary storms.
- **Rings:** Showed that the rings are dynamic and constantly changing, revealing vertical structures and the effects of small "shepherd" moons.

Spotlight on Enceladus

- **Characteristics:** Enceladus is a small, relatively smooth, and highly reflective moon of Saturn.
- **Geological Significance:** Its interior is geologically active, with gravitational flexing from Saturn (tidal heating) believed to be the energy source that keeps the subsurface water liquid and drives the cryovolcanic activity (the ice geysers).
- **Search for Life:** The recent analysis confirms that the organic molecules essential for life (carbon, hydrogen, nitrogen, oxygen) are being actively ejected from the ocean, making Enceladus a priority target for future astrobiology missions.

Dark Stars

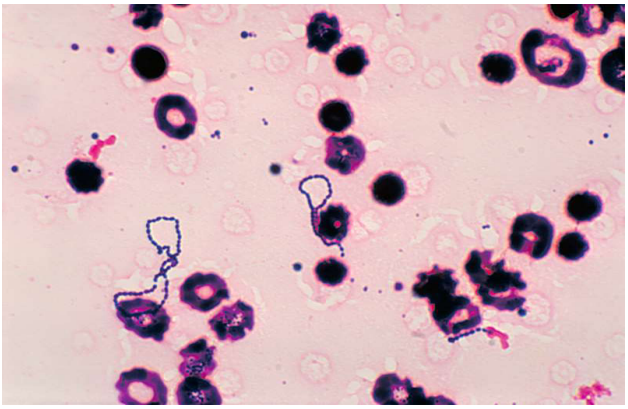
Why in News?

- The **James Webb Space Telescope (JWST)** has provided the **most compelling hints yet** for the existence of **"dark stars,"** a hypothetical type of star powered by **dark matter annihilation** instead of nuclear fusion.
- Recent studies analyzing JWST data of extremely distant, bright objects from the **Cosmic Dawn** (the universe's first few hundred million years) suggest their spectra and morphology are **consistent with supermassive dark stars** rather than ordinary early galaxies.

About Dark Stars

- **Definition:** Dark stars are **hypothetical objects** that are thought to be the **first phase of stellar evolution** in the early universe.
- **Power Source:** They are powered by the **self-annihilation of Weakly Interacting Massive Particles (WIMPs)**—a leading dark matter candidate—that are gravitationally concentrated in the star's core. This annihilation releases energy that heats the star.
- **Structure and Size:**
    - o They are composed mostly of **hydrogen and helium** (ordinary matter), with a small fraction of mass in dark matter.
    - o Since dark matter heating prevents the star from collapsing sufficiently to ignite nuclear fusion, they remain **puffy, giant clouds** (hundreds to thousands of times wider than the Sun).
    - o They are relatively **cool** (surface temperatures around 10,000 K) but **extremely luminous**—as bright as a small, early galaxy.
- **Luminous, Not Dark:** Despite the name, they are not actually "dark"; they **shine extremely bright** from the heat generated by dark matter annihilation.

Viridans Streptococc



Why in News?

- A **new study** by Tampere University (Finland) examined coronary arteries from **121 sudden-death autopsies**.
- The study found that **Viridans streptococci** were the **most frequent species**, present in about **42%** of both autopsy and surgical cases.
- This research highlights the bacteria's role in the formation of sticky protective layers called **biofilms** deep inside atherosclerotic plaques.

About Viridans Streptococci

- **Type of Bacteria:** Group of **gram-positive cocci** (spherical bacteria).
- **Location:** Commensals (normal flora) in the **gastrointestinal, respiratory, and female genital tracts**. Most prevalent in the **oral cavity** (common oral bacteria).
- **Associated Disease:** Commonly associated with **infective endocarditis (IE)**, typically colonizing previously damaged cardiac tissue.
- **Function in Arteries:** Can form **biofilms** (sticky bacterial layers) deep inside **atherosclerotic plaques**.
- **Immune Evasion:** Biofilms act as **protective layers** that allow the bacteria to survive, evading the body's immune system.

How do Oral Bacteria Trigger Heart Attacks?

- **Hiding:** The **biofilm** formed by *Viridans streptococci* remains hidden inside the fatty plaque.
- **Release/Inflammation:** Parts of the biofilm can **break loose**. Once released, the bacteria trigger **inflammation** in the artery wall.
- **Plaque Rupture:** The inflammation weakens the **fibrous "cap"** covering the fatty plaque.
- **Heart Attack:** This weakening makes the plaque more likely to **rupture**, which is a critical event that leads to **clot formation** and, ultimately, a heart attack.

Diethylene Glycol (DEG) Poisoning and Regulatory Crisis

Why in News?

- The toxic industrial chemical **Diethylene Glycol (DEG)** has recently come under intense scrutiny in India following the deaths of at least **14 children in Madhya Pradesh** (and subsequent reports suggesting a higher number of casualties in MP and Rajasthan).
- These deaths are directly linked to the consumption of a contaminated medication, the **Coldrif cough syrup**, which was found to contain dangerous levels of the contaminant. This tragedy is the latest in a recurring pattern of mass poisoning events in India and globally, which has led to urgent action from regulatory bodies, including a crackdown on the manufacturing unit and a global alert from the World Health Organization (WHO).

About Diethylene Glycol (DEG)

Diethylene glycol is a chemical that has caused multiple mass poisoning events worldwide when it is fraudulently or mistakenly used as a substitute for safe pharmaceutical solvents.

- **Chemical Properties:**
  - It is a clear, colourless, odourless, and hygroscopic liquid .
  - It is miscible (soluble) in both water and many organic compounds.
  - Crucially, it has a **sweetish taste**, which is one reason it is sometimes illegally substituted for pharmaceutical-grade ingredients like Glycerin or Propylene Glycol, especially in syrups for children.
- **Industrial Use:**
  - It is primarily an **industrial chemical** used in products such as:
    - Antifreeze
    - Brake fluids
    - Solvents
    - Precursor to plasticizers and resins
    - Humectant for tobacco, cork, and glue
- **Toxicity and Human Consumption:**
  - **It is not intended for human consumption.** The maximum permissible limit of DEG in medicines, as a contaminant in excipients like Propylene Glycol or Glycerin, is typically **0.1 percent**.
  - When ingested, DEG is metabolized in the body, primarily in the liver, into toxic compounds like **Diglycolic Acid (DGA)**.
  - DGA is a potent toxin that causes severe **kidney damage**, leading to **Acute Kidney Injury (AKI)**, anuria (inability to urinate), and often **death**.
  - Symptoms can include nausea, vomiting, abdominal pain, and lethargy, often progressing rapidly to fatal renal failure.

The Coldrif Syrup Tragedy and Regulatory Response

The recent incident in India highlights severe regulatory and manufacturing failures:

- **Contamination Level:** Laboratory tests confirmed that the contaminated batch of Coldrif syrup contained up to **48.6% diethylene glycol**, which is hundreds of times the acceptable safety limit of **0.1%**.
- **Cause of Contamination:** The contamination is suspected to have occurred due to the **illegal use of industrial-grade DEG** as a cheaper

substitute for pharmaceutical-grade solvents (like Propylene Glycol) by the manufacturer, Sresan Pharmaceuticals.

- **Action Taken:**
    - The manufacturer, Sresan Pharmaceuticals, has had its license revoked and the facility was sealed for over **300 violations** of Good Manufacturing Practices (GMP) and Good Laboratory Practices (GLP).
    - The owner, along with a doctor and wholesalers involved in the supply chain, have been arrested.
    - The Union Health Ministry in India has ordered strict compliance with the revised **Schedule M norms** (Good Manufacturing Practices) under the Drugs and Cosmetics Act, 1940, which includes new requirements for supply chain traceability and mandatory DEG/EG testing.

International Telecommunication Union (ITU) : AI for Good and Global Connectivity

Why in News?

- The **Department of Telecommunications (DoT)** of India and the **International Telecommunication Union (ITU)** recently co-hosted the **'AI for Good Summit'** at the **India Mobile Congress (IMC) 2025** in New Delhi.
- This collaboration highlights India's leading role in advancing a **responsible, ethical, and inclusive Artificial Intelligence (AI) ecosystem** and the global efforts by the ITU to leverage AI for achieving the **United Nations Sustainable Development Goals (SDGs)**, particularly in sectors like healthcare, agriculture, and public service delivery.

About International Telecommunication Union :

The International Telecommunication Union is the **United Nations specialized agency** for information and communication technologies (ICTs), dedicated to connecting all the world's people.

- **Establishment and History:**
    - It was established in **1865** as the **International Telegraph Union**, making it one of the oldest international organizations.
    - In **1947**, the ITU officially became a **specialized agency of the United Nations**.
- **Nature:** It is an **intergovernmental organization** that coordinates between governments and private sector bodies on global telecommunication and ICT services.
- **Membership:** It has a robust membership of **194 countries** and over **1,000 companies, universities, and international and regional organizations**.
- **Headquarters: Geneva, Switzerland**.
- **India and ITU: India** has been an active member of the ITU since **1869** and has been a regular member of the ITU Council since **1952**.

Core Functions of the International Telecommunication Union (ITU)

1. **Allocate Global Resources:** Allocate the **global radio spectrum** and coordinate **satellite orbits** to ensure their efficient and equitable use by all nations.

2. Standardization: Coordinate and set **technical standards** (Recommendations) that ensure global telecommunication and ICT networks, systems, and equipment seamlessly **interconnect** (e.g., country codes, mobile roaming).
3. **Development:** Work to improve **access to ICTs** and bridge the **digital divide** in underserved communities and developing countries worldwide.

India Mobile Congress (IMC) 2025

The India Mobile Congress (IMC) is **Asia's largest technology forum**, providing a platform for the entire ICT and digital ecosystem.

- **Organization:** It is jointly organised by the **Department of Telecommunications (DoT)** and the **Cellular Operators Association of India (COAI)**.
- **Focus:** The event brings together global leaders to explore the innovations that are shaping the future of connectivity, digital transformation, and the evolving role of AI, particularly focusing on **5G/6G, quantum technology, cybersecurity,** and the **IndiaAI Mission**.

Key Highlights of the 'AI for Good Summit' at IMC 2025 :

The summit, titled **"AI for Good – Impact India" Conference 2025**, had significant outcomes and discussions:

- **National Priorities:** It aimed to leverage AI to address Indian national priorities, including **healthcare, agriculture, climate resilience,** and **digital inclusion**, aligning with India's vision of **'Viksit Bharat'** (Developed India).
- **AI Governance and Ethics:** Discussions stressed the need for **global partnerships** and **ethical frameworks** to address challenges such as **AI misuse, deepfakes, voice cloning, financial fraud**, and **data privacy**.
- **Network Evolution:** Telecom leaders highlighted the crucial role of AI in moving from 5G to **6G** networks, making them more **intelligent, self-healing, and autonomous**.
- **Innovation Showcase:** The event featured the **Innovation Factory initiative**, a collaborative platform by DoT and ITU that showcased numerous AI startups developing solutions for global challenges.

Keratoconus

Why in News?

A **recent joint study** by the LV Prasad Eye Institute (LVPEI) and the Royal Victorian Eye and Ear Hospital has revealed that keratoconus, a vision-threatening condition, **can worsen even after treatment**, specifically **Corneal Collagen Cross-Linking (CXL)**.

About Keratoconus

Keratoconus is a progressive **vision disorder** that occurs when the normally round **cornea** (the clear, dome-shaped front part of the eye) becomes **thin and irregular** (cone-shaped) .

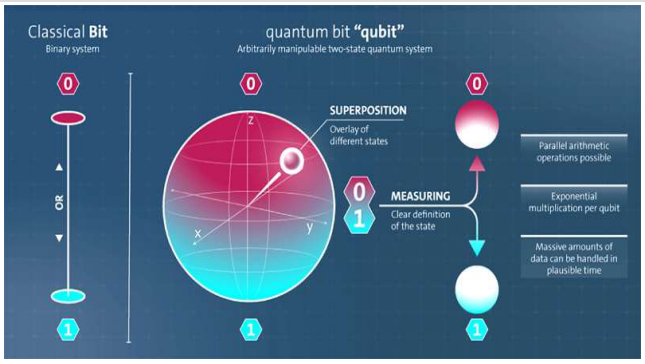
- This abnormal shape **prevents the light entering the eye from being focused correctly** on the retina, causing distortion of vision, irregular astigmatism, and myopia.
- **Onset:** It often starts when people are in their late teens to early 20s.
- **Progression:** The vision symptoms slowly get worse over a period of about 10 to 20 years, often stabilizing by the fourth decade of life.

- **Affected Eyes:** It frequently affects both eyes and can lead to very different vision between the two eyes. Symptoms can differ in each eye and change over time.
- **Causes:** The exact causes are not fully clear but are thought to involve genetic makeup and environmental factors like chronic eye rubbing and chronic eye inflammation (e.g., from allergies). The cornea weakens because the **collagen fibers** that hold its shape become weak.

Treatment and Prevention

- **Prevention:** There is **no known prevention** for keratoconus, but patients are strongly advised to **stop rubbing their eyes** as it is a significant risk factor for progression.
- **Early Stages:** Can be treated with **glasses** or soft contact lenses. As the disease progresses, specialized hard contact lenses (like Rigid Gas Permeable or Scleral lenses) are often needed for better vision correction.
- **Slowing Progression: Corneal Collagen Cross-Linking (CXL)** is a procedure designed to stop or slow down the progression of keratoconus by strengthening the corneal tissue.
- **Advanced Stages:** If the disease continues to progress or is very severe, surgical interventions may be needed:
    - **Intracorneal Ring Segments (ICRS) or Corneal Allogenic Intrastromal Ring Segments (CAIRS):** Implantable rings used to flatten the cornea and improve vision.
    - **Corneal Transplantation:** May be needed to restore sight when the cornea is too scarred or severely thinned. Keratoconus is a leading cause of corneal transplantation.

Qubit



Why in News?

- Caltech scientists recently announced a major technological breakthrough, building the world's largest **neutral-atom qubit array** containing **6,100 qubits**. This is a significant jump from previous arrays that contained only a few hundred.
- This milestone, achieved using highly focused laser beams ("optical tweezers") to trap individual cesium atoms, is a critical step in the race toward building **fault-tolerant quantum computers** capable of effective error correction and full-scale computation.
- The team demonstrated that this unprecedented scale was achieved without sacrificing quality, maintaining a long-lasting **superposition** for about 13 seconds and manipulating individual qubits with **99.98% accuracy**.

About Qubit

A qubit, or quantum bit, is the basic unit of information used to encode data in quantum computing.

- **Definition:** It is the quantum equivalent of the traditional **bit** used by classical computers to encode information in binary.
- **The Classical Bit vs. The Qubit:**
    - **Classical Bit:** Can only exist in a state of **0** or **1**.

- **Qubit:** Is a two-level quantum system but, due to the laws of quantum mechanics, can also exist in a **linear combination of both states simultaneously**.

- **Key Quantum Property: Superposition:** The phenomenon that allows a qubit to be in both states at the same time. This is what enables quantum computers to process a vast number of possibilities in parallel.
- **Nomenclature:** The term "qubit" is attributed to the American theoretical physicist **Benjamin Schumacher**, who coined the term in 1995. He is also credited with the discovery of **Schumacher compression** (the quantum analogue of Shannon's noiseless coding theorem).
- **Physical Realisation:** Qubits are created by manipulating and measuring quantum particles (or quantum systems), such as:
  - Neutral atoms (like the Caltech array)
  - Trapped ions
  - Superconducting circuits
  - Photons
  - Semiconductor spin qubits
- **Significance:** Quantum computers using qubits can store exponentially more data than traditional bits and perform very advanced computations—such as advanced simulation and cryptanalysis—that would be impossible for classical supercomputers to complete within a human lifetime.

Types of Qubit Architectures

Different physical systems are used to build qubits, each with distinct advantages and challenges:

Qubit Type	Description	Key Advantage	Current News Example
Neutral Atoms	Individual atoms trapped in a vacuum by optical tweezers (lasers).	Highly scalable and long coherence times (stability).	Caltech's **6,100-qubit** record.
Superconducting	Tiny circuits cooled to near absolute zero to create a quantum state.	High-speed operation and maturity in manufacturing processes.	IBM's **1,121-qubit Condor** processor.
Trapped Ion	Individual ions suspended using electromagnetic fields.	Highest fidelity (lowest error rate) in gate operations.	IonQ achieving **99.99% two-qubit gate fidelity**.

Naked Mole Rat

Why in News?

- A new study into the extraordinary **longevity** and **cancer resistance** of the Naked Mole Rat has identified an evolved DNA repair mechanism unique to the species, providing potential insights into developing therapies for human aging and age-related diseases.
- The research, which focused on a protein called cyclic GMP-AMP synthase (**cGAS**), revealed that the mole-rat's version enhances DNA repair, a stark contrast to the human and mouse version which can suppress it.

About Naked Mole Rat

- **Description:** It is a small, hairless burrowing **rodent** native to parts of East Africa.
- **Distribution:** Predominantly found in southern Ethiopia, Kenya, Somalia, and Djibouti.

- **Habitat:** Inhabit drier parts of the tropical grasslands and savanna. They live in **underground burrows** that may stretch up to 5 km.
- **Food:** They are **herbivores** and feed primarily on very large tubers.
- **Social Structure:** It is **eusocial**, meaning they live in large colonies (around 70 animals) with only one breeding female (the queen) and the majority of others serving as non-breeding workers. Their lifestyle is more akin to that of bees and wasps.
- **Conservation Status:** IUCN: **Least Concern**

Characteristics of Naked Mole Rat

- **Exceptional Longevity:** They are famous for living an astonishingly long time, up to around **37 years**, nearly 10x longer than mammals of similar size. Their mortality rate does not increase with age.
- **Disease Resistance:** They are remarkable for their resistance to **cancer** and show no measurable deterioration of the brain and spinal cord.
- **Other Unique Traits:**
    - Lacks **pain sensitivity** in its skin.
    - Has very low metabolic and respiratory rates.
    - Is resistant to oxygen deprivation (**hypoxia**).
    - Is **cold-blooded** (poikilothermic), unable to control their body temperature and dependent on the outside temperature.

Key Findings of Researchers (cGAS and DNA Repair)

The recent study, published in the journal *Science*, pinpointed a molecular difference in the **cyclic GMP-AMP synthase (cGAS)** enzyme that appears to be key to their extended, disease-free lives.

- **Function of cGAS:** The protein is best known as an innate immune system sensor, but it also accumulates in the cell nucleus where it influences DNA repair.
- **Key Differences in cGAS Function:**
    - **Humans and Mice:** cGAS tends to **suppress DNA repair** via homologous recombination (HR), potentially increasing the risk of aging and cancer.
    - **Naked Mole Rats:** Evolutionary mutations in the cGAS enzyme cause it to **enhance DNA repair** (specifically HR), promoting genome stability and contributing to their longevity.
- **The Mechanism:** This functional reversal is due to **four specific amino acid substitutions** in the mole-rat cGAS structure.
    - These substitutions reduce the protein's ubiquitination and degradation, allowing it to **persist for longer** in the nucleus after DNA damage.
    - This prolonged presence allows it to act as a temporary scaffold, strengthening interactions with key repair factors like **FANCI** and **RAD50**, thereby boosting the accuracy and efficiency of DNA repair.
- **Translational Impact:** Fruit flies engineered to express human cGAS with the four naked mole-rat-specific mutations lived longer than controls. Delivering the naked mole-rat cGAS to aged mice also reduced frailty and lowered age-related inflammation markers. This discovery opens compelling possibilities for developing interventions to enhance DNA repair in human cells to combat aging and cancer.

Maitri II Station

Why in News?

The Union **Finance Ministry** recently granted in-principle approval and sanctioned a budget for the construction of **Maitri II**, which will be India's newest and fourth research station in **eastern Antarctica**. This strategic move is intended to replace the aging original Maitri station and reinforce India's long-term commitment to climate and polar research under the Antarctic Treaty System.

About Maitri II Station

- **What it is:** India's upcoming fourth research station in Antarctica, intended to replace the nearly three-decade-old Maitri-I base.
- **Location:** Proposed to be located in **eastern Antarctica**, near the existing Maitri station along the **Schirmacher Oasis**.
- **Timeline:** Construction is expected to be completed and the station fully operational by **January 2029**.
- **Nodal Agency: National Centre for Polar and Ocean Research (NCPOR)** under the Ministry of Earth Sciences (MoES) is the nodal agency responsible for the Indian Antarctic Program and the operation of the station.

Key Features of Maitri II Station

Maitri II is designed to be a significant upgrade and a model for sustainable polar research:

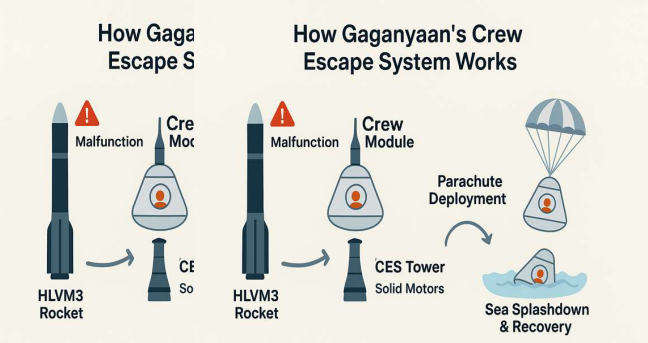
- **Size and Capacity:** It will be **larger** than Maitri-I, with enhanced facilities and better living accommodations for researchers. It is expected to accommodate up to **90 scientists**.
- **Green Research Base:** It is specifically planned as a sustainable, "green research base" to adhere to stringent environmental protocols.
- **Renewable Energy Integration:**
    - **Solar Power:** For summer expeditions.
    - **Wind Energy:** To harness the strong Antarctic winds for sustainable operations.
- **Advanced Technology:** It is planned to deploy cutting-edge, **automated instruments** onboard. These instruments will keep recording scientific data and relay it to mainland India, allowing the station to remain functional even if it is **unmanned** for certain periods.
- **Purpose:** To improve the quality of Indian scientific research, strengthen the nation's strategic and diplomatic leadership in global polar governance, and support critical studies on climate change, glaciology, and polar ecosystems.

India's Other Antarctic Research Stations

The Maitri II station will be India's fourth facility on the continent.

Station Name	Year Established	Location / Status	Key Facts
Dakshin Gangotri	1983	Queen Maud Land / **Decommissioned**	India's first station; abandoned and converted into a supply base after being buried in ice.
Maitri (I)	1989	Schirmacher Oasis, East Antarctica / **Operational (Aging)**	India's second permanent station; will be retained as a **summer camp** after Maitri II becomes operational.
Bharati	2012	Larsemann Hills, East Antarctica / **Operational**	India's third and most modern coastal station; built from 134 shipping containers.
Maitri II	Planned by 2029	Near Maitri-I, East Antarctica / **Upcoming**	India's largest and greenest planned base, replacing Maitri-I.

Crew Escape System (CES)



Why in News?

- The **Crew Escape System (CES)** is a critical safety mechanism of ISRO's **Gaganyaan Mission**, which aims to launch a crew into Low Earth Orbit (LEO). Its performance has been a central focus of recent tests.
- ISRO has successfully conducted key flight tests, notably the **Flight Test Vehicle Abort Mission-1 (TV-D1)**, which was specifically designed to demonstrate the performance of the CES and the subsequent crew module recovery sequence. This success marks a major milestone towards ensuring astronaut safety for the manned mission.

About Crew Escape System

The CES is an **emergency escape measure** designed to quickly pull the crew module along with the astronauts to a safe distance from the launch vehicle in the event of a launch abort or critical anomaly.

- **ISRO's Approach:** ISRO has adopted the **Puller type** of CES for the Gaganyaan mission, where the CES, mounted atop the crew module, uses quick-acting **solid motors** to rapidly pull the module away from the failing launch vehicle.
- **Test Vehicle:** ISRO developed a cost-effective, **single-stage Test vehicle** powered by the **Vikas engine** to rigorously validate the CES under simulated abort conditions during ascent.

Classification of CES

The CES is classified into two types based on the way it extracts the crew module:

- **Puller type:**
  - **Mechanism:** It is mounted *atop* the crew module and **pulls** the module away from the launch vehicle using solid motors.
  - **Usage:** Used in ISRO's **Gaganyaan**, the U.S.'s **Saturn V**, and Russia's **Soyuz** vehicles.
- **Pusher type:**
  - **Mechanism:** A ring of compact, high-thrust liquid-fuel engines fitted *below* the crew module **pushes** the module away from the rocket.
  - **Usage:** Used in vehicles like **SpaceX's Falcon 9** (Dragon Capsule).

Working of Crew Escape System

The operation of the CES is a fully autonomous sequence:

1. **Anomaly Detection:** The **Integrated Vehicle Health Management system (IVHM)**—a sophisticated network of sensors, electronics, and software—continuously monitors all vital vehicle and crew health parameters in real-time. It detects anomalies and decides on the need to activate the CES.
2. **Activation and Separation:** Upon activation, the CES fires its high-thrust solid motors to rapidly accelerate and pull the crew module a safe distance away from the malfunctioning vehicle within seconds.
3. **Module Release and Deceleration:** Once clear, the CES is jettisoned, and the crew module begins its descent. It is decelerated by a **multistage parachute system** which reduces the module's velocity in steps.
4. **Safe Splashdown:** The sequence is designed to ensure the module splashes down safely in the sea without exceeding the crew's physiological limits upon impact. The crew typically remains inside the module until recovery.

Sudden Infant Death Syndrome (SIDS)

Why in News?

Recent breakthroughs in metabolomics and genetic research are providing new insights into the causes of Sudden Infant Death Syndrome (SIDS), offering the potential for **simple blood tests** to identify vulnerable infants. This research is critical as SIDS remains a leading cause of infant mortality globally, and October is marked as Sudden Infant Death Syndrome month.

About Sudden Infant Death Syndrome (SIDS)

SIDS is a clinical term for the sudden and unexpected death of an infant less than one year old, for which no cause can be found even after a complete investigation.

- **Other Names:** It is sometimes known as '**cot death**' or '**crib death**'.
- **Occurrence:** Most SIDS deaths occur during the **first six months** of a baby's life, slightly more often in baby boys, and typically happens when the baby is **asleep**.
- **Possible Underlying Cause:** It is believed SIDS involves a **"Triple Risk Model,"** where a vulnerable infant (with an underlying defect, possibly brain-related, which controls breathing and waking) experiences an external trigger (like an unsafe sleep environment) during a critical developmental period.

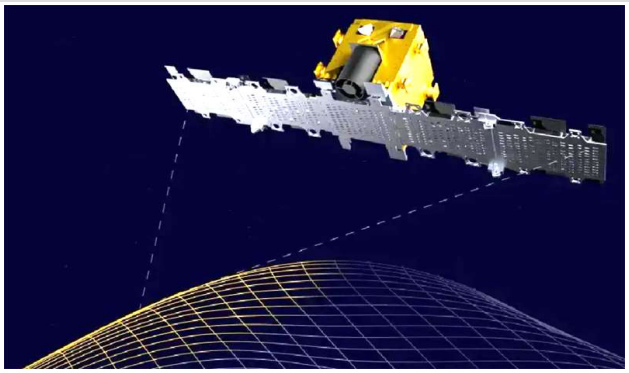
Risk Factors & Prevention Guidelines

SIDS risk is a combination of underlying biological vulnerability and environmental factors. Following safe sleep recommendations is the most effective prevention strategy.

Category	Risk Factors	Key Prevention Guidelines (Safe Sleep)
Infant/Maternal	**Premature birth** or low birth weight; A **family history** of SIDS; Exposure to **smoking/secondhand smoke** during or after pregnancy; **Poor prenatal care**.	**"Back to Sleep"**: Always place the baby on their **back** for all sleep times (naps and night).
Sleep Environment	**Unsafe sleeping positions** or environments, including soft bedding, pillows, and loose blankets; **Overheating**.	**Safe Sleep Surface**: Use a **firm, flat, non-inclined** surface (crib, bassinet, or play yard) with only a fitted sheet.
Co-Sleeping	**Sharing an adult bed** (especially if the adult is smoking, very tired, or impaired by substances/medication).	**Room-Sharing**: Keep the baby's sleep area in the **same room** as the parents, but on a **separate surface** (ideally for the first 6-12 months).
Other Protective Factors	N/A	**Breastfeeding/Human Milk Feeding** is associated with a lower risk. **Offer a pacifier** at nap and bedtime (once breastfeeding is established). Ensure **routine immunizations** are given.

Note: *The consensus from major health organizations is that **vaccines do not cause SIDS**; in fact, routine immunization may be protective against SIDS.*

Mission Drishti



Why in News?

Space-tech startup **GalaxEye**, based in Bengaluru, has announced that it plans to launch its maiden Earth observation satellite, **'Mission Drishti,'** in the **first quarter of 2026** (January–March).

About Mission Drishti

- **World's First:** It is the world's first **multi-sensor Earth Observation (EO) satellite** that integrates both Synthetic Aperture Radar (SAR) and high-resolution optical sensors on a single platform.

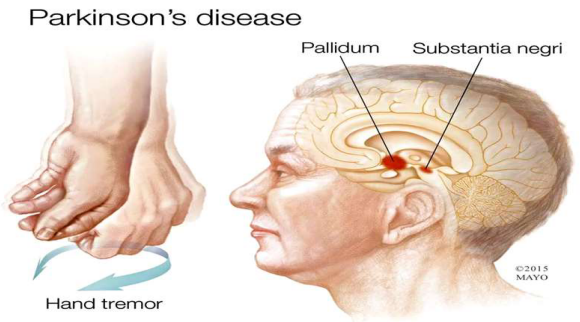
- **India's Largest Private Satellite:** Weighing **160 kg**, it is the largest privately built satellite in India and offers the country's **highest resolution** (1.5 meters) Earth imagery.
- **Constellation Plan:** This launch is the first step toward a constellation of **8-12 satellites** that GalaxEye plans to deploy by **2029** for near-real-time global coverage.

Key Features & Applications

- **All-Weather, All-Time Data:** The combination of SAR and optical payloads, utilizing GalaxEye's proprietary SyncFused Opto-SAR technology, allows it to capture high-precision data through **clouds, smoke, and at any time (day or night)**, which traditional single-sensor satellites cannot do consistently.
- **High Resolution:** It offers a spatial resolution of **1.5 meters**, which is highly detailed.
- **Proven Resilience:** The satellite has successfully passed rigorous structural tests at **ISRO's U R Rao Satellite Centre (URSC)**.
- **Range of Applications:** The resulting geospatial data will be vital for several sectors:
    - **Defence and Security** (e.g., border surveillance).
    - **Disaster Management** (e.g., rapid damage assessment).
    - **Infrastructure Monitoring** and Utilities.
    - **Agriculture, Financial, and Insurance** assessments.

This mission is a major step for India's private space sector and will provide unprecedented, actionable Earth intelligence globally.

Parkinson's Disease (PD)



Why in News?

- Recent research suggests a link between **Restless Legs Syndrome (RLS)**, a condition that compels people to move their legs, and an **increased risk** of developing **Parkinson's disease (PD)** later in life.
- A study in South Korea found that the incidence of PD was significantly higher in individuals with RLS compared to those without the condition.
- Intriguingly, the study also observed that RLS patients who were treated with **dopamine agonists**—a class of drugs used for both RLS and PD—had a decreased risk of developing PD, which may suggest that the association between the two conditions is not solely due to the breakdown of the brain's dopamine system, but may involve other underlying mechanisms.

About Parkinson's Disease (PD)

Parkinson's Disease is a **progressive neuro-degenerative disorder** that primarily affects movement.

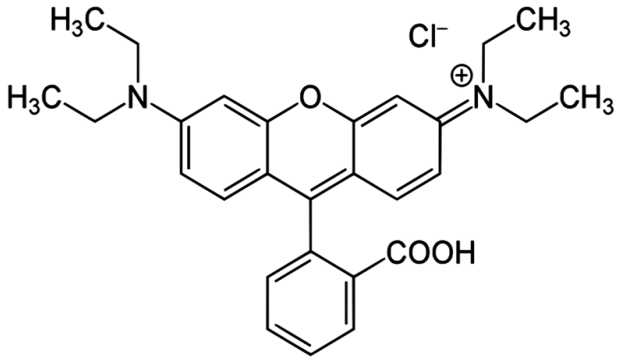
- **Cause of Symptoms:** The most common symptoms are caused by the loss of **dopamine-producing neurons** in a brain area called the **substantia nigra**. Dopamine is a crucial chemical messenger for smooth, purposeful movement.
- **Key Symptoms:** Problems with movement, **tremor** (involuntary shaking), **stiffness**, and impaired balance. As it progresses, it can lead to difficulties walking, talking, and performing simple tasks.
- **Parkinsonian Gait:** People with PD often develop a characteristic gait, which includes a tendency to lean forward, take small, quick steps as if hurrying (called **festination**), and have reduced arm swinging. They may also have trouble initiating movement ("start hesitation") or freeze suddenly while walking.

- **Who is Affected:** It typically affects **older people**, but younger people can also be affected. Men are more frequently affected than women.
- **Risk Factors:** The exact cause is unknown, but a family history of the disease increases risk. Exposure to environmental factors like air pollution, pesticides, and solvents may also increase risk.

Diagnosis and Treatment

- **Diagnosis:** Currently, there are **no definitive blood or radiological tests** to diagnose Parkinson's disease. Diagnosis is primarily clinical, based on symptoms and a neurological exam. However, new tools like the **alpha-synuclein seed amplification assay (aSyn-SAA)**, which detects misfolded alpha-synuclein proteins (a hallmark of PD) in the cerebrospinal fluid, and a **skin biopsy test (Syn-One)** are showing promise as highly accurate diagnostic aids.
- **Treatment:** While there is **no cure**, treatments can significantly help manage symptoms.
    - **Medication:** The cornerstone of therapy is **levodopa** (often combined with carbidopa), which the brain converts into dopamine to replenish the reduced supply. New formulations are being developed, including inhaled and sublingual options, as well as pump-based delivery systems for continuous infusion (like the tavapadon drug which is under FDA review).
    - **Surgery and Non-Invasive Procedures:**
        * **Deep Brain Stimulation (DBS):** A surgical procedure to help control involuntary muscle movements and severe tremor. Advances like **adaptive DBS** allow for real-time, personalized adjustments.
        * **Focused Ultrasound (FUS):** A non-invasive treatment using sound waves to reduce tremor and stiffness.
    - **New Drug Targets:** Research is focusing on **disease-modifying therapies** that aim to slow or stop PD progression by targeting the buildup of toxic **alpha-synuclein** protein.

Rhodamine B Latest Developments



Why in News?

- Rhodamine B, a synthetic dye, has recently been in the news due to multiple instances of **food adulteration bans** across various Indian states and the development of **new, highly sensitive detection techniques** for the harmful chemical.

Recent Developments on Rhodamine B

New Detection Technique using 'Coffee-Stain Effect'

- **Raman Research Institute (RRI)** scientists have developed a powerful and cost-effective technique to identify harmful dyes like Rhodamine B.
- This method leverages the **"coffee-stain effect"**—the ring left by drying droplets of a liquid—to detect the dye at incredibly low concentrations, potentially as low as **one part per trillion**.
- This technological breakthrough is aimed at creating simple, accessible test kits for toxic substances in food and water.

State-Level Bans on Rhodamine B in Food

Despite the dye being prohibited for food use by the Food Safety and Standards Authority of India (FSSAI), several Indian states have implemented specific bans and enforcement drives:

- **Karnataka** and **Tamil Nadu** have enforced bans on the use of Rhodamine B, particularly in popular street foods like **Gobi Manchurian** and **cotton candy**.
- **Puducherry** and **Himachal Pradesh** have also imposed similar bans on cotton candy after samples were found to contain the cancer-causing chemical.
- Violations of these bans carry strict penalties, including **imprisonment for up to seven years** and fines of up to **₹ 10 lakh**.

About Rhodamine B

Feature	Details
Type	Synthetic dye (fluorescent xanthene dye).
Colour	Known for its **bright pink** colour in water. Appears **green** in powder form.
Characteristics	Highly water-soluble chemical compound. Exhibits **fluorescent properties**.
Prohibited Status	Classified as **substandard and unsafe** under India's Food Safety and Standards Act (2006) for use in food.

Major Concerns and Impacts on Health

Rhodamine B is considered **toxic** and **carcinogenic**, leading to its ban in food products in many countries, including the US (FDA) and the EU (where it's a Substance of Very High Concern).

- **Toxicity and Organ Damage:** Can cause **oxidative stress** on cells and tissues if ingested. Long-term consumption is linked to **liver dysfunction** or **cancer** and damage to **kidney** and **brain tissues** (cerebellum and brainstem).
- **Carcinogenic Potential:** It is a suspected **carcinogen** and **neurotoxic** dye. Animal research indicates **tumour development** in organs like the liver and bladder.
- **Genotoxicity:** Can cause **DNA damage**, leading to mutations.
- **Allergic Reactions:** In sensitive individuals, it can trigger allergic reactions such as itching, redness, skin thickening, and chronic allergic responses.

Common Applications (Legal & Illegal)

- **Legal/Industrial Use:** Primarily used in industries like **textiles** (to dye silk, wool, and cotton), **paper**, **leather**, and **cosmetics**. It is also widely used in **scientific research** as a fluorescent tracer dye.
- **Illegal Use (Food Adulteration):** Used illegally as a cheap colouring agent to give a vibrant hue to items like:
  - **Cotton Candy**
  - **Gobi Manchurian** and other Indo-Chinese sauces
  - **Chilli powder** and **curry powder**
  - Pink-coloured sweets and cakes

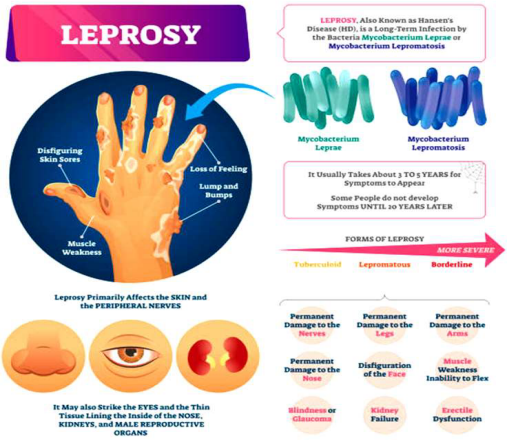
The state-level action against the use of Rhodamine B in specific food items in India highlights the ongoing public health concern regarding illegal food adulteration.

EDITORIALS

Crux of The Hindu & Indian Express

Science & Technology

India's Fight Against Leprosy: The Road to Zero Transmission



Why in News?

- India's leprosy prevalence rate has dramatically dropped by **99%** (from 57.2 per 10,000 in 1981 to 0.57 in 2025). The **National Leprosy Eradication Programme (NLEP)** has now launched the **National Strategic Plan and Roadmap for Leprosy (2023-2027)**, setting an ambitious goal to **interrupt transmission** and achieve **zero indigenous cases by 2030**.

Understanding Leprosy (Hansen's Disease)

Leprosy is a **chronic infectious disease** caused by the bacterium **Mycobacterium leprae**.

- **Impact:** It primarily affects the skin, nerves, eyes, and respiratory tract, leading to **ulcers, deformities, and disability** if left untreated.
- **Transmission:** It spreads through **droplets** from the nose and mouth during **close and prolonged contact** with untreated individuals.
- **Global Status:** It is classified as a **Neglected Tropical Disease (NTD)**, with about 200,000 new cases reported worldwide each year.

India's Journey to Leprosy Elimination

India's success stems from continuous national efforts and the adoption of modern medicine:

Period	Effort/Program	Key Development
1954-55	**National Leprosy Control Programme (NLCP)**	Initial use of **Dapsone monotherapy** (a single antibiotic).
1983	**National Leprosy Eradication Programme (NLEP)**	Transitioned to NLEP after **WHO endorsed Multi-Drug Therapy (MDT)** in 1982. MDT, provided **free of cost**, revolutionized treatment.
2005	**Elimination Status**	India achieved **national elimination status** (prevalence rate <1/10,000) and has sustained it since.

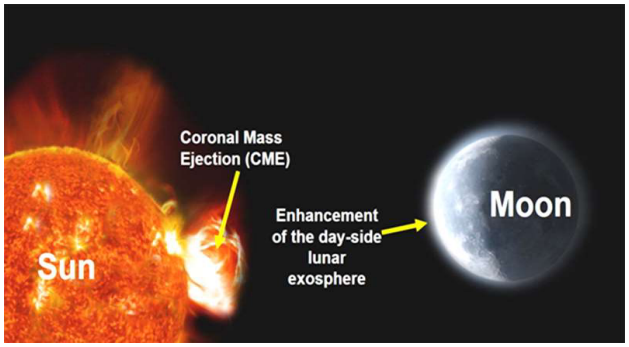
- **Current Progress (2025):** The national prevalence rate is **0.57 per 10,000**. The rate of child cases among new detections has dropped significantly from 9.04% to **4.68%** in the last decade.

Current Strategic Plan (NSP 2023-2027)

The new National Strategic Plan aims to **end leprosy transmission by 2030** through focused interventions:

- **Digital Tracking:** Use of the **Nikusth 2.0 Portal** for digitized patient tracking and district-level monitoring.
- **Screening and Integration:** Integration of screening with health programs like **Ayushman Bharat** and **Rashtriya Bal Swasthya Karyakram (RBSK)** to ensure screening across all age groups.
- **High-Risk Focus: Special monitoring** for 121 districts where prevalence remains higher (>1/10,000) and inclusion of **Particularly Vulnerable Tribal Groups (PVTGs)** under PM-JANMAN for targeted care.
- **Global Support:** Continued collaboration with the **WHO** for **free MDT supply** and technical support, and the establishment of **National AMR Surveillance** to monitor drug resistance trends.

Chandrayaan-2 Detects Solar Storm Impact on Moon's Exosphere



Why in News?

- India's **Chandrayaan-2 lunar orbiter** has achieved a path-breaking scientific observation: for the **first time ever**, it has detected the direct effects of the **Sun's Coronal Mass Ejection (CME)** on the **Moon's exosphere**. This finding was made possible by the **CHACE-2** (Chandra's Atmospheric Composition Explorer-2) instrument onboard the orbiter.

Key Observations by Chandrayaan-2's CHACE-2

The **CHACE-2** payload, which is a **neutral gas mass spectrometer** developed by ISRO to study the composition and dynamics of the lunar exosphere, made the crucial observation during a rare series of CMEs on May 10, 2024.

- **Pressure and Density Spike:** CHACE-2 recorded a significant **increase in the total pressure** of the **dayside lunar exosphere** when the CME impacted the Moon. The **total number density** (concentration of neutral atoms/molecules) increased by **more than an order of magnitude** (tenfold).
- **Mechanism Confirmation:** This observation confirms long-standing theoretical models which predicted that the solar plasma from CMEs would **enhance the process of sputtering**—knocking off atoms and molecules from the lunar surface—thereby temporarily increasing the density and pressure of the exosphere.
- **Significance:** This provides **direct empirical evidence** of how solar activity, specifically CMEs, alters the lunar environment.

The Lunar Exosphere and Solar Activity

The Moon is particularly **vulnerable to solar activity** because it lacks both a substantial atmosphere and a global magnetic field.

- **Lunar Exosphere:** This is an extremely thin atmosphere where gas atoms and molecules rarely collide. It is classified as a **surface boundary exosphere** because its lower boundary is the lunar surface itself.
    - It contains gases like **helium, argon, and neon**, derived from radioactive decay, **solar wind**, and meteoroid impacts.
- **Coronal Mass Ejection (CME):** This is a violent expulsion of **plasma** (protons and electrons) and magnetic fields from the Sun's **corona**. CMEs are major drivers of **space weather**. When they strike the Moon, they directly bombard the surface with high-energy particles.

Implications for Future Missions

This breakthrough observation has critical practical significance for India's long-term space exploration plans:

- **Space Weather Prediction:** It deepens the scientific understanding of **lunar space weather** and how the Moon responds to solar disturbances.
- **Lunar Base Planning:** The data is vital for **architects planning scientific bases** and habitats on the Moon, as they need to account for such **extreme events** that can temporarily alter the lunar environment and pose challenges for equipment and human activity.

Atomic Stenciling : Precision Patching of Gold Nanoparticles

Why in News?

- Researchers have developed an **atomic stenciling technique** to precisely apply **polymer patches** onto microscopic **gold nanoparticles**. This breakthrough offers unprecedented **control over the nanoparticles' structure**, moving the field of nanomaterials closer to realizing theoretical concepts for advanced smart materials.

The Precision Patching Process

The technique relies on two key steps to achieve atomic-level control over the applied polymer patterns.

Step	Mechanism	Role
1. Atomic Stenciling (The Masking)	Researchers use **iodide atoms** as a highly selective "atomic stencil" or mask. These atoms are engineered to bond and stick **only** to specific, flat **crystal faces** of the gold nanoparticle.	The iodide atoms act as a **barrier**, blocking those particular surfaces from the subsequent step.
2. Polymer Painting (The Patching)	A **polymer solution** is introduced. The polymer material only bonds to the **unmasked, exposed gold surfaces**—the areas not covered by the iodide atoms.	The polymer forms a **precise patch** exactly where intended, determined by the shape of the atomic mask.

Significance and Applications

This method achieves an extraordinary level of control, enabling the creation of novel nano-structures with superior functionality.

Key Benefits

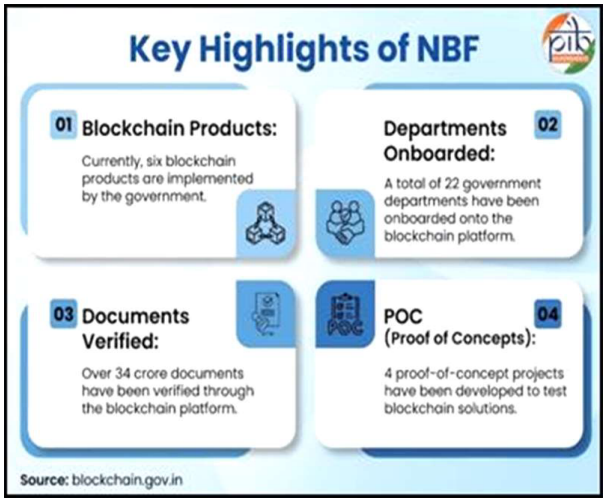
- **Atomic-Level Control:** The technique allows for **atomic-level control** over the patch's size, shape, and location.
- **Design Diversity:** It enables the creation of over **20 distinct types** of **patterned nanoparticles** (e.g., corner patches, face patches, web designs).
- **Self-Assembly:** The resulting patches are so **uniform** and precisely located that the nanoparticles can **spontaneously self-assemble** into highly ordered, stable **3D crystals (superlattices)**—a major, previously theoretical, milestone in nanomaterials science.

Potential Applications

This precise structural control is a crucial step toward creating **metamaterials**—artificial materials with properties **not found in nature**.

- **Targeted Drug Delivery:** Nanoparticles could be patterned to attach selectively to specific cells or tissues in the body, enhancing the efficiency and safety of drug delivery.
- **Ultra-efficient Catalysts:** Precise placement of polymer patches could create tailored surfaces that significantly boost catalytic reaction rates and selectivity.
- **Advanced Electronics:** Creation of novel electronic components and memory storage devices.
- **Smart Materials:** Development of materials that can sense and respond to their environment in programmable ways.

Digital Trust: India's National Blockchain Framework for Public Services



Why in News?

- **Blockchain technology** has become a major **digital innovation** in India with the launch of the **National Blockchain Framework (NBF)** in **September 2024**. This framework aims to make **public services** more **transparent**, **accountable**, and **efficient**.
- As of **October 2025**, the platform has already been used to **verify over 34 crore documents**, showing its widespread use in government work.

What is the National Blockchain Framework (NBF)?

- The NBF is **India's own platform** designed to speed up the use of **blockchain for public services**. It offers a **single, unified structure** for creating **secure, clear, and scalable** solutions across different government areas.

Core Components:

The NBF relies on key components to function:

- **Vishvasya Blockchain Stack:** This is the **local, modular technical foundation** for building and running blockchain applications in government.
    - **Blockchain-as-a-Service (BaaS):** Provides a **shared blockchain network** that government offices can easily use to launch applications.
    - **Distributed Infrastructure:** It operates from **NIC data centres** (in Bhubaneswar, Pune, and Hyderabad) to ensure it is **always available** and can handle large loads.
    - **Permissioned Layer:** Makes sure that **only verified members** are allowed to check and confirm transactions.
    - **Open APIs:** Offers standard tools for **authentication** (proving identity) and **data sharing** with other applications.
- **NBFLite:** This is a **test version** (sandbox) of the blockchain system, allowing **startups, universities, and researchers** to **test new applications** in a safe, controlled space.
- **Praamaanik:** An innovative solution that uses blockchain to **verify the truth and origin of mobile applications**, protecting users from online scams.
- **National Blockchain Portal:** A **central website** that explains India's plan and supports the adoption of blockchain across all government sectors.

NBF Transforming Digital Governance in India

The NBF is already being used to improve trust and efficiency across several public services:

- **Certificates and Document Chain: Securely stores** and verifies the authenticity of **academic and government certificates** (like caste and income papers). Over **34 crore documents** have been checked using this platform.
- **Logistics Chain:** Helps **track the movement of goods**. For example, in Karnataka's *Aushada* system, it ensures **drug authenticity**, verifies patients, and helps **stop fake drugs** from entering the supply chain.
- **Judiciary and ICJS Chain:** Creates a **secure, permanent record of legal data**. It supports the **Inter-operable Criminal Justice System (ICJS)**, which links all parts of the criminal justice system for case records and evidence.
- **Property Chain:** Securely records **property transactions**, provides a full **ownership history**, which helps **reduce legal disputes** and speeds up their resolution.

Blockchain Technology Explained

- **About: Blockchain** is a **digital record book** that is **shared** across many computers, **permanent** (cannot be changed), and **clear** to all members. It records transactions safely without needing a middleman, building **verifiable trust** among everyone involved.
- **Features:** Its key qualities are **decentralization** (no single point of control), **immutability** (data can't be tampered with), **transparency**, and **security**.

Key Initiatives Promoting Blockchain Adoption in India

The government and regulatory bodies are actively supporting blockchain:

- **National Strategy on Blockchain:** A **roadmap** from the Ministry of Electronics and Information Technology (**MeitY**) that sets **short- and long-term goals** for integrating blockchain across all sectors.
- **Centre of Excellence (CoE) in Blockchain:** Setup by **NIC** to offer **expert advice, training, and support** for testing pilot projects before they are launched on a large scale.
- **TRAI's Role:** The telecom regulator (**TRAI**) uses **Distributed Ledger Technology (DLT)** (a form of blockchain) to **stop spam and fraud** in SMS messages.
- **RBI's Blockchain Initiatives:** The central bank (**RBI**) is piloting the **Digital Rupee (e[1])** for retail

payments, using blockchain to enable **traceable, instant, and inclusive payment systems**.

- **NSDL's Adoption of Blockchain:** The National Securities Depositories Limited (**NSDL**) uses a tamper-proof ledger to track details of corporate bonds, boosting investor confidence.

How is India Building a Blockchain-Ready Workforce?

India is focused on training its people for this new technology:

- **Skill Development:** Over **21,000 government officials** have been trained in new technologies, including blockchain, through **214 programs**.
- **Post Graduate Diploma:** A **900-hour course** focusing on blockchain, financial technology (FinTech), AI, and security.
- **BLEND programme by C-DAC:** An online course for **engineering students and professionals** to learn blockchain architecture and real-world applications.
- **FutureSkills PRIME:** A **MeitY-backed project** aimed at **upgrading the skills** of IT workers in 10 emerging technologies, with blockchain being one of them.

Conclusion

The **National Blockchain Framework**, aligning with **Digital India** and **Aatmanirbhar Bharat** (Self-Reliant India) goals, is key to driving **trust-based digital governance**. By combining its **own technology, regulations, and skilled workforce**, India is positioning itself as a **global leader in blockchain**.

India's Global Leap: Driving the Bharat 6G Vision

Why in News?

At the **India Mobile Congress (IMC) 2025**, India cemented its rising status in **next-generation telecom** by hosting the **2nd International Bharat 6G Symposium**. This event marks a major step toward building a **self-reliant, innovative, and globally connected 6G ecosystem** to achieve the vision of a **"Developed India" (Viksit Bharat) by 2047**.

The IMC is Asia's most important technology expo, jointly organized by the **Department of Tele-communications (DoT)** and the **Cellular Operators Association of India (COAI)**.

Key Outcomes of 2nd International Bharat 6G Symposium at IMC 2025

The symposium focused on setting global standards and highlighting India's economic and technical goals for the 6G era.

- **New Delhi Declaration on 6G:** Global research groups (including **Bharat 6G**, Europe's 6G-IA, and North America's Next G Alliance) issued a **Joint Declaration** to define 6G as a **global public good**.
    - **Core Principles:** The declaration set five core principles for 6G networks: **trusted and secure, resilient and reliable, open and interoperable, inclusive and affordable, and sustainable and globally connected**.
    - It also calls for **skills development** and **global partnership** to align with **India's 6G Vision 2030**.
- **Economic Vision:** The symposium highlighted India's 6G roadmap, which targets:
    - **USD 1.2 trillion impact on GDP by 2035.**
    - **10% of global 6G patents.**
    - **Threefold growth in satellite communications by 2033.**
    - It also showcased **India's own 4G stack** as proof of its capability to become **technologically self-reliant and ready to export**.

- **Focus on Collaboration and Inclusivity:** The symposium pushed for stronger **global partnership, local research (R&D), and cooperation between industry and universities**. This signals India's shift from being a technology consumer to a **co-creator and global leader**, supported by achievements like the deployment of one lakh **indigenous 4G towers**.

What is Bharat 6G Vision?

Launched in 2023, the **Bharat 6G Vision** aims to make India a **global leader and co-creator** in next-generation wireless communication, aligning with the **Viksit Bharat 2047** goals for **affordability, sustainability, and universal access by 2030.**

Key Components of the Vision:

Initiative	Description
Bharat 6G Alliance (B6GA)	An **industry-led** and government-supported body that brings together telecom companies, researchers, startups, and universities. It has signed partnerships with major global alliances (like Next G Alliance, 6G-IA) for **joint research and global standards setting**.
Bharat 6G Mission	Aims to make India a **global co-creator and leader** in 6G by **2030**, focusing on **local innovation, capacity building, and skills development** while ensuring the technology is **sustainable, secure, and inclusive**.
Infrastructure & R&D	The government has funded two advanced testbeds (**6G THz Testbed** and **Advanced Optical Communication Testbed**). It has also approved **100 5G labs** across academic institutions to build a 6G-ready ecosystem.

India's Initiatives for 6G Ecosystem

- **Telecom Technology Development Fund (TTDF):** Launched in 2022 to **fund R&D in 5G and 6G**. It supports local companies and universities in developing products for **affordable rural connectivity**.
- **Technology Innovation Hub (TIH):** Set up at **IIIT Bangalore** to pioneer **Advanced Communication Systems** for 5G+ and 6G.

6G (Sixth-Generation) Explained

- **Definition:** The successor to 5G, 6G will use **much higher radio frequencies** to deliver data with **near-zero delay**, achieving speeds up to **1,000 times faster than 5G**.
- **Global Standard:** The International Telecommunication Union (ITU), a UN agency, has named the 6G technology standard **'International Mobile Telecommunications (IMT) 2030'**.
- **Applications:** 6G will enable **real-time applications** like remote surgery, complex smart robotics, and truly immersive virtual experiences. **AI integration** will make the networks much smarter and more efficient.

Challenges Related to 6G Implementation in India

Several challenges must be addressed for India to achieve its 6G vision successfully:

- **Infrastructure Readiness:** The current **5G rollout is still incomplete**. The jump to 6G requires **dense fiber networks**, advanced **semiconductors**, and more **local hardware**, areas where India's capability is still growing.
- **Limited R&D Ecosystem:** India's research output and private investment in next-gen telecom are **low compared to global leaders** like the US and China.
- **Spectrum and Standards Gap:** Global rules for allocating the **terahertz (THz) bands** needed for 6G are still being decided, creating uncertainty for India's planning.
- **Talent and Skill Shortage:** There is a lack of trained experts in key areas like **AI, photonics, and network engineering** needed for local 6G innovation.
- **Affordability and Digital Divide:** The high cost of deployment could **increase the gap** between urban and rural connectivity if not carefully managed.

Steps Needed to Ensure Successful Implementation of India's 6G Vision

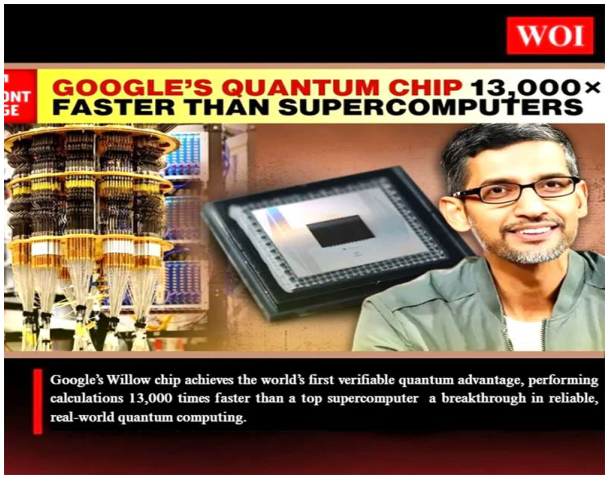
To overcome challenges and ensure success, India needs to take these steps:

- **Promote Indigenous Manufacturing:** Include 6G component manufacturing under the **Production Linked Incentive (PLI) Schemes** to boost domestic production and rely less on imports.
- **Skill Development: Expand 5G Labs** in universities to build a 6G-ready workforce and start new courses in AI, IoT, and photonics.
- **Spectrum Policy and Regulation:** Create a forward-looking **National Spectrum Strategy** for the high THz frequencies and participate actively in global standard-setting bodies like the ITU.
- **Inclusive Access:** Align the 6G rollout with existing projects like **Digital India** and **BharatNet** to guarantee fair and affordable access in **rural and remote areas**.

Conclusion

India's 6G journey marks a clear shift from being a technology user 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**.

Google's 'Willow' Achieves Verifiable Quantum Advantage



Why in News?

- **Google** announced that its quantum processor, **"Willow,"** has reached the **first-ever verifiable quantum advantage**. This was achieved using a new algorithm called **Quantum Echoes**, which performed a computation **13,000 times faster** than the world's most powerful supercomputers. This breakthrough is a crucial step toward practical **quantum applications**, such as **Hamiltonian learning**.

What is Google's Verifiable Quantum Advantage?

This achievement establishes a clear, measurable boundary where quantum technology decisively outperforms classical machines.

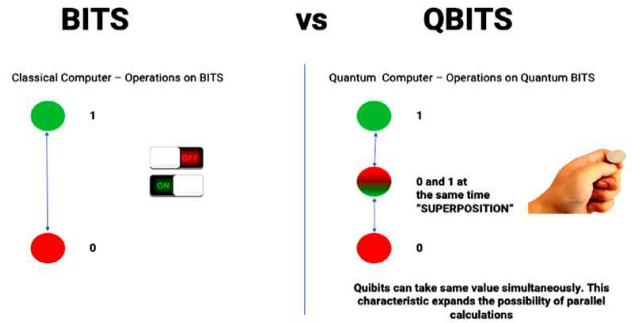
- **Concept of Quantum Advantage:** This is the moment a quantum computer proves its superiority over classical supercomputers by efficiently solving a specific problem that the latter cannot handle in a feasible amount of time.
- **Google's Breakthrough:** The **Willow quantum processor**, equipped with up to **105 qubits**, executed the **Quantum Echoes algorithm**. This algorithm is designed to track the forward and backward evolution of **entangled quantum states** to study how information is "scrambled" in a quantum system (quantum chaos).
- **The Measurable Result:** This process enabled the measurement of the **Out-of-Time-Order Correlator (OTOC)**, which is a key scientific tool for tracking how **entanglement** spreads as qubits interact.
    - The **Willow processor** completed the OTOC measurement in **just two hours**. This task was estimated to take a classical supercomputer an impossible length of time, equivalent to **several years** (13,000 times longer).
    - Crucially, unlike earlier demonstrations, this result can be **independently confirmed** by other quantum or classical systems, making it the **first real-world, measurable quantum advantage**.

Practical Applications

The ability to accurately measure the OTOC opens the door for real-world quantum computation.

- **Hamiltonian Learning:** OTOC circuits can be used in **Hamiltonian Learning**, a quantum method where the computer **simulates a physical system** (like a molecule) and compares the simulation to actual experimental data. This allows scientists to **accurately determine unknown parameters** of the system, such as its energy levels or interaction forces.
- **Molecular Structure Estimation:** The OTOC method, which has been tested using **Nuclear Magnetic Resonance (NMR) spectroscopy**, provides valuable insights into **molecular geometry** by studying the behavior of quantum spin within materials, compounds, and proteins.

Quantum Computing Glossary



Term	Simple Explanation
Qubit (Quantum Bit)	The basic unit of quantum information. It can exist as **0, 1, or both simultaneously** (**superposition**).
Superposition	The property that allows a qubit to hold multiple states at once, giving quantum computers massive parallel processing power.
Entanglement	A mysterious quantum link where two or more qubits remain connected, so that changing one instantaneously affects the others, even if they are physically far apart.
Quantum Simulation	Using quantum computers to create highly accurate models of molecules, materials, or complex physical systems that are too difficult for classical machines.

Critical Mineral Security: New Centres of Excellence Under NCMM

Why in News?

- The **Ministry of Mines** has added two new **Centres of Excellence (CoEs)** under the **National Critical Mineral Mission (NCMM)**: the **Indian Institute of Science (IISc), Bengaluru**, and the **Centre for Materials for Electronics Technology (C-MET), Hyderabad**. These two join the seven institutions previously recognized under this key national initiative.
- The CoEs will operate on a **Hub & Spoke model**, bringing together the specialized knowledge of academic, research & development (R&D), and industry partners.

National Critical Mineral Mission (NCMM)

The mission is a strategic initiative to secure the minerals essential for India's modern economy and national security.

- **About:** The NCMM was announced in the **Union Budget 2024–25** with the goal of ensuring India's **long-term mineral security**. It aims to establish a reliable and continuous supply chain from both **domestic and international sources**.
- **Coverage & Objectives:** The mission is comprehensive, covering the entire mineral value chain:
    - **Exploration, Mining, Beneficiation, Processing, and Recycling** from end-of-life products.

- The primary objective is to secure access to minerals vital for **clean energy technologies, electronics, and strategic sectors**.

- **Key Features:**
  - A significant focus will be on **offshore mining** of **polymetallic nodules**, which are rich sources of **cobalt and rare earth elements (REEs)**.
  - **Governance:** The mission will be overseen by the **Empowered Committee on Critical Minerals**, with the **Ministry of Mines** serving as the nodal (main governing) authority.

What are Critical Minerals?

Critical minerals are raw materials that are absolutely necessary for a country's **economic growth and national security**. Their limited global supply often poses significant supply chain risks.

Key Applications

These minerals are indispensable for India's shift toward clean energy and advanced technology:

Sector	Critical Minerals	Application
Electric Vehicles (EVs) & Energy Storage	**Lithium, Nickel, and Cobalt**	Powering the **lithium-ion batteries** used in EVs (under NEMMP) and large-scale energy storage systems.
Solar Energy	**Silicon, Tellurium, Indium, and Gallium**	Essential components for making **photovoltaic (PV) cells**. India's **64 GW solar capacity** relies heavily on these.
Wind Energy	**Neodymium and Dysprosium** (Rare Earth Elements)	Vital for manufacturing the **powerful magnets** used in modern wind turbines.

Coal Sector Digitization : Koyla Shakti and CLAMP Platforms

Why in News?

- In line with the **Digital India Mission**, the **Ministry of Coal** has introduced two significant digital platforms—**Koyla Shakti** and **CLAMP**—with the goal of dramatically improving **transparency, operational efficiency, and governance** within the coal sector.

Koyla Shakti Dashboard

Koyla Shakti is a unified tool designed for comprehensive, real-time tracking and strategic decision-making across the entire coal supply chain.

- **Unified Platform:** It is a **unified digital dashboard** for real-time monitoring and analytics of **coal production, transportation, and supply**.
- **Purpose:** It functions as a smart analytics tool for **end-to-end coal supply chain monitoring**.
- **Key Stakeholders:** The platform integrates data from various entities, including **Coal companies, Railways, Ports, ministries, and state departments**.
- **Functions:**
  - **Real-time tracking** of coal production, transport, and dispatch activities.
  - Providing **policy support** through data analytics, forecasting, and automated incident alerts.
  - Enhancing **transparency, efficiency, and strategic coordination** among all linked agencies.

CLAMP Portal (Coal Land Acquisition, Management, and Payment)

The CLAMP Portal is focused on simplifying and digitizing the often-complex processes related to land and compensation in the coal sector.

- **Centralized System:** It is a **centralized digital system** designed to streamline and digitize all processes related to **land acquisition, compensation, and rehabilitation & resettlement (R&R)** for coal projects.

- **Features:**
    - It maintains a **centralized repository for all land records** across various coal Public Sector Undertakings (PSUs).
    - Facilitates **real-time data monitoring** and complete process digitization.
    - Significantly **improves transparency** in compensation payments and enhances **inter-agency coordination**.

US FDA Eases Guidelines for Biosimilar Development

Why in News?

The **US Food and Drug Administration (FDA)** has released **new draft guidelines** aimed at significantly **reducing the cost and time** required for **biosimilar development**. This shift is expected to **significantly benefit Indian pharma companies**, which have already **invested heavily** in building strong biosimilar pipelines. This change could potentially **remove the requirement for comparative efficacy trials**, saving an estimated **USD 20–25 million per project** and shortening development timelines from 5–7 years to just **3–4 years**.

What is a Biosimilar?

A biosimilar is a complex therapeutic product that is related to, but not identical to, an existing approved drug.

- **About:** A biosimilar is a **biologic medication** that is **highly similar** to an already FDA-approved biologic, known as the **reference product**.
- **Composition:** Both biosimilars and their reference biologics are **complex proteins** made from **living sources** such as cells, tissues, microorganisms (like bacteria or yeast), or combinations of natural materials.
- **Not a Generic:** A biosimilar is **not a generic drug**.
    - **Generics** are simple chemical copies of small-molecule drugs and are identical to the original.
    - **Biosimilars** are **complex proteins** derived from living cells, meaning they can be **highly similar but never identical** to the original biologic due to the nature of their production.

Economic and Therapeutic Impact

The availability of biosimilars is crucial for improving patient access to expensive, life-saving treatments.

- **Cost Advantage:** Biosimilars are typically available at a **lower cost** than the original reference biologics, which improves **patient access to affordable treatments** for chronic diseases.
- **Applications:** Biosimilars are safe and effective for treating a variety of **chronic diseases**, including **cancer, diabetes, and autoimmune disorders**.

India's Growing Position in the Global Biosimilar Market

The new FDA guidelines are a major boost for India's domestic pharmaceutical industry and its global ambitions.

- **Current Standing:** Indian pharma firms currently hold **under 5%** of the **USD 30 billion global biosimilars market**.
- **Growth Trajectory:** Indian biosimilar exports, currently valued at **USD 0.8 billion**, are projected to grow **five-fold to USD 4.2 billion by 2030**, capturing 4% of the global market. The industry aims to reach **USD 30–35 billion by 2047**.

- **Supporting Initiatives:** This growth is being backed by domestic initiatives such as the **National Biopharma Mission** and the expansion of **Genome Valley** in Telangana, which provide the necessary R&D infrastructure.

NHAI's Network Survey Vehicles (NSVs) to Scan 20,000 km of Highways for Defects

Why in News

- The **National Highways Authority of India (NHAI)** has announced that it will deploy **Network Survey Vehicles (NSVs)** in **23 states**, covering **20,933 km** of **National Highways (NHs)**.
- These vehicles will be used for **collection, processing, and analysis** of data related to **road inventory and pavement condition**, identifying **surface cracks, potholes, patches**, and other defects.
- The initiative is part of NHAI's effort to ensure **scientific and data-driven road maintenance** following criticism over the **poor condition of highways** leading to accidents and fatalities.

Objective of the Initiative

- To conduct **comprehensive highway condition surveys** using advanced sensor-based vehicles.
- To collect and analyse **pavement condition and road asset data** for maintenance and planning.
- To **upload collected data** to the **Road Asset Management System (RAMS)** in the **prescribed format** for centralized access and analysis.

Background

- **Policy Guidelines (2019):**
  - Since 2019, NHAI has had guidelines mandating that **NSV-based surveys** be conducted by the **authority's engineer** and an **independent engineer before issuing completion certificates** for new highway stretches.
- The **new assignment (2025)** expands the scope — aiming for **nationwide, large-scale condition assessment** of existing National Highways.

How NSVs Work

Feature / Tool	Function
Laser sensors	Measure road surface irregularities and rutting.
Global Positioning System (GPS)	Provide accurate geolocation for road data mapping.
Video image processing tools	Capture surface conditions visually for analysis.
High-resolution 360° cameras	Record visual data for defect identification.
Inertial Measurement Unit (IMU)	Measure vehicle motion for surface roughness calculations.
Distance Measuring Indicator (DMI)	Measure exact distance covered and help in mapping defects.

- The **3D laser-based NSV system** automatically captures and reports defects **without human intervention**.
- Data will be collected for **2/4/6/8-lane projects**, both **before work starts** and **every six months thereafter**.
- The collected information will be used for **pavement maintenance, asset management, and infrastructure planning**.

Integration with Road Asset Management System (RAMS)

- **RAMS (also known as Datalake)** has been developed by the **Ministry of Road Transport and Highways (MoRTH)**.
- It aims to create a **single, unified road database** for:
  - **Planning** and **budgeting**

- **Management** and **maintenance** of the entire **National Highway network**
- Ensures **systematic and scientific life-cycle analysis** of highway assets.

Scope of the 2025 NSV Survey

Parameter	Details (from text)
Total NHs in India	1.46 lakh km
Managed by NHAI	Over 50,000 km
Length to be Surveyed	**20,933 km** (covering **91,280 km lane length**)
States Covered	**23 States**
No. of Packages	5 (North, South, East, West, Centre)

Regional Coverage

Region	Length (km)	States Covered
North	2,687 km	Delhi, Haryana, Punjab, Himachal Pradesh, Uttarakhand, Jammu & Kashmir
West	3,915 km	Rajasthan, Gujarat
Centre	4,616 km	Maharashtra, Madhya Pradesh
South	4,537 km	Andhra Pradesh, Tamil Nadu, Telangana, Karnataka, Kerala
East	5,179 km	Assam, Bihar, Jharkhand, Meghalaya, Odisha, Uttar Pradesh, West Bengal

- **No bidder will be awarded more than one package**, ensuring wider participation and accountability.

Survey Specifications (From Terms of Reference – TOR)

- The NSV survey will capture **13 types of pavement defects**, including:
  - Crack measurement
  - Ravelling
  - Patch area
  - Potholes
  - Edge break
  - Roughness
  - Rutting
  - Lane marking condition *(+ other defect types as per TOR)*
- It will also record **road and terrain details**, including:
  - **Carriageway type**
  - **Road type**
  - **Pavement and shoulder width**
  - **Topography and median details**
  - **Right of way (ROW)**
  - **Utilities and land use patterns**

Implementation and Monitoring

- **NHAI** has **invited bids** from qualified private firms to implement the survey.
- Each selected firm will be responsible for **data collection, processing, and uploading** to the **RAMS**.
- Surveys will be **repeated at six-month intervals**, enabling real-time monitoring of highway health.

Significance

Aspect	Impact / Benefit
Road Safety	Detects and helps fix surface defects that could lead to accidents.
Data-driven maintenance	Enables scientific decision-making for timely repair and budgeting.
Transparency	Independent, sensor-based assessment ensures accountability in road construction and maintenance.
Asset Management	Supports predictive maintenance under RAMS for long-term cost efficiency.
Public Benefit	Leads to smoother, safer, and longer-lasting highways.

Challenges

- Ensuring **regular data updates** and proper integration with RAMS.
- Maintaining **equipment calibration** and **data accuracy** across 23 states.
- Coordination between **NHAI engineers**, **contractors**, and **data agencies** for timely corrective action.

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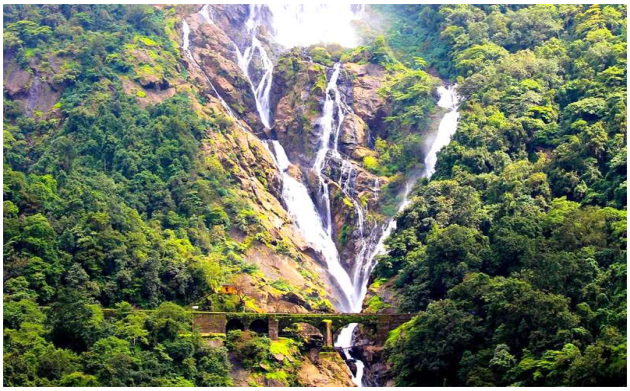
Ecology & Environment

Bhagwan Mahaveer Wildlife Sanctuary : Goa's Largest Protected Area



Why in News?

- Goa's **State Board for Wildlife** recently recommended that a proposal seeking wildlife clearance for **iron ore handling at Kalem railway station**—located within the sanctuary and national park—be placed before the **National Board for Wildlife (NBWL)** for their final "consideration."

About Bhagwan Mahaveer Wildlife Sanctuary

- **Location:** Situated on the eastern border of the state of Goa, near the village of **Mollem**, set amidst the foothills of the Western Ghats.
- **Area:** It covers an area of **240 sq. km.**
- **National Park: Mollem National Park** (170 sq.km.) constitutes the protected core area of the sanctuary.
- **History:** Originally known as the **Mollem Game Sanctuary**, it was declared a wildlife sanctuary in **1969** and later renamed the Bhagwan Mahavir Wildlife Sanctuary.

Natural Features and Attractions

- **Key Attractions:** It is home to the famous **Dudhsagar waterfall**, the **Devil's Canyon**, the **Tambdi Surla temple**, the Tambdi falls, and a number of other historic and religious sites.
- **Vegetation:** Comprises **West Coast tropical evergreen forests, West Coast semi-evergreen forests, and moist deciduous forests.**
- **Flora:** The landscape is dominated by trees such as **Teak, bamboo, cashew, and eucalyptus** trees.

Fauna

- **Mammals:** The sanctuary is particularly known for its **Leopards, Elephants, Deers & Gaur, or Indian Bison.**
- **Reptiles:** The chief attraction of the sanctuary is the **King Cobra**, which is found here in abundance.
- **Avian Species:** It is home to around 200 species of birds, including the **Malabar pied hornbill, Indian black woodpecker, great Indian hornbill, kingfishers, paradise flycatcher, shrikes, and grey jungle fowl.**

Snow Leopard (Panthera uncia)

Why in News?

- The state of **Himachal Pradesh in India** recently finished a major project to count its Snow Leopards.
- The good news is that the population has **increased!** The survey recorded **83 Snow Leopards**, which is much higher than the 51 counted a few years ago (in 2021). This is a great sign for the survival of this rare cat.
- This count makes Himachal Pradesh the **first state in India** to officially complete a full population estimate for Snow Leopards.

About the Snow Leopard (*Panthera uncia*)

The Snow Leopard is a large, wild cat that lives in the high, cold mountains of Asia. Because they are so hard to spot, they are often called the **"ghost of the mountains."**

- **Where They Live:** They are found across 12 countries in Central and South Asia. In India, they live high up in the Himalayas, in regions like **Ladakh, Himachal Pradesh, Uttarakhand, Sikkim, and Arunachal Pradesh.**
- **Indian Population:** It is estimated that India is home to about **500–700** of these cats.
- **Official Status:** They are listed as **Vulnerable** on a global list (IUCN Red List), which means their wild population is still at risk.
- **State Symbol:** They are the official **State Animal of Ladakh and Himachal Pradesh.**

How They Survive the Cold (Key Characteristics)

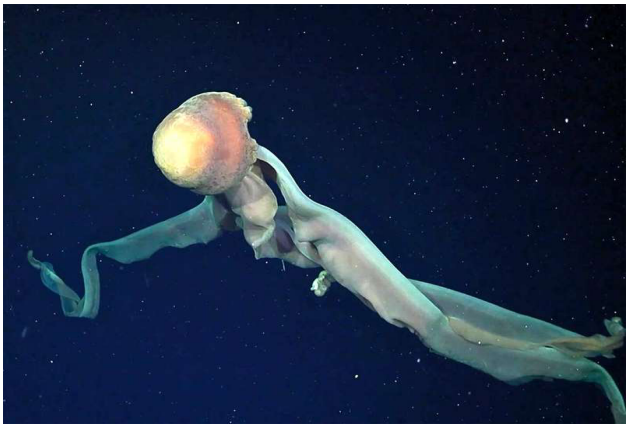
Snow Leopards have special features that help them live in their freezing, rocky home (usually between 3,000 and 4,500 meters altitude):

Adaptation	Simple Explanation
Thick Fur	It's a smoky-grey colour with black spots, helping the cat **hide easily** among the rocks and snow.
Large Paws	They are wide and furry, acting like **natural snowshoes** to keep the cat from sinking into deep snow.
Extra-Long Tail	Used like a balancing pole when jumping on steep cliffs. They also wrap it around their bodies to **stay warm** when they sleep.
Strong Legs	They can jump very far—up to **10 meters (30 feet)**—in one leap!
Vocalisation	Unlike Lions or other big cats, the Snow Leopard **cannot roar**.
Size	They are medium-sized cats, typically weighing between 30 and 55 kg.

Community & Conservation

- The recent count in Himachal Pradesh was a big team effort, involving the government and a conservation group.
- The project was special because **local indigenous women** from the Kibber area helped with the data analysis. This shows that community participation is very important for conservation success.

Mar del Plata Canyon: Deep-Sea Discoveries in Argentina



Why in News?

An amazing **expedition** to Argentina's Mar del Plata Canyon recently found over **40 potential new species** of deep-sea life. This includes fascinating creatures like **glass squids** and **pink lobsters**.

This discovery highlights the canyon as an extremely important place for **marine biodiversity** that needs to be protected. The deep-sea footage, streamed live, captivated millions of viewers and inspired new interest in ocean exploration.

About the Mar del Plata Canyon

The Mar del Plata Canyon is one of the largest underwater canyons off the coast of **Argentina**.

- **Location:** It is located on the continental margin (the edge of the continent that slopes down) off the coast of the **Buenos Aires Province**, Argentina. It lies about **250-300 km offshore** from the city of Mar del Plata.
- **The Special Water:** The canyon is a highly productive area because it's influenced by the **Argentine Shelf-break Front**.
    - This is a key boundary where **cold, nutrient-rich waters** from the south (Falkland-Malvinas Current) meet

warmer shelf waters. This meeting point is energetic and brings up nutrients, creating a rich feeding ground for diverse marine life.

- **Seabed:** The bottom of the canyon is made up of fine sand mixed with land-based material and small fossils.

What are Submarine Canyons?

A submarine canyon is a **steep-sided, V-shaped valley** that cuts into the continental slope of the ocean floor. Think of them as **giant river canyons, but underwater**.

- **How They Form:** They are carved out over a long time, mainly by strong, dense currents of water and sediment called **turbidity currents** (like an underwater landslide).
- **Size:** They can be huge. Most are less than 48 km long, but some, like the Mar del Plata Canyon, are much longer and thousands of meters deep.
- **Role:** Like rivers on land, these underwater valleys act as major **conduits**, or pathways, that transport **sediments, nutrients, and organic carbon** from the shallower continental shelf down to the deep ocean basins. This is vital for deep-sea ecosystems.

Pulicat Lake

Why in News?

- Recently, **Pulicat Lake fishermen** from villages across Andhra Pradesh and Tamil Nadu have raised urgent demands for a **long-term solution** to the severe siltation and sand accumulation at the lake's estuary (mouth).
- The blockage of the estuary, which is critical for the exchange of seawater, is **threatening the lake's entire ecosystem** and the livelihoods of **thousands of fishing families**.
- **Impact:** The obstruction is causing **stagnant water**, a sharp drop in salinity, and a **drastic decline in fish and prawn populations**, which are the basis of the local economy.

About Pulicat Lake

Pulicat Lake is a vital coastal waterbody and an internationally important wetland.

- **Nature:** It is a vast coastal, shallow **brackish water lagoon** along the coast of the Bay of Bengal into which streams drain.
- **Size & Location:** It is the **second largest brackish water lagoon in India** after Chilika Lake. It **sprawls across the states of Andhra Pradesh and Tamil Nadu**.
- **Separation from Sea:** The lagoon is separated from the Bay of Bengal by the narrow barrier island of **Sriharikota island**, which is home to the Satish Dhawan Space Centre (SDSC).
- **Inflow and Outflow:**
  - It is primarily fed by the **Aarani River** (at the southern tip) and the **Kalangi River** (from the northwest).
  - The **Buckingham Canal**, a navigation channel, passes through the lagoon.
- **Conservation Status:** It was designated as a **Ramsar Site** (Wetland of International Importance) in **2002**.

Ecology and Economic Importance

- **Biodiversity:** The lake is a unique **ecotone** (a transition area between two biological communities) that supports rich biodiversity, including aquatic life such as mudskippers, seagrass beds, and oyster reefs. It is a nursery ground for many fish and prawn species.
- **Avian Fauna:** It supports more than 200 avian species and is a critical habitat for a large population of **migratory birds** such as greater

flamingos, Eurasian curlews, oystercatchers, bar-tailed godwits, and sand plovers.

- **Flora:** The vegetation is represented by about 132 plant species, including *Walsura piscida*, *Manilkara elengi*, *Excoecaria agallocha* (mangrove associate), and *Spinifex littoreus*.
- **Livelihood:** The lake is a primary source of livelihood for over **35,000 fisherfolk** residing in the surrounding villages, making its health a critical socio-economic issue.

Painted Stork (Mycteria Leucocephala)

Why in News?

- A pair of **Painted Storks** was recently sighted in **Kaziranga National Park and Tiger Reserve, Assam**, after a gap of four years.
- The sighting is being celebrated by officials as a significant ornithological record for the park and an indicator of a healthy and biodiverse wetland ecosystem.

Key Facts About the Painted Stork

- **Classification:** It is a large wading bird belonging to the stork family, **Ciconiidae**.
- **Physical Features:** It is easily recognizable by its **heavy, yellow, down-curved bill** and striking plumage. The adults have distinctive **rose-pink tertial feathers** (the inner wing feathers), black and white markings, and a long yellow-orange bill.
- **Habitat and Distribution:**
    - **Habitat:** They prefer **freshwater wetlands**, marshes, lakes, and flooded agricultural fields in all seasons.
    - **Range:** Found widely across the plains of tropical Asia, from the Indian Subcontinent (India, Sri Lanka, Bangladesh, Nepal) into parts of Southeast Asia, south of the Himalayas.
    - They are largely **non-migratory** but make seasonal movements in response to changes in weather or food availability.
- **Feeding and Ecology:**
    - They are piscivores (fish-eaters).
    - They employ a unique feeding strategy by immersing their half-open beak in shallow water and sweeping it from side to side to snap up small fish and other prey, which are sensed by touch.
    - They are considered an **indicator species** whose presence reflects the health of a wetland ecosystem.
- **Conservation Status:**
    - **IUCN Red List Status: Near Threatened (NT)**.

Valmiki Tiger Reserve (VTR)

Why in News?

- Recent news from the Valmiki Tiger Reserve has highlighted a significant and concerning rise in **human-tiger conflict** incidents.
- Specifically, the reserve and its adjacent areas in West Champaran, Bihar, saw a cluster of **fatal tiger attacks on villagers** in late August and early October 2025.

- These incidents, which have resulted in multiple human deaths, have caused panic in the bordering villages and prompted the forest department to issue alerts and intensify patrolling.
- This growing conflict is often linked to the **increased tiger population** in VTR—which grew by 75% between 2018 (31 tigers) and 2022 (54 tigers)—and is exacerbated by factors like heavy monsoon waterlogging that may drive wildlife into human-use areas, or the tigers using fringe sugarcane fields as hunting grounds.

About Valmiki Tiger Reserve

Valmiki Tiger Reserve is the **only Tiger Reserve in Bihar** and holds a critical position in the transboundary Himalayan Terai landscape.

Feature	Details
Location	Northern part of the **West Champaran District of Bihar**, on the **India-Nepal border**.
Area	Approximately **899.38 sq. km.** (Core: 598.45 sq. km., Buffer: 300.93 sq. km.)
Components	Comprises the **Valmiki National Park** and the **Valmiki Wild Sanctuary**.
Geographic Significance	Forms the **easternmost limit** of the **Himalayan Terai forests** in India. Situated in the **Gangetic Plains bio-geographic zone** with a combination of **Bhabar and Terai tracts**.
Contiguity	It is contiguous with the **Royal Chitwan National Park** and Parsa Wildlife Reserve of **Nepal** in the north, and connected to the Sohagi Barwa Wildlife Sanctuary in Uttar Pradesh, making it vital for gene flow.
Physical Features	Spread over the lower **Shivalik region** with the Himalayan mountains as a backdrop. The tract is porous with boulders and sand deposits.
Drainage	The reserve is bordered by the **River Gandak** on the western side. Other major rivers flowing through it include **Pandai**, **Manor**, **Harha**, **Masan**, and **Bhapsa**.
Vegetation	Variety of types including **tropical wet deciduous forests**, grasslands, savannas, and riverine forests.
Flora	Forests are dominated by **Sal trees** (*Shorea robusta*), with other species like teak, bamboo, semal, khair, and *Shisham*.
Fauna	**Tiger**, leopard, fishing cat, leopard cat, sambar, hog deer, spotted deer, **black buck**, **gaur**, sloth bear, langur, rhesus monkey, and an aim for **rhino habitat expansion**.

Conservation Status and Challenges

- **Recognition:** VTR was recognized under the **Conservation Assured Tiger Standards (CATS)** in 2021, and received the India – Biodiversity Award for conservation of wild species in the same year.
- **Tiger Population:** The population recorded a significant **75% increase** from 31 in 2018 to **54 in 2022** (as per the 'Status of Tigers: Co-predators & Prey in India-2022' report).
- **Key Challenges:**
    - **Human-Wildlife Conflict:** The primary challenge, driven by the increased tiger population and human reliance on the forest for grazing and resources.
    - **Habitat Fragmentation:** Linear infrastructure like **roads and railways** intersecting the forest corridors, which increases the risk of wildlife mortality.
    - **Anthropogenic Pressures:** High dependence of the surrounding **~150 fringe villages** on the reserve for resources like firewood and grass, leading to biotic pressure and degradation.
    - **Invasive Species:** Infestation by invasive species like *Mikania micrantha* (mile-a-minute vine) which degrades grasslands essential for prey species.

Ortolan Bunting

Why in News?

- The Ortolan Bunting has been recently spotted at **Baruipur**, in the southern periphery of **Kolkata (West Bengal)**, marking an extremely **rare sighting** in the region.

- This rare occurrence of the Palearctic migrant highlights the importance of monitoring **migratory bird patterns** and local avian biodiversity.

I. About Ortolan Bunting (Ornithology & Migration)

Feature	Detail
Scientific Name	***Emberiza hortulana*** (It is a small **Palearctic migrant** songbird).
Distribution (Breeding)	Found across most of **Europe**, extending as far east as **Mongolia** and north towards the **Arctic Circle**.
Migration	A long-distance migrant that winters in **Sub-Saharan Africa**, typically travelling via the Middle East. Rare sightings in India often involve 'disoriented' individuals.
Conservation Status	**Least Concern** (**LC**) under the **IUCN Red List** (Globally). *Note: Its population is declining rapidly in parts of Europe due to habitat loss and illegal trapping.*
Unique Context	It is infamous in French cuisine as a **delicacy**, a practice that has historically driven significant population declines in Europe despite being outlawed.

II. Habitat and Physical Characteristics (Ecology)

Feature	Detail
Preferred Habitat	**Open, cultivated, or uncultivated areas** with **sparse woody vegetation**. Can be found up to an altitude of **2500** metres.
Avoids	**Absolutely avoids forested areas**, including during migration. The **oceanic climate** is also not suitable for it.
Size	Small bird, with a length of **6.3** to **6.7** inches and a wingspan of about **10** inches.
Key Features (Male)	Has a **greenish-gray head** with a **yellow throat**, a swooping mustache, and a ring around the eye. Its back and rump are brown and streaked.
Beak	Possesses a **conical beak** well-suited for **cracking and eating seeds** (a granivore).

Chlorophytum Vanapushpam

Why in News?

- A new species of perennial herb, ***Chlorophytum vanapushpam***, was recently identified by researchers during a field exploration in the **Vagamon hills** of the **Idukki district, Kerala**.
- This discovery in the **Western Ghats** highlights the region's rich biodiversity and its role as a potential center of origin for the *Chlorophytum* genus.

I. About *Chlorophytum Vanapushpam* (Botany & Location)

Feature	Detail
Scientific Name	***Chlorophytum vanapushpam*** (Belongs to the genus *Chlorophytum*, family **Asparagaceae**).
Discovery Location	**Vagamon** and **Neymakkad** rocky hills in the **Idukki district, Kerala** (part of the **Western Ghats**).
Altitude	Found at elevations between **700** m and **2124** m.
Meaning of Name	A composite of Malayalam words: **'Vanam'** (Forest) and **'Pushpam'** (Flower), translating to **'Forest Flower'**.
Close Relative	It is a close relative of ***Chlorophytum borivilianum***, commonly known as **'safed musli'**.
Significance of Location	The **Western Ghats** is considered a **center of origin** of the *Chlorophytum* genus, with a total of **18** species identified there so far.

II. Key Features and Distinction (Morphology)

Feature	Detail
Growth Habit	A **perennial herb** that grows up to **90** cm in height.
Flowers & Leaves	Features **white flowers** in small clusters and **slender leaves**.
Reproduction Cycle	**Flowering** and **fruiting** occur from **September** to **December**.
Seeds	The seeds are relatively large, about **4** to **5** mm across.
Distinction from Safed Musli	Unlike its famous cousin, *Chlorophytum borivilianum* ('safed musli'), ***Chlorophytum vanapushpam*** **lacks tubers**.
Medicinal Context	Many species of *Chlorophytum*, including 'safed musli', are known for their **medicinal properties** and are used in traditional preparations.

Coral Triangle

Why in News?

The Philippines is preparing to host **Southeast Asia's first coral larvae cryobank**, which will link research institutions across the Coral Triangle (Philippines, Taiwan, Indonesia, Malaysia, and Thailand) to form a regional network. This initiative aims to **cryopreserve coral larvae** (genetic material) to safeguard biodiversity and aid in the **restoration of damaged reefs** threatened by climate change.

I. About the Coral Triangle (Geography & Significance)

Feature	Detail
Nickname	Often referred to as the **'Amazon of the Seas'** due to its rich biodiversity.
Area	A huge marine area spanning over **10 million** square kilometers.
Core Countries	**6** nations form the core: **Indonesia**, **Malaysia**, **Papua New Guinea**, the **Philippines**, **Timor-Leste**, and the **Solomon Islands**. (Singapore is sometimes also included in the wider context).
Biodiversity	Home to more than **75%** of the world's coral species (over **600** species), a third of all reef fish, vast mangrove forests, and **6** of the **7** marine turtle species.
Human Dependency	Sustains the food security and livelihoods of more than **120 million** people through fisheries and tourism.
Threats	**Coral bleaching** (from rising sea temperatures), ocean acidification, destructive fishing, and pollution.

II. Coral Larvae Cryobank (Conservation Strategy)

Feature	Detail
Objective	To freeze and store **coral larvae** at **ultra-low temperatures** to **preserve genetic material** (genotypes) for future reef restoration.
Technology	**Cryopreservation** using a technique called **Vitrification**, where larvae are rapidly frozen into a glass-like state to **prevent damaging ice crystal formation**.
Process	Larvae are collected during spawning, treated with cryoprotectants, vitrified, stored, and later thawed using rapid warming (e.g., lasers) for rehydration and regrowth.
Function	Acts as a **genetic insurance policy** or **"seed vault"** for corals, ensuring that unique and resilient coral lineages are not lost due to mass bleaching events.
Regional Partners	Philippines, **Taiwan**, Indonesia, Malaysia, and Thailand are collaborating to establish a cryobank network.

III. What Are Corals? (Ecology)

Feature	Detail
Nature	Corals are essentially **animals** (marine invertebrates) belonging to the group **Cnidaria**.
Individual Unit	Each individual coral animal is called a **polyp** (lives in colonies of hundreds to thousands of identical polyps).
Physical State	They are **sessile**, meaning they permanently attach themselves to the ocean floor.
Reef Structure	Corals secrete a hard **calcium carbonate** (limestone) exoskeleton, which builds the **coral reef** structure over time.
Symbiotic Relationship	Corals share a crucial mutualistic relationship with tiny, single-celled algae called **zooxanthellae**.
Zooxanthellae Role	The algae live within the coral tissue and provide the coral with **food and nutrients** through **photosynthesis** (giving the coral most of its color).
Coral Bleaching	When stressed (usually by high water temperature), corals **expel the zooxanthellae**, causing the coral to turn white, which is known as **bleaching**.

Male Mahadeshwara Wildlife Sanctuary

Why in News?

- A **12-year-old male tiger** was recently **brutally hunted, dismembered, and buried** in the sanctuary.
- This incident occurred only four months after a **previous poisoning incident** in the same sanctuary.

About Male Mahadeshwara Hills Wildlife Sanctuary

- **Location:** Located in the **Chamarajanagara District of Karnataka**, at the intersection of the **Western Ghats and the Eastern Ghats**.
- **Status:** Declared a **Wildlife Sanctuary in 2013**.
- **Contiguity:** Contiguous with several other protected areas:
    - **Biligiri Rangaswamy Temple (BRT) Tiger Reserve**
    - **Sathyamangalam Tiger Reserve**
    - **Cauvery Wildlife Sanctuary**
- **Rivers:** Bounded by the **Kaveri River** to the northeast and the **Palar River** to the south.
- **Cultural Significance:** Home to the famous **Male Mahadeshwara Temple**, dedicated to **Lord Shiva** (known locally as Mahadeshwara).

Flora and Fauna

- **Vegetation:** Primarily **dry deciduous forests**, which degrade to scrub forest in fringe areas. Interspersed with patches of moist deciduous, semi-evergreen, evergreen, and shola forests at different altitudes.
- **Flora (Examples):** *Anogeissus latifolia, Boswellia serrata, Hardwikia binata*, and *Chloroxylon swietenia*.
- **Fauna (Key Species):**
    - **Mammals:** Elephants, Indian bison, wild dogs, leopards, foxes, sambars, and spotted deer.
    - **Conservation Status:** It is a noted **tiger habitat** with an increasing population of tigers.

Marine Stewardship Council (MSC) Certification

Why in News?

About **10 Indian marine and saline fish and shrimp varieties** are set to get the global **Marine Stewardship Council (MSC) certification** soon.

- This move is aimed at enhancing **seafood exports** and promoting **sustainable fishing practices** in India.
- The certification is expected to increase the revenue of India's fisheries sector by an estimated **30%** and help fishermen access **affluent global markets** like Europe and Japan.
- The Union Government is **subsidising** the certification process for the fisheries under the **Pradhan Mantri Matsya Sampada Yojana (PMMSY)**.

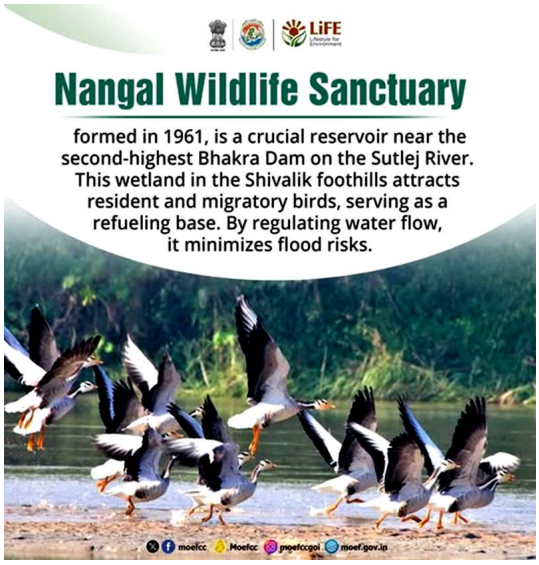
- MSC-certified products, which carry the **blue ecolabel**, often fetch a price **premium** in international markets.

About Marine Stewardship Council (MSC) Certification

The Marine Stewardship Council (MSC) is an **international non-profit organisation** that sets globally recognised, science-based standards for **sustainable fishing** and **seafood traceability**.

- **Objective:** The MSC certification program recognises and rewards sustainable fishing practices, helping to create a more sustainable seafood market and safeguarding fish supplies for the future.
- **Assessment:** The scheme is based on independent **third-party assessments** and is built on three core principles:
    1. **Stock Health** (Sustainable Target Fish Stocks): Are enough fish left in the ocean? Fishing must be at a level that ensures the population can remain productive and healthy.
    2. **Environmental Impacts** (Minimizing Impacts): Fishing activity must be managed carefully so that other species and habitats within the ecosystem remain healthy.
    3. **Effective Management** (Effective Fisheries Management): The fishery must comply with relevant laws and be able to adapt to changing environmental circumstances.
- **Eligibility:** It is open to all **wild-capture fisheries** that wish to voluntarily demonstrate that their operations are sustainable, regardless of their location, size, and fishing gear.
- **Validity:** The certification is valid for **5 years**, but is subject to **annual surveillance audits**.
- **International Standard:** It is the only wild-capture fisheries certification based on the **Food and Agriculture Organisation's (FAO) Code of Conduct for Responsible Fishing** and Guidelines for the Eco-labelling of Fish and Fishery Products from Marine Capture Fisheries.
- **India's First: Astamudi clam** (*Paphia malabarica*) from Kerala was India's first Marine Stewardship Council (MSC) certified fishery (though this certification has since lapsed and is seeking re-certification).

Nangal Wildlife Sanctuary



Why in News?

About **100 wild boars** were found dead in **Nangal Wildlife Sanctuary** in March this year.

- The post-mortem report indicates that the wild boars might have died due to **toxic waste** in **Nangal Lake**, which is part of the sanctuary.
- The deaths are suspected to be caused by **industrial effluents** entering the water body, potentially originating from industrial areas in neighboring **Himachal Pradesh**.
- The report cited severe degenerative changes in the animals' **lungs and liver** and suggested systemic degenerative changes leading to septicaemia.

- The incident highlights the serious threat of **pollution and toxic contamination** to the fragile ecosystem of the Ramsar site and the Sutlej River basin.

About Nangal Wildlife Sanctuary

Nangal Wildlife Sanctuary is a critically important protected area in North India, particularly recognized for its wetland ecosystem.

- **Location & Geography:** It is a protected area located in the foothills of the **Shivalik Hills** in the **Rupnagar district**, in the state of **Punjab**.
- **Establishment & Designation:**
  - It was established as a wildlife sanctuary in **2009**.
  - It was designated a **Ramsar Site** (Wetland of International Importance) in **2019**.
- **Size and Water Body:** It spans an area of **116 hectares** and forms a part of the larger **Nangal Wetland**, situated on the banks of the **Sutlej River**.
- **Man-Made Reservoir:** The sanctuary occupies a **human-made reservoir** constructed as part of the **Bhakra-Nangal Project** in **1961**.
- **Biodiversity Significance:**
  - It supports **rich biodiversity**, including over **150 bird species** and numerous mammals, amphibians, and reptiles.
  - It provides crucial habitat for several **threatened animals** such as the **Indian pangolin**, **Egyptian vulture**, and **leopards** (Vulnerable).
  - It is a crucial **migratory stopover** for many bird species, particularly waterfowl.
- **Historic Importance:** The site is of historic importance, as the Indian and Chinese Prime Ministers formalized the **"Five Principles of Peaceful Coexistence" (Panchsheel)** there in **1954**.

International Solar Alliance (ISA)

Why in News?

- The **International Solar Alliance (ISA) Assembly** is scheduled to convene later this month, presided over by **India**. The assembly will serve as a crucial forum to **assess progress** and **address challenges** related to the global promotion of affordable solar energy, reinforcing ISA's role in advancing global solar cooperation and the transition to cleaner energy systems.

Key Facts about the ISA

Feature	Details
Nature	A **treaty-based international intergovernmental organization**.
Launch	Launched in **2015** by **India and France** at the **COP21 summit in Paris**.
Headquarters	**National Institute of Solar Energy (NISE)** in **Gurugram, India** (The first international organization established in the country).
Primary Objective	To scale up solar energy and **reduce the cost** of solar power generation through the aggregation of demand for finance, technologies, innovation, R&D, and capacity building.
Focus	Deploying cost-effective, transformational solar solutions, particularly in **Least Developed Countries (LDCs)** and **Small Island Developing States (SIDS)**.

The 'Towards 1000' Strategy (Vision 2030)

The ISA is guided by its ambitious 'Towards 1000' strategy, which sets the following four goals to be achieved by **2030**:

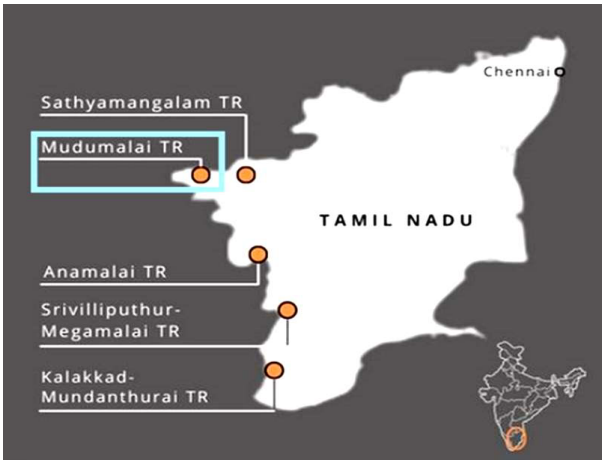
1. **Investment:** Mobilize **USD 1000 billion** of investments in solar energy solutions.

2. **Access:** Deliver energy access to **1000 million people** using clean energy solutions.
3. **Capacity:** Install **1000 GW** of solar energy capacity.
4. **Mitigation:** Mitigate global solar emissions by **1000 million tonnes of CO2** every year.

Membership and Assembly Structure

- **Membership Eligibility:**
  - Initially open to solar-resource-rich States lying fully or partially between the **Tropic of Cancer and the Tropic of Capricorn**, and which are members of the United Nations.
  - Partner country status may be granted to UN member States outside the tropical region.
- **Current Status:** The ISA currently has **100+ countries as signatories**, with more than **90 countries having ratified** the framework agreement to become full members.
- **ISA Assembly:**
  - It is the **apex decision-making body**, comprising representatives from each member country.
  - It deliberates on substantive matters such as the selection of the Director General, the functioning of ISA, and the approval of the operating budget.
  - The first Assembly was held in October 2018 in Greater Noida, India.

Sathyamangalam Tiger Reserve (STR)



Why in News?

The **Madras High Court** recently took a firm step for conservation by **ordering appropriate action** against all **illegal resorts and tourist lodges** operating within the **prohibited zone** of the Sathyamangalam Tiger Reserve (STR). This decision highlights the ongoing efforts to protect the reserve's critical habitat and unique biodiversity from unregulated commercial activities.

Key Features and Strategic Importance

The Sathyamangalam Tiger Reserve, located in the Erode District of **Tamil Nadu**, is a **vital ecological hub** in South India.

- **Ecological Corridor:** STR is strategically located at the **junction of the Eastern and the Western Ghats** within the **Nilgiri Biosphere Reserve**. This position makes it a crucial **wildlife corridor** that facilitates the movement and genetic exchange of large mammals, especially **Tigers** and **Elephants**, between the two major mountain ranges.
- **Contiguity:** It is part of the extensive Nilgiris biosphere landscape, which includes the contiguous protected areas of:
  - **Mudumalai Tiger Reserve** (Tamil Nadu)
  - **Bandipur Tiger Reserve** (Karnataka)
  - **BR Tiger Reserve and Wildlife Sanctuary** (Karnataka)
  - Together, this landscape holds the **largest tiger population in the world** (over 280 tigers).
- **Conservation Success:** STR was declared a Wildlife Sanctuary in 2008 and upgraded to a **Tiger Reserve in 2013**. It has been recognized internationally, winning the **TX2 award** (for doubling the tiger population) by the World Wide Fund. The tiger population has seen a significant increase, with recent data showing **at least 80 tigers** within its boundaries.

- **Historical Significance:** The region historically served as a strategic passage along the **Mysore–Tamil Nadu trade routes**.

Geography and Biodiversity

Category	Details
Area & Terrain	Covers over **1,400 sq.km**; terrain is **hilly and undulating** (altitude 750 m to 1649 m).
Rivers	Major rivers include the **Bhavani, Moyar, and Noyyal** rivers, which sustain the diverse ecosystem.
Vegetation	Consists of Southern **tropical dry thorn forests**, mixed deciduous forests, semi-evergreen forests, and riparian forests.
Flora & Fauna	Rich in species like **Teak, Sandalwood, Bamboo**; major fauna includes **Elephant, Tiger, Panther, Sloth bear, Gaur, and Black Buck**.
Tribal Communities	Home to indigenous groups such as the **Irula and Kurumba** tribes, whose traditional livelihoods are closely linked to the forest ecosystem.

IUCN World Conservation Congress (WCC)

Why in News?

India recently unveiled its **National Red List Roadmap and Vision 2025-2030** at the **IUCN World Conservation Congress 2025** in Abu Dhabi. This initiative marks a significant step to create a comprehensive, science-based framework to assess and conserve India's vast flora and fauna, aligning its efforts with global standards.

About the IUCN World Conservation Congress (WCC)

The WCC is the world's largest and most diverse gathering of nature conservation experts, leaders, and decision-makers, held **once every four years**.

- **Goal:** It helps shape **global priorities** for nature conservation, climate change, and sustainable development for the coming decade and beyond.
- **Theme of IUCN Congress 2025: "Powering transformative conservation."**
- **Key Outcome (2025):** The Congress adopted the **Abu Dhabi Call to Action**, setting out key priorities for accelerating urgent and practical action for nature.

Components of the Congress

Component	Function
Forum	The largest knowledge marketplace for conservation and sustainable development science, practice, and innovation.
Exhibition	A platform for IUCN Members, Commissions, businesses, partners, and academia to showcase their work and innovations.
Member's Assembly	IUCN's **highest decision-making body**. Member organisations (governments and civil society) vote on motions defining the Union's general policy and elect the IUCN Council.

India's National Red List Roadmap (Vision 2025-2030)

This roadmap is a landmark national endeavor for biodiversity conservation, spearheaded by the Ministry of Environment, Forest and Climate Change.

- **Objective:** To establish a nationally coordinated, science-based system to assess and monitor the **conservation status of India's species**, following **IUCN global standards**.
- **Target:** The goal is to **assess approximately 11,000 species** (both flora and fauna) and publish **National Red Data Books** by **2030**.
- **Significance:** It will provide the **baseline data** and **threat analysis** necessary for evidence-based conservation policies, helping to identify endangered species for focused protection efforts.
- **Collaboration:** It was developed by the **Zoological Survey of India (ZSI)** and the **Botanical Survey of India (BSI)**, in collaboration with IUCN-India.

- **Global Alignment:** This initiative supports India's commitments under the **Convention on Biological Diversity (CBD)** and the **Kunming-Montreal Global Biodiversity Framework (KM-GBF)**.

Key Facts about IUCN

The **International Union for Conservation of Nature (IUCN)** is the global authority on the status of the natural world and the measures needed to safeguard it.

- **Nature:** A **membership Union** of both **government and civil society organisations**, making it the world's largest and most diverse environmental network.
- **Foundation:** Created in **1948**, headquartered in Gland, **Switzerland**.
- **Key Product:** It is best known for compiling and publishing the **IUCN Red List of Threatened Species**, the global standard for assessing extinction risk.

Governance of IUCN

- **Highest Body:** The **Members' Assembly** of the World Conservation Congress.
- **Governing Body (In between Congresses):** The **President and Council**.
- **IUCN Statutes:** The fundamental document that lays out the governance of IUCN.

Araneus nox (Leathery Garden Orb-weaver)

Why in News?

A recent survey by researchers in the **Idukki Wildlife Sanctuary** in Kerala, India, reported the **first record** of the spider species **Araneus nox** in the country. This discovery significantly adds to India's arachnid biodiversity records.

About Araneus nox

- **Common Name:** Leathery Garden Orb-weaver.
- **Classification:** It is an **orb-weaving spider** species belonging to the **Araneidae** family.
- **First Documented:** It was first described in **1877** by French arachnologist Eugène Simon from Basilan in the **Philippines**.
- **Web:** It is known for spinning near-perfect, **vertically oriented circular webs** on vegetation and tree branches.
- **Appearance:** It is a small to medium-sized orb-weaver with a distinctively **textured, leathery abdomen**. Its coloration can range from light brown to jet black, sometimes featuring clusters of light brown bristles (setae).
- **Habitat:** It is mainly found in **gardens, forests, and backyards**.
- **Distribution (Known Range):**
    - **Southeast Asia** including Cambodia, Laos, Myanmar, Thailand, and Vietnam.
    - Also in the Philippines, Malaysia, Indonesia, and Myanmar.
    - **New Record:** India (Idukki Wildlife Sanctuary, Kerala). Notably, the Indian sighting was the first time **both male and female** specimens were identified outside of its known range.

What are Orb-weaving Spiders?

- **Family:** They belong to the family **Araneidae** (sometimes historically called Argiopidae or Epeiridae) of the order Araneida.
- **Characteristics:** This is a **large and widely distributed group** of spiders. They are noted

for weaving **round, more or less symmetrical webs** (known as orb webs) suspended in open-air spaces.

- **Ecological Role:** They are vital in the ecosystem as **natural pest controllers**, feeding on a variety of flying insects caught in their intricate webs.

Southern Right Whale

Why in News?

The recent finding that **Southern Right Whales** (*Eubalaena australis*) are **producing fewer calves** is signaling a significant **environmental disruption**, primarily attributed to **climate change** affecting their feeding grounds.

About Southern Right Whale

The Southern Right Whale is one of four species of right whales.

- **Classification:** Like all whales, they are **mammals** that breathe air at the surface.
- **Name Origin:** They earned their name from whalers who considered them the **"right" whales to hunt** because they were slow-moving, floated when killed, and were rich in valuable oil and baleen.
- **Scientific Name:** *Eubalaena australis*.

Southern Right Whale Distribution

They are found throughout the oceans of the Southern Hemisphere.

- **Migration:** They migrate between summer feeding grounds in the **cold water around Antarctica** and more temperate, sheltered coastal bays in winter for breeding.
- **Coastal Visits:** They are regularly seen along the coasts of South Africa (May to November), Argentina (Península Valdés), Australia, and Brazil during the calving season.

Southern Right Whale Features

These are large, dark-colored whales with distinctive features.

- **Size:** They can grow up to **60 feet (18 meters) long** and weigh about **60 tons**.
- **Appearance:** They are mostly **dark gray or black** and lack a dorsal fin.
- **Callosities:** Their most distinctive features are the irregular patches of roughened skin on their head, known as **callosities**, which are covered in parasitic crustaceans (whale lice) and appear white or yellow. These patterns are unique to each individual, serving as a **natural "fingerprint"** for identification.
- **Blubber:** They possess very large amounts of fat, or **blubber**, for insulation against the cold.

Southern Right Whale Conservation Status

- **IUCN Red List (Global):** Classified as **'Least Concern'** due to the overall population size increasing significantly since the end of commercial whaling.

Green Sea Turtle : Conservation Status Update

Why in News?

The global conservation status of the **Green Sea Turtle** was recently reclassified on the International Union for Conservation of Nature (IUCN)'s Red List of Threatened Species, moving from **Endangered (EN)** to **Least Concern (LC)** in **October 2025**. This momentous change reflects a global population increase of approximately **28%** since the 1970s.

Latest Status and Conservation Success

- **Improved Red List Status:** The shift to **Least Concern** is the result of decades of sustained and coordinated **conservation action** across the world.
- **Key Conservation Efforts:**
    - Implementation of **international trade bans** and national laws against the commercial take of turtles and eggs.
    - **Community-based initiatives** focused on protecting nesting beaches and reducing unsustainable harvesting.
    - Use of **Turtle Excluder Devices (TEDs)** in fishing gear to reduce accidental capture (**bycatch**).
- **Success Stories:** Notable recoveries have been seen in key populations, including those in Ascension Island, Brazil, Mexico, and Hawai'i, with some areas approaching pre-exploitation levels.
- **A Word of Caution:** While the global status is improved, conservationists stress that the work is **not over**. Several regional subpopulations are still threatened or declining, such as those in the Central South Pacific (**Endangered**) and the North Indian Ocean (**Vulnerable**). Green turtles also remain below their historical abundance levels before widespread exploitation.

About Green Sea Turtle

Characteristic	Detail
IUCN Status (Global)	**Least Concern (LC)**
Size	The **largest hard-shelled sea turtle** species.
Name Origin	Named for the **green fat** beneath its carapace, not the shell's color (which is olive to black).
Diet	Changes with age: **Juveniles are carnivorous**, but adults are primarily **herbivorous** (grazing on seagrass and algae).
Ecological Role	A **keystone species** in tropical marine ecosystems, helping maintain healthy seagrass meadows and coral reefs.
Distribution	Found in **tropical and subtropical waters** around the globe.
Lifespan	Estimated to be **60-70 years**.

Features of Green Sea Turtle

- They possess a relatively **small head**.
- They **do not have teeth**, but their jaws have modified, serrated **"beaks"** suited to their herbivorous adult diet.
- They lack visible ears but have eardrums covered by skin, allowing them to hear best at **low frequencies**.
- They spend almost their entire lives **underwater**, only coming ashore for **nesting**.

IUCN's World Commission on Protected Areas (WCPA)

Why in News?

The Director of **Kaziranga National Park and Tiger Reserve**, Dr. Sonali Ghosh, has recently received the prestigious **Kenton R. Miller Award** for Innovation in Protected Area Sustainability, constituted by the **IUCN World Commission on Protected Areas (WCPA)**. She is the **first Indian** to receive this global honour.

About IUCN's World Commission on Protected Areas (WCPA)

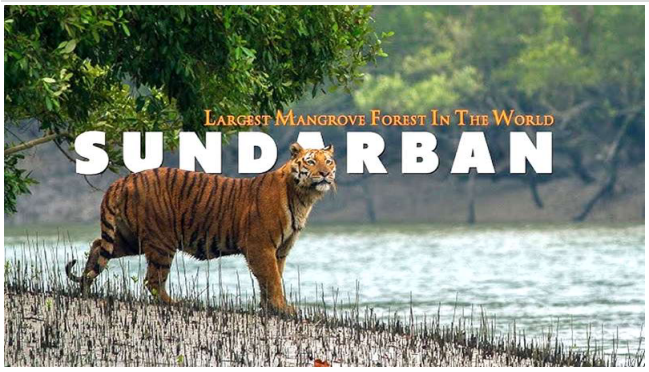
- **Parent Body:** The WCPA is one of six technical commissions of the **International Union for Conservation of Nature (IUCN)**.
- **Establishment:** It was established in **1948** as a global network dedicated to the conservation of nature and the sustainable use of natural resources.
- **Functions:**
    - It specializes in **protected area governance, management, and policy**.
    - It supports the **creation and effective management** of protected areas globally, including national parks, reserves, and marine protected areas.

- WCPA is a key partner in the implementation of the Kunming-Montreal Global Biodiversity Framework, particularly **Target 3** (30x30 goal).

Key Facts about Kenton R. Miller Award

Feature	Detail
Established	2006
Presented By	IUCN-WCPA
Frequency	Biennially (Every two years)
Purpose	Recognizes **Innovation** in National Parks and Protected Area Sustainability.
Named After	Dr. Kenton R. Miller, a former Director General of the IUCN and a conservation pioneer.
Recognition	Honors individuals or teams whose **innovations** in planning, management, finance, governance, monitoring, capacity building, and communication have a **significant impact** and peer recognition **without prior international awards**.
Prize	Comes with a **US $5,000 cash grant** and international recognition.
Recent Recipient (2025)	**Dr. Sonali Ghosh** (India) for her model of community-based conservation that integrates traditional ecological knowledge with modern science. She co-received the award with Roque Simón Sevilla Larrea (Ecuador).

Sundarbans National Park



Why in News?

- The **International Union for Conservation of Nature (IUCN)** recently released its latest assessment, the **World Heritage Outlook 4 (2025)**, which downgraded the conservation outlook status of the Sundarbans National Park from **'Good with Some Concerns'** to **'Significant Concerns'**.
- This indicates that the park is now facing serious pressures that are likely to have a high impact on its natural values. Manas National Park and the Western Ghats in India have also been placed in the 'Significant Concern' category.

Deterioration in Conservation Outlook: Key Threats

The IUCN's downgrade is attributed to several escalating pressures on the unique mangrove ecosystem:

- **Climate Change** : This is now the top threat, having surpassed historical issues like hunting.
  - **Sea Level Rise:** The relative mean sea-level in the Sundarbans is rising at an alarming rate, significantly higher than the global average, leading to the **permanent submergence of low-lying islands** and the loss of critical habitat.
  - **Extreme Weather Events:** Increased frequency and intensity of **cyclones and storm surges** cause devastating erosion and inundate the forests.
- **Hydrological and Salinity Changes:**
  - **Reduced Freshwater Flow:** Upstream dams and embankments on the Ganges, Brahmaputra, and Meghna rivers have severely **reduced the inflow of fresh water**.
  - **Increased Salinity:** The combination of reduced freshwater and rising sea levels has drastically **increased soil and water salinity**, which is detrimental to the survival of mangrove species like the **Sundari tree** (*Heritiera fomes*), and the overall biodiversity, including aquatic fauna.

- **Pollution and Resource Extraction:**
    - **Contamination:** Industrial effluents, untreated sewage, and oil spills from increased shipping traffic contaminate the waterways.
    - **Unsustainable Extraction:** High biotic pressure from the large local human population leads to the **over-exploitation of natural resources** like fish, crab, and fuelwood, exacerbating habitat degradation.
- **Diseases and Invasive Species:** The mangrove systems are facing pathogenic threats, such as the **'top dying' disease** in the Bangladesh portion of the Sundarbans, which impacts productivity.

About Sundarbans National Park

Feature	Details
Location	Southeastern region of **West Bengal**, India, forming part of the **Gangetic Delta**.
Area	Part of the larger Sundarbans mangrove forest, the **largest in the world** (spanning India and Bangladesh). The Sundarbans Tiger Reserve is poised to become India's second-largest with a proposed expansion.
Key Designations	Established in 1973 under **Project Tiger**. **UNESCO World Heritage Site** (1987). **Biosphere Reserve** (1989). **Ramsar Site** (2019).
Rivers	Formed by the combined delta of the **Ganga, Brahmaputra, and Meghna** rivers.
Flora	Predominantly **Mangrove forests**, including species like **Sundari tree** (*Heritiera fomes*), Golpati, Champa, Dhundul, Genwa, and Hatal.
Fauna	Home to the **Royal Bengal Tiger** (the only mangrove habitat in the world for this species), Fishing cats, Estuarine crocodiles, Indian grey mongoose, Ganges and Irrawaddy dolphins, and a variety of birds and reptiles.

Positive Conservation Measures

Despite the challenges, a few positive steps and initiatives are underway:

- **Expansion of Tiger Reserve:** A proposal to expand the **Sundarbans Tiger Reserve** by approximately 1,100 sq km is nearing approval, which would bring more area under better conservation management and funding.
- **Mangrove Augmentation:** The government has implemented promotional and regulatory measures like the **MISHTI (Mangrove Initiative for Shoreline Habitats & Tangible Incomes)** programme and various afforestation/eco-restoration schemes to augment mangrove cover.
- **Community Engagement:** Initiatives like **Joint Forest Management Committees (JFMCs)** and Eco-development Committees are in place to actively involve local communities in conservation and eco-development activities.

Indian Wolf (Canis lupus pallipes)

Why in News?

- The **International Union for Conservation of Nature (IUCN)** has for the first time evaluated the **Indian wolf** (*Canis lupus pallipes*) separately from the broader Grey Wolf species (*Canis lupus*).
- This significant move recognizes its **ancient lineage** and **genetic distinctiveness**, potentially leading to its reclassification as a **distinct species** (*Canis indica*) within the *Canis* genus.

About the Indian Wolf

Aspect	Details
Scientific Name	*Canis lupus pallipes* (proposed for reclassification as *Canis indica*)
Evolutionary Significance	It represents one of the **oldest living wolf lineages** globally, having diverged long before the last Ice Age.
Habitat	Prefers **open dry scrublands, semi-arid grasslands, and pastoral agro-ecosystems**. It is adapted to warmer climates, lacking the thick winter coat of its northern relatives.
Behavior	Generally lives in **smaller packs** (rarely exceeding 6-8 individuals). It is relatively **less vocal** (rarely known to howl) and is **nocturnal**, hunting primarily at night.
Distribution	Found in the Indian subcontinent (mainly **India** and **Pakistan**) and parts of Southwest Asia (e.g., Iran, Turkey, Syria). Its Indian range is largely restricted to the Deccan Plateau, Gujarat, Rajasthan, and Madhya Pradesh.
Population Estimate	Approximately **3,093 individuals** remain across India and Pakistan (with the vast majority in India), a number smaller than the tiger population.

Conservation Status and Major Threats

Conservation Status

Authority	Status	Significance
IUCN Red List	**Vulnerable**	This is the result of the new, separate evaluation, highlighting its precarious status.
CITES	**Appendix I**	Prohibits international commercial trade.
Wildlife (Protection) Act, 1972 (India)	**Schedule I**	Affords it the highest degree of legal protection against hunting.

Key Threats

The Indian wolf's population is facing a steady decline, primarily because most of its habitat lies **outside Protected Areas (only ~12.4%)**, exposing it to significant anthropogenic threats:

- **Habitat Loss and Fragmentation:** Conversion of its native grassland and scrubland habitat for **agriculture, urbanisation, and linear infrastructure** (like highways and solar/ renewable energy projects).
- **Human Persecution/Conflict: Retaliatory killings** (often by poisoning) by local communities due to **livestock predation**.
- **Shrinking Prey Base:** Depletion of wild prey species (like blackbuck and chinkara) forcing them to rely on livestock.
- **Hybridisation and Disease: Genetic dilution** through cross-breeding with **feral and stray dogs**, which also transmit diseases like **Canine Distemper Virus (CDV)**.

5 beaches in Maharashtra Have Been Awarded The Prestigious Blue Flag Certification

Why in News?

Recently, five beaches in **Maharashtra** have been awarded the prestigious **Blue Flag certification**, a significant achievement that places them among the cleanest and most sustainable coastal destinations globally. The announcement was made by state officials, highlighting the state's growing focus on eco-tourism and adherence to international environmental standards.

The five newly certified beaches in Maharashtra are:

1. **Shrivardhan Beach** (Raigad district)
2. **Nagaon Beach** (Raigad district)
3. **Parnaka Beach** (Palghar district)
4. **Guhagar Beach** (Ratnagiri district)
5. **Ladghar Beach** (Ratnagiri district)

This addition brings India's total number of Blue Flag-certified beaches to **18**.

About Blue Flag Certification

The Blue Flag is a highly respected **eco-label** and voluntary award for beaches, marinas, and sustainable tourism boats. It represents a global gold standard for **environmental excellence, safety, and sustainability** in the tourism sector.

Feature	Details
Awarded by	**Foundation for Environment Education (FEE)**, an international non-profit organization based in **Denmark**.
Criteria	Beaches must meet **33 stringent criteria** across four main categories. Most criteria are **imperative** (mandatory compliance).
Key Categories	**1. Water Quality:** Regular testing and compliance with high-grade microbiological standards.
	2. Environmental Management: Sustainable waste management, control of plastic pollution, and proper maintenance of facilities.
	3. Environmental Education & Information: Providing public information on the local ecosystem and offering environmental education activities.
	4. Safety & Services: Adequate safety measures (lifeguards, first-aid), accessibility for all (including persons with disabilities), and clean public amenities.
Programme Origin	Started in **France in 1985**; extended to areas outside of Europe in 2001.
Mission	To promote **sustainability** in the tourism sector through environmental education, protection, and the application of sustainable development practices.

India's Blue Flag Beaches (Total 18)

With the five new additions in Maharashtra, India has significantly expanded its network of Blue Flag beaches:

- **Maharashtra (5):** Shrivardhan, Nagaon, Parnaka, Guhagar, and Ladghar.
- **Other Certified Beaches (13):**
  - **Gujarat:** Shivrajpur
  - **Diu:** Ghoghla
  - **Karnataka:** Kasarkod, Padubidri
  - **Kerala:** Kappad
  - **Andhra Pradesh:** Rushikonda
  - **Odisha:** Golden
  - **Andaman and Nicobar:** Radhanagar
  - **Tamil Nadu:** Kovalam
  - **Puducherry:** Eden
  - **Lakshadweep:** Minicoy Thundi Beach, Kadmat Beach
  - **Odisha:** Chandrabhaga (India's first, received a temporary withdrawal/re-certification history)

This certification process is managed under India's **Integrated Coastal Zone Management Programme (ICZMP)** of the Ministry of Environment, Forest and Climate Change (MoEFCC).

Silent Valley National Park

Why in News?

Silent Valley National Park was recently in the news due to a couple of significant discoveries:

- **Odonate Discovery:** A recent odonate (dragonflies and damselflies) survey conducted by the Silent Valley National Park and the Society for Odonate Studies (SOS) identified **six new species** of dragonflies and damselflies, increasing the total known odonate species in the park from 103 to **109**. The newly recorded species include the Long Legged Clubtail and the Blue-necked Reedtail, among others. The presence of these species, which are known indicators of **freshwater quality**, confirms the excellent ecological integrity of the park's freshwater streams.
- **"Noisy" Cricket Species:** Researchers also identified and described a **new species of forest cricket**, named ***Ajareta sairandhriensis***, whose

loud ringing calls at night are said to be redefining the perceived "silence" of the valley. The new genus, *Ajareta*, is potentially endemic and speciose (species-rich) in the Indian subcontinent's evergreen forests.

About Silent Valley National Park

Silent Valley National Park is a stretch of **pristine wet evergreen forest** located in the state of **Kerala**, along the southwest corner of the Nilgiris in South India.

- **Significance:** It is one of the **last undisturbed tracts of tropical rainforest** in India and constitutes the centerpiece of the **Nilgiri Biosphere Reserve**, which was sanctified as a **World Heritage Site by UNESCO in 2012**.
- **Area and Altitude:** It covers an area of approximately **237.52 sq.km**, with an altitude varying between 658 to 2383 meters.
- **River:** The park is nourished by the **Kunthipuzha River**, which flows through the dense forest.
- **Name Origin:** The valley is popularly said to be "**silent**" because of the historical perceived absence of **cicadas**, a type of insect that typically produces a loud buzzing sound in many forests.
- **Vegetation:** It is home to four main types of vegetation: West Coast tropical evergreen forest, southern sub-tropical broad-leaved hill forest, montane wet temperature forest, and grasslands.
- **Flora and Fauna:**
    - **Flora:** The valley's rich flora includes about **1,000 species of flowering plants**, 107 species of orchids, and towering *Culinea* trees.
    - **Fauna:** It is most famous for its population of **Lion-tailed Macaques**, an endangered primate species endemic to the Western Ghats. Other notable mammals include the Nilgiri langur, Malabar giant squirrel, Indian elephant, tiger, and gaur (Indian bison). It also hosts over **200 species of birds**.

National Energy Conservation Awards (NECA)

Why in News?

- The **National Energy Conservation Awards (NECA)** were recently in the news because the **Bureau of Energy Efficiency (BEE)** invited applications for the **35th NECA 2025**.
- The major highlight of this edition is the introduction of a new award category: **Digital Content Creators and Influencers**. This signifies the government's move to leverage social media's influence to promote energy conservation behaviors among the masses, aligning with the vision of **Mission LiFE (Lifestyle for Environment)**.

About National Energy Conservation Awards (NECA)

The National Energy Conservation Awards are one of India's most prestigious platforms, recognizing excellence, innovation, and leadership in energy efficiency and conservation.

- **Instituted By: Bureau of Energy Efficiency (BEE)** in **1991**.
- **Objective:** To honor the exemplary contributions of various entities—including industries, buildings, transport undertakings, and institutions—in **reducing energy consumption** and enhancing energy efficiency.
- **Significance:** The awards aim to inspire a competitive spirit among stakeholders, driving the adoption of energy-efficient technologies and sustainable practices across the nation.

- **Award Presentation:** The awards are presented annually on **December 14th**, observed as **National Energy Conservation Day**, by high-level dignitaries, often including the President of India.

NECA 2025 Award Categories

The 35th edition of the awards covers a wide range of sectors:

- **Established Categories:**
  - **Industries**
  - **Transport**
  - **Buildings**
  - **Institutions** (Evaluation through the State Energy Efficiency Index)
  - **Energy-Efficient Appliances**
  - **Energy Efficiency Innovation**
- **New Category:**
  - **Content Creators and Influencers**

This new category aims to mobilize content creators as **ambassadors of change** to inspire millions of citizens to adopt energy-conscious lifestyles and promote mindful consumption.

What is the Bureau of Energy Efficiency (BEE)?

The Bureau of Energy Efficiency is a statutory body under the **Ministry of Power**, Government of India, that is responsible for promoting energy efficiency and conservation.

Feature	Details
Establishment	March 1, 2002
Legal Basis	Energy Conservation Act, **2001**
Mission	To develop policies and strategies that focus on **self-regulation and market principles** to promote energy efficiency.
Primary Objective	To reduce the **energy intensity** of the Indian economy.
Key Function	It coordinates with various bodies, including designated consumers and agencies, to implement programs like the **Standards & Labeling (Star Rating)** program for appliances and the **Perform Achieve and Trade (PAT)** scheme for large industries.

Blackbuck (Indian Antelope)

Why in News?

- The blackbuck has made a **remarkable comeback** in the **Barnawapara Wildlife Sanctuary** in **Chhattisgarh**, after being declared locally extinct in the state in 2017.
- The state forest department's five-year revival plan (2021–2026) has successfully reintroduced and bred a population of approximately **190 blackbucks** in the sanctuary.

About Blackbuck

- **Scientific Name:** *Antilope cervicapra*
- **Description:** It is a species of **antelope** native to India and Nepal, also known as the Indian Antelope.
- **Distribution:** Historically widespread across the Indian subcontinent, their populations are now fragmented. They are found mainly in protected areas across states like **Rajasthan, Gujarat, Madhya Pradesh, Tamil Nadu,** and **Odisha**.
- **State Animal:** It has been declared the state animal by the governments of **Punjab**, **Haryana**, and **Andhra Pradesh**.
- **Habitat:** The blackbuck primarily lives in **open grasslands**, dry scrub areas, and thinly forested regions, requiring access to perennial water sources.

Blackbuck Features

- **Size and Horns:** It is a medium-sized antelope. Only the **male** blackbucks possess the distinctive, ringed, **spiraling horns**, which can grow quite long, sometimes over 20 inches.
- **Coloration:**
    - **Males** are characteristically **dark brown or black** on their backs and sides, with white fur on their bellies, inner legs, and around their eyes, creating a striking contrast. Males often have a grey sheen to their dark parts during the breeding season.
    - **Females** and young males are lighter in color, typically **yellowish-brown** or fawn.
- **Speed:** They are among the **fastest terrestrial animals** in India, capable of reaching speeds up to 50 miles per hour, which is their primary defense mechanism against predators. They also have excellent eyesight.
- **Social Structure:** They are **gregarious and social**, with herds generally ranging from 5 to 50 animals.

Blackbuck Conservation Status

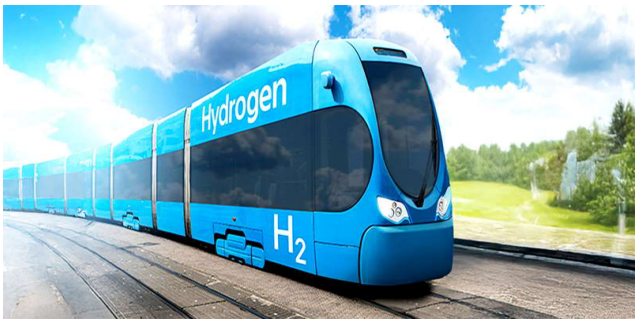
- **IUCN Red List: Least Concern** (LC) on a global level.
- **Indian Wildlife (Protection) Act, 1972:** Listed under **Schedule I**, which affords them the **highest level of legal protection** in India against hunting and poaching.
- **Threats:** Despite their global status, the population is declining in certain areas due to **excessive hunting**, **habitat loss and fragmentation**, and disease.

EDITORIALS

Crux of The Hindu & Indian Express

Ecology & Environment

Indian Railways' Decarbonisation: Hydrogen Trains and Net-Zero Goal



Why in News?

In July 2025, the **Indian Railways** successfully conducted a trial run of the country's **first hydrogen-powered coach** at the Integral Coach Factory (ICF) in Chennai. This trial marks a key step toward the Indian Railways' ambitious goal of achieving **net-zero carbon emissions by 2030**.

Indian Railways' Low-Carbon Strategy

The Railways is pursuing a multi-pronged approach to decarbonization:

- **Electrification and DFCs: 98%** of the broad-gauge network is now electrified (nearly 45,000 km), aiming to reduce reliance on diesel. Efforts are underway to increase **rail freight share to 45% by 2030** using Dedicated Freight Corridors (DFCs).
- **Renewable Energy Integration:** The Railways has commissioned **756 MW** of renewable capacity (solar, wind, and hybrid). Over **2,000 railway stations** are now solar-powered.
- **Hydrogen for Heritage Initiative:** This initiative, which includes the recently tested coach, plans to introduce **35 hydrogen-powered trains** primarily for non-electrified routes. This aligns with the **National Green Hydrogen Mission**.
- **Climate Finance:** India has utilized **₹ 58,000 crore** in sovereign green bonds, with **₹ 42,000**

crore directed toward rail electrification. The **Indian Railway Finance Corporation (IRFC)** is a key entity in raising green financing.

Significance of Decarbonizing Indian Railways

This transition offers substantial environmental and economic benefits:

- **Environmental Impact:** Large-scale electrification and the hydrogen initiative could prevent **60 million tonnes of CO2 emissions annually**, equivalent to removing 13 million cars from roads.
- **Economic Savings:** By 2030, the Railways could save over **₹ 1 lakh crore** in fuel costs.
- **Energy Independence:** Utilizing **green hydrogen** helps reduce India's reliance on imported fossil fuels, boosting the domestic clean energy ecosystem.
- **Public Awareness:** As a service used by 24 million passengers daily, the Railways acts as a **mass-scale platform** for promoting sustainable transport.

Key Challenges in the Transition

- **High Costs:** The production of **green hydrogen remains expensive**, posing a financial challenge for large-scale adoption, and the long-term **operational cost** of hydrogen-fuel trains is yet to be established in the Indian context.
- **Diesel Share:** Rail traction accounts for only about **3% of national diesel use**, meaning the elimination of diesel from railways addresses only a **minor portion** of India's overall diesel emissions.
- **Renewable Power Integration:** For the net-zero goal to be genuine, electrification must be paired with **renewable electricity procurement** rather than sourcing power from the current coal-heavy national grid.

Overcoming Barriers

The Railways can overcome these challenges by:

- **Cost Reduction:** Investing heavily in **R&D and Public-Private Partnerships** to scale up indigenous green hydrogen technology.
- **Rolling Stock Innovation:** Deploying hydrogen trains on routes where electrification is not cost-effective and incorporating technologies like **regenerative braking** and **AI-powered energy optimization**.
- **Green Power Sourcing:** Securing **long-term power purchase agreements** with solar and wind producers to ensure **"Green Power for Green Trains."**
- **Financial Support:** Leveraging **green bonds**, international climate funds, and **Viability Gap Funding** to manage initial high costs.

Mass Flowering of Kurinji in Nilgiris

Why in News?

The mass flowering of a variety of **Kurinji** after eight years in **Tamil Nadu's newly notified Gudalur Reserve Forest** in the Nilgiris has been observed. This event signals **biodiversity recovery** and serves as an important **indicator of healthy grasslands and changing climate conditions**.

About Kurinji Flowers

- **Endemic to Western Ghats:** There are over **60 species of Kurinji**, including the famous **Neelakurinji** (*Strobilanthes kunthiana*), all of which are endemic to the Western Ghats. The Nilgiris hosts 33 varieties.
- **The Recent Bloom:** In Gudalur, the recent mass bloom is of ***Strobilanthes sessilis***, a variety that flowers **once every eight years**.

- **Life Cycle:** Kurinji flowers once in its lifetime and then dies after flowering, relying on its seeds for the next generation.
- **Color Variations:** The flowers come in various shades of **purple, blue, white, and pink**.

Neelakurinji (*Strobilanthes kunthiana*)

The most famous variety, Neelakurinji, has unique characteristics:

- **Habitat:** It is a shrub native to the **shola forests** of the Western Ghats, found abundantly in the **Kodaikanal region**.
- **Flowering Cycle:** It blooms once every **12 years**.
- **Conservation Status:** It is classified as **Vulnerable** on the IUCN Red List.
- **Name Origin:** The **Nilgiris ("Blue Mountains")** get their name from the vast blue carpet created by the mass flowering of the Neelakurinji.

Significance

- **Ecological Importance:** The mass flowering attracts large numbers of **butterflies, honeybees, and other insects**, thereby supporting crucial **pollination** activity. It is also an **indicator** of **healthy grasslands** and thriving wildlife populations, including elephants, tigers, and hornbills.
- **Cultural Significance:** In local mythology, the Kurinji flower is associated with **Lord Muruga**. Among the **Muthuvas and Todas tribes**, Kurinji symbolizes **love and passion**.

Delhi Declaration 2025: Global South's Call for Local Climate Action

Why in News?

- The **Delhi Declaration on Local Action for Global Climate Goals** was recently adopted at the **ARISE Cities Forum 2025** in New Delhi. This declaration, which serves as a landmark commitment from cities of the **Global South**, is set to be presented at **COP30** in Belém, Brazil, aiming to shape global climate action through strengthened **multilevel governance**.

What is the Delhi Declaration 2025?

The Delhi Declaration 2025 is a major commitment aimed at bolstering **urban climate leadership and resilience**, particularly across the Global South.

Key Commitments:

- **Advance Local Climate Action:** Strengthen and resource **multilevel Nationally Determined Contributions (NDCs)** for measurable climate outcomes.
- **Drive Inclusive Urban Resilience:** Promote adaptation, **circular economy** practices, and **nature-based solutions** in city planning.
- **Promote Just Transitions:** Ensure **fairness and equity** in the shift toward net-zero emissions.
- **Strengthen Governance:** Build **data-driven, transparent, and accountable systems** for urban climate action.
- **Mobilise Climate Finance:** Enable **direct and predictable access** to climate finance for cities, recognizing them as pivotal players.
- **Champion Global South Leadership:** Encourage **South-South cooperation** and knowledge sharing on climate innovation.

Significance:

- The declaration positions cities as crucial players, representing a collective urban commitment to **act locally** while directly influencing **global climate policy** (from Bharat to Belém).

- **ARISE** stands for **A**daptive, **R**esilient, **I**nnovative, **S**ustainable, and **E**quitable, and the Forum was led by **ICLEI South Asia** (International Council for Local Environmental Initiatives).

Why Urban Climate Governance Matters

Urban Climate Governance refers to the framework of institutions, policies, and collaborations that enable cities to plan and implement effective climate action.

- **Emission Control:** Urban areas contribute to over **70% of global CO, emissions**, making them critical centers for climate solutions.
- **Vulnerability:** With the global urban population projected to reach **68% by 2050**, cities in the Global South, including India (adding nearly 10 million urban residents yearly), face heightened risks from **heatwaves, pollution, and floods**.
- **Disproportionate Impact:** The **urban poor** suffer most due to weak service access and informal housing. Climate change further stresses existing, overstressed waste, water, and energy systems.
- **Localizing Policy:** The Delhi Declaration aims to shift from a top-down approach, ensuring that global goals are translated into locally determined, **resilient, and inclusive** urban realities.

India's Initiatives in Urban Climate Governance

India has several national missions and frameworks to address urban climate challenges:

- **National Mission on Sustainable Habitat (NMSH):** Focuses on **energy efficiency in buildings**, sustainable mobility, and solid waste management.
- **Smart Cities Mission (SCM):** Aims to develop 100 cities with **climate-smart infrastructure**, renewable energy, and data-driven governance.
- **ClimateSmart Cities Assessment Framework (CSCAF):** A tool to evaluate cities based on five key themes: **energy, mobility, water, waste, and urban planning**.
- **AMRUT 2.0:** Promotes **water security**, green spaces, and **climate-resilient infrastructure**.
- **National Clean Air Programme (NCAP):** Targets reduction in PM2.5 and PM10 levels.
- **Nature-Based Solutions:** Initiatives like **Nagar Van Yojana** promote urban green cover for heat mitigation and carbon sequestration.

International Snow Leopard Day

Why in News?

India observed **International Snow Leopard Day** on **October 23** with the launch of the nationwide **'#23for23' campaign** to raise public awareness and promote conservation of the elusive big cat and its fragile high-altitude ecosystem.

Key Facts about the Snow Leopard and Conservation Efforts

International Snow Leopard Day & Campaign

- **Designation:** The **United Nations** General Assembly designated **23rd October** as International Snow Leopard Day in **2024** to promote global cooperation for snow leopard conservation and ecosystem protection.
- **'#23for23' Campaign:**
    - **Goal:** To raise awareness for snow leopard conservation.
    - **Initiators:** The **Global Snow Leopard and Ecosystem Protection Program (GSLEP)** and the **Snow Leopard Trust worldwide**.

- **Activity:** Participants are encouraged to dedicate **23 minutes of physical activity** for honouring the snow leopard, symbolizing collective commitment to the 23 identified snow leopard habitats.

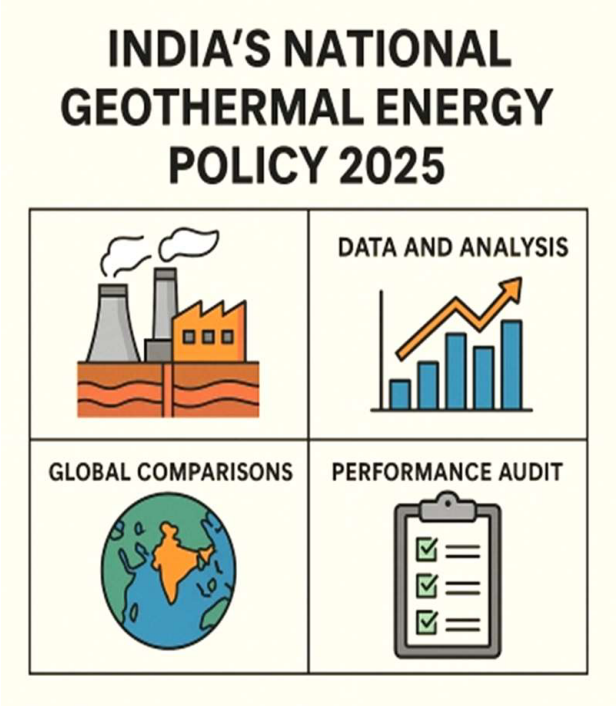
Snow Leopard (*Panthera uncia*)

- **Common Name:** Often called the **'ghost of the mountains'** due to its elusive nature.
- **Habitat:** Found across high mountain regions of Asia, including India, Nepal, Bhutan, China, and several Central Asian countries.
- **Elevation:** Prefers elevations between **3,000 to 4,500 meters**.
- **Classification & Status:**
  - **IUCN Status (2017):** Classified as **Vulnerable**.
  - **International Conventions:** Listed under **Appendix I of CITES** and the **Convention on the Conservation of Migratory Species of Wild Animals**.
  - **India's Protection:** Listed as a **Schedule I species** under the Wildlife (Protection) Act, 1972.
- **Key Traits:** They are **solitary animals** and, despite the name, are **genetically more closely related to tigers** than leopards. They have a gestation period of 90-100 days.
- **Major Threats: Habitat loss**, prey depletion, poaching, illegal trade, and **climate change**.

India's Conservation Measures

- **Population Assessment:** The **Snow Leopard Population Assessment in India (SPAI)** reports an estimated total of **718 snow leopards** in the country, marking the first scientific population survey in the Indian Himalayas.
- **Distribution: Ladakh** hosts the highest population, with **477** individuals.

India's First National Policy on Geothermal Energy 2025



Why in News?

The 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

The policy establishes a comprehensive framework to promote geothermal energy from resource assessment to market utilization.

- **Broad Scope of Application:** The policy covers all major aspects of geothermal energy development:
  - Geothermal Resource Assessment.
  - Power Production Systems (like dry steam, flash steam, and binary cycle).
  - **Direct-use Applications** and **Ground Source Heat Pumps (GSHP)** for heating and cooling.

- Encourages utilization of **abandoned oil and gas wells** for geothermal energy extraction.
- Regulates the incidental **extraction of valuable mineral by-products** like lithium, silica, and borax under the Mines and Minerals (Development and Regulation) Act (MMDR Act), 1957.

- **Promotion of Emerging Tech:** It specifically promotes **emerging and innovative technologies** such as:
  - **Enhanced Geothermal Systems (EGS)** and **Advanced Geothermal Systems (AGS)**.
  - Geothermal energy storage.
  - Offshore geothermal wells and hybrid geothermal-solar plants.
- **Geothermal Resource Data Repository:** Mandates the establishment of a comprehensive data repository through inter-ministerial collaboration (including the Ministry of Mines, Geological Survey of India (GSI), and National Data Repository (NDR)) to overcome data gaps.
- **Fiscal & Financial Support:** Provides substantial financial backing to enhance project viability:
  - Under the Renewable Energy Research and Technology Development Programme (RE-RTD): Up to **100% financial support** for government/non-profit research institutions and up to **70% support for private entities**.
  - Additional support mechanisms include: Inclusion under the **Indian Carbon Credit Trading Scheme**, **waiver of open access charges**, and eligibility under **Renewable Purchase Obligations (RPOs)**.
  - Other incentives include long-term concessional loans, Sovereign Green Bonds, and Viability Gap Funding (VGF).
- **State-Level Guidelines:** Grants State/UT governments the authority to issue:
  - **Exploration leases** (valid for 3–5 years).
  - **Development leases** for up to 30 years.
  - Establishes a **single-window clearance mechanism** through designated state nodal agencies to streamline approvals.

What is Geothermal Energy?

Geothermal energy is the **thermal energy derived from the Earth's interior** (primarily from residual heat from the planet's formation and continuous radioactive decay), which can be used for direct heating and generating electricity. It is classified as a **renewable energy source** because the Earth continuously produces heat within its core, and its extraction can be managed to balance with the natural heat recharge rate of the reservoir.

India's Geothermal Potential

- **Distribution:** India's potential is spread across **381 hot springs** and **10 identified geothermal provinces** including Ladakh (**Puga Valley**), Himachal Pradesh, Gujarat, Odisha, and Chhattisgarh.
- **Estimated Capacity:** A potential of about **10,600 MW of geothermal power** has been estimated in the country.
- **Global Context:** Globally, geothermal energy contributes about 15.4 GW (2019), led by countries like the U.S., Indonesia, and the Philippines.

Benefits

- **Continuous Supply (Baseload):** Geothermal power plants can operate **24×7**, providing a consistent energy supply unaffected by weather, unlike solar and wind.
- **Renewable Source:** Sustainable with proper reservoir management.

- **Minimal Environmental Footprint:** Features a **small land footprint** per GWh and **less water consumption** compared to most conventional energy sources.

Disadvantages/Issues

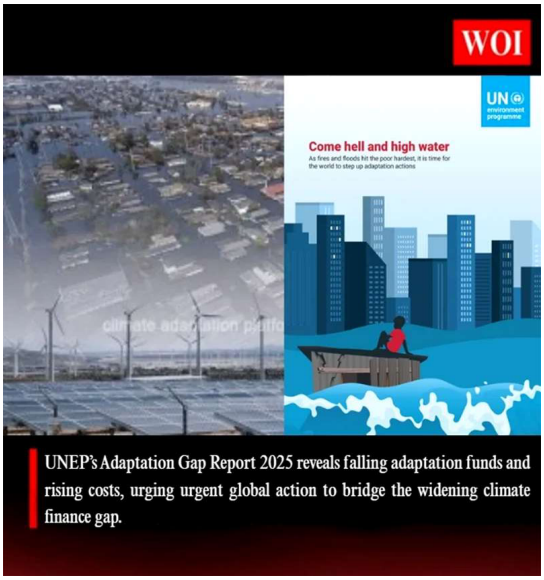
- **Environmental Risk:** Improper harnessing can lead to the release of **hazardous gases and minerals** trapped inside the Earth.
- **High Costs:** Geothermal projects have **higher capital costs** and face techno-economic viability issues due to often **remote locations** of high-potential sites.

Significance of the National Geothermal Energy Policy 2025

The policy is a crucial step towards India's clean energy transition and has a multifaceted significance:

- **Energy Security & Grid Stability:** It facilitates **baseload renewable power generation**, which is critical for **grid stability** and reducing reliance on intermittent energy sources and fossil fuels.
- **Attracting Investment:** The policy significantly boosts geothermal energy adoption by offering **long-term concessional loans, Sovereign Green Bonds, Viability Gap Funding (VGF)**, and fiscal incentives (like **GST/import duty exemptions**), thereby attracting private investment.
- **Regional Development:** It supports remote regions, particularly the **Himalayan and Northeastern areas**, by providing clean heating and power solutions.
- **Decarbonization & Innovation:** It encourages **industrial decarbonization** by reusing existing oil and gas infrastructure (abandoned wells) and strengthens India's position in global renewable innovation by promoting advanced technologies like EGS/AGS.
- **Policy Synergy:** It complements other national initiatives such as the **National Green Hydrogen Mission** and the RE-RTD Programme for renewable R&D.

UNEP Adaptation Gap Report 2025: Alarming Climate Finance Shortfall



Why in News?

- The **United Nations Environment Programme (UNEP) Adaptation Gap Report (AGR) 2025** warns that **climate adaptation efforts remain severely underfunded** despite the escalating intensity of global climate impacts. The report highlights the critical need for urgent global cooperation and reformed climate finance to build resilience and meet sustainable development goals.

Key Highlights of the Adaptation Gap Report (AGR) 2025

The report presents a sobering assessment of the financial needs versus the current funding available for climate adaptation in developing nations.

Financial Shortfall and Rising Needs

- **Rising Adaptation Finance Needs:** Developing countries will require an estimated **USD 310–365 billion annually by 2035** for climate adaptation. Adjusted for inflation, needs could reach **USD 440–520 billion annually**. This reflects the escalating costs of implementing adaptation measures against rising climate risks.

- **Widening Adaptation Finance Gap:** Current international public adaptation finance stands at only **USD 26 billion (2023)**. This results in a massive **finance gap of USD 284–339 billion per year**, indicating current funding is highly inadequate.
- **Missed Global Targets:** The **Glasgow Climate Pact goal** of doubling 2019 adaptation finance to **USD 40 billion by 2025** is likely to be **missed**. The **New Collective Quantified Goal (NCQG)** of **USD 300 billion by 2035** is deemed insufficient as it is not inflation-adjusted.
- **Funding Mechanisms:** Support via mechanisms like the **Adaptation Fund, Global Environment Facility, and Green Climate Fund** rose to USD 920 million in 2024 (an 86% increase over the 2019–23 average), although UNEP cautions this may be a temporary spike due to growing fiscal constraints.

Unequal Burden and Progress

- **Unequal Burden:** Developing nations face an unequal burden: about **58% of adaptation funds** come as **debt instruments**, mostly **non-concessional loans**, risking **deepening long-term debt** and exacerbating **climate injustice**.
- **Slow Progress in Planning:** While 172 of 197 countries have national adaptation plans, **36 of these are outdated**, weakening their ability to respond to evolving climate risks. **Small Island Developing States (SIDS)** show the strongest integration of adaptation into national policies.

Key Recommendations

The report provides a roadmap for closing the gap through coordinated global action.

- **Fast-track the Baku to Belém Roadmap:** Adopted at **COP 29** to the UNFCCC, this roadmap calls for scaling up climate finance for developing nations to **USD 1.3 trillion annually by 2035**.
- **Enhance Private Sector Participation:** Current private adaptation finance is around **USD 5 billion annually**. This could rise to **USD 50 billion per year** with supportive policies, including **blended finance** and **public-private partnerships** to de-risk investments.
- **Prioritise Grants and Concessional Finance:** To avoid new debt traps, focus on **non-debt-creating instruments**, especially **grants** and concessional support. Resources should be redirected toward adaptation by phasing out **fossil fuel subsidies**.
- **Strengthen Mitigation:** The report emphasizes that **reducing emissions** can contain adaptation costs by limiting the intensity of future climate impacts.

Key Terms Related to Adaptation

- **Adaptation:** Means **adjusting to current or expected changes** in the climate and their effects to reduce damage or make use of new opportunities.
- **Adaptation Costs:** The expenses involved in **planning, preparing, and implementing adaptation measures**.
- **Adaptation Gap:** The **difference** between the adaptation actions actually implemented and the **desired societal goals** needed to effectively cope with climate impacts.

India's Stance: Balancing Climate Commitments with Development

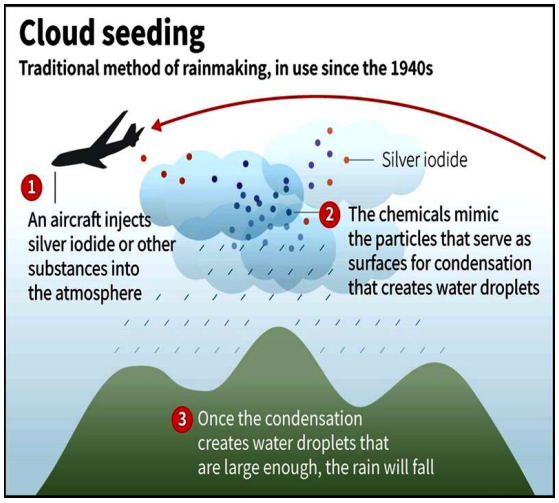
India's strategy is driven by a pragmatic focus on domestic resilience and a call for global equity.

- **Adaptation-Centric Focus:** India's climate strategy is shifting toward **adaptation-driven action**—prioritising **climate resilience** (e.g., strengthening agriculture and water systems) over deep emission cuts. This aligns with India's **National Adaptation Fund for Climate Change (NAFCC)**.

- **Development Before Decarbonisation:** As stated in the *Economic Survey 2024–25*, achieving **"developed nation" status by 2047** is seen as essential before aggressive deep decarbonisation efforts. This stance echoes the principle of **"Common But Differentiated Responsibilities and Respective Capabilities (CBDR-RC)"** under the UNFCCC.
- **Pragmatic Global Posture:** India's likely delay in submitting its **2035 Nationally Determined Contributions (NDCs)** underscores its discontent with weak global progress and lack of trust, exacerbated by events like the **withdrawal of the US from the Paris Agreement (2025)** and the Loss and Damage Fund.
- **Long-Term Vision:** While adaptation is the immediate priority, **mitigation remains the long-term goal**. India is committed to achieving **Net Zero by 2070**, aligned with its NDCs and **Long-Term Low Emissions Development Strategy (LT-LEDS)**.

The UNEP Adaptation Gap Report 2025 warns that adaptation finance is far below global needs. Without urgent concessional funding, stronger mitigation, and reformed climate finance, developing nations risk severe climate impacts. Investing in adaptation now is vital for future survival.

How Cloud Seeding Works — and Can It Help Fight Air Pollution?



1. Background — What Happened Recently?

- On **October 28, 2025**, a **small aircraft (Cessna 206H)** carried out a **cloud seeding experiment** over **Delhi** to see if it could help **reduce air pollution**.
- The aircraft took off from **IIT Kanpur**, flew over **Delhi areas** like **Burari, Mayur Vihar, and Karol Bagh**, and landed in **Meerut**.
- The aim was to **create light rainfall** to help **wash away pollutants** from the air.
- Delhi Environment Minister Manjinder Singh Sirsa said this was **India's first major attempt** to scientifically reduce pollution through cloud seeding
- If it succeeds, similar trials will continue in Delhi through the **winter season** (till February 2026).

2. What is Cloud Seeding?

- **Cloud seeding** is a scientific technique used to **artificially increase rainfall** by adding special particles (called "seeds") to clouds.
- These "seeds" help **cloud droplets** grow larger and heavier so that they **fall as rain**.

Simple science behind it:

- Normally, water vapour in the air **condenses around tiny particles** like dust or pollen '! forms small droplets '! droplets collide '! grow '! and fall as rain.
- In **cloud seeding**, scientists **add more particles** to help this process happen faster or more effectively.

3. What Are These 'Seeds'?

- The seed materials are usually **salts or chemicals** that attract water.

Commonly used substances include:

  - **Silver iodide (AgI)**
  - **Potassium iodide (KI)**
  - **Sodium chloride (NaCl)** — common salt

- These act as **"cloud condensation nuclei (CCN)"** — tiny surfaces on which water vapour can condense to form droplets.
- They can also act as **"ice nuclei"** in cold clouds, helping ice crystals form that later melt into raindrops.

4. How Is Cloud Seeding Done?

Cloud seeding material can be spread in several ways:

Method	How it works
Aircraft	Chemicals are released directly into clouds using planes.
Flares	Burning flares attached to aircraft wings release the chemicals.
Rockets / Drones	Used to deliver seeding material into the cloud layer.
Ground Generators	Machines on the ground send chemicals upward into the sky.

Delhi's Experiment

- **Eight flares** were attached to the aircraft wings.
- Each flare weighed about **2 to 2.5 kg**.
- The chemicals were released into clouds having **15–20% humidity**.
- It took around **2–2.5 minutes** to release each flare.

5. What Conditions Are Needed for Cloud Seeding?

Cloud seeding **cannot create clouds** — it can only work **if clouds already exist**.

Key Requirements

1. **Enough clouds** — not a clear sky.
2. **Sufficient cloud depth** — clouds must be thick enough to hold moisture.
3. **Presence of small droplets** inside the clouds.
4. **Favourable wind and humidity** conditions.

- (former Secretary, Ministry of Earth Sciences) explained: "You need clouds with enough droplets. Seeding helps droplets grow so they become heavy and fall as rain. You cannot do it under a clear sky."
- In Delhi, clouds often form in winter due to **western disturbances** (weather systems coming from the Mediterranean region).
- However, winter clouds are **not always suitable** — they may be too thin or have **low moisture content**, making seeding difficult.

6. Why Use Cloud Seeding to Fight Pollution?

The Logic: "Rain Washes Away Pollutants"

- When it rains, **raindrops capture and carry down dust, smoke, and pollutants** (like PM2.5 and PM10).
- This process, called **"wet deposition" or "washout"**, temporarily cleans the air.
- An MIT study explained that as a **raindrop falls**, it attracts **tiny aerosol particles** like soot, sulfates, and organic matter.
- Each raindrop can collect **hundreds of these particles**, clearing them from the air.

Expert Opinion

- **Gufran Beig** (Founder of SAFAR): "If it rains enough, pollutants get washed away. The effect is temporary, but it can break the cycle of pollution for a few days."
- So, the **goal in Delhi** is to trigger **short bursts of rainfall** that can give **temporary relief from smog** and **improve visibility**.

7. Challenges and Limitations

Challenge	Explanation
Cloud Availability	Winter clouds may not have enough moisture for seeding to work.
Short-Term Impact	Rain cleans the air only temporarily; pollution sources remain.
Effectiveness Doubts	Past experiments show mixed results — sometimes rainfall increase is very small.
High Cost	Each operation requires aircraft, chemicals, and expert teams.
Environmental Concerns	Some worry about the long-term impact of chemicals like silver iodide.

In fact, in many parts of India, cloud seeding has been used for **rainmaking during droughts**, but with **limited success** (rainfall increase seen only around **20–25% in some studies**).

8. Is It the Right Solution for Delhi's Pollution?

Many experts believe **cloud seeding treats the symptom, not the cause**.

Root causes of Delhi's air pollution:

- **Vehicle emissions**
- **Industrial smoke**
- **Construction dust**
- **Stubble burning**
- **Fireworks**
- **Weather conditions trapping pollutants near the ground**

So, even if cloud seeding gives short relief, the air will become dirty again unless **main pollution sources** are controlled.

9. India's Experience with Cloud Seeding

- India has tried cloud seeding earlier in **Maharashtra, Tamil Nadu, Karnataka, and Andhra Pradesh** to increase rainfall.
- Results have been **mixed** — success depends on local weather and type of clouds.
- The **Indian Institute of Tropical Meteorology (IITM), Pune** continues to study the science behind seeding and its best practices.

10. Conclusion

- Cloud seeding is a **scientific way to enhance rainfall**, not to "create rain from nothing."
- It can give **temporary relief** by washing pollutants out of the air — but it **won't solve Delhi's pollution problem permanently**.
- Long-term improvement requires:
  - Better control of emissions,
  - Cleaner fuels,
  - Less stubble burning, and
  - Stricter environmental policies.

So, while the experiment is **scientifically interesting and worth studying**, it is **not a magic solution** to Delhi's pollution.

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Geography

False Smut Disease (Haldi Rog)

Why in news :

False Smut is a significant **fungal disease** of **rice (paddy)**, recently in news due to widespread damage in major agricultural states like **Punjab**.

1. Key Facts :

Aspect	Detail
Disease Type	Fungal Disease
Causative Agent	Fungus: ***Ustilaginoidea virens***
Common Names	**Haldi Rog** (due to yellow spore mass), **Lakshmi Disease**, or **Oothupathi Disease**
Impact Area	Exclusively affects the **paddy grain**; does not directly impact other plant parts.

2. Disease Progression and Symptoms

- **Infection Stage:** The fungus infects the crop during the **flowering stage** (difficult to control).
- **Symptom Visibility:** Symptoms appear **after the emergence of rice panicles**.
- **Visual Symptoms:**
  - Infected grains show **black fungal mycelium growth**.
  - This is covered by a characteristic **yellow fungal growth** (early spores).
  - Mature spores are **orange** and eventually turn **yellowish green or greenish black**.
- **Pattern:** Typically, **only a few grains** in a panicle are infected.

3. Economic Impact and Loss

- **Grain Quality:** Causes **chalkiness of grains**.
- **Yield Loss:** Leads to a **reduction in grain weight** and loss of **seed germination** capacity.

- **Severity:** Yield loss is significant and proportional to the **percentage of infected panicles** and the **extent of infection within each panicle**.

4. Favorable Conditions for Spread

The disease thrives under specific environmental and agronomic factors:

1. **Warm and Humid Weather:** Optimal for fungal growth.
2. **Inoculum Presence:** Spores survive on **infected plant debris** (stubble, straw) from previous harvests.
3. **Soil Nutrients: High nitrogen content** (excessive application) increases the crop's susceptibility.

5. Management Challenge

- **Control Method:** Fungicide application is a feasible control measure.
- **Associated Problem:** High fungicide usage leads to:
    - Development of **resistance** in the causal agent.
    - Increased **environmental pollution**.

Philippines

Why in News

A 6.9 magnitude offshore earthquake recently struck Cebu province, drawing attention to the region's seismic risk.

Country Details

- Location: Island country in Southeast Asia, situated in the western Pacific Ocean
- Maritime Borders: Shares sea boundaries with Vietnam, Taiwan, Palau, Malaysia, and Indonesia
- Surrounding Water Bodies: South China Sea, Philippine Sea, Celebes Sea, Sulu Sea
- Highest Point: Mount Apo
- Major Rivers: Cagayan (longest), Mindanao, Agusan
- Major Volcano: Mayon Volcano (noted for frequent eruptions)
- Largest Lake: Laguna de Bay
- Climate: Tropical and monsoonal
- Natural Resources: Timber, petroleum, nickel, cobalt, silver, gold, salt, copper
- Energy Leadership: Third in global geothermal energy production, after the USA and Indonesia
- World Heritage Site: Puerto-Princesa Subterranean River National Park (UNESCO, 1999)

Leyte Island

Why in News

Leyte Island in the Philippines was recently struck by a 6.7 magnitude earthquake.

Island Profile

- Location & Geography:
  - Part of the Visayas archipelago in the Philippines
  - Eighth-largest island in the country, sixth most populated
  - Area: 7,056 sq.km.
  - Coastline: 969 km
  - Northern tip nearly joins Samar Island; separated by the San Juanico Strait, which narrows to just 2 km in parts
  - The San Juanico Bridge (2.16 km) connects Leyte and Samar
- Landscape:
  - Dominated by thick forests and mountains
  - The Leyte Valley in the northeast is a prominent agricultural region
- Major Cities:
  - Tacloban (eastern coast)
  - Ormoc (western coast, noted for geothermal power plants)

Historical Significance

- Known to Spanish explorers in the 16th century as Tandaya
- Saw rapid population growth after 1900, notably in Leyte and Ormoc valleys
- Important World War II site: US forces landed on Leyte on October 20, 1944; the Japanese were expelled after the Battle of Leyte Gulf

Economic Activities

- Agriculture is the mainstay: rice, corn, coconuts, bananas
- Fishing is widely practiced
- Resources include manganese; quarrying of sandstone and limestone also occurs

Mission for Aatmanirbharta in Pulses : A Six-Year Plan for Self-Sufficiency

- The Union Cabinet approved the **Mission for Aatmanirbharta in Pulses** on October 1, 2025, with a significant financial outlay, aiming to achieve self-sufficiency in pulse production and reduce India's import dependency.
- This comprehensive strategy covers the entire value chain, from research and seed systems to procurement and price stability.

1. Mission Overview and Financials

Feature	Details
Cabinet Approval Date	**October, 2025**
Implementation Period	**2025–26 to 2030–31** (6 years)
Primary Goal	Boosting domestic production and achieving self-sufficiency (**Aatmanirbharta**) in pulses.
Focus Crops	**Tur, Urad, and Masoor**

2. Key Features and Implementation Strategy

The mission adopts a comprehensive strategy covering research, seed systems, area expansion, procurement, and price stability.

- **Focus on Quality Seeds:**
  - Focuses on developing and disseminating the latest varieties of pulses which are **high in productivity, pest-resistant and climate-resilient**.
  - **Multi-location trials** will be carried out in major pulse-growing states.

- States will prepare **five-year rolling seed production plans**.
- **Breeder seed production** will be supervised by the **Indian Council of Agricultural Research (ICAR)**.
- **Foundation and certified seed production** will be closely tracked through the **Seed Authentication, Traceability & Holistic Inventory (SATHI) portal**.

- **Capacity Building:**
  - Structured training programmes for farmers and seed growers to promote **sustainable techniques and modern technologies**.
- **Post-harvest Infrastructure:**
  - The Mission will help develop **1,000 processing units** to strengthen markets and value chains.
  - A maximum **subsidy of Rs. 25 lakhs** will be available for setting up processing and packaging units.
- **Cluster-Based Approach:**
  - Interventions will be tailored to the specific needs of each cluster to enhance productivity and promote geographic diversification of pulse production.
- **Procurement and Price Stability:**
  - Assured **maximum procurement** of **Tur, Urad, and Masoor** under **Price Support Scheme (PSS) of PM-AASHA**.
  - **NAFED and NCCF** will undertake **100% procurement** in participating states for the **next four years** from registered farmers who enter into agreements.
  - A mechanism for **monitoring global pulse prices** will be established to safeguard farmer confidence.

3. Timeline

Phase	Duration
Mission Implementation	**2025–26 to 2030–31** (Six-year period)
Assured Procurement	**Next four years** (100% procurement by NAFED and NCCF)

Niger River

Why in News?

An accident involving a boat carrying passengers on the **Niger River** in north-central Nigeria recently resulted in the death of at least **26 people.**

About the Niger River

- **Principal River:** It is the principal river of **western Africa.**
- **Length and Ranking:** With a length of **4,200 km**, it is the **third longest river in Africa**, following the Nile and the Congo.
- **Nickname:** It is the longest and largest river in West Africa and is nicknamed the **"Boomerang River"** due to its serpentine shape.
- **Nodal Area:** The northern part of the river, known as the **Niger Bend**, is crucial as it is the closest major water source to the **Sahara Desert.**

Course and Flow

- **Source:** It rises in **Guinea**, just 240 kilometers from the Atlantic Ocean.
- **Unusual Route:** It takes an unusual route, initially running **away from the sea** and flowing

into the Sahara Desert. It then takes a sharp right turn near **Mali's Timbuktu city.**

- **Countries:** It flows through five West African countries: **Mali, Niger, Benin, and Nigeria.**
- **Mouth:** It empties into the Atlantic Ocean via the Niger Delta.
- **Vegetation Zones:** The river passes through virtually all of western Africa's vegetational zones, including grasslands, rainforests, and swamps.
- **Tributary:** Its main tributary is the **Benue River.**
- **Basin:** The Niger River Basin covers **7.5 percent** of the African continent.

Niger Delta

- **Location:** Located in **southern Nigeria**, where the Niger River meets the Atlantic Ocean (Gulf of Guinea).
- **Significance:** It is the **largest river delta in Africa** and features the **fifth largest mangrove forest** on Earth.

Major Cities

- The Niger Valley is sparsely settled, but the largest cities located along its course include:
    - **Bamako** (Mali)
    - **Niamey** (Niger)
    - **Onitsha** (Nigeria)

Easter Island (Rapa Nui)

Why in News?

- **New research** provides the strongest evidence yet that Easter Island's iconic **moai statues were "walked" upright** using an ingenious rocking motion, not simply dragged or rolled on wooden sleds.
- This confirms a long-standing local oral tradition that the statues "walked" themselves into place.

About Easter Island

Feature	Details
Local Name	**Rapa Nui** ("Great Rapa") or **Te Pito te Henua** ("Navel of the World")
Location	**Polynesian island** in the southeastern Pacific Ocean.
Political Status	Special **Chilean territory**.
Isolation	One of the **most isolated inhabited islands** in the world (approx. 3,540 km west of Chile).
Geography	Small, **triangular-shaped volcanic island** (163.6 sq.km). Comprises three **extinct volcanoes**: **Terevaka** (highest point), **Poike**, and **Rano Kau**.
Climate	Subtropical climate (often misclassified as tropical rainforest climate), with mild winters.
Protection	**UNESCO World Heritage Site** (since 1996), with major parts protected under the **Rapa Nui National Park**.

What are Moai Statues?

- **Description:** Large **megalithic statues** shaped like human figures, famous for their oversized heads.
- **Construction:**
    - Carved primarily from **volcanic tuff** (soft, porous rock) at quarries, mainly the **Rano Raraku** crater.
    - They were then moved to their final locations and erected on stone platforms called *ahu*.
- **Size:** Can stand up to **40 feet tall** and weigh up to **75 tonnes**, though the average is about half that.
- **Key Feature:** Many were topped with a "hat" or cylindrical topknot called a **Pukao**, made from a soft red stone.

- **Time Period:** Scholars believe the Rapa Nui people built the moai between the **13th and the 16th centuries**.
- **Quantity:** Over **900 moai** have been found on the island.

What do Moais represent?

- **Ancestral Honor:** They were built to honor **revered ancestors** (chieftains or other important people) who had passed away.
- **Watch over the Tribe:** Once erected on the **ahu** (stone platforms, which were also tombs), they typically **faced inland** to symbolically watch over and protect the community.
- **Spiritual Power:** They were considered **repositories of sacred spirit** (*mana*), and their intentional differing characteristics were meant to keep the appearance of the person they represented.

Damodar River : The 'Sorrow of Bengal' and DVC Controversy

Why in News?

The Damodar River and the **Damodar Valley Corporation (DVC)** are frequently in the news, particularly during the monsoon season, due to the **recurring flood-like situation** in West Bengal.

- **Political Controversy:** The West Bengal government, led by Chief Minister Mamata Banerjee, has repeatedly **accused the DVC (a central government undertaking) of causing "man-made floods"** by unilaterally releasing large volumes of water from its reservoirs (like Maithon and Panchet) without proper coordination.
- **Recent Flooding (2025):** Heavy rainfall and subsequent water releases from DVC reservoirs in mid-2025 (e.g., in July and October) led to flooding in downstream districts of West Bengal, including Howrah, Hooghly, and East Burdwan, causing property and agricultural damage.

Damodar River Latest News

The most recent significant news around the Damodar River relates to the political and management controversy surrounding flood control, which is a perennial issue:

- **DVC Water Release Dispute:** In October 2025, the West Bengal Chief Minister publicly attacked the DVC for releasing a massive 65,000 cusecs of water, allegedly without prior notice to the State, coinciding with the end of the Durga Puja festival. This was labeled a "reckless act" and an attempt to inflict misery, highlighting the ongoing lack of coordination between the central DVC body and the state government on water management.
- **Infrastructure Collapse:** Reports surfaced recently of an **iron bridge over the Damodar River in Asansol, West Bengal, collapsing** (about a month ago from the current date).

About Damodar River

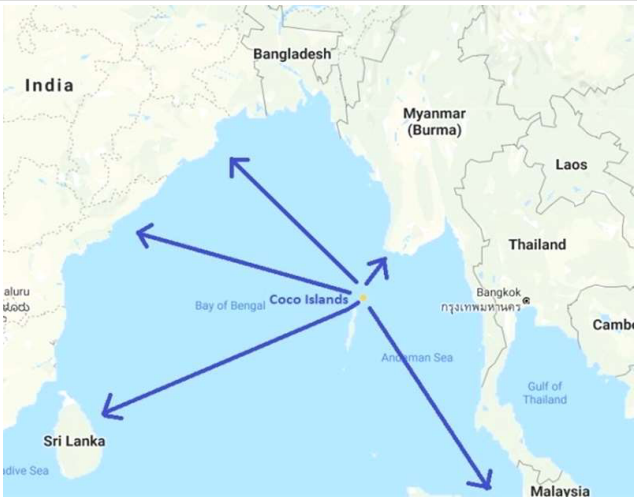
Feature	Details
States	**Jharkhand** (Origin) and **West Bengal** (Flows through & joins Hooghly).
Nickname	**"Sorrow of Bengal"** due to its history of devastating floods.
Origin	**Palamau hills** of the **Chota Nagpur Plateau** in Jharkhand.
Mouth	Meets the **Hooghly River** at Shayampur, West Bengal (The Hooghly River is a distributary of the Ganga River, making Damodar a part of the **Ganges River System**).
Total Length	**592 km**.
Tributaries	**Barakar River** (most important), Konar River, Jamunia River, Bokaro River, Sali River, etc.

Damodar Valley Project (DVP)

The DVP is a historical and critical project for the region:

- **Significance:** It was **India's first multipurpose river valley project**, established for hydroelectric power generation, irrigation, and—critically—**flood prevention**.
- **Operator: Damodar Valley Corporation (DVC)**, an undertaking of the Indian Government established in July **1948**.
- **Model:** It was modeled on the **Tennessee Valley Authority (TVA)** of the United States.
- **Major Dams:** DVC controls four major dams: **Tilaiya** (on Barakar), **Konar** (on Konar), **Maithon** (on Barakar), and **Panchet** (on Damodar). The Durgapur Barrage is downstream.

Coco Islands: Strategic Friction in the Bay of Bengal



Why in News?

The Coco Islands have recently been in the news because **Myanmar has provided assurance to India** that there is **no Chinese presence** on the islands, which are located in the Bay of Bengal. This issue remains a matter of significant **strategic interest and security concern** for India due to the islands' geographical proximity to its key naval assets.

Key Facts about Coco Islands

Feature	Details
Location	A small group of islands in the **Bay of Bengal**.
Sovereignty	Part of the **Yangon Region of Myanmar**.
Proximity to India	The largest island, **Great Coco Island**, lies just **55 km** (less than 100 km) from India's strategic **Andaman and Nicobar Islands**.
Geography	Geologically, they are an extended division of the **Arakan Mountains** (Rakhine Mountains), sharing the same submerged topography that emerges as the Andaman and Nicobar Islands.
Historical Note	They were a source of food for the British penal colony in the Andaman Islands in the early 19th century. They were officially made part of **British Burma in 1882**.

Strategic Significance and Indian Concerns

The Coco Islands hold immense geostrategic value, particularly for India's maritime security:

- **India's "Backyard":** Their extreme proximity to the Andaman and Nicobar Islands places them in a critical location, giving them the potential to monitor Indian naval and missile activities, including those of India's **nuclear-powered submarine fleet**.
- **Surveillance Risk:** There are longstanding concerns (dating back to the 1990s) and recent reports, including satellite imagery, suggesting significant infrastructure upgrades—like the **extension of the airstrip** and construction of **radar stations** and new barracks—that could be used by China for **Signals Intelligence (SIGINT)** and maritime surveillance.
- **Monitoring Sea Lanes:** The islands are in a key position to observe vital **Sea Lines of Communication (SLOCs)** and the **Strait of Malacca**, a critical global trade and energy route. A foreign military presence here could threaten India's role as a net security provider in the Indian Ocean.
- **China's Geopolitical Play:** The alleged use of Coco Islands is seen by some analysts as part of China's strategy to extend its surveillance

reach into the Bay of Bengal, challenging India's influence and countering the Quad alliance. This contributes to India's dilemma of dealing with China's growing footprint in a diplomatically isolated Myanmar.

Atacama Desert : Drought Resilience Research and Unique Geography

Why in News?

- Scientists are currently focusing their research on a small, exceptionally resilient flower, **Cistanthe longiscapa**, found in Chile's arid **Atacama Desert**.
- The plant is being studied because it could hold crucial **genetic clues** to help develop **drought-tolerant crops** worldwide, which is becoming increasingly vital as climate change drives worsening drought conditions globally.
- This research is part of a broader scientific effort to leverage the unique biology of extremophiles (organisms that thrive in extreme environments) found in the world's driest desert.

About Atacama Desert

The Atacama Desert is renowned as the **driest non-polar desert in the world**, a hyper-arid region on the Pacific coast of South America.

- **Location and Geography:**
  - Located in **northern Chile**, forming a continuous strip for nearly 1,000 km along the coast.
  - It is uniquely situated in a **two-sided rain shadow**, nestled between the **Andes Mountains** (east) and the **Chilean Coast Range** (west), blocking moisture from both the Atlantic and Pacific Oceans.
  - Its aridity is intensified by the presence of the **cold Humboldt Current** (or Peru Current) offshore, which cools the air, preventing the formation of rain-bearing clouds.
  - It is bordered by **Argentina, Peru, and Bolivia**.
  - It hosts **12 volcanoes**, mainly located in the western outliers of the Andes.
- **Climate and Conditions:**
  - **Rainfall:** Average rainfall is about **1 mm** per year, with some locations within the desert having never received any measurable rainfall in recorded history.
  - **Temperature:** Temperatures are comparatively mild throughout the year, with an average of about **63 degrees F (18 degrees C)**. The cold ocean current prevents the scorching heat seen in many other deserts.
- **Significance:**
  - **Natural Resources:** It holds the world's largest natural supply of **Sodium Nitrate**, used for fertilizers and explosives.
  - **Archaeology:** The **Chinchorro Mummies**, the oldest artificially mummified human remains ever found, were discovered here.

- **Space Analogy:** Its dry, red, and seemingly lifeless landscapes have made it a vital **analogue for Mars**, used by space agencies like NASA to test rovers and life-detection instruments.
- **Astronomy:** The extremely high altitude, clear skies, and lack of light pollution make it one of the world's premier sites for **astronomical observatories** (e.g., ESO's Paranal Observatory).

What is Cistanthe longiscapa?

Cistanthe longiscapa, known locally as "**pata de guanaco**," is a resilient, small, fuchsia-colored flower that is the focus of current genetic research.

- **Behavior:** It is known for blooming during **rare rainfall events** in the Atacama, creating the spectacular "flowering desert" phenomenon.
- **Key Adaptation (Photosynthesis Switching):** The plant's unique ability to switch its method of photosynthesis makes it a key model for extreme environments.
  - **Crassulacean Acid Metabolism (CAM):** When under stress from **drought, intense sunlight, or salinity**, the plant activates CAM. This is a water-saving method where the plant opens its stomata (pores) at night to take in **CO2** (Carbon Dioxide), minimizing water loss through daytime evaporation.
  - **C3 Photosynthesis:** When conditions improve (after a rare rain), it reverts to the more common and highly efficient C3 photosynthesis.
- **Research Goal:** Scientists at institutions like Chile's Andres Bello University are conducting **genetic sequencing** to identify the genes that control this metabolic flexibility, with the goal of **transferring these drought-tolerant characteristics to staple food crops** to enhance global food security.

Palau

Why in News?

- Palau recently hosted the world's first-ever **live underwater interview** in a bid to raise global awareness about the urgency of **ocean conservation** and the existential threat of **climate change** to small island nations. The interview was conducted by **President Surangel Whipps Jr.** with Estonian activist and Olympic swimmer **Merle Liivand**.
- The conversation was made possible by innovative **Li-Fi technology**, which uses light waves for communication underwater.

About Palau

- **Geographical Location:** It is an island nation located in the western Pacific Ocean, forming the western part of the Caroline Islands.
- **Archipelago:** It consists of a tightly clustered archipelago of approximately **340 islands** with a total land area of 466 sq.km.
- **Hemispheres:** It is geographically positioned in both the **Northern and Eastern hemispheres** of the Earth.
- **Maritime Borders:** Palau shares maritime borders with the **Federated States of Micronesia** (east), **Indonesia** (south), and the **Philippines** (west).
- **Capital City: Ngerulmud** is the capital of Palau, located on **Babeldaob** (the largest island). It is

known as the **world's least populous capital city**.

- **Commercial Center: Koror** is the largest and most populous city, acting as the main commercial center.
- **Languages:** Official languages include **Palauan** and **English**, along with Japanese, Sonsorolese, and Tobian.
- **Independence:** Palau became independent in **1994**, after being part of a United Nations trust territory administered by the US.
- **Compact of Free Association (COFA):** It is closely aligned with the US under the COFA, which gives the **US responsibility for Palau's defence** and provides Palau with substantial financial assistance. This arrangement highlights Palau's **geostrategic importance** in the ongoing geopolitical competition between the US and China in the Pacific.
- **Ocean Conservation:** Palau is a global leader in marine protection, known for the establishment of the **Palau National Marine Sanctuary**.

Armenia : Newest State Member of the International Union for Conservation of Nature (IUCN)

Why in News?

- **Armenia** has recently become the newest **State Member** of the **International Union for Conservation of Nature (IUCN)**.
- This highlights the country's growing commitment to biodiversity conservation and sustainable development, particularly as it prepares to host the **17th Conference of the Parties to the Convention on Biological Diversity (CBD COP17) in 2026**.

Geographic and Political Profile

Aspect	Details
Official Name	Republic of Armenia (*Hayastani Hanrapetut'yun*)
Capital & Largest City	**Yerevan**
Location	**Landlocked** country in the **South Caucasus** region, often considered at the **crossroads of Europe and West Asia**.
Bordering Countries	**Georgia** (North), **Azerbaijan** (East and Southwest exclave of Nakhchivan), **Iran** (Southeast), and **Turkey** (West).
Terrain	Dominated by the **Lesser (or Little) Caucasus Mountains**; largely a **mountainous highland** with many extinct volcanic peaks.
Highest Peak	**Mount Aragats** (4,090 m), an extinct volcano.
Climate	**Highland continental**; characterized by hot summers and cold, snowy winters.
Key Rivers	**Aras** (forms much of the border with Turkey and Iran), **Hrazdan, Arpa,** and **Vorotan** (important for hydropower and irrigation).
Largest Lake	**Lake Sevan**, one of the largest high-altitude freshwater lakes in Eurasia, home to the endemic **Sevan trout**.
Official Language	**Armenian** (uses its own distinct alphabet).

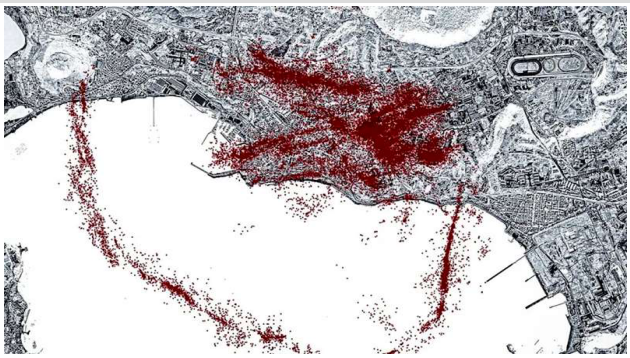
Biodiversity and Conservation Focus

- **Ecological Significance:** Armenia's diverse habitats—ranging from alpine meadows and mountain forests to semi-deserts—make it an important region for global conservation.
- **Unique Species:** It is home to several rare and threatened species, including the **Critically Endangered Caucasian leopard** (*Panthera pardus tulliana*) and the endemic **Bezoar goat**.
- **IUCN Membership Benefits:** Joining the IUCN grants Armenia access to global expertise,

science-based tools (like the IUCN Red List and Green List), and international financing mechanisms, aiding its national goals of **restoring forests** and **expanding protected areas**.

- **National Resources:** The country possesses small deposits of metals like **gold, copper, molybdenum,** and **zinc**. Its volcanic soil is naturally rich in nitrogen, potash, and phosphates.

Campi Flegrei Volcano Latest News : AI Reveals Hidden Faults and Heightened Seismic Risk



The discovery of a clear **"ring fault"** beneath Italy's Campi Flegrei volcano, achieved using an **Artificial Intelligence (AI) model**, is significant because it provides a **much clearer and more detailed picture** of the subterranean structures driving the volcanic unrest.

Why in News?

- An AI model, developed by Stanford University and Italy's National Institute of Geophysics and Volcanology (INGV), has revealed a sharply defined **ring-fault system** beneath the Campi Flegrei caldera.
- This breakthrough was made possible by the AI model's ability to automatically detect and precisely locate a vast number of small earthquakes—over **54,000 between 2022 and 2025**, which is four times the number found by traditional methods.
- The mapping of these long fault structures, which are consistent with the surface features, suggests the geological potential for **earthquakes in the magnitude 5 range**, a significant concern for the densely populated region.
- The current seismic activity is interpreted as being driven by the overall **inflation (uplift)** of the caldera due to pressure from hydrothermal fluids and gas in the subsurface, rather than the immediate upward migration of magma.

About Campi Flegrei Volcano

Campi Flegrei, also known as the **Phlegraean Fields**, is an active volcanic region situated in the densely populated Bay of Naples in Italy, a location also famous for the Vesuvius Volcano.

- **Type and Size:** It is a massive volcanic system spread across a large caldera, which spans approximately 12–15 km in diameter, making it the **largest active volcanic caldera in Europe**.
- **Geological History:** The caldera formed after two of Europe's largest eruptions: the massive **Campanian Ignimbrite** eruption about 36,000 years ago, and the **Neapolitan Yellow Tuff** eruption about 15,000 years ago.
- **Supervolcano Status:** Campi Flegrei is frequently categorised as a **supervolcano**, due to the massive scale of its past eruptions (Volcanic Explosivity Index - VEI 7), which had global consequences, though its 1538 eruption was relatively small (VEI 3).
- **Activity/Unrest:** It has been showing signs of unrest, characterized by intense hydrothermal activity, earthquake swarms, and periods of localized ground deformation called **bradyseism** (cycles of ground uplift and subsidence), since 2005. The land around the town of Pozzuoli has been rising and sinking in dramatic episodes for decades.
- **Last Eruption:** The last recorded eruption was a small event in **1538**, which formed the **Monte Nuovo** cinder cone.

Implications of the AI Discovery

The AI model's clear imaging of the ring fault and hidden earthquake swarms is a significant step forward in volcanic hazard monitoring:

- **Refined Hazard Assessment:** Scientists can now refine models of volcanic behavior and better assess the risk. The discovery highlights that, in addition to the long-term eruption threat, there is a distinct **short-term hazard from moderate, shallow earthquakes** along the ring fault that could damage infrastructure.
- **Improved Monitoring:** The new machine learning workflow, which is now operational in the region, allows scientists to detect and locate small earthquakes **in near real-time** with greater precision, shortening the time between detection and interpretation.
- **Broader Application:** The success at Campi Flegrei demonstrates how machine learning can transform volcanic hazard monitoring at other calderas with dense seismic networks, like Santorini in Greece.

Uruguay Latest News: Euthanasia Law and Political/Economic Highlights

Why in News?

The most significant recent news is the passage of a law in the **Senate decriminalising euthanasia**, making Uruguay the **first predominantly Catholic Latin American country** to legalise the practice through formal legislation.

- The law, which cleared its final hurdle on **October 15, 2025**, after a five-year debate, allows **mentally competent adults** suffering from **incurable conditions** and experiencing **unbearable suffering** to request a medically-supervised end to life (euthanasia).
- It **does not permit assisted suicide**, where a patient self-administers the lethal dose.
- The legislation has been hailed as reinforcing Uruguay's reputation as one of the most socially liberal nations in the region, which previously pioneered the legalization of abortion, same-sex marriage, and recreational marijuana. The government now needs to implement the necessary regulatory mechanisms.

Economic Highlights (2025 Outlook)

- **Economic Growth:** Real GDP growth is expected to reach around **2.5%** in **2025**, driven by a recovery in private consumption and exports, following a strong rebound in 2024 (aided by the end of a historic drought).
- **Trade Focus:** The **cellulose** sector is becoming a dominant export, projected to overtake **beef** as the country's main export product. Uruguay remains an integral member of the Mercosur trading bloc.
- **Investment Climate:** Uruguay continues to be highlighted as one of the most stable, transparent, and **investor-friendly** countries in Latin America, with a strong focus on renewable energy, technology, and agroindustry.
- **Monetary Policy:** Inflation is generally expected to remain around the central bank's target of **4.5%** in 2025, supported by prudent monetary policy.

About Uruguay

Feature	Details
Location	Southeastern coast of **South America**.
Borders	Argentina (west/southwest), Brazil (north/east), South Atlantic Ocean (southeast).
Geographic Note	Only South American nation situated **entirely south of the Tropic of Capricorn**.
Climate	Humid subtropical.
Terrain	Rolling plains and grasslands (**Pampas**), low plateaus, and hills (Haedo and Grande Ridges).
Major Rivers	Uruguay River, Rio de la Plata/Paraná River.
Highest Point	Mount Catedral.
Capital	**Montevideo**.

Madagascar

Why in News?

- An elite military unit, the **CAPSAT** (Corps of Personnel and Administrative and Technical Services), that had aligned itself with youth-led anti-government protests in Madagascar, successfully **overthrew the government** of President **Andry Rajoelina** in October 2025.

About Madagascar

Madagascar is the **second-largest island country in the world**, located approximately **400 km off the coast of East Africa** in the Indian Ocean.

- **Location:** It is separated from the African coast (nearest country is Mozambique) by the **Mozambique Channel**. The islands of Mauritius and Réunion (France) lie to the east.
- **Capital & Languages:** Its capital is **Antananarivo**. The official languages are **Malagasy** and **French**.
- **History:** It was a French colony from 1896 until its **independence in 1960**.
- **Economy:** The economy is heavily reliant on **agricultural industries** (including forestry and fishing), with key exports including coffee, **vanilla**, and sugarcane.
- **Biodiversity:** The island is a global biodiversity hotspot, with nearly **90 percent** of its plant and animal species being **endemic** (found nowhere else in the world) due to its isolation from the African continent. The island's highest point is **Maromokotro** in the Tsaratanana Massif.

Taftan Volcano

Why in News?

- New research indicates that the **Taftan volcano** in southeastern Iran, long considered extinct after a silence of over **700,000 years**, is showing clear signs of **renewed unrest**. Satellite data captured between July 2023 and May 2024 revealed a significant ground uplift near the summit, suggesting increasing pressure beneath the surface and leading scientists to reclassify it from "extinct" to **"dormant"** (or semi-active).

About Taftan Volcano

Taftan is the most prominent volcanic feature in its tectonic setting and is located in a seismically active region.

- **Type: Semi-active Stratovolcano** (or Composite Volcano).
- **Location:** Southeastern Iran, near the border with Pakistan.
- **Elevation:** Approximately **12,927 feet (3,940 meters)**.
- **Geological Setting:** It is the only active volcano in the **Makran continental volcanic arc**, which was formed by the **subduction** of the Arabian oceanic crust beneath the Eurasian continental plate.
- **Key Features:** It features two main summits (Narkuh and Matherkuh) and hosts an active **hydrothermal system** with numerous smelly, sulfur-emitting vents called **fumaroles**.
- **Eruption History:** It is not known to have erupted in recorded human history, with its last major activity estimated over 700,000 years ago.

What is a Stratovolcano?

A stratovolcano, also known as a **Composite Volcano**, is the most visually recognizable and often the most dangerous type of volcano.

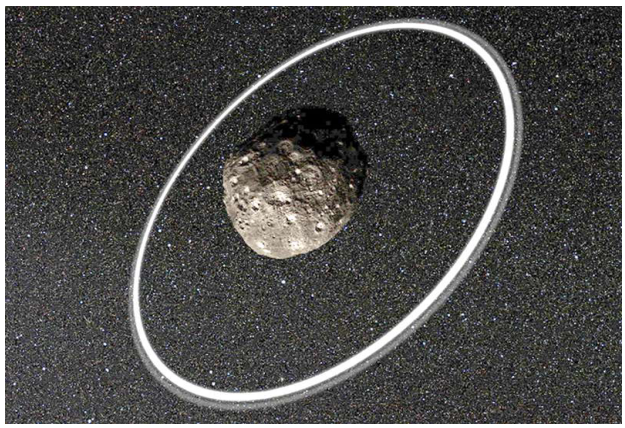
- **Shape:** They are **tall, steep, and cone-shaped** mountains built up by successive layers (strata) of hardened lava, tephra (ash), pumice, and pyroclastic flows.
- **Location:** Typically found above **subduction zones**, such as those ringing the Pacific Ocean in the **"Ring of Fire."**
- **Magma Type:** They are characterized by lavas (like **andesite** and **dacite**) that are **cooler and more viscous** (thicker) than the basalt found in shield volcanoes.
- **Eruptions:** The high viscosity of the magma traps gas, allowing pressure to build to high levels. This results in the potential for highly **explosive and violent eruptions**.

EDITORIALS

Crux of The Hindu & Indian Express

Geography

Celestial Body – Chiron



Why in News?

- Astronomers recently observed, for the **first time, a ring system in the process of formation and evolution** around the icy celestial body Chiron.
- This dynamic discovery provides a rare glimpse into how such structures originate and change, even around small bodies. New research published in October 2025, using data from a **stellar occultation** event in September 2023, revealed significant changes in the ring system compared to previous observations, indicating it is rapidly evolving in real-time.

About Celestial Body – Chiron

Chiron, formally designated **(2060) Chiron** and also known as **95P/Chiron**, is a unique object in the outer Solar System.

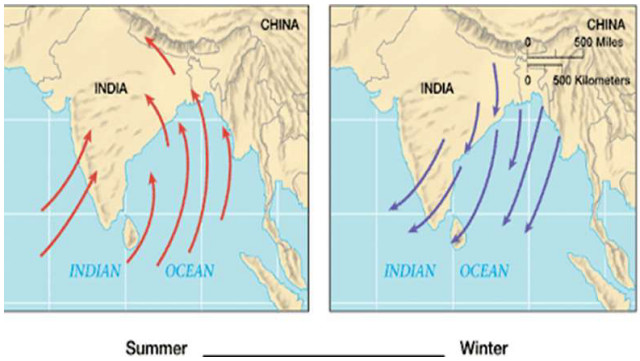
- **Classification:** It is the first-identified member of a class of objects called **centaurs**. These objects orbit between the giant planets (**Jupiter and Neptune**), exhibit characteristics of both **asteroids** (rocky/minor planet) and **comets** (icy body with occasional activity), hence the name 'centaur' (half-man, half-horse).

- **Discovery:** It was discovered on November 1, **1977**, by astronomer **Charles Kowal** at Palomar Observatory.
- **Orbit:** Chiron travels in an unstable, eccentric orbit, crossing the orbit of **Saturn** and passing just inside that of **Uranus**. It takes approximately **50 years** to complete one orbit around the Sun.

Features of Celestial Body – Chiron

- **Size:** It has a diameter of about **200 kilometers** (125 miles).
- **Composition:** It mainly consists of **rock, water ice**, and **complex organic compounds** (such as carbon monoxide, carbon dioxide, methane, ethane, and propane).
- **Comet-like Activity:** Chiron exhibits occasional **comet-like activity**—ejecting gas and dust into space, forming a fuzzy luminous cloud called a **coma**. It even displayed a small tail in 1993.
- **Ring System:**
    - Observations clearly showed that it is surrounded by a complex disk containing multiple structures, including at least **three well-defined, dense rings** (at approximately 273 km, 325 km, and 438 km from its center) and a broader, diffuse disk-like structure.
    - The rings are likely composed mainly of **water ice** mixed with small amounts of rocky material, similar to those of Saturn, and may have formed from material recently ejected from Chiron.
    - The rings of Chiron are **dynamic** and appear to be **evolving in real-time**, making it a unique object to study ring formation.
- **Observation Method:** A method called **stellar occultation** (watching the body pass in front of a distant star, temporarily blocking its light) was used by a team including Brazilian, French, and Spanish researchers to observe the rings in unprecedented detail.

Northeast (Retreating) Monsoon: Relief for Southern India



Why in News?

- The **timely onset** of the **northeast monsoon** in October 2025 has delivered crucial rainfall and much-needed relief to **Tamil Nadu** and **Andhra Pradesh**, which depend heavily on this seasonal rain for agriculture and water security.

What is the Northeast Monsoon?

The northeast monsoon, which occurs from **October to December**, is also known as the **retreating monsoon**. It is shorter and less widespread than the primary southwest monsoon (June to September) but is vital for Southern India.

- **Mechanism (Wind Reversal):** By October, the Indian landmass begins to **cool faster than the surrounding ocean**, creating a **high-pressure area** over the land and a **low-pressure area** over the Bay of Bengal.
- This pressure difference causes the wind flow to **reverse direction**. Winds begin to blow from the **land to the sea** (northeasterlies).
- **Rainfall Source:** Critically, as these northeasterly winds travel across the **Bay of Bengal**, they **pick up moisture**.
- This moisture-laden air then reaches the southeastern coast, bringing abundant rainfall to **Tamil Nadu, southern Andhra Pradesh**, and parts of Sri Lanka.

Importance for Southern India

The northeast monsoon is particularly crucial for regions like Tamil Nadu because:

- It is the **primary source of rainfall** for these areas, as they receive very little rain during the main southwest monsoon season.
- The rain **supports the cultivation of rabi crops** (winter crops).
- It is essential for **replenishing reservoirs** and improving water security across the southern peninsula.

Australian Tropical Forests Turn from Carbon Sink to Source

Why in News?

- A recent **study** published in **Nature** has identified tropical forests in **northeastern Australia** as the **first globally** to switch from functioning as a **carbon sink** to becoming a **net carbon source**. This critical reversal is primarily driven by **increased tree mortality** due to severe **climate stressors** like cyclones, rising temperatures, atmospheric dryness, and drought, demonstrating how climate change can disrupt global carbon budgets.

Understanding Carbon Sinks and Sources

The balance between carbon sinks and sources is crucial for managing atmospheric carbon dioxide CO2 levels and mitigating climate change.

What is a Carbon Sink?

A **carbon sink** is any natural or artificial reservoir that **absorbs more carbon** from the atmosphere than it releases, effectively storing **CO2** and mitigating global warming.

- **Key Examples:**
  - **Forests:** Trees absorb CO2 through **photosynthesis** and store the carbon in their wood, roots, leaves, and soil.
  - **Oceans:** The **largest active carbon sink**, absorbing CO2 directly from the air, and marine organisms (like phytoplankton) use it for photo-synthesis.
  - **Soil & Peatlands:** Store vast amounts of carbon in organic matter.

What is a Carbon Source?

A **carbon source** is anything that **releases more carbon** into the atmosphere than it absorbs.

- **Natural Carbon Sources:**
  - **Respiration:** Animals, plants, and microorganisms release CO2 during cellular respiration.
  - **Wildfires:** Burning vegetation releases stored carbon.
  - **Ocean Release:** Warmer oceans release dissolved CO2 back into the air.
- **Human-Induced (Anthropogenic) Carbon Sources:**
  - **Fossil Fuel Combustion:** Burning coal, oil, and natural gas for energy.
  - **Deforestation:** Reduces carbon absorption and releases stored carbon from vegetation.
  - **Industrial Processes:** Emissions from cement production and manufacturing.

Consequences and Mitigation of Forest Carbon Reversal

The transition of major forests from sinks to sources signals a potential **climate tipping point**, creating a **vicious feedback loop** that accelerates global warming.

Consequences

- **Vicious Feedback Loop:** Climate change intensifies forest damage (e.g., increased tree

death), which releases more carbon, further warming the climate and intensifying future climate stressors (more fires, droughts).

- **Ecosystem Collapse:** Accelerates biodiversity loss and extinction risk as conditions become unsuitable for native species.
- **Socio-Cultural Impacts:** Threatens the livelihoods, food sources, and culture of **Indigenous communities** dependent on the forests.

Measures Needed for Mitigation

Strategy	Action
Aggressive Global Emission Cuts	Prioritize **deep, rapid, and sustained reductions** in fossil fuel emissions and strictly implement enhanced carbon budgets under the Paris Agreement.
Proactive Forest Management	Implement large-scale strategies like **assisted species migration**, controlled burns for fuel reduction, and integrated pest management to break the cycle of dieback.
Climate-Adaptive Policies	Invest in water-efficient irrigation, promote **drought-resistant crops**, and strengthen public health systems against climate risks.
Empowerment of Local Communities	Integrate **Indigenous knowledge** into forest governance, secure land tenure rights, and ensure active participation in sustainable management.

India's Green Footprint: GFRA 2025 Rankings

Why in News?

- India has achieved a significant milestone in global environmental conservation by moving up to the **9th position globally in terms of total forest area**, according to the latest **Global Forest Resources Assessment (GFRA) 2025** released by the Food and Agriculture Organization (FAO). Importantly, India also **retained its 3rd position worldwide in net annual forest area gain**, underscoring its consistent and effective afforestation efforts.

Global Forest Resources Assessment (GFRA) 2025 Highlights

- The GFRA, conducted every five years by the **FAO**, assesses global forest resources based on official national data. This data is vital for policymaking, international conventions (like those on climate change and biodiversity), and promoting sustainable forest management globally.

India's Global Position

Category	India's Rank	Key Metric
Total Forest Area	**9th Globally** (Up from 10th in the previous assessment)	**72.7 million hectares**
Annual Forest Area Gain	**3rd Worldwide** (Maintained)	Consistent net gain due to afforestation.

Top Countries by Total Forest Area

The world's forest area is highly concentrated, with the top five countries holding over half of the global total.

- **1st:** Russia (**832.6 million ha**)
- **2nd:** Brazil (**486 million ha**)
- **3rd:** Canada (**368.8 million ha**)

India's Key Initiatives for Forest Conservation

India's sustained rise in the rankings is a direct result of robust legal frameworks and large-scale government-backed programs focused on protection and expansion of green cover, often involving community participation.

Initiative Type	Key Legislations & Policies	Other Key Initiatives
Legal & Policy Framework	**Forest (Conservation) Act, 1980:** Restricts the diversion of forest land for non-forest purposes.	**National Mission for a Green India (GIM):** Part of the NAPCC, aiming to enhance ecosystem services and carbon sequestration.
	Wildlife (Protection) Act, 1972: Provides legal protection to species and habitats (e.g., National Parks).	**CAMPA (Compensatory Afforestation Fund Management and Planning Authority):** Utilizes funds from diverted forest land for compensatory plantation.
	National Forest Policy, 1988: Sets the goal of bringing **33%** of the country's total land area under forest and tree cover.	**Ek Ped Maa Ke Naam Initiative:** A national campaign encouraging citizens to plant a tree in honour of their mothers.
	Forest Rights Act, 2006: Recognizes the rights of traditional forest dwellers and empowers them in forest management and conservation.	

Chrysanthemum Garden

Why in News?

Jammu and Kashmir (J&K) has launched its first-ever **Chrysanthemum Garden (Bagh-e-Gul-e-Dawood)** in Srinagar. This initiative aims to **extend the Valley's tourist season** beyond the spring bloom of tulips, providing a major tourist attraction during the traditionally lean **autumn season** (September-November), and boosting the local economy through floral tourism.

Location Details

- **Location:** Situated inside the **Nehru Memorial Botanical Garden** near **Cheshma Shahi**, Srinagar.
- **Setting:** It is cradled between the **Zabarwan mountains** and the **Dal Lake**, standing adjacent to Srinagar's famous Tulip Garden.
- **Scale:** The garden is spread over a sprawling **5-hectare (or 100+ Kanals)** area. It features over **50 different varieties** of chrysanthemums, with an expected bloom of over **30 lakh flowers** this season.

Chrysanthemum (Gul-e-Dawood)

- **Scientific Name:** *Chrysanthemum × morifolium* (often referred to as *Dendranthema Grandiflora* in some contexts)
- **Family: Asteraceae** (also known as the Daisy family).
- **About:** It is a **perennial herbaceous plant**, popularly known as the **"Queen of the East"**. It is a major **ornamental crop** cultivated for cut flowers, loose flowers, and pot plants. It is **native to East Asia and Europe** and is the **national flower of Japan**.
- **Advantages:** Unlike tulips, which require annual importation of bulbs, chrysanthemums are a locally grown flower in Kashmir that is grown **vegetatively**, leading to lower recurring costs.

Climate & Soil Requirements

- **Climate:** The plant is best suited for **tropical and subtropical climates**, requiring **long days** for vegetative growth and **short days** for flowering.
- **Temperature:** The optimal temperature range is **20-28°C during the day** and **15-20°C at night**.
- **Soil:** It prefers a **well-drained red loamy soil** with a good amount of organic matter.

Severe Cyclonic Storm 'Montha' Strikes Indian Coast

Why in News?

Cyclone Montha, categorized as a **Severe Cyclonic Storm (SCS)**, made landfall in **Andhra Pradesh**, causing **heavy rains, strong winds, and widespread damage** across coastal Andhra Pradesh, Odisha, and parts of Tamil Nadu.

Formation and Intensity of Cyclone Montha

The storm developed over the **west-central Bay of Bengal (BoB)** and rapidly intensified.

- **Origin:** It began as a low-pressure system over the **west-central Bay of Bengal**.
- **Intensity:** It quickly intensified into a Severe Cyclonic Storm (SCS) with wind speeds ranging from **89 to 117 kmph**.

Cyclones Formation in BoB

Cyclones that form in the Bay of Bengal typically move toward the Indian coast due to prevailing weather patterns.

- These storms are driven **westward** by the **easterly trade winds**.
- This motion pushes the systems toward the **Indian east coast**, similar to the way Atlantic storms track toward the Americas.

Naming of the Cyclone: 'Montha'

The naming of tropical cyclones is governed by an international panel to ensure clarity and aid disaster management.

- **Name Origin:** The cyclone was named **"Montha,"** a word contributed by **Thailand**.
- **Meaning:** In Thai, "Montha" means **beautiful or fragrant flower**.
- **Naming Authority:** The name was contributed under the framework of the **World Meteorological Organization (WMO)** and the **Economic and Social Commission for Asia and the Pacific (ESCAP) Panel on Tropical Cyclones (PTC)**. This panel oversees the naming of cyclones in the **North Indian Ocean** region.
- **Guidelines:** Cyclone names are mandated to be **gender-neutral, culturally neutral, and capped at eight letters** to ensure clarity and aid in effective **disaster management and public awareness**.

WMO-ESCAP Panel on Tropical Cyclones (PTC)

The PTC is the key intergovernmental body coordinating tropical cyclone-related activities in the region.

- **Formation:** Formed in **1972** to coordinate efforts among countries affected by cyclones in the **Bay of Bengal and the Arabian Sea**.
- **Members:** Its current members include **Bangladesh, India, Iran, Maldives, Myanmar, Oman, Pakistan, Qatar, Saudi Arabia, Sri Lanka, Thailand, United Arab Emirates, and Yemen**.
- **Coordination:** The Panel works under the **WMO Tropical Cyclone Programme** and coordinates with **Regional Specialized Meteorological Centres (RSMCs)** and Tropical Cyclone Warning Centres (TCWCs).
- **India's Role:** The **India Meteorological Department (IMD)** is recognized as one of the six RSMCs globally.

Eruption of India's Only Mud Volcano at Baratang

Why in News?

- On **October 2, 2025**, **India's only mud volcano** located at **Baratang** in the **Andaman and Nicobar Islands** erupted **after over two decades** of dormancy.
- The last reported major eruption at this site was in **2005**.

What is a Mud Volcano?

- A **mud volcano** is a **geological formation** where **mud, water, and gases** (mainly methane) **erupt to the surface** through geological fissures.
- Unlike traditional **igneous volcanoes**, **mud volcanoes do not emit lava**, but instead release **slurries of mud**, often accompanied by **gases** and **steam**.

Key Characteristics:

Feature	Mud Volcano
Composition	Mud, water, gases (methane, CO_2, N_2)
Heat	**Lower temperatures** than igneous volcanoes
Ejecta	No lava – only mud, gas, and water
Size Range	From a few meters to **700 m high** and up to **10 km wide**
Also known as	**Mud Domes**
Formation Cause	**Decaying organic matter + tectonic activity**
Common Locations	Subduction zones, petroleum basins

Location: Baratang, Andaman & Nicobar Islands

Parameter	Details
District	North and Middle Andaman
Distance from Port Blair	~150 km
Eruption Site	**Jarwa Creek**, Baratang
Accessibility	Major tourist spot (currently closed for safety)
Volcano Type	**Mud Volcano** (not igneous)

Eruption Details (Oct 2025):

- Erupted with a **deafening sound** around **1:30 PM**.
- Created an **earth mound of 3–4 metres**.
- Mud and smoke have **covered over 1,000 sq metres**.
- **Eruption is still active**.
- **Tourist movement suspended**, forest routes closed.
- **Local administration**, forest and geological teams are monitoring the site.

Related Event: Barren Island Eruption (Sept 2025)

- Minor **volcanic activity** observed on **Sept 13 and 20** at **Barren Island**, India's **only active volcanic island**.
- Located ~140 km from Port Blair.
- **Eruption history**: 1787, 1991, 2005, 2017, 2022.
- Situated on **Indian-Burmese tectonic plate junction**.
- Uninhabited; nearest settlements: **Swaraj Dweep (Havelock)** and **Narcondam Island**.

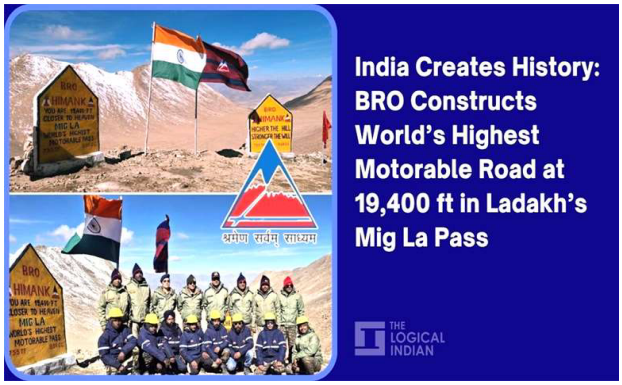
Difference: Mud Volcano vs Igneous Volcano

Feature	Mud Volcano (Baratang)	Igneous Volcano (Barren Island)
Composition	Mud, gas, water	Molten lava, ash
Temperature	Relatively low	Extremely high
Eruption Cause	Organic decomposition + tectonics	Magma movement
Eruption Frequency	Rare	More frequent in recent years
Tourist Access	Baratang accessible (closed now)	Barren is restricted

Geological Significance:

1. **Part of Indian Plate's interaction zone** with **Burmese Plate**.
2. Located in **high seismic and tectonic activity zone**.
3. Helps scientists study:
    - **Gas emissions**
    - **Organic matter decay**
    - **Tectonic pressures**

Mig La Pass (19,400 feet) : World's Highest Motorable Road Built by India



Why In News :

Recently, India built the **world's highest motorable road** at **Mig La Pass (19,400 feet)** in **eastern Ladakh**, breaking its own previous record at **Umling La (19,024 feet).**

Key Highlights:

Feature	Details
Location	Mig La Pass, Eastern Ladakh
Altitude	19,400 feet (5,913 metres)
Project	Likaru–Mig La–Fukche alignment
Executing Agency	**Border Roads Organisation (BRO)**
Under Project	**Himank**
Led By	Brigadier Vishal Srivastava
Flag Hoisting	Indian National Flag and BRO Flag hoisted on completion
Previous Record	Umling La Pass (19,024 ft)
Nearby Strategic Points	Hanle, Fukche village (near LAC – Line of Actual Control)

Significance of the Achievement:

1. Strategic Importance

- It connects Hanle with Fukche, which lies close to the **Line of Actual Control (LAC)**.
- Enhances **border infrastructure**, aiding military logistics and movement in high-altitude regions.
- Strengthens **India's preparedness** in eastern Ladakh amid ongoing tensions with China.

2. Engineering Marvel

- **Challenges Overcome**:
  - Low oxygen levels (~50% of sea level)
  - Sub-zero temperatures
  - Snowstorms and unpredictable weather
  - Loose soil and rocky terrain
- Required **extreme high-altitude engineering techniques** and physical endurance.

3. Socio-Economic Benefits

- Improves **connectivity for border villages** like Hanle and Fukche.
- Reduces isolation during winters, enabling **better access to medical aid, supplies, and education**.
- Shortens travel time significantly and ensures **year-round access**.

4. Tourism & Research

- The region around Hanle has an Indian Astronomical Observatory.
- Improved connectivity could **boost astro-tourism** and scientific collaboration.

About BRO (Border Roads Organisation):

Aspect	Details
Formed	7 May 1960
Motto	***Shramena Sarvam Sadhyam*** ("Everything is achievable through hard work")
Parent Body	Ministry of Defence (since 2015)
Structure	Includes 18 Projects (divided into Task Forces, RCCs, BCCs, etc.)
Personnel	Mix of civilian (GREF) and Army Engineers
Works In	**19 Indian states, 3 UTs, and foreign countries like Afghanistan, Myanmar, Bhutan, Sri Lanka, Tajikistan**
Past Projects	Delaram-Zaranj Highway (Afghanistan), Farkhor & Ayni Airbases (Tajikistan), Disaster relief efforts
Key Operations	Road/bridge/airfield construction, snow clearance, disaster reconstruction
Employment	Over **2 lakh local workers** engaged in remote areas

Comparative Altitude Perspective:

Location	Altitude
Mig La Pass (New Road)	19,400 ft
Umling La (Previous record)	19,024 ft
South Base Camp, Everest (Nepal)	17,598 ft
North Base Camp, Everest (Tibet)	16,900 ft

The construction of the road at Mig La Pass is a **monumental achievement** for India—**a blend of strategic foresight, engineering excellence, and national resolve**. It not only asserts India's infrastructural might at the world's roof but also delivers real benefits to remote communities and defense readiness.

Indian Coffee Gaining Popularity Globally

Why in News

- Prime Minister **Narendra Modi**, during his *Mann Ki Baat* address on **October 26, 2025**, highlighted that **Indian coffee is gaining international popularity**.
- He praised the **diverse coffee varieties** cultivated across different parts of India — from **Karnataka and Tamil Nadu** to **Kerala, Odisha, and the North-East**.
- PM Modi also appreciated the **role of coffee in empowering women, tribal farmers, and restoring degraded lands**, especially in regions like **Koraput (Odisha)**.

Key Highlights of PM Modi's Statement

- **Global Recognition:** Indian coffee is earning fame worldwide for its quality and diversity.
- **Major Coffee Regions Mentioned:**
  - **Karnataka:** Chikmagalur, Coorg, Hassan, Biligiri region (Karnataka–Tamil Nadu border)
  - **Tamil Nadu:** Pulney, Shevaroy, Nilgiri, Annamalai
  - **Kerala:** Wayanad, Travancore, Malabar
  - **Odisha:** Koraput
  - **North-East India:** Growing participation in coffee cultivation
- **Human Interest Stories:**
  - Professionals who left corporate jobs to take up coffee farming in **Koraput**.
  - Many **women farmers** achieving **economic independence and social respect** through coffee.

Environmental & Economic Impact (Commerce & Industry Ministry) :

- **Koraput coffee** has:
  - Helped **restore degraded forest land**.
  - **Reduced soil erosion.**
  - Provided **steady cash income** for tribal communities, replacing subsistence agriculture.

About Coffee :

- **Nature:** A **tropical plantation crop**, grown under **shade trees**.
- **Main Varieties:**
  - **Arabica:** Mild flavour, aromatic, grown at higher altitudes.
  - **Robusta:** Stronger flavour, more caffeine, disease-resistant, grown at lower altitudes.

Major Coffee-Growing Regions in India

State	Important Areas	Share in Output
Karnataka	Coorg, Chikmagalur, Hassan	~70%
Kerala	Wayanad, Travancore, Malabar	~20%
Tamil Nadu	Pulney, Shevaroy, Nilgiri, Annamalai	~7–8%
Andhra Pradesh & Odisha	Araku Valley, Koraput	Emerging
North-East India	Nagaland, Manipur, Mizoram	Developing

Climatic & Soil Requirements

Factor	Requirement
Elevation	600–1,600 metres above sea level
Temperature	15°C – 28°C
Rainfall	150 – 250 cm annually
Climate Type	Hot and humid
Soil Type	Well-drained loamy soil rich in humus, iron, and calcium
Ripening Condition	Dry weather needed during berry ripening

India's Coffee Exports

- **Top Export Destinations:**
  - **Europe:** Italy, Germany, Belgium (largest markets)
  - **Others:** Middle East countries, South Korea, Japan
- **Export Type:** Mostly **green (unroasted) coffee beans**, but **specialty and value-added coffees** are growing in demand.

Significance

1. **Economic:** Boosts exports and rural income.
2. **Social:** Empowers women and tribal farmers.
3. **Environmental:** Promotes eco-friendly cultivation and forest restoration.
4. **Global Image:** Strengthens "Brand India Coffee" on the world stage.

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Internal Security

Fatah-4 Missile : Key Features and Capabilities

- The Fatah-4 Missile is an indigenously developed, ground-launched, subsonic cruise missile by Pakistan, designed to significantly enhance the country's conventional strike capability with high precision.

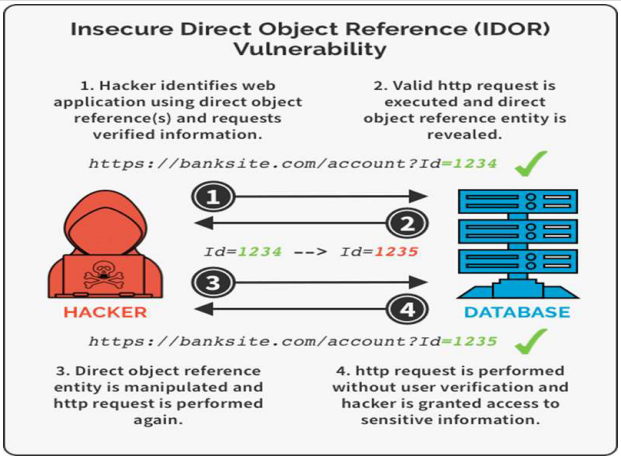
Key Specifications

Feature	Details
Type	Ground-Launched Cruise Missile (GLCM)
Range	750 kilometers (470 miles)
Speed	Subsonic, reaching up to approximately **Mach 0.7**
Warhead	**330 kilograms**, designed to carry **conventional munitions** (not nuclear).
Guidance	Advanced avionics and modern navigation systems, including GPS and INS.
Propulsion	**Solid-propellant** system, allowing for quick deployment and launch.
Launch Platform	Mobile **Transporter-Erector-Launcher (TEL)** vehicles.

Advanced Tactical Capabilities

- **Exceptional Precision (CEP):** The missile's most significant feature is its extremely low **Circular Error Probability (CEP)**, reported to be as low as **4 meters**. This precision is highly valued for hitting high-value strategic targets with minimal collateral damage.
- **Air Defence Evasion:** It is designed with a **terrain-hugging flight** capability, flying at very low altitudes to evade detection by enemy radar and air defence systems.
- **Advanced Targeting:** The guidance suite reportedly includes capabilities like electronic countermeasures and an **AI-based system** to help lock onto and engage targets in difficult electronic warfare environments.
- **Strategic Role:** The Fatah-4 is a core asset of the Army Rocket Force Command, providing a long-range, precision strike option to complement the country's conventional deterrence strategy.

Insecure Direct Object Reference (IDOR)



Why in News?

- A significant data security lapse was recently averted when the Indian government's **Income Tax e-filing portal** fixed a major security flaw known as **Insecure Direct Object Reference (IDOR)**.
- The vulnerability, discovered by independent researchers, could have allowed any logged-in user to access the **sensitive personal and financial details** (including Aadhaar and PAN) of other taxpayers simply by manipulating web parameters like a user's Permanent Account Number (PAN) in a request.
- The issue was reported to the Indian Computer Emergency Response Team (CERT-In) and subsequently patched, highlighting the severe consequences of broken access controls in large-scale government systems.

About Insecure Direct Object Reference (IDOR)

Insecure Direct Object Reference (IDOR) is a **web application security vulnerability** that is a sub-type of **Broken Access Control** (which topped the OWASP Top 10 list in 2021).

- **Vulnerability Mechanism:** It occurs when an application exposes **internal object identifiers** (like database keys, sequential IDs, or file paths) to users in the URL, form fields, or API requests **without proper access controls** to verify the user's authorization to access that specific object.
- **Attack Consequence:** An attacker can manipulate these exposed identifiers to bypass authorization and gain **unauthorized access** to sensitive data or perform unauthorized actions (like editing, deleting, or viewing) on resources belonging to other users.

How Does it Happen?

IDOR attacks occur when an application fails to perform a crucial **server-side check** to ensure that the authenticated user is the *owner* of the resource being requested or has the *permission* to interact with it.

1. **Direct Reference Exposure:** The application uses a direct, often sequential or easily guessable, identifier in a user-controllable input.
    - *Example URL:* https://example.com/view_invoice?invoice_id=12345
2. **Lack of Access Control:** The server correctly authenticates the user (checks they are logged in) but **fails to check their authorization** (fails to check if invoice 12345 belongs to *them*).
3. **Tampering/Exploitation:** An attacker simply changes the identifier to a predictable or guessed value belonging to another user.
    - *Attacker URL:* https://example.com/view_invoice?invoice_id=12346
    - If the system loads invoice 12346 (which belongs to a different user) for the attacker, the application is vulnerable to IDOR.

Types of IDOR Attacks

IDOR vulnerabilities are diverse and can manifest in various parts of an HTTP request:

- **URL Parameter Tampering:** Modifying an ID in the URL's query string or path. (e.g., changing user_id=101 to user_id=102).

- **POST/JSON Body Manipulation:** Changing an object reference within the body of a request (often in an API call or form submission), such as changing a hidden account_id field.
- **Cookie or Header Manipulation:** Altering object references stored in cookies, custom headers, or even in JSON Web Tokens (JWTs) if they are not securely signed.
- **Path Traversal:** A specialized type of IDOR where the attacker manipulates a file path (e.g., using ../ to navigate directories) to access unauthorized files or configuration on the server's file system.

Key Mitigation and Prevention Strategies

Preventing IDOR primarily revolves around implementing **strict, server-side access control** for every resource request.

- **Implement Server-Side Access Control (Crucial):** For every request that uses a user-supplied object identifier, the application **must** verify that the currently authenticated user is authorized to access, modify, or delete that specific object. The application should *never* trust user input alone.
- **Use Indirect Object References (IDOR Mapping):** Instead of exposing the actual database primary key (like a sequential ID) to the user, use an **indirect reference map** (or a **hash map** stored on the server's session) to internally translate a random, unpredictable identifier to the real object ID.
- **Use Complex/Random Identifiers:** Replace sequential or predictable numeric IDs with hard-to-guess identifiers like **Universally Unique Identifiers (UUIDs)** or **long, random strings**. This acts as a defense-in-depth measure, making enumeration much harder, though it does not eliminate the need for proper access control.

Hwasong-20

Why in News?

North Korea recently unveiled its latest and most powerful intercontinental ballistic missile, the **Hwasong-20**, at a military parade in Pyongyang on October 10, 2025, presided over by the country's leader Kim Jong Un. The missile's debut is considered a major strategic development as it is a large, **solid-fuel ICBM** with a claimed range that could cover the entire US mainland, and is designed to potentially carry multiple warheads, which significantly challenges existing missile defense systems.

About Hwasong-20

- **Classification:** It is an **Intercontinental Ballistic Missile (ICBM)** developed by North Korea, which they describe as their "most powerful nuclear strategic weapon system."
- **Propulsion System:** It uses a high-thrust, **solid-fuel engine** that incorporates **carbon fiber composite materials**. This engine reportedly underwent its ninth and final ground test on September 8, 2025, before the public debut.
- **Strategic Advantage (Solid-Fuel):**
    - **Rapid Deployment:** Solid-fueled rockets are inherently more mobile, easier to conceal, and can be launched far more quickly (in minutes) than liquid-fueled versions, making them harder for adversaries to track and preemptively target.
- **Estimated Range:** It has a reported operational range of over **15,000 km (9,300 miles)**, giving

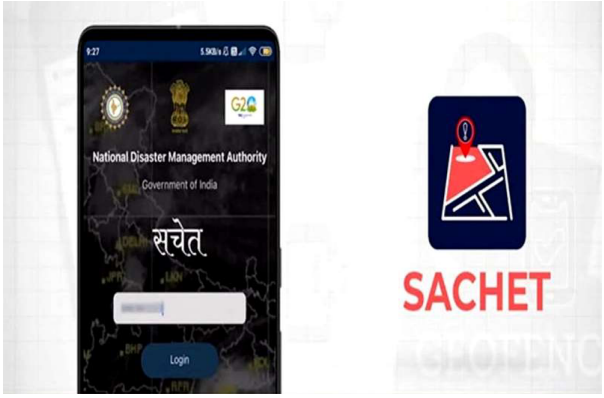
it the theoretical capability to strike any part of the continental United States.

- **Warhead Capability:** The missile features a blunt warhead design, leading analysts to believe it is intended to be **Multiple Independently Targetable Reentry Vehicle (MIRV)-capable**, meaning a single missile could deliver multiple nuclear warheads to different targets. (This technology has not been verified).
- **Guidance System:** It is equipped with an advanced guidance system that combines an **Inertial Guidance System (INS)** with GPS or optical sensors for enhanced accuracy.

What is an Intercontinental Ballistic Missile (ICBM)?

- **Definition:** It is a land-based, nuclear-armed ballistic missile with a range of more than **3,500 miles (5,600 km)**.
- **History:** The first ICBMs were deployed by the **Soviet Union** in 1958, followed by the United States the next year.
- **Launch Platforms:** ICBMs can be launched from:
    - Silos underground
    - Mobile Transporter-Erector-Launchers (TELs) on land
    - Submarines at sea (SLBMs)
- **Operational Countries:** Countries currently recognized as having operational ICBMs include: **Russia, United States, China, France, India, United Kingdom, Israel, and North Korea.**

Integrated Alert System (SACHET)



Why in News?

India's **Integrated Alert System (SACHET)** was recently highlighted by the Principal Secretary to the Prime Minister in a session on **Disaster Risk Reduction (DRR)** at the **G20 ministerial meeting in Durban**. The system was showcased as an example of India's multi-agency architecture for disaster warning, which integrates meteorological, hydrological, seismic, and oceanographic institutions. This comprehensive framework operates on the globally recognized **Common Alert Protocol (CAP)** standard.

About Integrated Alert System (SACHET)

SACHET (which means 'alert' in Hindi) is India's national disaster early warning platform, envisioned and mandated by the **National Disaster Management Authority (NDMA)**.

- **Primary Goal:** To provide **real-time, geo-targeted alerts** to citizens across the country for both natural and man-made disasters.
- **Developer:** It was indigenously developed by the **Centre for Development of Telematics (C-DOT)**, the premier R&D center of the Department of Telecom.
- **Technology Standard:** It is based on the **Common Alerting Protocol (CAP)**, an international standard recommended by the International Telecommunication Union (ITU) for exchanging all-hazard emergency alerts.

Key Features and Functionality

The system's core strength lies in its multi-agency integration and multi-channel dissemination, ensuring warnings reach the right people at the right time.

- **Geo-Targeted Alerts:** The system sends alerts only to mobile phones and communication devices in the specific, localized area expected to be affected by the disaster or emergency.
- **Multi-Modal Dissemination:** To ensure last-mile reach, SACHET employs multiple technologies, including:

- **SMS** and **Cell Broadcast** (sent directly to mobiles in the targeted area).
- **Mobile App** (the dedicated SACHET app for real-time notifications).
- **TV, Radio, Social Media**, **RSS Feed**, **Browser Notifications**, and **Satellite-based services** (like GAGAN and NavIC for remote areas).

- **Pan-India Operation:** The system is **operational in all States and Union Territories (UTs)** of India.
- **Alert Generation Agencies:** It integrates real-time information from key alerting agencies such as the India Meteorological Department (**IMD**), Central Water Commission (**CWC**), and Indian National Centre for Ocean Information Services (**INCOIS**).
- **Citizen Access:** Users can receive alerts for their **current location** or can choose to subscribe to notifications for any other state/district in India.
- **Mobile App Utility:** In addition to disaster warnings, the SACHET mobile app provides day-to-day weather reports and forecasts from the IMD, along with useful resources like **'Do's and Don'ts'** and **helpline numbers**.

Steadfast Noon

Why in News?

- **NATO's annual nuclear deterrence exercise, Steadfast Noon,** recently commenced, hosted by the **Netherlands** with Volkel Air Base serving as the main hub. The exercise, involving a mix of conventional and dual-capable aircraft from 14 Allied nations, comes amid heightened geopolitical tensions and is a demonstration of the Alliance's commitment to its nuclear posture.
- NATO officials emphasize that the exercise is **routine, long-planned, and not linked to any current world events**, but its public visibility is a deliberate strategy to reinforce credible deterrence.

About Steadfast Noon

Steadfast Noon is the annual, routine nuclear exercise conducted by the **North Atlantic Treaty Organization (NATO)**. It is a key element in maintaining the credibility and effectiveness of the Alliance's nuclear deterrent.

- **Primary Objective:** To **test and refine the procedures** that underpin NATO's nuclear deterrent, ensuring its **credibility, security, and effectiveness**.
- **Host Nation:** The exercise **rotates** among different NATO countries each year. The **2025 edition is hosted by the Netherlands**, with operations centered at **Volkel Air Base**.
- **Operational Sites:** In addition to the Netherlands, airbases involved include Kleine Brogel in **Belgium**, Lakenheath in the **United Kingdom**, and Skrydstrup in **Denmark**.
- **Participants:** It involves approximately **70 aircraft** and around **2,000 personnel** from 14 Allied nations.
  - Participants for 2025 include the Netherlands, Belgium, Denmark, Finland, Germany, Poland, the United States, and the United Kingdom, among others.
  - **Sweden and Finland** participated with conventional support capabilities for the first time with combat aircraft, showcasing the alliance's expanding unity.

- **Key Aircraft:** The exercise involves both conventional support aircraft (like refuelling tankers and surveillance planes) and **Dual-Capable Aircraft (DCA)**.
    - **DCA** refers to aircraft that can deliver both conventional and nuclear weapons, such as **Germany's Tornado** and the American and Dutch **F-35** jets.
- **Drill Details:** The exercise is a **simulated training** activity and **does not use any actual nuclear weapons**—no weapons are loaded or flown. A key focus this year is the **ground element of securing nuclear assets** against threats like drone or low-visibility attacks.
- **Non-Participant: France** does not participate as it maintains its nuclear forces outside of NATO's integrated military command and control structure.

Astra Mark 2 Missile

Why in News?

- The Defence Research and Development Organisation (DRDO) is actively working to **extend the range of the Astra Mark 2 beyond 200 kilometres**, with the Indian Air Force (IAF) planning to acquire approximately **700 units** for its fighter jet fleet.
- This push for an indigenous, long-range Beyond Visual Range (BVR) missile comes in the wake of recent aerial engagements where the need for superior BVR capability was reinforced.

About Astra Mark 2 Missile

- It is a **Beyond Visual Range (BVR) air-to-air missile** designed to neutralize enemy aircraft at long stand-off distances.
- It is being developed by the **Defence Research and Development Organisation (DRDO)**.
- More than 50 public and private industries, including Hindustan Aeronautics Limited (HAL), have contributed to the indigenous development of the weapon system.
- It builds upon the successful **Astra Mark-1** air-to-air missile, which has a strike range of around 90-110 kms and is already operational with the IAF, integrated with the **LCA Tejas** and **Su-30 MKI** fighter jets.
- The Astra Mark 2 is intended to provide the Indian Air Force with a crucial indigenous edge in air-to-air combat, complementing imported systems like the Meteor missile on the Rafale fleet. It also holds **significant export potential** to friendly foreign countries due to its performance and competitive cost.
- The missile is in the final stages of user trials, with integration on the **Tejas Mk-1A** and **Su-30MKI** fighter jets imminent, with full-scale induction expected to commence in the near future.

Astra Mark 2 Missile Features

Feature	Astra Mark 2 Specification	Comparison/Details
Propulsion	**Dual-Pulse Solid Rocket Motor**	Provides initial boost and a second pulse (thrust) later in flight to sustain high speed and increase the **'no-escape zone'** against highly manoeuvrable targets. This is a key upgrade from the Mark-1's single-pulse motor.
Current Range	**160 - 200 km** (Initial target)	The stated goal is now to extend the operational range **beyond 200 km** to counter threats like China's PL-15 missile.
Speed	Approximately **Mach 4.5**	Capable of sustained supersonic speed during its flight.
Guidance	Advanced **Active Radar Homing (ARH) Seeker**	Features an indigenous Radio Frequency (RF) Seeker, with potential new versions incorporating technology inspired by the analysis of adversaries' systems, including enhanced anti-jamming capabilities.
Physical Specs	Longer and heavier than Mk-1	Diameter of approximately **190 mm** and a weight of around **175 kg**.
Propellant	**Smokeless** solid-fueled motor	Reduces the visual signature, aiding stealth and detection avoidance.

Military Combat Parachute System (MCPS)

Why in News?

- The Defence Research and Development Organisation (DRDO) recently achieved a major milestone by successfully testing the **Military Combat Parachute System (MCPS)** in a combat freefall jump from an altitude of **32,000 feet**.
- This successful demonstration was carried out by test jumpers of the Indian Air Force.

About Military Combat Parachute System (MCPS)

The MCPS is an **indigenously developed** advanced aerial delivery system, marking a significant step toward self-reliance in critical defence technologies.

- **Organizations Involved:** It has been jointly designed and developed by DRDO's laboratories:
    - Aerial Delivery Research and Development Establishment (ADRDE), Agra.
    - Defence Bioengineering and Electromedical Laboratory (DEBEL), Bengaluru.

Key Features and Capabilities

- **High-Altitude Deployment:** It is the **only** parachute system currently in operational use by the Indian Armed Forces capable of deployment above **25,000 feet**, showcasing its suitability for High Altitude, High Opening (HAHO) and High Altitude, Low Opening (HALO) operations.
- **Advanced Tactical Features:** The system incorporates a **lower rate of descent** and **superior steering capabilities** for precise navigation and safe landing in designated zones.
- **Navigation Compatibility:** It is compatible with **Navigation with Indian Constellation (NavIC)**, India's own regional navigation satellite system. This feature provides strategic autonomy, making the system resistant to interference or denial of service by foreign GPS systems.

Significance of MCPS

- **Enhanced Operational Autonomy:** The indigenously developed and NavIC-compatible system ensures **freedom of use** against any adversary, eliminating strategic vulnerability from foreign control over navigation systems.
- **Boost to Self-Reliance (Aatmanirbhar Bharat):** Its successful test and subsequent induction open doors for more indigenous parachute systems, drastically **reducing dependency on other nations** for supply, maintenance, and serviceability, especially during conflict or war.
- **Maximum Utility:** The domestic design ensures a **least turnaround time** for routine maintenance and repair compared to imported equipment, ensuring maximum utility over its lifetime.

Defence Minister Rajnath Singh and DRDO Chairman Dr. Samir V Kamat have lauded the successful demonstration as a major step toward self-reliance in aerial delivery systems.

Akash Missile System

Why in News?

- India recently **pitched the supply of the Akash missile system to Brazil** during high-level talks between India's Defence Minister and Brazilian Vice-President Geraldo Alckmin in New Delhi.
- This proposal is part of India's broader strategy to boost its indigenous defense exports to friendly foreign nations and strengthen defence industrial cooperation, particularly under the **'Make in India'** and **'Atmanirbhar Bharat'** initiatives.

About the Akash Missile System

The **Akash Missile System** is a mobile, indigenously designed, **short-range surface-to-air missile (SAM)** system developed by India's **Defence Research and Development Organisation (DRDO)**.

Key Features and Capabilities:

Feature	Description
Role	Designed to protect vulnerable areas, points, and assets from aerial threats.
Targets	Fighter aircraft, cruise missiles, drones, and helicopters.
Range & Altitude	Covers a range of **4.5 km to 25 km** and can engage threats between **100 meters and 20 kilometers** in altitude.
Propulsion	Features a solid-fuel, **ramjet** propulsion system.
Speed	Capable of reaching speeds of **Mach 2.5 to 3.5** (up to 4,200 km/h).
Radar/Guidance	Uses the sophisticated **Rajendra radar** for multifunctional fire control. It employs a **command guidance** system.
Engagement	Can simultaneously engage **multiple targets** in Group Mode or Autonomous Mode, with a high kill probability (up to 99% with a salvo of two missiles).
Mobility	It is a **fully mobile system**, effective across various terrains and features built-in **electronic counter measures** (ECCM).

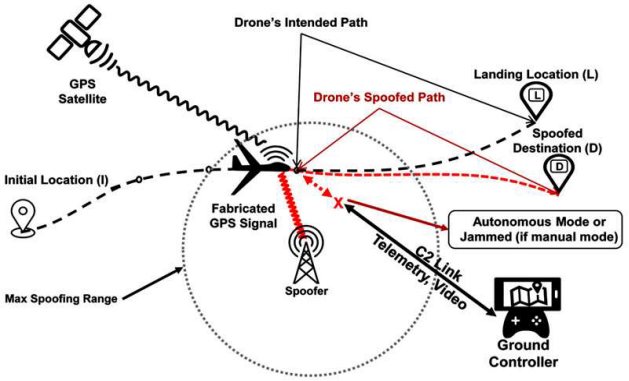
The Akash system is produced by Hyderabad-based **Bharat Dynamics Ltd. (BDL)** and is currently in service with the **Indian Air Force (IAF)** and the **Indian Army**.

Air India Flight Diverted Due to GPS Spoofing

Why in News?

- An Air India flight traveling from **Vienna to Delhi** was forced to divert after its navigation systems were disrupted by a suspected **GPS signal spoofing attack** over the **Middle East**.
- The spoofing caused critical malfunctions in the aircraft's flight control systems, including the autopilot and autothrust.

What is GPS Spoofing?



GPS spoofing is a type of **cyberattack** where **fake or counterfeit GPS signals** are transmitted to a receiver, leading it to calculate **incorrect position, navigation, or time information**.

- **Mechanism:** Attackers use **ground-based transmitters** to broadcast powerful counterfeit signals that overpower and replace the genuine signals coming from GPS satellites. The aircraft's GPS receiver then locks onto these false signals, generating erroneous location data.

Impact on Aviation and Key Difference

Feature	Description
Effects on Aircraft	Spoofing causes critical malfunctions in navigation systems, such as the **autopilot, flight director, and autoland** functions. This can result in **misrouting**, cockpit confusion, false warnings, and the risk of **entering restricted airspace or collisions**.
Spoofing vs. Jamming	**Spoofing** feeds **false data** to the receiver, making it harder to detect and counter. **Jamming**, by contrast, merely **blocks or disrupts** the genuine signals, causing a loss of signal but not false information.

Mitigation Measures

To protect aircraft from GPS spoofing, the following measures are essential:

- **Backup Systems:** Utilizing **Inertial Reference Systems (IRS)**, which provide alternative, self-contained location and navigation data independent of external GPS signals.
- **Technological Defenses:** Implementing **anti-spoofing technologies**, using **multi-constellation** Global Navigation Satellite Systems (GNSS) that draw data from multiple satellite networks, and employing advanced signal processing techniques.
- **Pilot Preparedness:** Ensuring pilots receive specialized **training** to recognize and respond effectively to navigation system failures caused by spoofing.

Widespread Outage at Amazon Web Services (AWS)

Why in News?

- A recent, widespread outage at **Amazon Web Services (AWS)** disrupted over **1,000 global online services**, including messaging apps and government portals.
- The incident, caused by an internal system failure, highlighted the significant risks of **centralised cloud providers** and prompted global discussions on digital resilience and sovereignty.

What is Amazon Web Services (AWS)?

AWS is the **cloud computing division of Amazon**, launched in 2006.

- **About:** It provides **on-demand IT infrastructure** like computing power, data storage, databases, analytics, and networking tools. Instead of maintaining their own physical servers, companies **rent computing resources** from AWS data centres across the world following a **"pay-as-you-go" model**.
- **Significance:** AWS is the **world's largest cloud provider**, leading Microsoft Azure and Google Cloud. Its infrastructure hosts many critical applications, financial systems, and digital services, meaning **any failure can lead to widespread, cascading service disruptions** across communication, finance, and governance sectors simultaneously.

Cause of the Outage: DNS Failure in DynamoDB

The outage was primarily caused by a **Domain Name System (DNS) resolution failure** within its **DynamoDB service endpoints** hosted in the North Virginia data center.

- **DNS:** The DNS acts like the Internet's address book, translating website names into IP addresses. If this system fails, applications cannot locate the correct servers.
- **DynamoDB Service Endpoints:** These are the essential connection points to AWS's NoSQL database service, DynamoDB.
- **Cascading Failure:** The DNS issue blocked access to these endpoints. Since many other critical AWS services, including the internal systems that manage new server launches and authentication (like IAM and EC2), rely on DynamoDB, the failure quickly led to a **vicious feedback loop** and a massive, widespread service disruption.

What is Cloud Computing?

Definition: Cloud computing is a model for delivering **information technology services** where computing resources (storage, processing power, databases, etc.) are provided **over the Internet** instead

of being hosted on local servers. Users access these resources **on-demand**, without owning or managing the physical infrastructure.

Model	Definition	Example
SaaS (Software as a Service)	Software delivered over the Internet; no installation or maintenance required.	Google Docs, Microsoft Office 365
PaaS (Platform as a Service)	Platform for developers to build, deploy, and manage apps without managing underlying hardware or OS.	Google App Engine
IaaS (Infrastructure as a Service)	Virtualized computing resources (servers, storage, networking) provided on-demand.	**Amazon Web Services**, Microsoft Azure
FaaS (Function as a Service)	Event-driven serverless computing; runs code only when triggered, no server management required.	Google Cloud Functions

Significance of Cloud Computing for India

Cloud services are the backbone of India's digital transformation initiatives:

- **Boosting E-Governance:** Platforms like **MeghRaj** and **National Informatics Centre (NIC) Cloud Services** enable fast deployment of government applications, making services efficient and reliable.
- **Financial and Social Inclusion:** Digital platforms like **Aadhaar**, **Unified Payments Interface (UPI)**, and **DigiLocker** leverage the cloud to improve accessibility, transparency, and inclusion.
- **Accessible Public Services:** Citizen-centric platforms such as **UMANG** and **DIKSHA** facilitate the seamless delivery of education, health, and administrative services, even to rural populations via **Common Services Centres (CSCs)**.
- **Economic Growth:** It reduces infrastructure costs, supports startups and SMEs, and accelerates India's digital economy by providing scalable and on-demand IT resources.

Cloud Centralisation Risk to Digital Sovereignty and Resilience

The dominance of a few large, centralised, often foreign-owned cloud providers poses several risks:

- **Systemic Risk to Critical Infrastructure:** A single point of failure (like the AWS outage) can disrupt essential national services, including banking, healthcare, and government portals.
- **Digital Sovereignty Concerns:** Over-reliance on foreign providers risks control over sensitive national data, as it may be subject to foreign jurisdictions or laws (like the U.S. CLOUD Act).
- **Vendor Lock-in and Hidden Dependencies:** Deep integration with a single provider's ecosystem makes it difficult and costly to switch, limiting a country's strategic autonomy.
- **Geopolitical Vulnerabilities:** Policy changes or sanctions imposed on global providers can impact a relying country's digital infrastructure.

Measures for India to Build Resilient Cloud Infrastructure

India needs a strategic, "cloud-smart" approach to ensure digital resilience:

1. **Multi-Cloud Adoption:** Government agencies should implement **multi-cloud strategies** (using multiple providers) to avoid over-dependence on a single vendor and reduce systemic risk.
2. **Strengthening MeghRaj & NIC Cloud:** Expand the capacity of the **National Cloud** (MeghRaj) to host and support critical public services and e-governance platforms like DigiLocker and e-Office.
3. **Domestic Data Centres:** Promote the expansion of **Tier-II and Tier-III domestic data centres** to ensure regional redundancy, local control, and compliance with data localisation norms.
4. **Data Localisation & Sovereignty:** Enforce norms that mandate sensitive government and citizen data be stored within Indian jurisdiction to prevent exposure to foreign legal risks.
5. **Skill Development:** Invest in training cloud administrators in **resilient architecture**, threat mitigation, and disaster recovery planning to manage complex, distributed systems effectively.

UN Convention Against Cybercrime (UNCC) : A Global Digital Fortress

Why in News?

- The **United Nations Convention against Cybercrime (UNCC)**, which is designed to be the world's first global framework to combat **cybercrime**, is moving closer to becoming legally binding.
- This follows its opening for signature in October 2025, where **72 of 193 UN member states** signed the treaty at a high-level conference in Hanoi, Vietnam.

Note: The Convention will **enter into force 90 days** after **40 countries** formally **ratify or accede** to it.

What is the United Nations Convention against Cybercrime (UNCC)?

The UNCC is a landmark international legal framework designed to address crimes committed via digital systems.

- **About:** Officially known as the *Convention on Cybercrime: Strengthening International Cooperation to Combat Crimes Committed Through Information and Communication Technology (ICT) Systems*, the UNCC is the first international criminal justice treaty negotiated in over two decades. It was **adopted by consensus** under **UN General Assembly Resolution 79/243 in December 2024** and developed by the **UN Office on Drugs and Crime (UNODC)**.
- **Key Provisions:**
  - It provides a common framework of **legal measures** to tackle crimes involving **ICT systems**.
  - It critically facilitates the **cross-border sharing of electronic evidence** for serious crimes like hacking, illegal data interception, money laundering, and online child sexual abuse material.
  - The treaty includes essential **human rights protections** while enabling digital law enforcement.
  - It promotes **capacity building and technical assistance** for developing nations to strengthen their defenses.
- **Implementation:** The Convention establishes a **Conference of the States Parties** to monitor its progress. **UNODC** serves as the **secretariat**, offering technical support and training for national implementation.

India and UNCC

India has not signed the UNCC as of October 2025, despite actively participating in its drafting. This aligns with India's consistent stance of seeking a larger role in shaping global digital frameworks and its earlier decision to also decline signing the Budapest Convention on Cybercrime.

Understanding Cybercrime and Cybersecurity

Cybercrime

- **About:** This refers to criminal activities that either **use or target** digital technologies, networks, or devices. Perpetrators exploit the **anonymity and vast reach of the internet** to commit crimes that transcend borders and threaten national security and financial stability.
- **Vulnerability: Developing countries** are especially vulnerable due to weaker cybersecurity infrastructure and lower public awareness.

- **Categories:**
    - **Cyber-enabled Crimes:** Traditional crimes (like fraud, hate speech, trafficking) that are conducted or amplified online.
    - **Cyber-dependent Crimes:** Crimes that can only occur using ICT systems (e.g., phishing, malware attacks, ransomware, identity theft).
- **Threat in India (NCRB 2023):** Cybercrime cases rose by **31.2% in 2023**, with major crimes including **Fraud, Extortion, and Sexual exploitation**. India also faces major **cross-border scams** originating from Southeast Asian nations.

Cybersecurity

- **About:** Cybersecurity is the practice of **protecting networks, devices, and data** from unauthorized access, damage, or theft. It acts as a **digital fortress**, using policies, strategies, and technologies to:
    - **Identify and assess threats.**
    - **Prevent and detect** cyberattacks.
    - **Mitigate harm** and ensure quick recovery.
- A strong framework maintains **privacy, trust, and data integrity** in a highly connected world.

Challenges and Opportunities for India Under the UNCC

India faces a complex decision that balances national security needs with legal autonomy and civil liberties.

Aspect	Challenges	Opportunities
Legal Autonomy	**Privacy Concerns:** Treaty surveillance measures may conflict with India's **constitutional right to privacy** (established in *Justice K.S. Puttaswamy v. Union of India, 2017*).	**Policy Alignment:** Could provide the necessary push for India to accelerate its **National Cybersecurity Strategy** and modernize its data protection laws.
Data Sharing	**Data Sovereignty Issues:** India's traditional opposition to **cross-border data-sharing** without explicit prior consent may clash with the treaty's evidence-sharing clauses.	**Stronger Global Cooperation:** Enables India to work more effectively with global partners on immediate **cybercrime investigations** and the sharing of critical evidence.
Influence	**Strategic Caution:** Hesitation to sign limits India's potential influence in the **future global rule-making** process for the digital domain.	**Capacity Building Support:** Provides access to UN-led **training and technical assistance** to enhance the skills and capabilities of national cybercrime enforcement units.

Conclusion

The UN Cybercrime Treaty is a pivotal development in global governance, aiming to ensure that all countries possess the tools to fight digital threats. For India, the ultimate challenge is choosing a framework that strengthens its cyber resilience and ability to cooperate internationally, without sacrificing core principles of digital sovereignty and individual constitutional rights.

India Concludes Presence at Tajikistan's Ayni Airbase : End of a Strategic Chapter

Why in News?

- India has officially **concluded its presence** and operations at **Tajikistan's Ayni Airbase** (also known as Gissar Military Aerodrome), marking the end of a nearly two-decade-long strategic chapter in **Central Asia**. The withdrawal was finalized after the **bilateral agreement** governing the stationing of Indian personnel and the joint use of the Soviet-era facility **lapsed in 2022**.
- The airbase's key strategic utility largely **expired** after the **Taliban's takeover of Afghanistan in 2021** and the collapse of India's long-time ally, the **Northern Alliance**.

Ayni Airbase: Location and Strategic Value

Ayni Airbase, which was India's second overseas military engagement after Farkhor, held significant strategic importance in the region.

- **Location:** The airbase is situated about **10 km west of Dushanbe**, the capital of Tajikistan.

- **India's Overseas Bases:**
    - **Farkhor Base (1998–2008):** India first established a presence in Tajikistan at Farkhor in 1998. It was equipped with helicopters, a repair unit, and a military hospital that provided medical assistance to Afghan Northern Alliance fighters. This base was later shut down around 2008.
    - **Ayni Base:** Established after the closure of Farkhor, Ayni became India's **second overseas base** and its only active military foothold abroad for many years.
- **Geopolitical Leverage:** Its **proximity (around 20 km) to Afghanistan's Wakhan Corridor** provided India with crucial **strategic leverage over Pakistan** and vital **access to the Central Asian region**.

Operational Purpose and Final Use

India invested roughly **$70 million** in rebuilding and modernizing the Soviet-era base, including extending the runway and adding new facilities.

- **Original Mandate:** The base was initially developed to **support the Northern Alliance** in Afghanistan against the Taliban, providing **logistics, aerial support, and intelligence** capabilities, complemented by the Farkhor Military Hospital.
- **Operational Status:** It was **never used for combat missions** and had **no permanent presence of fighter aircraft**. India had stationed Mi-17 helicopters there, which also assisted Tajik forces.
- **2021 Evacuation:** The Ayni Airbase played a critical role during the chaotic **Taliban takeover in 2021**. India utilized the base to **evacuate its nationals and officials** from Afghanistan via military and civilian aircraft.

Implications of the Conclusion

The winding up of operations at Ayni highlights the challenges India faces in projecting power and maintaining a military footprint in a region increasingly dominated by **Russia and China**.

- **Geopolitical Shift:** Reports suggest that Tajikistan's decision not to renew the lease may have been influenced by **pressure from Russia and China**, which view non-regional military presence as an unwelcome assertion of influence in their shared sphere.
- **Loss of Strategic Depth:** The conclusion marks a loss of a key **observation post near Afghanistan** and a reduction in India's direct military reach into Central Asia. India will now focus on strengthening **economic and diplomatic ties** to maintain its influence in the region.

India-Nepal Sign Agreements for Cross-Border Power Lines

Why in News?

- India and Nepal have officially signed **two major power cooperation agreements** to develop new **400 kilovolt (kV) cross-border transmission lines**.
- The agreements are designed to significantly **boost power trade capacity** and **strengthen regional grid connectivity** between the two nations.

Key Agreements and Projects

The agreements were signed between **India's POWERGRID** and the **Nepal Electricity Authority (NEA)**, focusing on two high-capacity transmission systems:

- **Inaruwa (Nepal) – New Purnea (Bihar, India):** Development of a 400 kV transmission line to

facilitate energy exchange between eastern Nepal and India.

- **Lamki, Dododhara (Nepal) – Bareilly (Uttar Pradesh, India):** Development of a 400 kV transmission line connecting western Nepal with northern India.

Significance and Impact

These projects are central to achieving multiple strategic and economic goals for both countries and the region.

- **Boost to Power Trade:** The new 400 kV lines will substantially increase the **transmission capacity**, promoting a **cleaner and more reliable energy exchange** between India and Nepal.
- **Nepal's Hydropower Potential:** The enhanced connectivity helps Nepal effectively **tap into its massive hydropower potential** by providing a reliable market for its surplus electricity.
- **India's Energy Demand:** For India, the exchange helps meet its **rising energy demand sustainably** through access to Nepal's clean, hydro-generated power.
- **Bilateral and Regional Integration:**
    - It significantly enhances **energy security** for both nations.
    - It further strengthens **India–Nepal bilateral ties**.
    - It actively supports **regional energy integration** in South Asia, in alignment with **India's Neighborhood First Policy**.

DRDO's Hypersonic Glide Vehicle – Dhvani

Why in News?

- India's **Defence Research and Development Organisation (DRDO)** is preparing for the **first test of "Dhvani"**, a next-generation **hypersonic glide vehicle (HGV)**.
- If successful, **Dhvani** will place India among an elite group of countries — **US, Russia, and China** — that possess **hypersonic missile capability**, representing a major leap in India's **strategic deterrence and defence technology**.

What is Dhvani?

Key Features of Dhvani:

Parameter	Details
Type	**Hypersonic Glide Vehicle (HGV)**
Speed	**> Mach 5** (i.e., > 6,174 km/h)
Range	Estimated **6,000 to 10,000 km**
Launch Platform	Ballistic missile (likely derived from Agni-series)
Flight Profile	Launched to **high altitude**, then **glides at hypersonic speed** with **maneuverability**
Length & Width	~9 meters long, 2.5 meters wide
Stealth Features	Blended wing-body design, **reduced radar cross-section**
Thermal Shielding	**Ultra-high-temperature ceramic composites** (withstand **2,000–3,000°C** during re-entry)
Expected Deployment	**By 2029–30**, if trials succeed

What Makes Dhvani Different?

- **Speed + Maneuverability**: Unlike conventional ballistic or cruise missiles, Dhvani can **alter course mid-flight**, making it **hard to detect, track or intercept**.
- **Stealth Geometry**: Angled surfaces and smooth contours minimize radar signature.
- **Thermal Resistance**: Advanced ceramics protect it during reentry — a key requirement at hypersonic speeds.
- **Indigenous Tech**: Developed entirely by **DRDO**, showcasing **self-reliance** in critical military tech.

Background Technology:

Dhvani builds on earlier DRDO projects like:

- **HSTDV (Hypersonic Technology Demonstrator Vehicle)**: Successfully tested; validated **scramjet propulsion** and thermal shielding.
- **Agni series missiles**: Provide the launch platform and guidance systems.

Global Context: Hypersonic Weapons Race

Country	Weapon	Status
Russia	Avangard	Operational
China	DF-ZF	Operational
USA	Dark Eagle, HACM	Under development
India	**Dhvani (HGV)**	**Test phase**

India's **Dhvani** aims to match or surpass global counterparts in **range, stealth, and precision**, but with **homegrown technology**.

Strategic Importance (For Mains Answer Writing):

1. Credible Nuclear Deterrent:

- Hypersonic HGVs **cannot be intercepted** by current missile defence systems.
- Enhances India's **second-strike capability**, strengthening **nuclear doctrine**.

2. Regional Power Projection:

- Creates a **technological gap** with adversaries, especially **Pakistan**, whose missile defences are outdated.
- **China cannot ignore** Dhvani's capability — rebalances regional military asymmetries.

3. Make in India in Defence:

- Entirely **indigenous R&D** shows success of India's **Atmanirbhar Bharat** initiative in critical tech sectors.
- Reduces reliance on imports in high-tech weapons systems.

4. Changing Nature of Warfare:

- Represents shift from traditional **ballistic missiles** to **maneuverable, hypersonic delivery systems**.
- India is no longer catching up — it's **shaping future warfare trends**.

Conclusion:

Dhvani is not just a missile — it is **India's message** to the world that it is ready to lead in **next-gen strategic technology**. As a symbol of **scientific advancement**, **national security**, and **self-reliance**, Dhvani reflects India's emergence as a **technologically sophisticated global power** in the evolving geopolitics of deterrence and defence.

Commissioning of ICGS Akshar

Why in News?

- On **October 4, 2025**, the **Indian Coast Guard Ship (ICGS) Akshar**—the **second vessel in the Adamya-class Fast Patrol Vessel (FPV)** series—was **commissioned at Karaikal, Puducherry**.
- The vessel, **indigenously designed and built by Goa Shipyard Limited (GSL)**, is a significant milestone under India's **Aatmanirbhar Bharat** and **Make in India** initiatives.

What is ICGS Akshar?

Key Details:

Feature	Specification
Name	ICGS Akshar ("Akshar" means *imperishable*)
Class	Adamya-class Fast Patrol Vessel (2nd in the series of 8)
Builder	**Goa Shipyard Limited (GSL)**
Length	51 metres
Displacement	Approx. 320 tons
Speed	Max speed of **27 knots**
Endurance	**1,500 nautical miles** at economical speed
Propulsion	Two **3,000 KW diesel engines**
Propellers	Two **Controllable Pitch Propellers (CPP)**
Weaponry	- 30 mm **CRN 91 Gun**

- Two 12.7 mm **Stabilized Remote-Controlled Guns (SRCG)**
- **Fire-control systems** integrated

Advanced Indigenous Systems Onboard:

- **Integrated Bridge System (IBS)**
- **Integrated Platform Management System (IPMS)**
- **Automated Power Management System (APMS)**

  All these enhance **automation**, **situational awareness**, and **mission readiness**

Primary Role of ICGS Akshar:

- **Surveillance and patrolling** of India's coastal and exclusive economic zones (EEZ).
- Enforcing **maritime laws**, anti-smuggling, anti-piracy, and **search and rescue (SAR)**.
- Supports **coastal security** under Commander, Coast Guard Region (East).

Significance (For Mains Answer Writing):

1. Boost to Maritime Security:

- Enhances India's ability to monitor and respond to threats along the **Eastern Seaboard**.
- Strengthens ICG's capability in **maritime domain awareness (MDA)**.

2. Indigenisation & Aatmanirbhar Bharat:

- Over **60% indigenous content**, including critical propulsion and weapon systems.
- Aligns with Government's push for **self-reliance in defence manufacturing**.

3. Strategic Coastal Deployment:

- Stationing at **Karaikal (Puducherry)** boosts strategic maritime presence in **Bay of Bengal and Eastern Indian Ocean Region** (IOR).

Background: Adamya-Class Fast Patrol Vessels

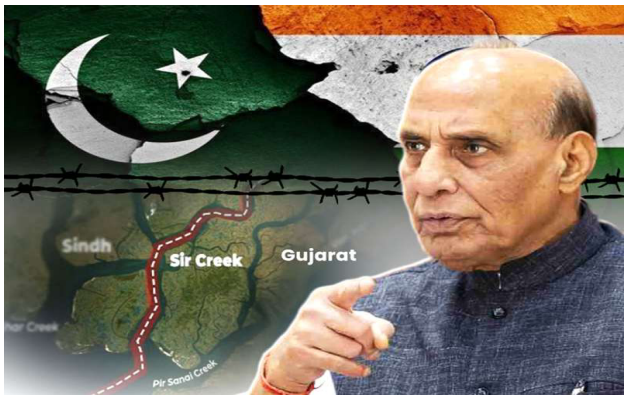
- A class of **8 high-speed, agile vessels** built by **GSL**.
- Designed for **multi-role operations** including:
  - Surveillance
  - Interdiction
  - SAR
  - Pollution response

EDITORIALS

Crux of The Hindu & Indian Express

Internal Security

Sir Creek Dispute: Why It Matters for India's Security & Why It Remains Unresolved



Why is Sir Creek in the News Again?

- Recently, in October 2025, the dispute resurfaced due to **military build-up by Pakistan in the Sir Creek area.**
- In response, India's Defence Minister Rajnath Singh issued a strong warning, stating that any "**misadventure**" in the region could "change both history and geography."
- This statement reflects just how critical this area is to India's national interest.
- These comments came during a military event in **Bhuj, Gujarat**, and were a direct warning to **Pakistan**, which has recently expanded its **military activities near Sir Creek** — including building new bunkers, radars, and military posts.
- But why is this **small stretch of marshy land and water so important**? And why have **India and Pakistan failed to settle this border issue for decades**?

What is Sir Creek?

Sir Creek is a **96-kilometre-long tidal water channel** located between **India's Gujarat (Rann of Kutch)** and **Pakistan's Sindh province**.

- It's called a **"tidal estuary"**, which means the flow of water changes with the tide.
- It was earlier known as **Ban Ganga**, and the British later renamed it **Sir Creek**.
- The area around it is **marshy**, **flood-prone**, and **full of snakes, scorpions, and muddy terrain** — making it very difficult to live in or even patrol.

Even though the land is difficult to use, Sir Creek is **very important for security, economy, and boundary rights**. That's why both countries **want control over it**.

History of the Dispute

The Dispute Goes Back to the British Era

- The conflict over Sir Creek started more than 100 years ago during British rule in India. At that time, the rulers of **Kutch** (now part of India) and the **Sindh government** (now part of Pakistan) argued over who had the right to collect firewood near the creek.
- In 1914, the **Bombay Presidency** (the British administrative authority in that region) tried to settle the dispute by issuing a resolution to define the boundary.
- However, this resolution had two conflicting statements:
    - **Paragraph 9** said the boundary was the **eastern bank of the creek**, which means the entire creek would belong to Sindh (now Pakistan).
    - **Paragraph 10** applied the **Thalweg Principle**, which says that in rivers or creeks, the boundary should be drawn along the **middle of the deepest channel**. This meant the creek should be shared, supporting India's claim.
- So, from the beginning, the document itself was **unclear**, and both countries **used different parts of it to support their positions**.

What Happened After 1947?

After **Independence**, **Kutch became part of India**, and **Sindh became part of Pakistan**. This made Sir Creek an **international boundary issue**.

- In **1965**, Pakistan even claimed more than half of the **Rann of Kutch**. A war broke out between the two.
- In **1968**, a **tribunal set up by the UN** gave **90% of the Rann of Kutch to India**, but **left out Sir Creek** because it was **too complex** due to its shifting nature and water-based geography.

Since then, the Sir Creek dispute has remained unresolved.

What Do India and Pakistan Claim?

Country	Claim
Pakistan	Says the **entire creek belongs to Pakistan**, as per Paragraph 9 of the 1914 agreement (eastern bank as boundary).
India	Says the **creek is navigable during high tide**, so the **Thalweg Principle applies**. The boundary should be **in the middle** of the creek. India also shows proof like the **1925 map** and **mid-channel pillars from 1924**.

- Pakistan argues the creek is **not fully navigable**, so Thalweg should not apply. India says it **is navigable**, especially during high tide, and **fishermen use it regularly**.
- This legal difference over one principle — **Thalweg** — has kept the issue stuck for years.

Strategic Importance of Sir Creek

Sir Creek may look unimportant on the map, but it is **crucial for national security**, especially for India. Here's why:

1. Close to Karachi – Pakistan's Economic Lifeline

- Karachi, the **largest city and main port of Pakistan**, is **just south of Sir Creek**.
- Any Indian movement in Sir Creek is **seen as a direct threat to Karachi**.

- That's why Pakistan has built **bunkers, radars, and military posts** near the area recently.

2. Gateway for Terror Infiltration

- In the **2008 Mumbai attacks**, terrorists came by sea from Karachi, entered Indian waters **through Sir Creek**, and hijacked an Indian boat.
- Since then, India has **tightened coastal security** in the area.
- Still, the creek remains **hard to monitor**, and could again be used for **smuggling, infiltration, or terror attacks**.

3. Chinese Interest

- There are concerns that **China**, through its support of Pakistan and the **China-Pakistan Economic Corridor (CPEC)**, may try to **increase its presence near the region**.
- India sees this as an added **security risk**.

Economic Importance of Sir Creek

1. Oil and Natural Gas

- The region is believed to have **untapped oil and gas reserves**.
- For a country like **India**, which wants to **reduce dependence on imported oil**, gaining access to this area is very important.

2. Fishing Industry

- The creek supports **rich fishing grounds** used by **fishermen from both India and Pakistan**.
- Due to no clear boundary, **hundreds of fishermen get arrested every year** for accidentally crossing the border.
- Many spend **years in jail**, even though they did not intend to cross over. This creates **human suffering** and worsens public opinion on both sides.

3. Exclusive Economic Zone (EEZ)

Under **international law (UNCLOS)**, a country has rights over sea resources in a zone called the **Exclusive Economic Zone**, which extends **200 nautical miles** from the coast.

- If the Sir Creek boundary shifts even **by a few kilometres**, it could **change the EEZ by thousands of square kilometres**.
- That means **more sea area**, more **oil and fish**, and more **strategic control** — making this dispute **economically and politically important**.

Efforts to Resolve the Dispute: Talks Without Results

- India and Pakistan have held **several rounds of talks** over the years, but **no final agreement** has been reached.
- In **1968**, an international tribunal, urged by UK Prime Minister Harold Wilson after the 1965 war, resolved most border issues in the Rann of Kutch but **left Sir Creek unresolved** citing its technical complexity due to the tidal and shifting nature of the estuary. The tribunal gave Pakistan about **10% of the disputed territory**.
- In the **1972 Simla Agreement**, both countries agreed to resolve bilateral disputes through peaceful dialogue. India has since insisted on resolving Sir Creek bilaterally, whereas Pakistan has pushed for **international arbitration**, which India opposes.

Key Events:

- **1989**: First formal talks in Islamabad. No results.
- **1990–1992**: More rounds of talks in Rawalpindi and New Delhi. Still no solution.
- **1998**: A **Sir Creek Working Group** was formed. India opposed **Pakistan's move to take the issue to international courts**, saying it must be solved **bilaterally**, as per the **Simla Agreement (1972)**.
- **2005–2007**: Joint surveys were done by both countries to map the creek, but **the data was never used to reach a deal**.
- **2012**: Last formal round of talks took place.
- **2016**: After the **Pathankot terror attack**, India stopped all structured dialogue, including on Sir Creek.

Why Has the Dispute Not Been Resolved Yet?

There are several reasons why the Sir Creek dispute remains unresolved:

1. **Legal Ambiguity**: The 1914 resolution is contradictory, and both sides have historical documents to support their positions.
2. **Shifting Geography**: Being a tidal estuary, Sir Creek's course changes with time, making it difficult to set a permanent boundary.
3. **Lack of Political Will**: Larger bilateral issues like Kashmir and cross-border terrorism often take precedence, leaving Sir Creek on the back burner.
4. **Mutual Distrust**: Given past betrayals, especially Pakistan's support for terror groups, India cannot afford to trust Pakistan's intentions in the region.

However, ignoring the dispute is not an option. An undefined boundary in such a sensitive location poses a **constant security risk**, and it hampers India's ability to **fully utilise its maritime resources**.

Conclusion:

Sir Creek is a **small but highly strategic area** critical to India's **national security**, **economic interests**, and **maritime rights**. The unresolved boundary affects **security**, **energy resources**, and **livelihoods** of thousands. Until both countries agree on the boundary, Sir Creek will continue to be a **major point of tension**. For India, maintaining a **strong military presence** and pursuing **diplomatic dialogue on its own terms** remains vital. A peaceful, bilateral resolution would help improve **regional security** and allow both countries to benefit from the area's resources.

India's Chicken's Neck gets rail spine

1. Key Announcement Details

- On **September 29, 2025**, India officially announced two new cross-border railway lines connecting India to Bhutan.
- These 2 new cross-border railway lines **near the strategic Chicken's Neck will integrate Bhutan with India's rail network** while strengthening Northeast India's security and supply chains.
- The announcement was made by **Ashwini Vaishnaw** (Minister of Railways) and **Vikram Misri** (Foreign Secretary of India).
- The project covers a **total railway length of 89 kilometres**, costing approximately **Rs 4,000 crore**.
- The routes are:
  - **Kokrajhar (Assam) '! Gelephu (Bhutan)**
  - **Banarhat (West Bengal) '! Samtse (Bhutan)**
- Expected time to complete the project: **3 to 4 years**.
- This initiative gained momentum following **Prime Minister Narendra Modi's 2024 visit to Bhutan**.
- Bhutan currently **does not have any railway connectivity**, so this marks a historic first for the country.

2. Significance of the Railway Links for Bhutan and India

For Bhutan:

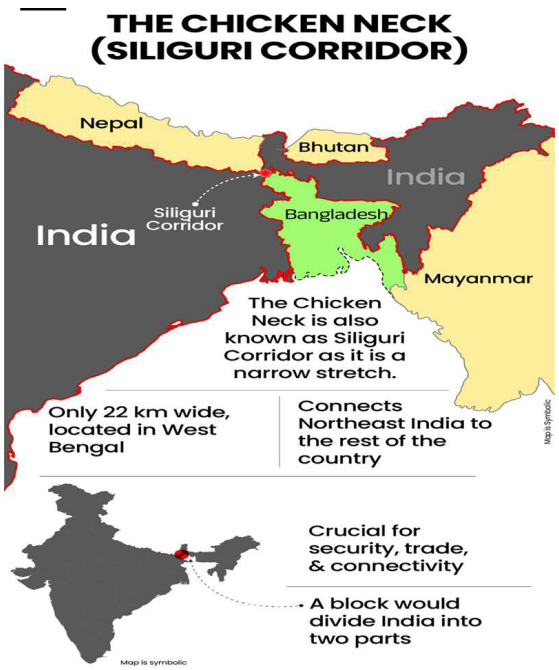
- The rail links will provide Bhutan with access to India's extensive railway network, which is critical for a **landlocked country** like Bhutan.
- This will facilitate:
  - Increased **tourism** (easier travel for tourists from India and beyond).
  - Enhanced **trade and economic activity**, making goods movement more efficient.
  - **Job creation and economic development** through improved connectivity and infrastructure.

- Bhutan's economy is closely tied to India, as India is Bhutan's **largest trading partner**.

For India:

- The project strengthens India's **economic and strategic partnership** with Bhutan.
- Improves connectivity with India's **Northeast region**, a strategically sensitive and economically developing area.
- Spurs greater economic growth and integration in border areas.
- Provides India strategic leverage in a region contested by China.

3. Geopolitical Importance: The Siliguri Corridor ("Chicken's Neck")



- The two railway lines are near the **Siliguri Corridor**, also known as the **"Chicken's Neck"**.
- The Siliguri Corridor is a narrow stretch of land (only about **21-22 km wide**) in West Bengal.
- It connects India's mainland to its seven Northeastern states:
    - Assam
    - Arunachal Pradesh
    - Nagaland
    - Manipur
    - Mizoram
    - Tripura
    - Meghalaya (known as the "Seven Sisters").
- The corridor is bordered by:
    - Nepal to the northwest
    - Bangladesh to the south
    - Bhutan to the north
- This corridor is a **critical but vulnerable land bridge** essential for economic and military connectivity.
- The city of **Siliguri**, located here, is a vital transport hub for road, rail, and air traffic linking Northeast India and neighboring countries.

Why is the Siliguri Corridor Vulnerable?

- Due to its narrow width and strategic location, it can be easily disrupted by:
    - Military conflict or incursions
    - Internal unrest or blockades
    - Natural disasters
- Any disruption could **isolate the Northeast**, threatening India's territorial integrity and economic security.

4. Security and Military Importance

- The new railway lines will improve the **movement of troops, weapons, and supplies** to the border regions.
- This is critical to maintain **India's security preparedness**, especially given the history of border tensions with China.
- The **2017 Doklam standoff** between India, Bhutan, and China occurred near this region, highlighting its sensitivity.
- The rail lines support faster military mobilization and improved economic integration, making the region more resilient.
- Bangladesh's interim Chief Advisor, **Mohammad Yunus**, highlighted India's Northeast as "landlocked," stressing the vulnerability of connectivity.

5. India's Broader Infrastructure Push in Border Areas

India is actively building multiple infrastructure projects near its borders with China, Bangladesh, Myanmar, and Bhutan to enhance strategic mobility.

Some examples include:

- **Sela Tunnel** in Arunachal Pradesh — to provide all-weather connectivity.
- **Darbuk–Shyok–Daulat Beg Oldie (DS-DBO) road** in Ladakh — crucial for border patrols near China.

These projects aim to:

- Bridge the infrastructure gap with China.
- Ensure rapid troop and logistics movement in remote, strategic areas.

6. The China Factor

- Bhutan is the **only South Asian country without formal diplomatic ties with China**.
- Despite this, China is increasing its influence in Bhutan through **investments and aid**.
- Bhutan has an unresolved **border dispute with China**.
- China is developing infrastructure such as a new railway connecting **Xinjiang to Tibet**, which runs close to disputed territories near Ladakh and Aksai Chin.
- This infrastructure strengthens China's military and logistical capabilities near the **Line of Actual Control (LAC)** with India.
- China's **Belt and Road Initiative (BRI)** involves extensive investments in infrastructure (ports, airports, railways) in countries around India, including Pakistan, Bangladesh, and Nepal. This is part of China's strategy to extend its influence in South Asia.

7. Strategic Message Behind India's Railway Links

- India's announcement reflects a **proactive approach** to developing cross-border infrastructure.
- It demonstrates India's commitment to the **economic development and integration of South Asia**, especially smaller neighbors like Bhutan.
- The project is a clear **signal to China** that India will resist any attempt to dominate its neighbors.
- It reinforces India's **strategic presence** in a sensitive geopolitical region near the Siliguri Corridor and the tri-junction of India, Bhutan, and China.

8. Bangladesh's Role and Changing Political Dynamics

- Bangladesh's interim government Chief Advisor, **Muhammad Yunus**, in a visit to China, called India's Northeast "landlocked."
- India responded by restricting some Bangladeshi exports and accelerating alternative connectivity projects that avoid Bangladesh.
- These moves indicate India's desire to reduce reliance on Bangladesh for connectivity.

Bangladesh's political shift:

- Former Prime Minister **Sheikh Hasina** (in power until August 2024) had friendly ties with India.
- The current interim government under Yunus has adopted a more **anti-India stance** and strengthened ties with China.
- Examples of Chinese involvement in Bangladesh causing concern for India:
    - Bangladesh shifting the **$1 billion Teesta River project** from India to China.
    - Reviving the **Lalmonirhat airbase** in northern Bangladesh with Chinese help.

9. Why Lalmonirhat Airbase is Significant

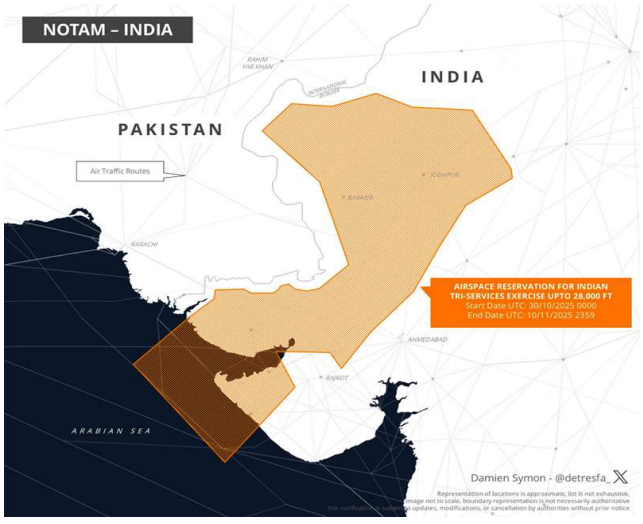
- Originally a British-era airfield, mostly dormant since Bangladesh's independence.
- Its revival with Chinese assistance could convert it into:

- A **logistics or surveillance hub**.
- A potential **military or dual-use base**.

- The airbase's location near the Siliguri Corridor poses a security threat to India.
- India fears it could be used by China or Pakistan to threaten the **Chicken's Neck** and Northeast India.

10. Historical and Geopolitical Context of the Corridor
    - The Siliguri Corridor's geography is shaped by historical events like:
        - The **Anglo-Gorkha War** and the **Duar War**.
        - Treaties such as the **Sugauli Treaty** and **Punakha Treaty**.
        - The **partition of India** and creation of East Pakistan (now Bangladesh).
    - These events created artificial boundaries affecting cultural and economic ties.
    - The corridor also connects to the **Chumbi Valley tri-junction** (India, Bhutan, China).
    - Chinese infrastructure expansion in the Chumbi Valley was a direct cause of the **2017 Doklam standoff**.
11. Security Challenges
    - The corridor's narrowness makes it prone to:
        - Military incursions and blockades.
        - Internal unrest and natural disasters.
    - Proximity to the Chumbi Valley increases vulnerability to Chinese advances.
    - Cooperation between China and Bangladesh could give China **indirect access** to the corridor area.
    - Any hostile action in this region risks isolating the Northeast, threatening India's unity and security.
12. China's Growing Influence in Bangladesh
    - China is Bangladesh's **largest arms supplier**.
    - China is a major partner in Bangladesh's infrastructure development (roads, railways, airports).
    - Joint military exercises have increased between China and Bangladesh.
    - Chinese companies influence strategic infrastructure projects in Bangladesh.
    - These trends cause India serious security concerns, especially about the Siliguri Corridor.
13. India's Strategic Response
    - India is fast-tracking alternative connectivity projects to bypass Bangladesh:
        - **Kaladan Multi-Modal Transit Project** (linking Kolkata to Mizoram via Myanmar).
        - **India-Myanmar-Thailand Trilateral Highway** connecting Northeast India to Southeast Asia.
    - India is enhancing its **internal infrastructure** around the Siliguri Corridor.
    - Increasing military preparedness in the region by:
        - Conducting exercises like **Teesta Prahar** (May 2023) focusing on integrated security.
        - Deploying border guarding forces (BSF, ITBP, SSB).
        - Enhancing surveillance and rapid troop movement capability.

India Issues NOTAM for Tri-Services Exercise "Ex Trishul" Along Pakistan Border



Why in News

- India has issued a **Notice to Airmen (NOTAM)** for a **large-scale tri-services military exercise** named **Exercise Trishul (Ex Trishul)**.
- The exercise will take place **along the Pakistan border from October 30 to November 10, 2025**, amid heightened tensions following **Operation Sindoor**.
- The **airspace reservation extends up to 28,000 feet**, as revealed by satellite imagery analysed by **geo-intelligence expert Damien Symon**, with the scale and area of the operations described as **"unusual."**

About Exercise Trishul

Aspect	Details
Name of Exercise	*Exercise Trishul (Ex Trishul)*
Type	**Tri-services exercise** (Army, Navy, Air Force)
Location / Area	Along the **India–Pakistan border**, including **creek, desert, and coastal sectors**
Dates	**October 30 – November 10, 2025**
Airspace Reservation	Up to **28,000 feet**
Participating Commands	Includes **Southern Command**
Objective	To demonstrate **joint operational capability**, **self-reliance (Atmanirbharta)**, and **innovation** under PM Modi's **"JAI" vision** — *Jointness, Atmanirbharta, Innovation*

Key Aims and Objectives

1. **Validation of Joint Operations:**
   - Troops from **Southern Command** to validate **joint operations** across diverse terrains.
2. **Operational Preparedness:**
   - Conduct **offensive manoeuvres** in **creek and desert sectors**.
   - Execute **amphibious operations** off the **Saurashtra coast**.
3. **Multi-domain Integration:**
   - Encompasses **Intelligence, Surveillance, and Reconnaissance (ISR)**, **Electronic Warfare (EW)**, and **Cyber Operations**.
4. **Atmanirbharta & Innovation:**
   - Showcase operational use of **indigenous defence systems**.
   - Refine **tactics, techniques, and procedures (TTPs)** for **modern warfare**.
5. **Strategic Signalling:**
   - To display India's readiness and deterrence posture amid heightened border tensions.

Backdrop: Operation Sindoor

Aspect	Details
Trigger Event	**Pahalgam terror attack (April 2025)**
India's Response	Launch of **Operation Sindoor** on **May 7, 2025**
Nature of Operation	**Precise airstrikes** against **terror infrastructure in Pakistan**
Outcome	Neutralised **over 100 terrorists**
Aftermath	Led to a **four-day military standoff**, the **deadliest in decades** between India and Pakistan.

- **Defence Minister Rajnath Singh** said the operation had sent a *"strong warning"* to Pakistan, which would now *"think twice before attempting any misadventure against India."*
- The minister, during his **visit to soldiers in Jaisalmer (Rajasthan)**, reaffirmed India's readiness and deterrence posture.

NOTAM (Notice to Airmen): Meaning and Context

Term	Explanation
NOTAM	Official notice issued to alert aircraft pilots and aviation authorities about temporary changes or restrictions in **airspace usage**.
In this context	Issued to reserve **airspace up to 28,000 feet** for the conduct of **Exercise Trishul** operations.
Significance	Prevents civilian aircraft movement in the designated exercise zones, ensuring **safety** and **operational security**.

Broader Strategic Context

- Comes at a time of **heightened India–Pakistan tensions** post-Operation Sindoor.
- Reflects India's ongoing focus on:
  - **Integrated theatre commands** and **joint operational doctrines**.

- **Use of emerging technologies** (ISR, cyber, EW).
- **Operational synergy** between land, sea, and air domains.

Atmanirbharta and the "JAI" Vision

- **JAI Vision:** Coined by PM **Narendra Modi** for the armed forces — **J = Jointness**, **A = Atmanirbharta (self-reliance)**, **I = Innovation**.
- The exercise aligns with this vision by integrating:
  - **Indigenous defence platforms**, and
  - **Joint multi-domain operations** for future warfare scenarios.

HAL Signs MoU with Russia's UAC to Manufacture SJ-100 Regional Jets in India

1. What Has Happened?

- **Hindustan Aeronautics Limited (HAL)** — a government-owned Indian aerospace company — has signed a **Memorandum of Understanding (MoU)** with Russia's **United Aircraft Corporation (UAC)**.
- The goal is to **manufacture the SJ-100 regional passenger jet** in **India**.
- This will be a **major step** towards India's dream of becoming an **aircraft manufacturing hub**.
- However, this move is **sensitive** because **UAC is under US sanctions** due to the **Russia–Ukraine war**, creating possible **diplomatic tensions** with the United States.

2. What Is the SJ-100 Jet?

- The **SJ-100** (earlier called **Sukhoi Superjet 100**) is a **regional passenger jet**.
- It can carry up to **103 passengers** and fly around **3,530 km**.
- It is mainly used for **short to medium-distance flights**.
- Competing aircraft in this category include:
  - **Embraer E190 (Brazil)**
  - **Airbus A220 (Europe)**
- If this MoU works out, the **SJ-100 could become the first full passenger aircraft** to be **made in India** — a milestone in Indian aviation history.

3. What Does the MoU Mean?

- The agreement is **not a final contract yet** — it is an **initial understanding** between HAL and UAC.
- HAL and UAC will **study the feasibility** (how possible it is) of making these planes in India.
- If successful, HAL could:
  - Build the SJ-100 for **India's domestic airlines**, and
  - Possibly **export** it in the future.
- This would make India part of the **global passenger aircraft manufacturing industry**, which is currently dominated by **Airbus (Europe)** and **Boeing (US)**.

4. Why Is This Important for India?

1. **First full passenger jet made in India**
   - India has made defence aircraft before (like Tejas and Sukhoi Su-30MKI), but this will be the **first commercial passenger jet** made fully in India.
   - The last such project was the **AVRO HS-748**, made between **1961–1988**.
2. **Boost to "Make in India" & "Atmanirbhar Bharat"**
   - This aligns with India's push to become **self-reliant in aerospace** and **manufacturing**.

3. **Growing domestic aviation market**
    - India is the **third-largest domestic aviation market in the world**, after the US and China.
    - Passenger numbers are growing rapidly — India needs **hundreds of new aircraft** in the next decade.
4. **Support for Regional Connectivity (UDAN Scheme)**
    - HAL said the SJ-100 could be a **"game changer"** for short flights under India's **UDAN scheme** (which connects small towns and cities through affordable flights).

5. The Diplomatic Angle — Why It's Controversial

(a) US Sanctions on Russia

- The **United Aircraft Corporation (UAC)** was **sanctioned by the US in June 2022**.
- The sanctions were part of US and Western actions **against Russia's defence and aerospace industry** following the **Ukraine invasion**.
- Other countries — **EU, UK, Canada, Switzerland, Japan** — also sanctioned UAC.

(b) India's Balancing Act

- India has **not joined Western sanctions** on Russia.
- However, Indian companies usually **avoid direct dealings with sanctioned entities** because of the risk of **secondary sanctions** from the US (penalties on third countries doing business with sanctioned firms).
- This MoU could therefore **irritate Washington**, which already has concerns about:
    - India's **import of Russian oil**, and
    - **Defence cooperation** with Moscow.

6. Possible Problems for the Project

Challenge	Explanation
US Sanctions Risk	HAL may face complications if US secondary sanctions are triggered.
Supply Chain Issues	Western countries have restricted export of aircraft parts to Russia. Many aircraft components (like engines and avionics) are from Western companies.
Delays in Russian Manufacturing	Russia is trying to replace Western parts with its own, but progress has been slow.
Uncertain Timeline	HAL has not announced when or where the jets will be built.

Even if sanctions do not directly affect India, **technical and supply issues** could delay or complicate aircraft production.

7. Broader Context — India, Russia, and the US

- India has **deep defence ties with Russia** — examples include:
    - **Sukhoi Su-30MKI** fighter jets (made in India by HAL)
    - **BrahMos missiles**
- At the same time, India is also **strengthening defence and strategic cooperation with the US** (like in **Quad** and **Indo-Pacific** initiatives).
- Hence, India tries to **balance both relationships**, maintaining **strategic autonomy** — not siding completely with either.

The new HAL–UAC deal will **test this balance**, as it shows India's willingness to **pursue its own industrial goals** even when it clashes with **US policy preferences**.

8. Economic and Strategic Significance

Aspect	Importance
Aviation Manufacturing	Could kickstart India's entry into passenger jet manufacturing.
Employment	Would create new skilled jobs in the aerospace sector.
Exports	India could later export SJ-100 to other regional markets.
Technology Transfer	Opportunity for Indian engineers to learn advanced aircraft design and production.
Strategic Message	Shows India's intent to make independent foreign and industrial policy decisions.

9. Estimated Market Demand

HAL estimates that:

- **200 aircraft** will be needed for **domestic regional routes** (within India) over the next decade.
- **Another 350 aircraft** may be needed for **short international flights** in the **Indian Ocean region**.

So, total demand could reach **550 aircraft** — a strong reason for India to build them locally instead of importing.

❐❐❐

History, Art & Culture

Bathukamma Festival

1. Recent Developments

The Bathukamma Festival celebrations, organized by the Telangana State Government, recently achieved a milestone by setting two new Guinness World Records.

2. Overview of the Festival

Bathukamma is a vibrant **floral festival** predominantly celebrated by the **women of Telangana**.

- **Meaning:** The name "Bathukamma" translates to **"Mother Goddess Come Alive"**, signifying the divine feminine power, **Goddess Gauri** (a form of Durga/Parvati), and her protective energy.
- **Time:** It is an annual festival celebrated for **nine days** during **Durga Navratri**, typically falling in **September–October** of the Gregorian calendar.

3. History and Significance

Historical Roots

- **Folklore** associates the festival with the miraculous survival of **Goddess Gauri**. It is also linked to legends concerning **King Dhramangada and Queen Satyavati** of the Chola dynasty.
- Historically, the **Kakatiya dynasty** promoted Bathukamma as a celebration of **feminine strength** and the abundance of **agricultural prosperity**.

Duration and Related Events

- The nine-day festivities conclude on the final day, known as **"Saddula Bathukamma"** or **"Pedda Bathukamma"**.
- It is followed by **Boddemma**, a distinct 7-day festival.
- Bathukamma has been officially recognized as the **Telangana State Festival**.

4. Rituals (The Floral Arrangement)

The core ritual involves the meticulous creation of the Bathukamma itself—a beautiful, large, conical arrangement.

- **Structure:** It is structured in concentric circles, resembling a **temple *gopuram***.
- **Materials:** It is built using various types of **seasonal flowers** (such as *Gunugu*, *Tangedu*, *Banti*, and *Chamanti*), symbolizing the bond between the earth, water, and human life.

Thumri Music

Why in News?

The world of Thumri music recently mourned the loss of **Pandit Chhannulal Mishra (1936–2025)**, a renowned singer and **Padma Vibhushan** awardee. He was one of the last major masters of the **Purab Ang** style of the Banaras Gharana.

What is Thumri?

- **Type of Music:** Thumri is a **semi-classical song style** in Hindustani music. It is often called the **"lyric of Indian classical music"** because it focuses heavily on expressing feelings and stories.
- **Origin:** It began in **Eastern Uttar Pradesh** (mainly in **Lucknow and Benares**) around the **18th century CE**, and was shaped by artists like **Sadiq Ali Shah**.
- **Themes:** Thumri songs are mostly about **love, longing, and devotion**. The stories usually revolve around the Hindu deities **Radha and Krishna.**
- **Language:** The lyrics are generally sung in local dialects like **Braj Bhasha, Awadhi, and Hindi**.

Key Features of Thumri

- **Emphasis on Emotion (Bhava):** The most important feature is the emphasis on **bhava** (deep emotion or feeling) over strict adherence to the rules of the *raga* (melody structure).
- **Flexibility:** Singers have a lot of **freedom to improvise** and add their own emotional touches.
- **Related Dance:** Thumri is closely linked to the classical dance form **Kathak**, which helps bring the song's emotional story to life.
- **Influence:** It mixes elements from folk song types like **Hori, Kajri, Dadra,** and others.

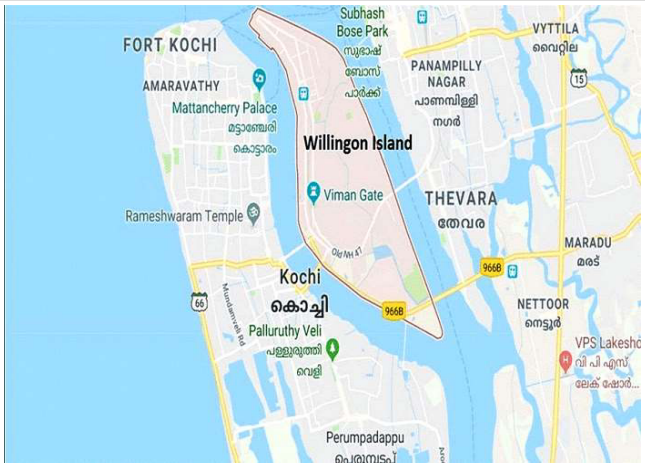
Types of Thumri

Type	Simple Characteristics	Associated Gharana
Purbi Thumri	Focuses more on deep emotion and lyrics; usually sung at a **slow pace.**	Banaras Gharana
Punjabi Thumri	More energetic and lively style; usually sung at a **fast pace.**	Patiala Gharana

Major Gharanas (Singing Schools)

- **Banaras Gharana:** Known for the emotional and soft **Purab Ang** style (Eastern style).
- **Lucknow Gharana:** Known for its refined, courtly style developed under the Nawabs.
- **Patiala Gharana:** Known for its vibrant and rhythmic style.

Willingdon Island and Lord Willingdon



Why in News?

Willingdon Island is relevant for both **Geography (Man-made Features)** and **Modern Indian History** due to its connection with a British Viceroy and its **strategic importance** as a major port and naval base. It occasionally features in news related to the **revival of port-related commercial activities** in Kochi.

I. Willingdon Island (Geography & Strategic Importance)

Feature	Detail
Location	Part of **Kochi**, in the state of **Kerala**, on India's West Coast.
Nature	A **man-made (artificial)** island, one of the largest in India.
Creation	Formed in the 1930s by **dredging the soil** from the **Vembanad Lake** during the construction of the modern Kochi Port.
Key Facilities	A **Strategic Hub** housing: * The **Port of Kochi** (a major port). * The **Kochi Naval Base** (Southern Naval Command of the Indian Navy). * The **Central Institute of Fisheries Technology (CIFT)**.
Connectivity	Connected to the mainland by the **Venduruthy Bridge** and other road/rail links.
Named After	**Lord Willingdon**, the then-Viceroy of India.

II. Lord Willingdon (Viceroy of India: 1931-1936) (Modern History)

Lord Willingdon served as the **22nd Viceroy and Governor-General of India** and implemented a policy of repression against the Indian National Congress.

Event	Detail
Civil Disobedience Movement	Relaunched by the Congress in 1932. Willingdon responded with **severe repression**, leading to the arrest of **Mahatma Gandhi** and the banning of Congress organizations.
Round Table Conferences	The **Second Round Table Conference (1931)** saw the participation of **Gandhi**. The **Third Round Table Conference (1932)** failed as the Congress did not attend.
Communal Award & Poona Pact	British PM Ramsay MacDonald announced the **Communal Award (1932)**. This was superseded by the **Poona Pact (1932)** between Gandhi and **Dr. B.R. Ambedkar**, which provided for **reserved seats** for Depressed Classes.
Government of India Act	The landmark **Government of India Act, 1935** was passed during his tenure.
Other Major Change	**Burma** was separated from India in 1935, as a provision of the Government of India Act, 1935.

Tikhir Tribe

Why in News?

- **Tikhir Tribal Council (TTC)** submitted a representation to the Nagaland Director General of Police (DGP).
- The council urged the inclusion of Tikhir tribe aspirants residing in **Noklak district** in the Nagaland Police constable recruitment.
- TTC also requested a common recruitment centre at **Shamator** for candidates from Noklak, Shamator, and Kiphire districts to ensure fairness.

About Tikhir Tribe

- **Location:** Indigenous **Naga tribe** found in the northeastern state of **Nagaland, India** (Shamator, Kiphire, and Noklak districts). Some members live in Myanmar.
- **Status:** Listed as a **Scheduled Tribe**.
- **Population:** 7,537 (2011 Census).
- **Recognition:** Recognized as a separate Naga tribe in **January 2022**.
- **Language:** Speak **Naga Yimchungru**, part of the Tibeto-Burman language family.
- **Livelihood:** Primarily an **agricultural community**.
- **History:** Were historically known as **headhunters**.
- **Challenges:** Faces marginalization and harassment from larger tribes.

Beliefs and Culture

- **Religion:** Majority converted to **Christianity**, often retaining elements of their traditional folk religion.
- **Main Festival: Tsonglaknyi**
    - **Observed:** Annually from **October 9th to 12th**, usually before the harvest.
    - **Meaning:** "Tsong" means Shield, "lak" means sanctification.
    - **Significance:** Festival of the **sanctification of the Shield** and weapons, and purification of the men folk for success (or prior to headhunting historically).

Karnak Temple

Why in News?

- A sweeping new **geoarchaeological study** was published on October 6, 2025.
- The study revealed how the **Karnak Temple complex** rose from an **island** amid Nile floods to become a sacred centre.
- Analysis of sediments and pottery showed the site was an elevated island formed by ancient Nile channels.
- This discovery links the temple's placement to the ancient Egyptian **creation myth**—where the first land (the primeval mound) emerged from the chaotic primeval waters.
- The earliest occupation and construction likely began during the **Old Kingdom** (c. 2591–2152 BC), with supporting ceramics dating to c. 2305–1980 BC.

About Karnak Temple

- **Location:** Complex of temples in **Karnak, Luxor Governorate**, south of **Egypt** on the **east side of the Nile River** bank. Once part of the ancient city of **Thebes**.
- **Construction Period:** Built between **2055 BC and around 100 AD**, with construction continuing for over 1,500 years.
- **Size:** It is the **largest building for religious purposes ever to be constructed** (covering about 200 acres). Ancient Egyptians called it **"most select of places"** (*Ipet-isu*).
- **Dedication:** Built as a cult temple and dedicated to the **Theban Triad**: the gods **Amun**, **Mut**, and **Khonsu**.
- **Key Features:** Includes the **Great Hypostyle Hall** (with 134 colossal columns), pylons, obelisks, and a **Sacred Lake**.
- **Historical Significance:** The height of its importance was during the **New Kingdom** (c. 1550–1070 BC).
    - Famous pharaohs like **Hatshepsut, Tuthmose III, Seti I, and Ramesses II** contributed significant additions.
    - Construction continued into the **Greco-Roman Period** (Ptolemies and Romans).
- **World Heritage Site:** It is a **UNESCO World Heritage site**, along with the Luxor Temple and the Valley of the Kings.

Mera Hou Chongba Festival : Symbol of Hill-Valley Unity in Manipur

Why in News?

The **Mera Hou Chongba festival**, a deeply symbolic celebration of Hill-valley unity, was recently observed in **Manipur**.

- The festival's annual celebration holds **immense significance**, particularly as it serves as a powerful, traditional platform for **reaffirming brotherhood, peace, and communal harmony** among the diverse indigenous communities of the state.

- It is one of the **only festivals** in Manipur where all indigenous communities participate, highlighting a **shared cultural identity** that transcends geographical and ethnic boundaries.

About Mera Hou Chongba Festival

Feature	Details
Annual Date	Celebrated on the **15th lunar day of the Mera month** of the Meitei calendar every year (typically falling in **October**).
Historical Roots	Believed to date back to the reign of **Nongda Lairen Pakhangba** (1st century CE), one of the legendary early rulers of Manipur.
Primary Theme	**Hill-Valley Unity, Brotherhood, and Solidarity** between the Meitei community (valley dwellers) and the hill tribes (Haos).
Procession	A **ritual march** led by the **Manipur titular King** (Maharaja Sanajaoba Leishemba) and **tribal village chiefs** from the Manipur Royal Palace (**Sana Konung**) to the historic **Kangla Fort**.
Key Rituals	* **Mera Thaomei Thanba:** The ritual lighting of the **ceremonial fire**. * **Mera Yenkhong Tamba:** The symbolic **exchange of gifts** between the hill chiefs and the valley people.
Culmination	A showcase of **cultural dances** and a **grand communal feast** marking the bond among different tribes.

Significance of the Festival

- **Unifying Platform:** Mera Hou Chongba is unique as it is the **only festival** where **all indigenous communities** of Manipur jointly participate, serving as a powerful expression of social cohesion.
- **Symbolic Exchange:** The exchange of gifts (hill products for valley products) signifies the **mutual dependence** and **ancient bond** between the two geographical regions of the state.
- **Peacebuilding:** By reviving and upholding this age-old tradition, the festival actively works to **reinforce unity, mutual respect, and social harmony** among the communities of Manipur.

EDITORIALS

Crux of The Hindu & Indian Express

History, Art & Culture

Somnath Temple : Updates, Significance, and Architecture

Why in News?

- The **Somnath Temple** has been in the news recently as it will be showcased as a symbol of resilience and cultural revival in the **Gujarat tableau** at the **"Unity Parade"** on Rashtriya Ekta Diwas (National Unity Day), which marks the 150th birth anniversary of Sardar Vallabhbhai Patel.
- Additionally, the temple continues to be a central point of pilgrimage, featuring in the recently announced **IRCTC '07 Jyotirlinga Yatra'** package and hosting cultural events like the **Kârtlki PûrGimâ Mela** (Kartiki Purnima Fair) and the **Somnath Festival** held during Maha Shivratri.

Key Facts About Somnath Temple

Feature	Details
Primary Deity	**Lord Shiva** (manifested as the Jyotirlinga).
Location	**Prabhas Patan**, near Veraval in Saurashtra on the western coast of **Gujarat**.
Religious Significance	Considered the **first of the 12 Jyotirlinga shrines** of Lord Shiva in India. It is also a **Triveni Sangam**—the confluence of three rivers: Kapila, Hiran, and the mythical Saraswati.
Origin Legend	Believed to be where the Moon God, Soma (hence the name **Somnath**, "Lord of the Soma"), regained his lustre after being cured of a curse by Lord Shiva.
History & Resilience	Referred to as the **'Eternal Shrine'** due to its repeated destruction and reconstruction over centuries, notably starting with an attack by Mahmud of Ghazni in the 11th century.
Present Structure	Constructed in the **Chalukya style** (also known as the Kailash Mahameru Prasad style) of Hindu temple architecture.
Reconstruction	The final, current temple was reconstructed after India's independence, spearheaded by **Sardar Vallabhbhai Patel** and completed in May 1951.
Architectural Feature	Its unique positioning is said to be in a straight line with the South Pole (Antarctica), with no land mass between the temple coast and the pole.

Architectural Highlights

The current temple is a masterpiece of the **Chalukya style**, known for its meticulous carvings and grand scale.

- **Shikhara (Spire):** Rises to a height of approximately **155 feet**. The top is adorned with a large *Kalash* (pot vessel).
- **Structure:** It features the three essential components of a traditional Hindu temple: the *Garbhagriha* (sanctum sanctorum), the *Sabha Mandap* (assembly hall), and the *Nritya Mandap* (dance hall).
- **Material:** Primarily constructed using **sandstone**.
- **Ingenuity:** It utilizes the ancient Indian technique of **interlocking stones** without the use of cement or mortar, contributing to its structural stability.

The history of the Somnath Temple is a profound testament to the unbroken continuity of Indian faith and culture.

Virtual Museum of Stolen Cultural Objects

Why in News?

UNESCO recently launched the **Virtual Museum of Stolen Cultural Objects** at its **World Conference on Cultural Policies and Sustainable Development (MONDIACULT 2025)** in Barcelona, Spain. The platform utilizes advanced digital technology to combat the illicit trafficking of cultural property and to keep the memory of lost heritage alive while awaiting physical repatriation.

About Virtual Museum of Stolen Cultural Objects

Feature	Details
Concept	An innovative **digital platform** that uses virtual reality, 3D imaging, and Artificial Intelligence (AI) to digitally **reconstitute and showcase stolen cultural objects** from around the globe.
Primary Aim	To **reconnect communities** with their stolen cultural treasures, raise global **awareness** of the consequences of illicit trafficking, and ultimately contribute to the **recovery and physical restitution** of the objects.
Unique Goal	Unlike traditional museums, the Virtual Museum is designed to **gradually empty itself** as the displayed objects are recovered and returned to their countries of origin.
Launch Event	Unveiled at **MONDIACULT 2025** (The World's largest conference on cultural policies).
Key Partners	Financially supported by the **Kingdom of Saudi Arabia** and developed in collaboration with **INTERPOL** (International Criminal Police Organization).
Design	The visual structure of the website was designed by Pritzker Prize-winning architect **Francis Kéré**, and is shaped like the **baobab tree**, an African symbol of strength and community.
Collection & Features	It currently displays nearly **240 missing objects** from **46 countries**. The platform includes a **Stolen Cultural Objects Gallery** and a dedicated **Return and Restitution Room** to highlight successful repatriations.

Sculptures from Indian Temple

The museum features two significant 9th-century sandstone sculptures submitted from India, which were stolen from the **Mahadev Temple in Pali, Chhattisgarh**:

- **Nataraja Figure:** This sculpture depicts **Lord Shiva** in his *Ananda Tandava* (cosmic dance). The dance symbolizes the cycle of **creation, preservation, and dissolution**, with Shiva's foot crushing **Apasmara**, the demon of **ignorance**, signifying the victory of knowledge over darkness.
- **Brahma Sculpture:** This figure depicts **Brahma**, the Creator, seated in *lalitasana* (a relaxed posture). He is shown with **three visible faces** and **four arms** holding sacred emblems such as a **rosary** and the **Vedas** (sacred scriptures), with a **swan** (*hamsa*) at his feet, symbolizing discernment.

The inclusion of these Indian artifacts highlights their cultural and religious significance and underscores the platform's role in addressing the global scale of cultural displacement.

Rani Chennamma: Celebrating 200 Years of the Kittur Revolt

Why in News?

The Government of India has celebrated the **200th anniversary of Rani Chennamma's historic victory at Kittur (1824)**. To honor her bravery and leadership against British rule, a **special ₹ 200 commemorative coin** has been released.

Who was Rani Chennamma?

Rani Chennamma was one of India's earliest and most courageous freedom fighters, leading an armed resistance against the British decades before the Revolt of 1857.

Aspect	Details
Early Life	Born on **October 23, 1778**, in **Kakati village (Karnataka)**. She belonged to a Lingayat family and was trained from a young age in **horse riding, sword fighting, and archery**.
Queen of Kittur	She married **Raja Mallasarja of Kittur** and became queen after his death in **1816**.
Revolt of Kittur (1824)	After her husband and son died, she adopted **Shivalingappa** as her heir. The **British East India Company refused to accept the adopted son**, viewing it as a chance to **take over Kittur**. This was an early case of the British policy known as the **Doctrine of Lapse**.
Fighting the British	Rani Chennamma **refused to surrender** and led her army against British officer **John Thackery**, whom she **defeated** in the first battle.
Defeat and Death	The British returned with a larger force, **captured the Kittur fort**, and imprisoned her at **Bailhongal Fort**, where she died in **1829**.

Legacy

- **Pioneer Freedom Fighter:** She is celebrated as one of **India's first freedom fighters**, leading the rebellion more than **three decades before the major Revolt of 1857**.
- **Symbol of Resistance:** She is revered as a **symbol of courage, justice, and women-led resistance** against colonial rule, particularly in Karnataka.
- **Cultural Memory:** Her story is kept alive through **folk songs (Janapada), ballads, and theater**. The annual **Kittur Rani Chennamma Utsav** is held in her honor.

Doctrine of Lapse

This was a key policy used by the British to take over Indian kingdoms:

- **Definition:** Introduced by Governor-General **Lord Dalhousie**, this policy allowed the **British**

East India Company to **take control of any princely state** if the ruler died **without a natural male heir** (son).

- **Rule on Adoption:** The policy **did not recognize any adopted son** as the rightful heir to the throne.
- **Annexed States:** Dalhousie used this doctrine to annex several states, including **Satara (1848), Jhansi (1853)**, and **Nagpur (1854)**.

Yuge Yugeen Bharat National Museum: A New Global Heritage Hub

Why in News?

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

Yuge Yugeen Bharat National Museum

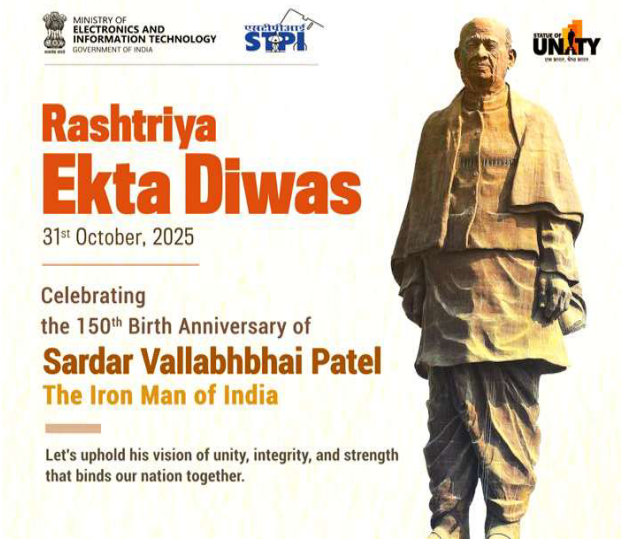
This ambitious project is designed to showcase the depth and breadth of Indian civilization over five millennia.

Aspect	Details
About	It is being developed by the **Ministry of Culture** as part of the **Central Vista redevelopment project**. It complements other heritage initiatives like the PM Museum and the National Archives Digitisation project.
Location	The museum will be housed in the **North and South Block buildings** of the **Central Vista** in New Delhi.
Theme	The central theme is **5,000 years of Indian civilization**, reflecting the "perennial" (everlasting) nature of India's history and culture.
Architecture and Design	**Arcop Associates**, led by principal architect **Kulapat Yantrasast**, was chosen as the top design consultant.
Heritage Collection	The museum will feature **rare objects from galleries across India** and the **existing collection of the current National Museum**. Examples include: * **Indus Valley** terracotta hourglass (2500-1700 BC) * **Gupta-period** sculptures (5th century) * **Chola** bronzes (10th-11th centuries)
International Collaboration	**India and France** are jointly developing the museum, leveraging **France's expertise** in museum design and management to ensure it meets global standards.

Conclusion

The Yuge Yugeen Bharat National Museum represents a significant commitment to preserving and presenting the rich heritage of India on a global stage, ensuring that the country's **5,000 years of civilization** are accessible to all.

Rashtriya Ekta Diwas 2025 : Commemorating Sardar Patel's 150th Birth Anniversary



Why in News?

Rashtriya Ekta Diwas (National Unity Day) 2025 marks the **150th birth anniversary** of **Sardar**

Vallabhbhai Patel, revered as the chief architect of India's political integration. The day, observed annually on **October 31st**, celebrates his legacy through events like the *Run for Unity* and *Unity March*, reaffirming the national commitment to cohesion.

What is Rashtriya Ekta Diwas (National Unity Day)?

Instituted to honour the man who unified India, the day promotes the ideals of national integration.

- **About:** Established by the Government of India in **2014** to recognize **Sardar Patel's pivotal role in unifying India**. It embodies the ideals of **national integration, peace, and unity in diversity**.
- **Purpose:** It encourages citizens to **reaffirm their commitment** to national integrity.
- **Associated Initiative:** The day is a key platform for promoting the **'Ek Bharat Shreshtha Bharat (EBSB)'** initiative, which was announced in 2015.

Statue of Unity

- **Significance:** Dedicated to Sardar Patel, the **Statue of Unity** at **Kevadia, Gujarat**, is the **world's tallest statue** at **182 metres**.
- **Location:** It overlooks the **Narmada River** and the Sardar Sarovar Dam, symbolizing national unity and pride.
- **Recognition:** In **2020**, it was recognized among the **"Eight Wonders of the Shanghai Cooperation Organisation (SCO)."**

Sardar Vallabhbhai Patel's Contribution to National Integration

As India's first Deputy Prime Minister and Home Minister, Patel masterminded the consolidation of the fragmented nation.

Post-Independence Consolidation of India

- **The Unification Challenge:** At Independence, nearly **40% of India's territory** was under **560 princely states**. The *Indian Independence Act, 1947*, freed these states, allowing them to choose independence or accession to India or Pakistan, a severe threat to unity.
- **Patel's Strategy:** Patel successfully led the integration of these states. He established a dedicated **States Department**, headed by **V. P. Menon**, to manage negotiations.
    - He employed a mix of **persuasion and firmness**, assuring rulers of **autonomy and privy purses** while emphasizing the benefits of unity.
    - This balanced approach led the majority of rulers to sign the **Instrument of Accession**, ensuring peaceful integration.

Handling Resistant States

Where diplomatic persuasion failed, Patel resorted to decisive action:

- **Junagadh:** Patel ordered police action after the Nawab acceded to Pakistan; accession was later confirmed through a **plebiscite**.
- **Hyderabad:** To counter the *Razakar* militia, he executed **"Operation Polo"** in 1948, leading to the state's integration.
- **Kashmir:** His firm stance and administrative backing were instrumental in aiding the state's integration following Maharaja Hari Singh's accession.

These actions set the precedent for a strong, unified Indian state.

Institutional Integration: The "Steel Frame"

- **All India Services (AIS):** Patel established the **All India Services (AIS)** under **Article 312**, ensuring **administrative unity and efficiency** across the federal structure.
- **Legacy:** He famously dubbed the AIS the **"Steel Frame of India,"** recognizing its crucial role in maintaining national integrity. His leadership earned him the title **"Iron Man of India."**
- **Comparative Perspective:** Unlike the militaristic approach of figures like **Otto von Bismarck of Germany**, Patel's methods were rooted in **democratic persuasion, consensus-building, and the rule of law**.

What is Ek Bharat Shreshtha Bharat (EBSB) Initiative?

Launched on **October 31, 2015**, the EBSB initiative seeks to sustain Patel's vision of unity through cultural exchange.

- **Objectives:** The initiative aims to **strengthen emotional bonds** and promote **cultural exchange and linguistic appreciation** among citizens by pairing different States and Union Territories.
- **Key Initiatives Promoting Unity:**
    - **State and UT Pairing:** Facilitates cultural and educational exchanges to strengthen bonds and appreciation for **"unity in diversity."**
    - **Bhasha Sangam App:** An initiative of the Ministry of Education to teach basic sentences in **22 Indian languages**, encouraging linguistic inclusion.
    - **Kashi Tamil Sangamam:** A prominent example of cultural exchange, celebrating the bond between **Kashi and Tamil Nadu** through art, language, and tradition.
    - **Yuva Sangam:** Promotes **student exchanges** and inter-state youth engagement.
- **Impact:** The initiative transforms the spirit of *Rashtriya Ekta Diwas* into a **continuous national movement**, reinforcing India's collective identity through millions of participants and supporting related programs like *Dekho Apna Desh*.

Conclusion

Rashtriya Ekta Diwas 2025 serves as a tribute to the "Iron Man of India" and a **renewed call to strengthen unity in diversity**. The day's observance, combined with the comprehensive **EBSB initiative**, continues to cement **Patel's ideals** as a living national ethos, promoting unity, diversity, and collective responsibility.

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Persons in News

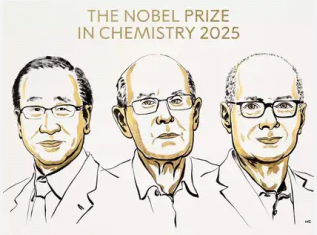
Politics & World Affairs

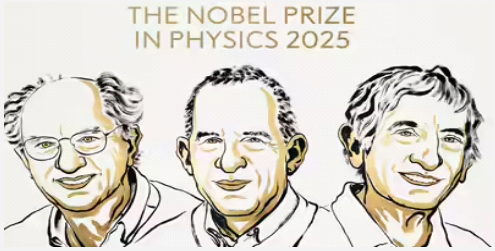
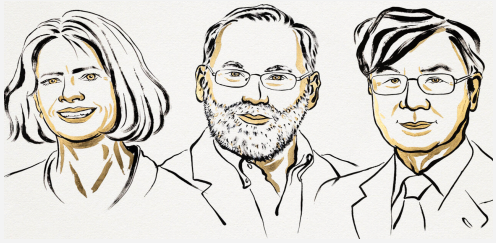
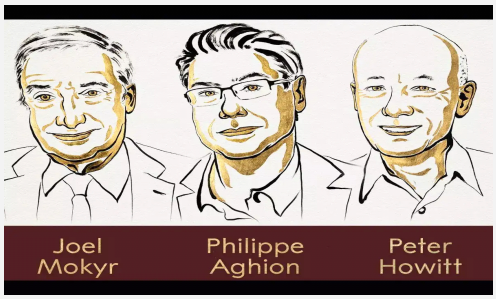
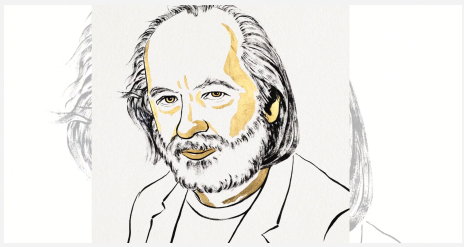
Personality / Entity	Country / Role	Achievement / Description (2025)
María Corina Machado 	Venezuela – Opposition Leader	Awarded **Nobel Peace Prize** for promoting **democratic rights** and **peaceful transition** from dictatorship.
Donald Trump 	U.S. President	Chaired **Gaza peace summit**, held **trade talks** with **Xi Jinping**, received **"Architect of Peace Award"** from **Richard Nixon Foundation**, and conferred with **South Korea's highest civilian honour – Grand Order of Mugunghwa**.
Amir Khan Muttaqi 	Afghanistan – Acting Foreign Minister	Met **India's EAM S. Jaishankar**; resulted in **India upgrading its Kabul mission to a full embassy**.
Sanae Takaichi 	Japan – Prime Minister	Elected as **Japan's first female Prime Minister** after winning **LDP leadership**.
King Charles III & Queen Camilla 	United Kingdom – Monarchs	Made a **high-profile visit to BAPS Shri Swaminarayan Mandir (Neasden Temple)** in London, strengthening **Indo-British cultural ties**.

National Personalities & Affairs (India)

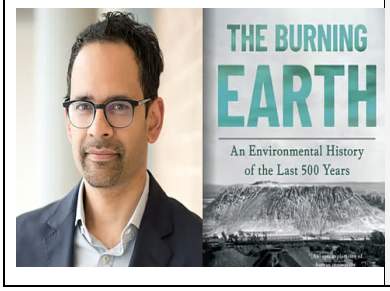
Personality / Entity	Role / Position	Achievement / Description (2025)
Sherry Singh 	Mrs Universe 2025 Winner	Became **India's first-ever Mrs Universe**, crowned in **Manila, Philippines**. Symbolized **beauty, intellect, and social responsibility**.
Deepika Padukone 	Actor & Activist	Appointed **India's first Mental Health Ambassador** by the **Health Ministry** on **World Mental Health Day (Oct 10, 2025)**.
President Droupadi Murmu 	President of India	Undertook a **historic sortie in a Rafale fighter jet** from **Ambala Air Force Station**.

Science, Technology & Economics (Nobel & Other Awards)

Field / Category	Laureates / Figures	Achievement / Description
Chemistry	Susumu Kitagawa, Richard Robson, Omar M. Yaghi 	Awarded **Nobel Prize in Chemistry** for **pioneering Metal–Organic Frameworks (MOFs)**.

Physics	John Clarke, Michel H. Devoret, John M. Martinis 	Won **Nobel Prize in Physics** for demonstrating **macroscopic quantum effects using Josephson Junctions**.
Medicine	Mary Brunkow, Fred Ramsdell, Shimon Sakaguchi 	Won **Nobel Prize in Medicine** for discovering **immuno-regulatory T cells** and **FOXP3 gene function in autoimmune diseases**.
Economics	Joel Mokyr, Philippe Aghion, Peter Howitt 	Received **Nobel Prize in Economic Sciences** for **innovation-driven economic growth** and **creative destruction** theory.
Literature	László Krasznahorkai 	Awarded **Nobel Prize in Literature** for **philosophical and visionary writing**.
Defence & Space	Dr. V. Narayanan (ISRO Chairman) 	Led **India's participation** in the **India Mobile Congress** and outlined **long-term space goals**.

Sports & Global Awards

Personality / Team	Sport / Field	Achievement / Description (2025)
Smriti Mandhana 	Cricket	**ICC Women's Player of the Month (Sept 2025)** for outstanding World Cup performance.
Abhishek Sharma 	Cricket	**ICC Men's Player of the Month (Sept 2025)** for key role in **Asia Cup victory**.
Morocco U20 Football Team 	Football	Won **FIFA Men's U20 World Cup 2025**, defeating **Argentina 2–0** in **Santiago, Chile** (Zabiri scored both goals).
Sunil Amrith 	Historian (Indian-origin)	Won **British Academy Book Prize** for *"The Burning Earth: An Environmental History of the Last 500 Years."*

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