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Institute for IAS Examination

PRELIMS KNOCKOUT

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2026 PART 1

MAY - DECEMBER 2025

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2026

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- HIV Prevention Drug Approved
- Japonica Rice
- Microcrystalline Cellulose (MCC)
- Endocrine-Disrupting Chemicals (EDCs)
- DengiAll
- Terbium (Tb)
- BHARAT Initiative
- Agricultural Monitoring and Event Detection (AMED) API
- Cysteine
- Coartem Baby
- Chronic Venous Insufficiency (CVI)
- WHO Launches “3 by 35” Initiative
- N-Nitrosodimethylamine (NDMA)
- Phenome India National Biobank
- Lyme Disease
- Liver Cirrhosis
- CLOVES Syndrome
- Hepatitis D
- CATCH Grant Program
- Human African Trypanosomiasis
- Pneumococcal Disease
- Escherichia coli (E. coli)
- Lewy Body Dementia (LBD)
- Bioactive Peptides (BAPs)
- Huntington's Disease
- Rubella
- Glanders
- Bloom Syndrome
- Diatoms
- Hand Foot and Mouth Disease (HFMD)
- Primary Amoebic Meningoencephalitis (PAM)
- SHRESTH Initiative
- Rabies
- New World screwworm myiasis
- SPARK-4.0 Initiative
- False Smut Disease
- Trichloroethylene (TCE)
- Mono Ethylene Glycol (MEG)
- Diethylene Glycol (DEG)
- Online National Drugs licensing system (ONDLS) Portal
- Crohn's Disease
- Zombie Deer Disease

- Calcium Carbide
- Fibromyalgia
- Sinapic Acid
- Nafithromycin
- Rhodamine B
- CRYODIL
- MAHA MedTech Mission
- Global Virus Network (GVN)
- Oral Cholera Vaccine -Shanchol
- Biomedical Research Career Programme (BRCP) Phase 3
- Leprosy
- Encephalomyocarditis Virus
- Melatonin
- Batten Disease
- Ricin
- African Swine Fever
- Pharmacogenomics
- Indian Pharmacopoeia Commission (IPC)
- Auramine O
- UNESCO- Global Ethics Framework on Neurotechnology
- National Action Plan on Antimicrobial Resistance 2.0
- Alprazolam
- Melanin
- BIRSA-101
- NEXCAR19
- GLP1 Medicines
- Norovirus
- Centre for Chronic Disease Control (CCDC)
- Bluetongue Virus (BTV)
- Fluoride
- Hemorrhagic Septicemia (HS)
- Nitrofurans
- GlowCas9 Protein
- Autophagy
- Dieback Disease
- Candida Auris
- Buccal Mucosa Cancer (BMC)

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- Drone-Based Quantum Key Distribution (QKD) System
- Bharat Forecasting System
- India’s 1st Quantum Technology Park in Amravati
- Satellite Internet Services
- DRUM Web App
- SAHAV Digital Ocean Data Portal
- Advanced Liquid Cooling Systems for Data Centres
- Cell Broadcasting System
- Quantum Noise
- India’s "Battery Passport" System
- Bluetooth Mesh Networking
- AI Alliance Network (AIANET)
- GPS interference
- Ham Radio Communication
- Dark web
- AI model for transliterating
- Charge-Coupled Device
- India Semiconductor Mission (ISM)
- EU AI Code of Practice on General-Purpose (GPAI)
- Brain-Computer Interface (BCI)
- Vikram 3201
- AI for Viksit Bharat and Frontier Tech Repository
- Graphite Spyware
- HealthAI Global Regulatory Network
- International Electrotechnical Commission
- AgriEnIcs Programme
- Indian Radio Software Architecture standard
- Insecure Direct Object Reference (IDOR)
- Intrusion Detection System
- Skilling for AI Readiness (SOAR) Programme
- Scheme for Innovation and Technology Association with Aadhaar (SITAA)
- Network Survey Vehicle (NSV)
- YUVA AI for ALL
- Artificial Intelligence for Agriculture Initiative (AI4AI)
- Project Suncatcher
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- Sanchar Sathi App
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- Science and Technology (S&T) Clusters Initiatives
- Altermagnets
- Antimatter
- Black Hole Merger
- 1st private test facility for heavy water upgrade
- Ionic Liquids
- Sakura Science Programme
- Isobutanol
- International Earth Sciences Olympiad
- Lithium-Ion (Li-Ion) Battery
- World's Largest Neutrino Detector Activated
- SJ-100
- Indigenous Production of High-RRR Niobium
- Research Development and Innovation Scheme
- Plutonium
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- SCOPE Eminence Awards
- Sveriges Riksbank Prize in Economic Sciences
- Nobel Prize in Physiology or Medicine 2025
- Nobel Prize in Physics 2025
- Nobel Prize in Chemistry 2025
- Nobel Prize in Literature 2025
- Nobel Peace Prize 2025
- Rashtriya Vigyan Puraskar 2025
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POLITY AND GOVERNANCE

CONSTITUTION

DIGITAL ACCESS PART OF FUNDAMENTAL RIGHT TO LIFE & LIBERTY

Context: The Supreme Court while hearing pleas to make Know-Your-Customer (KYC) procedures inclusive for Persons with Disabilities (PwDs), emphasized that the **"right to digital access" is an instinctive component of the right to life and liberty under Article 21.**

Legal Framework Supporting Digital Rights for Persons with Disabilities (PwDs)	
Constitutional Provisions	**Article 14 & 15:** Prohibit discrimination and ensure equality in digital access. **Article 21:** Right to life includes meaningful digital access. **Article 38:** State must reduce inequalities; digital inclusion is essential.
RPwD Act, 2016	**Section 13(1):** Equal rights in property, finance, and credit access. **Section 42:** Accessible media, electronic content, and devices. **Section 46:** Accessibility in services and infrastructure, including digital finance.
Sustainable Development Goals (SDGs)	**SDG 10:** Reduced inequalities. **SDG 16: I**nclusive institutions and digital access.
UN Convention on the Rights of PwD (UNCRPD)	**Article 9:** Ensures accessibility in ICTs (India is Signatory, the RPwD Act, 2016 and Rules (2017) align with Article 9 of UNCRPD)

What is KYC Framework?

- The KYC process is mandated under the Prevention of Money Laundering Act (PMLA), 2002 to verify the identity of customers.
- **Applications**: Required for opening bank accounts, accessing welfare schemes, obtaining SIM cards, and availing financial services.
- **RBI's Role:** The Reserve Bank of India (RBI) prescribes a **Customer Due Diligence (CDD)** framework.
    - **Clause 18 of KYC Direction, 2016:** Introduces the Video-based Customer Identification Process (V-CIP), enabling secure, real-time video interaction for remote customer verification.

SUPREME COURT'S ADVISORY JURISDICTION

Context: The President invoked the Supreme Court's Advisory Jurisdiction under **Article 143(1)** to seek its opinion on whether timelines can be set for the President and Governors to act on Bills passed by state Assemblies.

About Supreme Court's Advisory Jurisdiction regarding Presidential Reference	
Constitutional Basis	• **Article 143(1):** The President may refer any question of law or fact of public importance (arisen or likely to arise). The SC may choose to give or decline its opinion. • **Article 143(2):** The President may refer disputes related to pre-Constitution treaties, agreements, covenants, or sanads. Here, the SC must tender its opinion.
Nature of Advice	• In both cases, the Court's opinion is advisory, not binding. • However, in some instances, the court has treated them with authoritative value.
Bench Requirement	• Under Article 145(3), at least a five-judge Constitution Bench must hear such References. • If a smaller bench (under Article 132, appellate jurisdiction) encounters such a question, it must refer the matter to a Constitution Bench.
Presidential Role	Though the reference is formally from the President, Article 74(1) requires such action to follow the Cabinet's aid and advice, preserving executive accountability.
Historical Use	Invoked 15 times since 1950 to clarify constitutional questions. • Kerala Education Bill (1957) • Berubari Union (1960)

	• Cauvery Water Disputes (1993) • Ram Janmabhoomi–Babri Masjid (1993)
Scope to Modify Past Judgments	• Article 143 cannot overturn settled judicial decisions (Cauvery case). Final judgments may only be challenged through review or curative petitions. • However, SC may clarify or expand principles without disturbing the decision (e.g., Natural Resources case, 2012).

RIGHTS OF PEDESTRIANS UNDER ARTICLE 21

- The Supreme Court (SC) recently passed a landmark order affirming the constitutional rights of pedestrians.
- The Court emphasized that the **right to unobstructed and disability-friendly footpaths is protected under Article 21 of the Constitution**.,
- In line with this, the SC directed that **all public roads must have footpaths that are accessible and usable for persons with disabilitie**s.

About Article 21

- Article 21 guarantees protection of life and personal liberty, stating that "no person shall be deprived of life except according to the procedure established by law."
- Maneka Gandhi v. Union of India (1978) case greatly expanded the meaning of Article 21. It overruled the earlier narrow view from A.K. Gopalan (1950) that any law could limit life or liberty.
- The Supreme Court ruled that the "**procedure established by law**" must be just, fair, and reasonable, not arbitrary or oppressive, thereby introducing the essence of the American concept of **due process** into Indian law.
- The Court also established the "**Golden Triangle**", asserting that Articles 14 (Equality), 19 (Freedoms), and 21 (Life and Liberty) are interlinked, so any law depriving a person of life or liberty must satisfy all three provisions.

Article 21 and the associated landmark judgments	
Right to Travel Abroad	Maneka Gandhi v. Union of India (1978)
Right to Live with Human Dignity	Francis Coralie Mullin v. UT of Delhi (1981)
Right to Livelihood	Olga Tellis v. Bombay Municipal Corporation (1985)
Right to Privacy	Justice K.S. Puttaswamy v. Union of India (2017)
Right to Clean Environment (Pollution-free water and air)	Subhash Kumar v. State of Bihar (1991)
Right to Shelter	Chameli Singh v. State of U.P. (1996)
Right to Health (Including emergency medical aid)	Parmanand Katara v. Union of India (1989)
Right to Education (up to 14 years, now Article 21A)	Unni Krishnan v. State of Andhra Pradesh (1993)
Right to Speedy Trial and Right to Free Legal Aid	Hussainara Khatoon v. Home Secretary, State of Bihar (1979)
Protection against Sexual Harassment at Workplace	Vishaka v. State of Rajasthan (1997)
Right to Die with Dignity (Passive Euthanasia and Living Will)	Common Cause v. Union of India (2018)

EMERGENCY

Context: To mark 50 years since the National Emergency, the Ministry of Culture and Delhi Government held an event titled 'Samvidhan Hatya Diwas'.

About National Emergency (Article 352)

- The term "National Emergency" refers to the state of emergency under Article 352, though the Constitution does not explicitly mention this term.
- **Grounds for Declaration:** Can be declared in case of war, external aggression, or armed rebellion (earlier called "internal disturbance").

- **Proclamation Process:** The President can declare a National Emergency after receiving a **written recommendation** from the Union Cabinet.
- **Parliamentary Approval:**
  - Must be approved by both Houses of Parliament within one month. If the Lok Sabha is dissolved, approval must come within 30 days of its reconstitution, provided Rajya Sabha has approved in the meantime.
  - **Requires a special majority** i.e., a majority of the total membership of each House, and a two-thirds majority of members present and voting.
- **Duration:** Valid for six months at a time, but can be extended indefinitely through repeated approvals by Parliament.
- **Revocation:** Can be revoked by the President anytime, or if the Lok Sabha passes a resolution disapproving it (Rajya Sabha has no such power).

Effect during National Emergency	
Centre–State Relations	• The Centre gains control over subjects in the State List (Article 250). • The President can alter the financial distribution between Centre and States. • The Centre can direct States on any matter.
Tenure of Legislatures	• The Lok Sabha and State Assemblies can have their term extended by one year at a time during the Emergency. • Their tenure cannot exceed six months after the Emergency ends.
Fundamental Rights	• **Article 358:** Automatically suspends Article 19 rights (only during *war or external aggression*). • ***Note:*** The 44th Amendment (1978) restricted this suspension; it does not apply to armed rebellion. • **Article 359:** The President can suspend enforcement of other Fundamental Rights, except Articles 20 and 21 (protection in criminal cases and right to life & liberty).

National Emergency has been declared three times in India's history		
October 1962 – January 1968	External Aggression	During the Indo-China War (1962).
December 1971 – March 1977	External Aggression	During the Indo-Pakistan War (1971), which led to the creation of Bangladesh.
June 25, 1975 – March 21, 1977	Internal Disturbance	Declared by President Fakhruddin Ali Ahmed on the advice of PM Indira Gandhi, amidst political unrest

Major Constitutional Amendments during the Emergency Period (1975-77)	
38th Amendment (1975)	• Made the President's satisfaction "final and conclusive" under Articles 352, 356, and 360, thus barring judicial review of Emergency proclamations.
39th Amendment (1975)	• Changed how election disputes involving the President, Vice President, Prime Minister, and Speaker were to be settled. • Gave Parliament the power to decide the authority for such disputes, effectively placing these offices beyond judicial scrutiny.
42nd Amendment (1976)	• Gave Directive Principles precedence over Fundamental Rights under Article 31C. • Reduced powers of the Supreme Court and High Courts: • Inserted Article 32A to prevent the SC from reviewing State laws' constitutional validity. (Later removed by 43rd Amendment) • Inserted Articles 131A and 226A to deny HCs power to examine Central laws. • Extended Lok Sabha's term from 5 to 6 years. • Amended Article 368 by adding clauses (4) and (5), giving Parliament virtually unlimited power to amend the Constitution without judicial challenge.

Aftermath of Emergency	
44th Constitutional Amendment Act (1978)	• Right to Property removed from Fundamental Rights and made a constitutional and legal right under Article 300A. • Limited the suspension of rights under Article 359: Articles 20 and 21 now remain enforceable even during Emergency. • Replaced the phrase "internal disturbance" with "armed rebellion" to ensure Emergency could not be imposed on vague grounds. • Made it mandatory for the Union Cabinet to provide written advice to the President before declaring an Emergency. • Required Parliamentary approval within one month, using a special majority. • Deleted Article 257A, which earlier allowed the Union Government to deploy armed forces in any state during a law-and-order crisis. • Reinstated the judiciary's power to review election disputes related to the President and Vice-President • Restored the term of Lok Sabha and State Assemblies to five years

THE VICE-PRESIDENT RESIGNS MID-TERM

Context: Chandrapuram Ponnusamy (C.P.) Radhakrishnan was recently sworn in as the 15th Vice-President (VP) of India in a midterm election, following the resignation of Jagdeep Dhankhar.

About Vice President of India

- The Vice President of India is the deputy to the head of state of the Republic of India, i.e. the president of India.
- The office of vice president is the second-highest constitutional office after the president and first in the line of succession to the presidency.
- The vice president is the **Chairman of the Rajya Sabha an**d ranks **2nd in the Order of Precedence of India.**

Constitutional Basis of Vice President

- **Article 63:** Provides that "There shall be a Vice-President of India."
- **Article 64:** Declares that the Vice President shall be the ***ex officio*** **Chairman of the Rajya Sabha.**
- **Article 65:** Empowers the Vice President to act as President during a temporary vacancy caused by the President's death, resignation, removal, or incapacity.
- **Tenure**: 5 years from the date of assuming office.
- **Resignation (Article 67(a)):** Can resign by writing to the President.
- **Removal (Article 67(b)):**
  - Can be removed by a resolution passed by the Rajya Sabha with an effective majority and agreed to by the Lok Sabha by a simple majority.
  - Requires a 14-day notice before the motion is moved.

Election of the Vice President (Article 66)

- **Electoral College:** Comprises all members of Parliament (both Lok Sabha and Rajya Sabha, including nominated members).
- **Voting System:** Conducted through **proportional representation** by means of the single transferable vote. Every MP's vote carries equal value. **Voting is by secret ballot** to ensure free choice. **The Anti-Defection Law does not apply;** hence, no party whip can be issued.

Role of the Vice President

Legislative Role (Chairman of Rajya Sabha)

- Presides over the Rajya Sabha sessions, ensuring orderly debates and fair conduct of business.
- Maintains neutrality and discipline in the House.
- Possesses a casting vote in case of a tie but does not participate in regular voting.

Executive Role (Acting as President)

- Acts as the President when the latter's office falls vacant.
- This is a temporary arrangement lasting up to six months, during which a new President must be elected.
- During this period, the Vice President's duties as Rajya Sabha Chairman are performed by the Deputy Chairman.

Unlike the President, the Constitution does not specify who performs the Vice President's duties if the office becomes vacant.

- **Nomination Requirements:** Candidate needs 20 proposers and 20 seconders among MPs. Must deposit ₹15,000 as a security amount. Must attach a certified copy of their name from the current electoral roll.
- **Eligibility Criteria:** Be a citizen of India; Have completed 35 years of age; Be qualified for election to the Rajya Sabha; Not hold any office of profit under the Union, State, or local government. If already a Member of Parliament, the person must vacate the seat upon assuming office as Vice President.

Comparative Perspective: India and the United States

- The Indian Vice President's office is **inspired by the U.S. model,** where the Vice President is also the presiding officer of the Senate (the upper House)
- However, key **differences** exist:
  - **In the U.S., the VP automatically becomes President upon a vacancy.** In India, the Vice President acts as President temporarily until a new President is elected within six months.
  - The **U.S. Constitution allows replacement of a Vice President (25th Amendment)**, while the Indian Constitution has no provision for filling a Vice Presidential vacancy until the next election.

RIGHT TO VOTE

Context: The Supreme Court directed the Election Commission (EC) to accept Aadhaar, voter ID, and ration cards for the Special Intensive Revision (SIR) of electoral rolls. The Court reaffirmed that the right to vote is vital to India's democracy and reflects Universal Adult Suffrage (UAS).

What is Universal Adult Suffrage (UAS)?

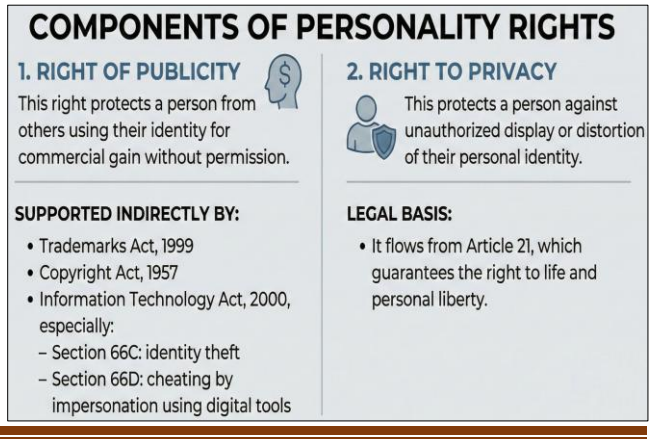
- Universal Adult Suffrage (UAS) is the right of all adult citizens to vote in elections, regardless of factors such as wealth, gender, caste, religion, or education.
- **Constitutional Provision: Article 326** grants every citizen aged 18 or above the right to vote in Lok Sabha and State Assembly elections, unless disqualified. The **61st Constitutional Amendment (1988)** lowered the voting age from 21 **to 18.**
- **Electoral Inclusion:** Reserved constituencies were provided for SCs/STs (not separate electorates). Women, minorities, tribal groups, and Dalits participated equally from the start.
- **EC Efforts:** Under Sukumar Sen (1st Chief Election Commissioner of India), the EC overcame monumental challenges, including enrolling 173 million mostly illiterate voters. The introduction of symbols for political parties allowed illiterate voters to participate meaningfully.
- **Judicial Reinforcement:** The SC recognized **democracy as part of the basic structure** in the *Kesavananda Bharati v. State of Kerala (1973) case*, making the right to vote fundamental to the Republic.
- New Zealand was the first self-governing country to grant women the right to vote in national elections in 1893 (though they could not stand for election until 1919).

PERSONALITY RIGHTS

Context: The Delhi High Court recently protected Aishwarya Rai Bachchan, Abhishek Bachchan, and Karan Johar from the misuse of their names, photographs, and public identity.

What Are Personality Rights?

- Personality rights are the **rights that a person has over their own identity.** These rights allow an individual to control how their: Name, Image or photograph, Voice, Likeness or appearance, Signature, Gestures or identifiable traits are used by others.
- These rights serve two purposes: (a) **Protecting dignity and privacy** (no one should misuse a person's identity without consent). (b) **Preventing commercial exploitation** (no one should earn money by unfairly using someone else's fame).
- Personality rights cannot be used to silence creative expression or public-interest commentary. Material already in the public domain may be used freely for legitimate purposes such as criticism or satire.
- Although the **term "personality rights" is not defined in any Indian statute**, Indian courts have recognized



these rights in a few judicial rulings. Courts rely on: Article 21 (privacy), Common law (passing off), Trademark and copyright principles, Judicial precedents

- Further, since **there is no legal definition** for expressions such as "celebrity," "famous personality," or "publicity rights," it is for the presiding judge to decide who qualifies as a celebrity and whether that person's publicity rights should be enforced.
- Interestingly, even though corporate bodies are treated as legal persons in law, **personality** or publicity **rights apply only to individuals and do not extend to corporate organizations.**

QUALIFICATIONS AS BASIS FOR APPOINTING PRIESTS

Context: The Kerala High Court has held that the appointment of temple priests is a secular activity that must comply with constitutional principles of equality and non-discrimination.

Constitutional Framework

- **Article 25:** Guarantees freedom of conscience and the right to freely profess, practise, and propagate religion, subject to public order, morality, health, and other fundamental rights.
- **Article 26:** Grants religious denominations the right to manage their own affairs, but this right is not absolute and is subject to constitutional morality and state regulation in secular matters.

The Court applied the **essential religious practice (ERP) test**, concluding that caste or hereditary lineage is not an essential component of Hindu priesthood. Therefore, regulating qualifications for priests does not violate religious freedom.

Significance of the Ruling

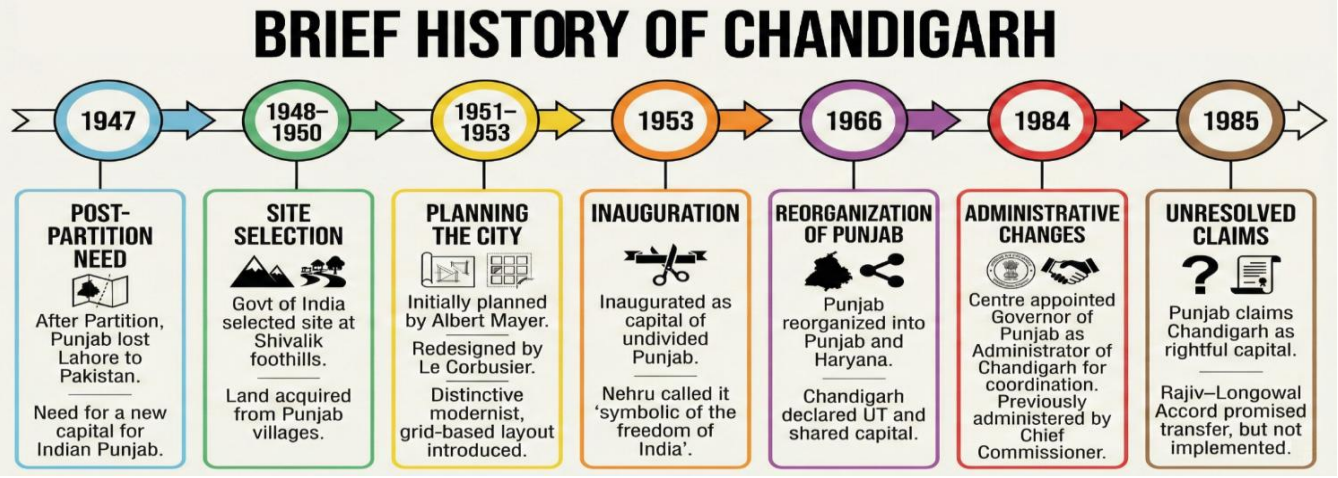
- **Protection of Equality and Secular Governance:** The judgment reinforces that state-administered temples must function in accordance with constitutional mandates of equality and non-discrimination.
- **Promotion of Merit-Based Access:** By prioritizing institutional training and certification, the ruling encourages meritocracy and inclusivity in temple priesthood, allowing qualified individuals from all backgrounds to apply.
- **Judicial Continuity with Reform-Oriented Precedents:** The decision aligns with key Supreme Court rulings:
  - **Seshammal v. State of Tamil Nadu (1972):** Appointment of priests is a secular function and subject to state regulation.
  - **Adi Saiva Sivachariyargal Nala Sangam v. State of Tamil Nadu (2015):** The state may regulate secular aspects of temple administration but cannot interfere with essential religious practices prescribed by Agamas.

ARTICLE 240 AND CHANDIGARH

Context: Recently, the Centre's proposed introduction of the Constitution (131st Amendment) Bill, 2025 in Parliament, to bring Chandigarh under Article 240 of the Constitution.

About Article 240 of the Constitution

- Article 240 **empowers the President of India to make regulations for the peace, progress, and good governance of certain Union Territories (UTs).**
- These include the **Andaman and Nicobar Islands, Lakshadweep, Dadra and Nagar Haveli and Daman and Diu, and Puducherry** (when its Legislative Assembly is suspended).



CONSTITUTION OF INDIA RELEASED IN SANTHALI LANGUAGE

Context: President of India released the Constitution of India in the Santhali language.

About Santhali Language

- Santhali belongs to the **Austroasiatic (Munda branch) language family,** distinct from Indo-Aryan (Hindi, Bengali) and Dravidian languages (Telugu, Tamil).
- It is spoken mainly by the Santhal tribal community, predominantly used in Jharkhand, Odisha, West Bengal, and Bihar.
- **Script**: Written in **Ol Chiki script**, developed in 1925 by Pandit Raghunath Murmu to preserve Santhali identity and literature. The script is written left to right, has 30 letters and two styles (print Chapa style and cursive Usara style).
- Included in the **Eighth Schedule** of the Constitution by the **92nd Constitutional Amendment Act, 2003.**

LEGISLATURE

PRIVATE MEMBER'S BILL

Context: In recent years, the scope for introducing and discussing Private Members' Bills has significantly declined in both Houses of Parliament.

About Private Member's Bills (PMBs)

- A Private Member's Bill (PMB) is a **legislative proposal introduced in Parliament by a Member of Parliament (MP) who is not a Minister (whether elected or nominated).**
- It allows individual MPs, from **either the ruling party or the Opposition**, to propose laws independently of the government.

Mechanism for Introduction

- The procedure for introducing a PMB in the **Lok Sabha** is laid down in **Rule 65.**
- A one-month notice is required before introducing the bill, with the permission of the Speaker (Lok Sabha) or Chairman (Rajya Sabha).
- **Time Allocation:**
  - **Lok Sabha**: Last two-and-a-half hours every Friday are reserved for PMBs.
  - **Rajya Sabha:** Two-and-a-half hours (2:30 p.m.–5:00 p.m.) on every alternate Friday are allotted.

Trends in Private Member's Bills

- Since Independence, only 14 PMBs have been passed and received Presidential assent.
- The first Private Member's Bill passed was the Muslim Wakfs Bill, 1952, introduced by Syed Mohammed Ahmad Kasmi.
- Since 1970, no PMB has been passed by both Houses of Parliament.

SC/ST ACT 1989

Context: The Telugu actor has been booked under the SC/ST (Prevention of Atrocities) Act, 1989 for allegedly making derogatory remarks about tribal communities at a recent film event.

About the SC/ST (Prevention of Atrocities) Act, 1989

- The Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act, 1989, is a special law enacted to **prevent crimes and discrimination specifically targeting members of Scheduled Castes (SCs) and Scheduled Tribes (STs)**. It aims to protect their dignity and ensure access to justice.

About the SC/ST (Prevention of Atrocities) Act, 1989	
Definition of Atrocities (Section 3)	Lists specific offences by non-SC/ST persons against SCs/STs such as public humiliation, land grabbing, bonded labour, social boycott, and sexual violence.
Punishment	Imprisonment from 6 months to life, along with a fine. Death penalty if false evidence causes wrongful execution.
Investigation Procedure	• All offences are cognizable. • Investigation must be conducted by a police officer not below the rank of Deputy Superintendent of Police (DSP).

Neglect of Duty (Section 4)	Public servants can be jailed for 6 months to 1 year if they fail to register FIRs, record statements, investigate, or file charge sheets within 60 days.
Special Courts (Section 14)	States must establish Special or Exclusive Special Courts for speedy trials. Cases should be tried day-to-day and concluded within 2 months, if possible.
Appeals	Appeals related to orders or bail go directly to High Courts.
Rights of Victims & Witnesses (15A)	Includes right to be heard at bail/parole, free FIR/charge sheet copies, travel and rehab support, video-recorded trials, NGO support, and protection.
No Anticipatory Bail (Sections 18 & 18A)	• No anticipatory bail for offences under the Act. • As per the 2018 amendment, no preliminary inquiry or prior approval is required for FIR or arrest.
Preventive & Monitoring Measures	• District Magistrates to identify atrocity-prone areas and take action. • States must impose collective fines, conduct surveys, and report to Parliament annually.
Externment	Persons likely to commit atrocities can be barred from certain areas for up to 3 years.
Forfeiture	Property used to commit atrocities can be seized by the state.
Caste Disputes	Caste of the SC/ST victim cannot be questioned to dismiss a complaint under this Act.
Override Clause	The Act overrides any other law or custom that contradicts its provisions.

NOMINATED MEMBERS OF RAJYA SABHA

Context: The President has nominated four new members to the Rajya Sabha (RS): Ujjwal Nikam (public prosecutor), Harsh Vardhan Shringla (former Foreign Secretary), C. Sadanandan Master (Kerala-based social worker and educationist), and Dr. Meenakshi Jain (noted historian).

About Nominated Members of the Rajya Sabha (Council of States)

- **Constitutional Provision:**
  - Under **Article 80(1)(a) read with Article 80(3) of the Indian Constitution**, the **President of India can nominate up to 12 members to the Rajya Sabha (RS).**
  - These members are chosen for their special knowledge or practical experience in one or more of the following fields: Literature, Science, Arts, Social Service
- **Rights and Restrictions of Nominated Members**
  - Enjoy the same rights and privileges as elected Members of Parliament (MPs).
  - **May join a political party within six months of taking office.**
  - **Cannot vote in Presidential elections**, but **can vote in Vice-Presidential elections** and during impeachment of the President.
  - Can participate fully in parliamentary proceedings, including debates and committee work.
  - They serve a term of six years in the Rajya Sabha.
- **Purpose of Nomination**: The nomination system aims to bring into Parliament eminent individuals who, though not active in politics, can contribute significantly to legislative debates through their expertise, experience, and diverse perspectives.

State Legislative Council Nominated Members

- **Number of Nominated Members:** One-sixth (1/6th) of the total members nominated by the Governor
- **Basis for Nomination:** Persons having knowledge or practical experience in literature, science, arts, **co-operative movement**, and social service

SC VERDICT UPHELD EQUAL INHERITANCE RIGHTS FOR TRIBAL WOMEN

Context: Recently, the Supreme Court affirmed that Gond tribal women are entitled to inherit ancestral property, even if their customary practices do not expressly provide for such rights.

- The central question in Ramcharan vs Sukhram (2025) was whether a Gond tribal woman, belonging to a community notified as a **Scheduled Tribe under Article 342**, could inherit ancestral property when: **(A) Hindu**

Succession Act, 1956 (HSA) does not apply to Scheduled Tribes under Section 2(2), and **(B)** There was no clear or established customary rule within the Gond community governing succession for women.

Constitutional Principles Underpinning the Judgment

- **Article 14 (Right to Equality):** The Court held that denying Gond tribal women the right to inherit ancestral property would violate Article 14, as there is no rational or constitutionally valid basis for excluding women from succession solely on the ground of gender.
- **Article 15(1) (Prohibition of Discrimination):** Excluding women from inheritance amounts to sex-based discrimination, which Article 15(1) expressly forbids. The Court emphasized that customary practices cannot override fundamental rights.
- **Article 38 (Reduction of Inequalities):** Article 38 obligates the State to minimize inequalities in status, opportunity, and access to resources across all groups.
- **Article 46 (Protection of SCs, STs, and Weaker Sections):** Article 46 directs the State to protect Scheduled Tribes from social injustice and exploitation. Denying women inheritance would deepen structural disadvantage, contrary to this constitutional mandate.
- **Article 342:** Article 342 authorizes the President to specify, through a public notification, the tribes or tribal communities (including parts or groups of them) that shall be recognised as Scheduled Tribes (STs) for a particular State or Union Territory.

About Hindu Succession Act, 1956 (HSA)

- HSA governs the **inheritance and succession of property among Hindus, including Buddhists, Jains, and Sikhs, in cases where a person dies without a will (intestate).**
- The Act brought about uniformity in inheritance laws and codified the rules for succession among Hindus, replacing diverse customary laws.
- In the 2005 amendment, it **recognized equal rights for male and female heirs** (including widows and daughters)**,** ensuring both have equal shares in ancestral and self-acquired property.
- The Act classifies heirs into **four categories: Class I heirs** (spouse, children, and mother), **Class II heirs, agnates, and cognates.**
- In case of **intestate succession**, property is distributed first to Class I heirs, then to Class II heirs, followed by agnates and cognates if no heirs from the previous classes exist.
- The Act also recognizes the right of a child in property who is in the mother's womb.
- **The Act does not apply to Scheduled Tribes unless specifically extended.** The Act is not applicable to the people governed by the Special Marriage Act, 1954.

PREVENTION OF CORRUPTION ACT (PCA)

Context: In May 2025, the Supreme Court ruled that even non-public servants can be convicted for abetting offences under the Prevention of Corruption Act, 1988.

About Prevention of Corruption Act (PCA), 1988

- The Prevention of Corruption Act (PCA), 1988 came into force on 9 September 1988. Its main aim was to strengthen and widen anti-corruption laws to make them more effective.

Salient Features of the Act

- **Consolidates earlier laws such as** Prevention of Corruption Act, 1947, Criminal Law Amendment Act, 1952, and certain sections of the Indian Penal Code (161–165A).
- **Enlarged definitions of "Public Duty" and "Public Servant".**
- **Shifted the burden of proof to the accused** (from prosecution under CrPC).
- Investigations must be conducted by an officer not below the rank of Deputy Superintendent of Police.

Who is a Public Servant under the Section 2(c) PCA, 1988?

- Anyone employed or paid by the Government, local authority, or government-owned/controlled bodies and corporations.
- Judges and others performing adjudicatory functions.
- Persons connected with the administration of justice
- Arbitrators or persons deciding matters referred by courts or public authorities.
- Officials handling elections or electoral rolls.
- Office-holders performing any public duty.
- Office-bearers of co-operative societies receiving government aid.
- Members or staff of service commissions, boards, or selection committees.
- University authorities, teachers, or anyone engaged by universities/public bodies for examinations.
- Employees or office-bearers of institutions receiving government assistance.

- **Covers offences such as**: Taking bribes, Misappropriation of property, obtaining pecuniary (monetary) advantage, Possessing assets disproportionate to income.

Provisions of the Prevention of Corruption (Amendment) Act, 2018

- PCA Amendment 2018 brought the PCA in line with the UN Convention against Corruption (2005), ratified by India in 2011.
- **Key Highlights:**
  - **Definition of Undue Advantage:** It refers to any gratification other than legal remuneration allowed to a public servant.
  - **Bribe-givers made liable:** Giving or promising undue advantage is now a punishable offence.
  - **Prior Sanction:** Required not only for prosecution but also for starting an investigation against public officials.
  - **Attachment of Property:** Linked with Prevention of Money Laundering Act, 2002 and Criminal Law Amendment Ordinance, 1944 to seize illegal assets.
  - **Enhanced Punishment**
    - **Minimum imprisonment:** 3 years (earlier 6 months).
    - **Maximum imprisonment**: 7 years (earlier 5 years).

INTER STATE WATER DISPUTE (ISWD)

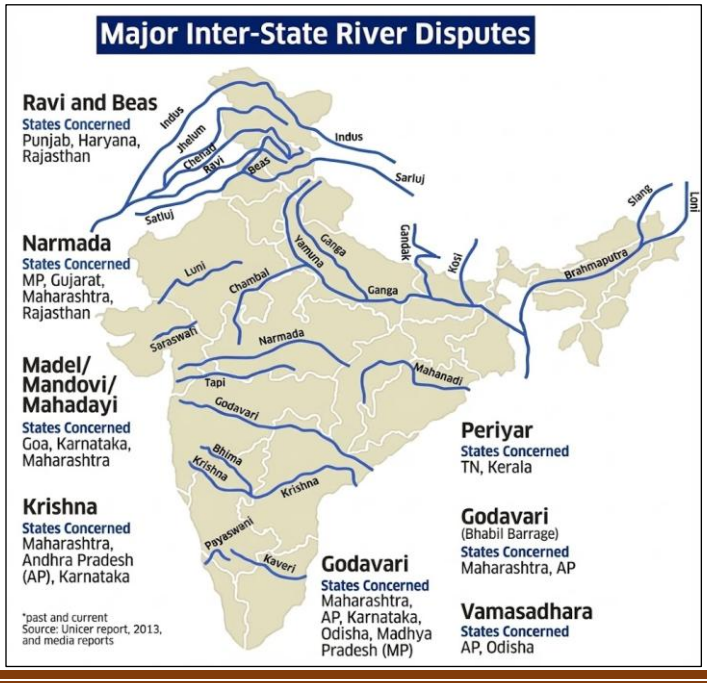
Context: The Ravi and Beas Waters Tribunal, established in 1986, has been granted a one-year extension to resolve long-standing water-sharing disputes among Punjab, Haryana, and Rajasthan.

About Inter-State Water Disputes (ISWD)

- ISWDs are conflicts that arise between states over the use, control, and distribution of waters from rivers that flow across state boundaries.
- These disputes frequently involve sharing river waters among riparian states, impacting agriculture, drinking water, power generation, and ecological balance.

Legal and Constitutional Framework

- **Constitutional Provisions:** Article 262 of the Indian Constitution deals with the adjudication of inter-state water disputes.
  - **Article 262(1):** Empowers Parliament to make laws for the adjudication of any inter-state river water dispute.
  - **Article 262(2):** Allows Parliament to bar the jurisdiction of the Supreme Court or any other court in matters relating to such disputes.
- **Legislations under Article 262:** Exercising its powers under Article 262, Parliament has enacted two key laws:
  - **The River Boards Act, 1956:** Enables the Union Government to establish River Boards for the regulation and development of inter-state rivers and river valleys, in consultation with State Governments.
  - **The Inter-State River Water Disputes Act, 1956:** Authorizes the Union Government to constitute a tribunal for adjudicating any inter-state river water dispute when a state government makes a request.
- **Seventh Schedule:** Defines the responsibilities of Union and States in water-related matters.
  - **Entry 56 (Union List):** Regulation and development of inter-state rivers and river valleys in the public interest.
  - **Entry 17 (State List):** Covers water supply, irrigation, canals, drainage, embankments,



water storage, and water power, but subject to Entry 56 of the Union List.

Process of Tribunal Formation under the Inter-State Water Disputes Act, 1956

- When one or more **states request the Central Government** to resolve a water dispute, the Centre must first **try to settle it through consultation** among the concerned states.
- If **consultations fail**, the **Central Government may establish a tribunal** to adjudicate the dispute.
- The **2002 amendments** to the Act introduced:
  - A **one-year deadline** for the Centre to constitute the tribunal after receiving a request.
  - A requirement that the **tribunal must give its decision within three years**.

International Rules for Water Disputes

1. Helsinki Rules (1966): The Helsinki Rules, adopted by the International Law Association (ILA), were among the first international guidelines for sharing and managing waters of rivers crossing multiple countries.

2. Berlin Rules on Water Resources (2004): The Berlin Rules, also formulated by the ILA, expanded and updated the Helsinki Rules to include all freshwater resources, not just international rivers.

ANTI-DEFECTION LAW

Context: The Supreme Court (SC) recently directed the Speaker of the Telangana Assembly to decide, within three months, disqualification petitions against 10 MLAs.

About Anti-Defection Law (10th Schedule)

- In the 1980s, India faced frequent political defections situations where elected representatives left their parties for personal or political gain.
- To control this instability, Parliament passed the **52nd Constitutional Amendment Act, 1985,** which introduced the Tenth Schedule, also called the anti-defection law.
- The **91st Amendment** removed the provision that allowed one-third of a legislature party to break away without attracting disqualification.

Key Provisions of the Tenth Schedule

1. Grounds for Disqualification

- **Members of Political Parties:**
  - Disqualified if they voluntarily give up party membership (even without resignation). Example: Publicly supporting another party may be treated as leaving one's own party.
  - Disqualified if they vote/abstain against party whip without permission and the party does not condone it within 15 days.
  - Members elected on party tickets must follow party directions.
- **Independent Members:** An independent MP/MLA is disqualified if he joins any political party after the election.
- **Nominated Members:** Can join a political party within 6 months of taking their seat. After 6 months, joining a party leads to disqualification.

2. Exceptions to Disqualification

- **Merger of Parties:** If a party merges with another and two-thirds of its legislators support the merger, no member is disqualified. Both those who join the merged party and those who stay with the original party are protected.
- **Speaker/Chairperson Exception:** A member elected as Speaker/Chairman may voluntarily give up party membership to remain neutral. After leaving the office, he can rejoin the party without penalty.
- **91st Amendment 2003:** Earlier, a "split" by one-third of members was not considered defection. This protection was removed.

3. Deciding Authority

- The Presiding Officer (Speaker/Chairman) decides defection cases. Earlier, their decision was final. This changed after the Supreme Court intervention.
- After *Kihoto Hollohan, 1993*, Presiding Officer's decision can be challenged in High Court/Supreme Court on grounds like: bad faith, bias, perversity.

4. Rule-Making Power

- The Presiding Officer can make rules to implement the Tenth Schedule.

- Rules must be placed before the House for 30 days for approval/modification.

5. Procedure for Handling Defection Cases

- Action begins only when a complaint is filed by a member. The accused member must be given a chance to explain.
- The case may be referred to the Committee of Privileges. **Defection does not lead to automatic disqualification**; a formal decision is necessary.

PROMOTION & REGULATION OF ONLINE GAMING ACT, 2025

Context: The President gave assent to the Promotion and Regulation of Online Gaming Act, 2025.

About the Act

- The Act aims to protect citizens from the risks associated with online money-based games while supporting safe digital growth.
- It imposes a **nationwide ban on Real Money Gaming (RMG) platforms.** At the same time, it promotes and regulates E-Sports and Online Social Games.

Key Terms

- **E-Sports:** Competitive digital sports where individuals or teams participate in organised tournaments. Success requires strategy, coordination, and quick decision-making. Examples: League of Legends, PUBG Mobile.
- **Online Social Games:** Skill-based games designed mainly for entertainment, learning, or social interaction. They are considered safe and do not usually cause harmful social effects. Example: Ludo King.
- **Online Real Money Games (RMG):** Games involving financial stakes, often linked to addiction, heavy losses, and social risks. They may involve chance, skill, or both. Examples: RummyCircle, Dream11.

INDIAN PORTS ACT, 2025

Context: The President has recently approved the Indian Ports Act, 2025.

About the Indian Ports Act, 2025

- The Indian Ports Act, 2025 replaces outdated provisions of the Indian Ports Act, 1908, with modern & contemporary regulations.

Key Highlights of the Act

- **Port Officers:** The Act designates the **conservator**, **appointed by the government, as the port officer.** This official manages vessel movement within port limits, oversees fee collection, and now also handles disease control, damage assessments, and penalty decisions.
- **Statutory Bodies**
    - **State Maritime Boards**: Formally recognised and empowered **to manage non-major ports.** They will handle port planning, infrastructure development, licensing, tariff regulation, and compliance with safety and environmental norms.
    - **Maritime State Development Council (MSDC): Given statutory status to improve coordination.** It will guide data collection, promote transparency, and advise the central government on national port planning, reforms, efficiency, and connectivity. Union Minister for Ports, Shipping and Waterways is ex officio the Chairperson of MSDC.
- **Dispute Resolution:** States must create Dispute Resolution Committees (DRCs) for conflicts involving non-major ports, concessionaires, users, and service providers. Appeals will lie with the High Court.
- **Tariff Regulation:** Major ports will fix tariffs through their respective Boards. **For non-major ports, State Maritime Boards or authorised concessionaires will set tariffs.**



Ports in India

- Ports are vital to India's economy, handling about 95% of export and import (EXIM) cargo by volume and 70% by value.
- There are 14 major ports out of which **12 Major Ports are in Operation** and 200 non-major ports (minor ports) in the country.
- While the Major Ports are under the administrative control of the Ministry of Ports, Shipping and Waterways, the non-major ports are under the jurisdiction of respective State Maritime Boards/ State Government.

WHO DECIDES NOMINATIONS TO UNION TERRITORY ASSEMBLIES?

Context: The Union Home Ministry informed the Jammu & Kashmir (J&K) and Ladakh High Court that the Lieutenant Governor (LG) has the authority to nominate five members to the Legislative Assembly of the J&K Union Territory without requiring the advice of the Council of Ministers.

Legal Basis for Nominations in UTs

- Union Territory Assemblies are governed by specific Acts of Parliament that define their composition and nomination rules.

UT-wise Nomination Provisions

UT	Elected MLAs	Nominated Members	Governing Law
Delhi	70	None	Government of NCT of Delhi Act, 1991
Puducherry	30	Up to 3 (nominated by the Union Government)	Government of Union Territories Act, 1963
Jammu & Kashmir	90	Up to 5 (nominated by the LG: 2 women, 2 Kashmiri migrants, 1 displaced person from PoK)	J&K Reorganisation Act, 2019 (amended 2023)

Key Court Judgment

- **Puducherry (Madras HC, 2018):** The Court held that the Union Government can nominate 3 MLAs without consulting the UT Council of Ministers. The Supreme Court later removed only the procedural guidelines but did not disturb the Union's nomination power.

SECTION 436-A CODE OF CRIMINAL PROCEDURE (CRPC), 1973

Context: The Union Home Ministry has asked all states and Union territories to actively implement the provisions of Section 436-A CrPC (replaced by Section 479 of BNSS).

About Section 436-A CrPC (Maximum Period of Detention for Undertrials)

- An **undertrial** (a person who is in jail while their case is still being heard) **cannot be kept in prison for longer than the maximum punishment possible for the offence** they are accused of.
- **If an undertrial has already spent half of the maximum possible sentence in jail** (except where the offence is punishable with death), the **court may release them on bail after hearing from the prosecutor.**
- **Example**: If the maximum punishment for an offence is 4 years, an undertrial who has spent 2 years in jail can ask for bail under Section 436-A.
- It was **introduced in 2006 through the Criminal Law (Amendment) Act, 2005** to reduce the problem of people staying in jail for too long without trial.
- The idea is based on the Supreme Court's decision in **Hussainara Khatoon v. State of Bihar (1979),** which recognised the **right to a speedy trial as part of Article 21** (Right to Life and Personal Liberty).

ANAND MARRIAGE ACT

Context: The Supreme Court has directed 17 States and 8 Union Territories to frame rules within four months for registering Sikh marriages under the Anand Marriage Act, 1909.

About Anand Marriage Act

- Anand Karaj means "**blissful union."** It is the **Sikh marriage ceremony performed in the presence of the Guru Granth Sahib.**
- During the ceremony, couple walks around the Guru Granth Sahib four times as laavan (sacred hymns) composed by Guru Ram Das are recited. These verses symbolically describe spiritual journey of married life.

- To give this distinct ceremony separate legal identity, the **Anand Marriage Act, 1909 was enacted.** It validated marriages performed through Anand Karaj and distinguished them from Hindu marriage rituals.
- The Act, only a page long, served one primary purpose- to legally sanctify all marriages solemnised through the Anand Karaj ceremony. However, the original Act did not include provisions for the registration of these marriages.
- This gap was addressed through the **Anand Marriage (Amendment) Act, 2012, which introduced Section 6 requiring States to create rules for registering Anand Karaj marriages.**
- Once registered under the Anand Act, couples do not need to register under any other marriage law.
- Even after legal recognition under the 1909 Act and its 2012 Amendment, most Sikh couples continue to register marriages under the Hindu Marriage Act, 1955. This Act also governs divorce, maintenance, and other matrimonial disputes.
- The Anand Marriage Act does not contain provisions for divorce, separation, or dispute settlement. As a result, Sikhs must rely on Hindu law, which many argue weakens their distinct religious identity.

SECTION 152 OF BHARATIYA NYAYA SANHITA (BNS)

Context: The Supreme Court (SC) has issued a notice on a petition that challenges Section 152 of BNS. The petitioner argues that this section brings back the old colonial sedition law in a new form.

Section 152 of the Bharatiya Nyaya Sanhita (BNS), 2023

- Section 152 **deals with acts that threaten the sovereignty, unity, and integrity of India**. It lays down when speech or actions can be treated as a serious offence against the nation.
- The law applies when a person purposely or knowingly engages in any act that may harm the unity or security of India.
- These acts may be carried out through: Spoken or written words, Signs or visible representations, Electronic communication, Financial support, Any other method
- The offence is **cognizable, non-bailable, and triable by a Court of Session.**

Punishable Acts Under Section 152

- Excite or attempt to excite secession (breaking away from India)
- Incite armed rebellion
- Promote subversive activities
- Encourage separatist feelings
- Perform any act that endangers the sovereignty, unity, or integrity of the country

Punishment

- Life imprisonment, or Imprisonment up to seven years, plus a fine

How Does It Differ from the Old Sedition Law?

- Section 152 **replaces Section 124A of the IPC (sedition)**. It adopts a **more focused approach** by targeting only those activities that directly threaten the nation's unity or sovereignty. It also **acknowledges modern forms**, including digital and financial channels.
- The law does not punish lawful criticism of the government.

DIGITAL PERSONAL DATA PROTECTION (DPDP) ACT

Context: The Government has notified DPDP Rules, 2025, to operationalize the DPDP Act, 2023.

What are the DPDP Rules, 2025?

The DPDP Rules, 2025 aim to strengthen citizens' rights, ensure responsible use of personal data by organizations, prevent unauthorized commercial exploitation, reduce digital harms, and promote a secure and trustworthy environment for digital innovation and economic growth.

Core Principles of the Act:

- **Consent & Transparency.**
- **Purpose Limitation:** data must be used only for specified purposes.
- **Data Minimization:** collect only what is necessary.
- **Accuracy:** keep data correct and updated.
- **Storage Limitation:** retain only as long as needed.
- **Security Safeguards:** protect data using reasonable measures.
- **Accountability:** organizations must ensure compliance.

About the Digital Personal Data Protection Act, 2023

- Enacted in 2023, the DPDP Act provides a comprehensive legal framework for the protection of digital personal data in India.
- It follows the **SARAL approach** - Simple, Accessible, Rational, and Actionable, by using clear language so that individuals and businesses can easily understand their rights and obligations.

Key Terms under the Act:

- **Data Fiduciary (DF):** An organization that determines the purpose and manner in which personal data is processed.

- **Data Principal:** The individual whose personal data is being processed, including parents or guardians in the case of children and persons with disabilities.
- **Data Processor:** An entity that processes personal data on behalf of a Data Fiduciary.
- **Consent Manager:** An interoperable platform that enables individuals to give, manage, or withdraw consent for data processing.
- **Data Protection Board (DPB) of India:** An independent, quasi-judicial body, statutory body established to monitor compliance, inquire into data breaches, ensure corrective measures, and enforce penalties. It does not act as a day-to-day regulator. The Head Office of the DPB shall be located in New Delhi.
- **Appellate Tribunal:** The Telecom Disputes Settlement and Appellate Tribunal (TDSAT), which hears appeals against decisions of the Data Protection Board (DPB).

PUBLIC ACCOUNTS COMMITTEE

Context: The Public Accounts Committee (PAC) under the chairmanship K.C. Venugopal has submitted a report on Toll collection.

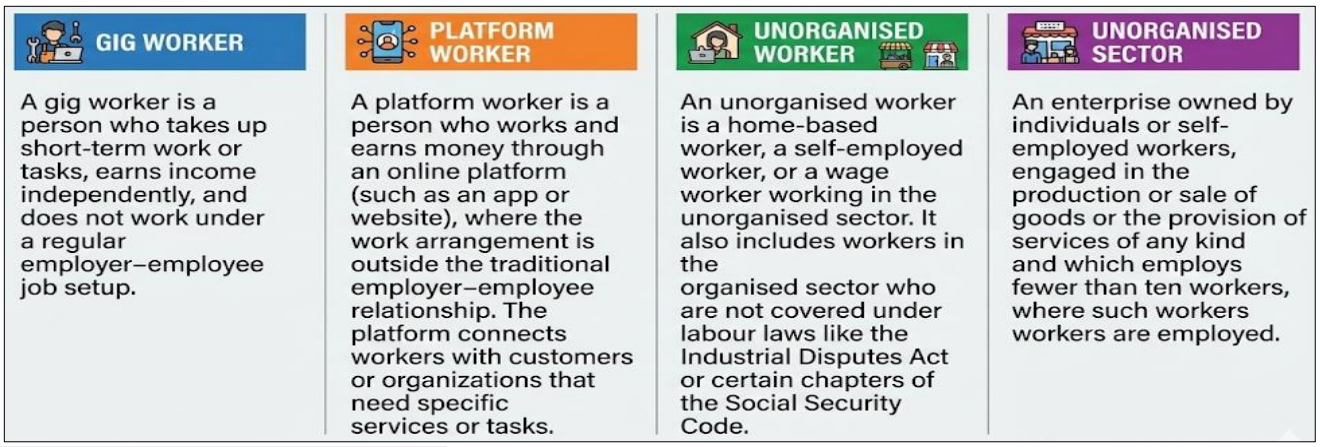
About Public Accounts Committee	
What is PAC?	• Parliamentary committee responsible for scrutinizing the government's financial accounts and ensuring transparency and accountability in public expenditure. • It is one of the key financial committees in Parliament.
Objectives	• To ensure financial accountability and transparency in government spending by scrutinizing audit reports (especially from the C&AG)
Historical Evolution	• Established in 1921 under Montague-Chelmsford Reforms. • Became a Parliamentary Committee in 1950 under the Speaker's control, with secretarial functions assigned to the Lok Sabha Secretariat.
Membership	• **22 members:** 15 from Lok Sabha and 7 from Rajya Sabha, elected annually on the basis of Proportional Representation. • The **Chairperson, traditionally from the opposition** since 1967-68, is **appointed by the Speaker from Lok Sabha.**

LABOUR CODES NOTIFIED

Context: The government has announced the implementation of four Labour Codes by consolidating the earlier 29 labour laws. The four Labour Codes include the Code on Wages, 2019, the Industrial Relations Code, 2020, the Code on Social Security, 2020, and the Occupational Safety, Health and Working Conditions Code, 2020.

I. Code on Wages, 2019

- **Universal Minimum Wages:** The Code establishes a statutory right to minimum wages for **all employees across both organized and unorganized sectors.** Earlier, the Minimum Wages Act applied only to scheduled employment and to workers earning below a monthly wage of ₹24,000, covering only about 30% of the workforce.
- **Introduction of Floor Wage:** A statutory floor wage will be set by the Government based on minimum living standards, with scope for regional variation. No State can fix minimum wages below this level, ensuring nationwide uniformity and adequacy.
- **Uniform Definition of Wages: Wages now include basic pay, dearness allowance, and retaining allowance.** At least 50% of total remuneration must be considered for wage calculation, ensuring consistency in gratuity, pension, and social security benefits.
- **Gender Equality:** Employers are prohibited from discriminating on the basis of gender, including transgenders, in recruitment, wages, and conditions of employment for work.
- **Overtime Compensation:** Employers must pay overtime wages at a rate of at least twice the normal wage for work beyond regular working hours.
- **Decriminalization of Offences:** For certain first-time offences, imprisonment has been replaced with monetary fines (up to 50% of the maximum fine).



II. Industrial Relations Code, 2020

- **Broader Definition of Industry:** Includes all systematic employer–employee activities, irrespective of profit motive or capital investment.
- **Expanded Definition of Worker:** A worker is defined as **any person (other than an apprentice) employed in an industry** to perform manual, unskilled, skilled, technical, operational, clerical, or supervisory work for hire or reward. This includes sales promotion employees, working journalists, and supervisory employees drawing wages below ₹18,000.
- **Fixed Term Employment (FTE):** Permits direct, time-bound contracts with full parity in wages and benefits, and gratuity eligibility after one year.
- **Re-skilling Fund:** A fund has been established to train retrenched workers, financed through employer contributions **equal to 15 days' wages for every retrenched worker**.
- **Higher Threshold for Lay-off:** The threshold for seeking prior government approval for lay-off, retrenchment, and closure in factories, mines, and plantations has been **raised from 100 to 300 workers**.
- **Expanded Definition of Strike:** The definition now **includes mass casual leave**, where **more than 50% of workers take casual leave on a single day**.
- **Strike Notice:** A 14-day prior notice before going on strike is now **mandatory in all industrial establishments**. Earlier, this requirement applied only to public utility services.
- **Negotiating Union/Council:** A trade union with **51% membership** will be recognized as the **sole negotiating union.** If multiple unions exist, a negotiating council will be formed with representatives from unions having at least 20% membership, with one seat allotted for every 20% of verified membership.
- **Industrial Tribunals:** Two-member tribunals, consisting of one judicial and one administrative member, have been introduced for faster dispute resolution.
- **Direct Tribunal Access:** Parties may directly approach industrial tribunals if conciliation fails within 90 days.

III. Code on Social Security, 2020

- **Expanded ESIC Coverage:** Employees' State Insurance (ESIC) now applies across India. **Establishments with fewer than 10 employees may voluntarily opt in** with the mutual consent of employers and employees. ESIC coverage is **mandatory even if a single worker is employed in a hazardous occupation,** and it has been extended to plantation workers.
- **Inclusion of Gig and Platform Workers:** Gig and platform workers are legally defined for the first time and extended social security coverage. Aggregators are required to contribute 1–2% of their annual turnover for social security, subject to a cap of 5% of payments made to such workers.
- **Social Security Fund:** A dedicated fund has been proposed to finance schemes for unorganized, gig, and platform workers, covering life, disability, health, and old-age benefits. Amounts collected through the compounding of offences will be credited to this Fund and utilized by the Government.
- **Expanded Dependents:** Coverage now includes **maternal grandparents**, and in the case of female employees, **dependent parents-in-law**.
- **Gratuity**: Fixed-term employees become eligible for gratuity after one year of continuous service, instead of the earlier requirement of five years.

- **Inspector-cum-Facilitator System:** Inspectors are re-oriented as facilitators, with the objective of helping employers comply with laws and regulations rather than focusing solely on enforcement.

IV. Occupational Safety, Health and Working Conditions Code, 2020

- **Unified Registration:** A uniform threshold of 10 employees has been set for electronic registration.
- **Simplified Compliance:** Introduces a "one licence, one registration, one return" framework, reducing duplication and compliance burden for establishments.
- **Revised Factory Thresholds:** Applicability thresholds have been increased from 10 to 20 workers (with power) and from 20 to 40 workers (without power).
- **Wider Definition of Migrant Workers:** The definition of inter-state migrant workers now includes those employed directly, through contractors, or those who migrate on their own..
- **National Database for Unorganised Workers:** A national database will be developed to register unorganized workers, including migrants, to facilitate employment opportunities, skill mapping, and access to social security benefits.
- **Women's Employment:** Women are permitted to work in all types of establishments and during night hours (before 6 a.m. and after 7 p.m.), subject to consent and safety measures.
- **Safety Committees:** Establishments employing 500 or more workers must constitute safety committees with representation from both employers and workers.
- **Victim Compensation:** Courts may direct that at least 50% of fines imposed on offenders be paid as compensation to victims or their legal heirs in cases of injury or death.

SHANTI ACT

Context: President Murmu granted assent to the **Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI)** Bill, 2025 passed by Parliament.

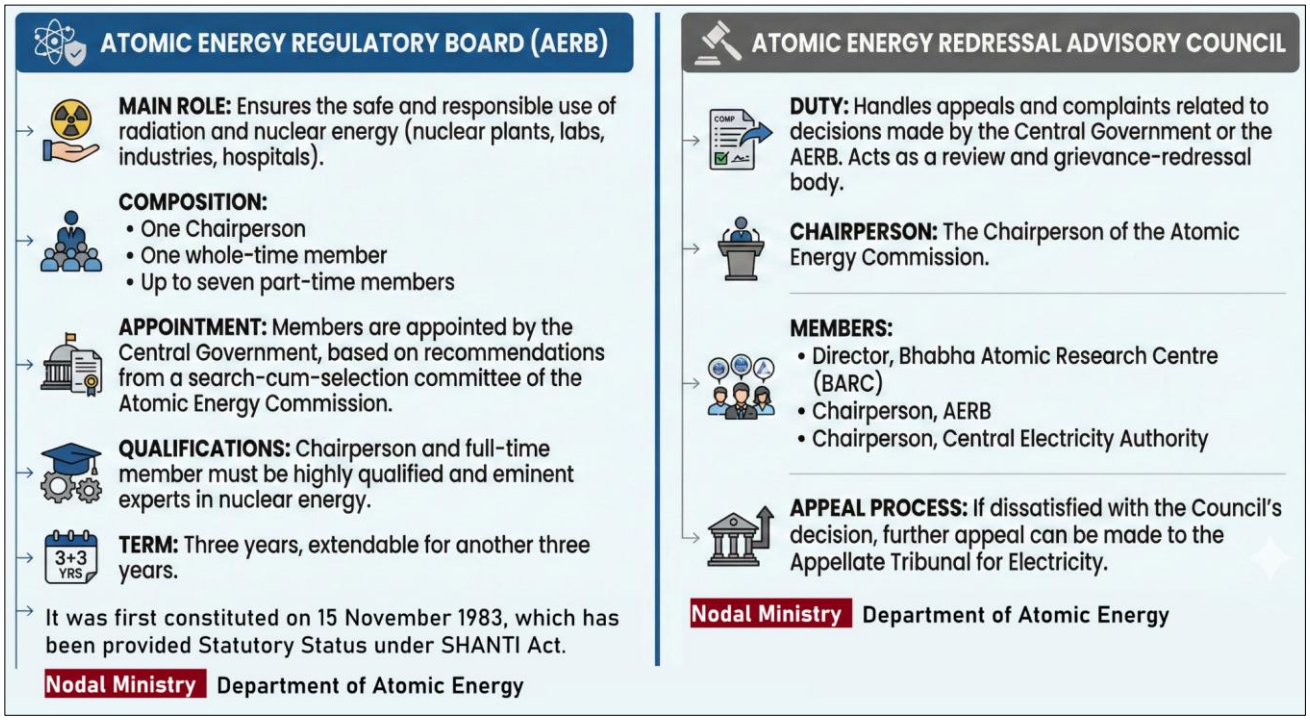
About SHANTI Act 2025

- The Act **replaces the Atomic Energy Act, 1962 and the Civil Liability for Nuclear Damage Act, 2010.** The 1962 Act provides for the development and use of atomic energy, and the 2010 Act provides a framework for assigning liability and compensation in case of a nuclear incident.

Key Provisions

- **Private Sector Participation:** Allows private companies **to operate nuclear plants, generate power, manufacture equipment, and undertake limited fuel-cycle activities** such as conversion, refining, and enrichment up to notified limits. All radiation-related activities require prior safety authorisation.
- **Activities Reserved for the Central Government:** Sensitive operations remain under exclusive Central Government control (or its wholly owned institution). These include spent-fuel reprocessing, recycling, radionuclide separation, high-level waste handling, heavy-water production, and advanced enrichment.
- **Statutory Status to Atomic Energy Regulatory Board (AERB):** Formally recognises the Atomic Energy Regulatory Board to strengthen independent regulation.
- **Atomic Energy Redressal Advisory Council: A proposed body** to hear appeals against the orders or decisions of the central government or AERB.
- **Appellate Authority:** The **Appellate Tribunal for Electricity** (which was estd. in 2005) will hear appeals under the provisions of the Act.
- **Licensing and Oversight:** Provides a structured system for granting, suspending, or cancelling licences and safety authorisations.
- **Graded Liability Framework:** Replaces a single liability cap with graded liability limits based on the type and nature of each nuclear installation, with liability limits ranging from Rs 100 crore to Rs 3,000 crore based on power capacity.
- **Non-Power Applications:** Regulates peaceful uses of nuclear and radiation technologies in sectors like health, agriculture, industry, and research.
- **Exemptions:** Certain research, development, and innovation activities may be exempted from licensing.
- **Civil Liability Regime:** Establishes a balanced mechanism for compensation in cases of nuclear damage.
- **Central Government Acquisition Powers:** Allows the Government to acquire facilities or assets in specified nuclear-related situations.

- **Claims Commissioners:** The Central Government may appoint Claims Commissioners for compensation adjudication.
- **Nuclear Damage Claims Commission:** Provides a dedicated Commission for serious nuclear damage cases.



PESA ACT

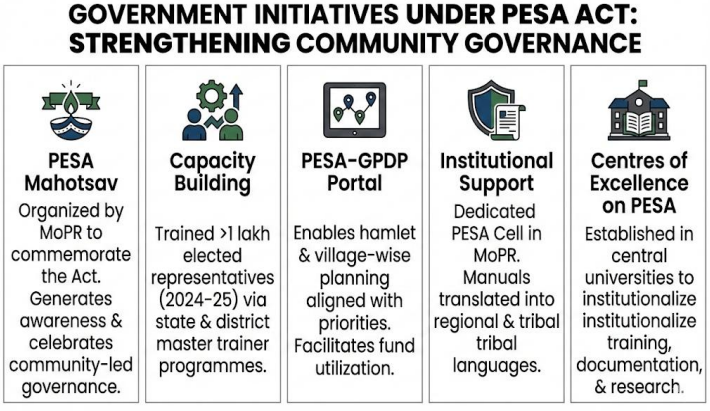
Context: The Ministry of Panchayati Raj (MoPR) celebrated a two-day ***PESA Mahotsav: Utsav Lok Sanskriti Ka*** in Visakhapatnam, Andhra Pradesh. The event marked the 29th anniversary of the Panchayats Extension to Scheduled Areas Act, 1996.

What is the PESA Act, 1996?

- Enacted on 24 December 1996, the PESA Act, 1996 **extends the provisions of the 73rd Constitutional Amendment to Fifth Schedule (Scheduled) Areas.** *(not applicable to 6th schedule areas).*
- It provides a legal framework for self-governance in tribal regions by empowering Gram Sabhas and Panchayats.
- The states with **Fifth Schedule Areas** covered under PESA are: Andhra Pradesh, Chhattisgarh, Gujarat, Himachal Pradesh, Jharkhand, Maharashtra, Madhya Pradesh, Odisha, Rajasthan, Telangana

Salient Features of the PESA Act

- **Primacy of the Gram Sabha:** The Gram Sabha is empowered to approve development plans, programmes, and projects; identify beneficiaries of welfare schemes; and protect customs, traditions, cultural identity, and community resources.
- **Control over Natural Resources:** The Act recognizes **Gram Sabha's ownership of Minor Forest Produce (MFP)** and the **planning and management of minor water bodies. Consultation with Gram Sabha** is mandatory for land acquisition, rehabilitation and resettlement, and for granting mining leases for minor minerals.
- **Socio-Economic Regulation:** Gram Sabhas have the power to regulate village markets, money-lending, and the sale and consumption of intoxicants. They also have the authority to prevent the alienation of tribal land and to restore land that has been unlawfully alienated.



- **Political Representation:** Proportional reservation for Scheduled Tribes (STs) is provided in Panchayats. Chairperson positions are reserved for STs, with provisions for the nomination of ST members where adequate representation is not achieved.
- **Consonance with Customary Law:** State laws must be in conformity with tribal customary practices. Administrative boundaries cannot override traditional village structures.

SPECIAL MARRIAGE ACT

Context: The Delhi High Court will now examine the constitutional validity of Sections 6 and 7 of the Special Marriage Act, 1954 (SMA).

About Special Marriage Act, 1954 (SMA)

- Enacted by Parliament in 1954, the SMA provides a **secular framework for marriage,** where the **State**, rather than religion, **sanctions the union**. In India, marriages are recognized under both religious personal laws and as civil marriages under the SMA.
- **Rationale: Personal laws governing marriage** (like Hindu Marriage Act or Muslim personal law) are religion-specific and often require conversion for interfaith or inter-caste marriages. The **SMA allows such marriages without conversion**.
- **Applicability and Eligibility:** Applicable to persons of all religions, including Hindus, Muslims, Christians, Sikhs, Jains, and Buddhists. **The minimum age for** Male is 21 years; while for females it is 18 years.

Key Sections

- **Section 5:** Parties must submit a written notice of intended marriage to the Marriage Officer of the district. Before solemnization, both parties and three witnesses sign a declaration before the Marriage Officer, after which a Marriage Certificate is issued as legal proof.
- **Section 6:** The notice is recorded in the Marriage Notice Book and displayed to invite objections within 30 days.
- **Section 7:** Any person may object within 30 days on grounds listed in Section 4 (such as age, consent, or prohibited relationships). The marriage cannot be solemnized until such objections are examined and resolved.
- **Section 19**: Marriage under the SMA by a member of an undivided Hindu, Buddhist, Sikh, or Jain family results in deemed separation from the joint family, potentially affecting inheritance and property rights.

JUDICIARY

E-ZERO FIR INITIATIVE

Context: Ministry of Home Affairs' (MHA) Indian Cybercrime Coordination Centre (I4C) has introduced the new e-Zero FIR (electronic Zero First Information Report) as a pilot project in Delhi.

About e-Zero FIR Initiative

- It is a digital system that **automatically converts complaints of cyber financial crimes involving ₹10 lakh or more into Zero** FIRs. These complaints may be filed either on the **National Cybercrime Reporting Portal (cybercrime.gov.in) or through the cybercrime helpline 1930.**
- **Objective**: To eliminate delays in the "golden hour" (when recovery of stolen funds is most feasible) and fast-track police response to high-value cyber financial frauds.
- The **e-Crime Police Station** of Delhi has been notified for the registration of e-FIRs and transferring them to jurisdictional police stations.

What is Zero FIR?

- A Zero FIR allows anyone to file a complaint **about a cognizable offence at any police station, regardless of jurisdiction.** It is later transferred to the station with proper authority.
- It was introduced on the recommendation of the **Justice Verma Committee**, set up after the 2012 Nirbhaya case.
- The Bharatiya Nagarik Suraksha Sanhita (BNSS) 2023 provides for Zero FIR under **section 173**.

What is FIR (First Information Report)?

- FIR is a **written document prepared by police** when they receive information about the commission of a **cognizable offence.** It marks the beginning of the criminal investigation process.

Cognizable Offence	Non-Cognizable Offence
• These are **serious offences** where the police can arrest a person without a warrant. • The police can also start an investigation on their own, without needing permission from a court. • Example: Murder, theft, rape, kidnapping.	• These are **less serious offences** where the police cannot arrest without a warrant. • The police need prior approval from the court before starting an investigation. • Example: Defamation, public nuisance, simple hurt.

DOCTRINE OF PRESUMPTION OF CONSTITUTIONALITY

Context: Petitioners challenged the Waqf (Amendment) Act, 2025, calling it a "creeping acquisition" of Muslim waqf properties. The Supreme Court (SC), however, noted that such laws enjoy the presumption of constitutionality.

What is the Doctrine of Presumption of Constitutionality?

- It is a principle in constitutional law that **assumes laws enacted by a competent legislature are constitutionally valid unless proven otherwise.**
- It reflects the judiciary's respect for the legislative process and the democratic mandate.
- Under this doctrine, the **burden of proof lies on the petitioner**, who must demonstrate that the law in question violates the Constitution.
- The **presumption continues until rebutted with clear and convincing arguments**, proving unconstitutionality beyond a reasonable doubt.

Scope of the Doctrine

- Applies to **all laws passed by Parliament or State Legislatures.**
- Covers both **plenary** (laws made directly by a legislature) and **delegated legislation.**
- Especially strong in economic and social legislation, where courts show greater deference to legislative wisdom.

POWER OF COURTS TO MODIFY ARBITRAL AWARDS

Context: The Supreme Court recently clarified that courts have limited powers to modify arbitral awards.

Arbitration in India

- Arbitration is an **alternative dispute resolution (ADR) mechanism**, **where parties agree to resolve disputes privately outside regular courts**. Other ADR methods include mediation and conciliation.
- It is less adversarial, flexible, quicker, and cost-effective.
- **Legal framework:** The **Arbitration and Conciliation Act,** 1996 follows the UNCITRAL Model Law on International Commercial Arbitration, 1985.

Comparison of Major ADR Methods

Feature	Arbitration	Mediation	Negotiation
Neutral Third Party	Yes, Arbitrator or panel makes a binding decision	Yes, Mediator facilitates, but does not decide	No, parties communicate directly
Control of Outcome	Low control, arbitrator imposes a decision	High control, parties craft the settlement; mediator facilitates	Full control, parties decide the agreement
Formality	Most formal, resembles a simplified trial with evidence	Informal, structured sessions but flexible procedures	Least formal, completely flexible and private
Result	Binding award, legally enforceable	Voluntary settlement agreement (contract)	Voluntary agreement (contract)
Confidentiality	High, typically private and confidential	High, often protected by law	High

Time/Cost	Faster and less expensive than litigation, but more formal than mediation	Faster and less expensive than arbitration or litigation	Least costly and fastest (if successful)

REMOVAL OF JUDGES IN HIGHER JUDICIARY

Context: Members of Parliament across party lines have submitted a motion in Parliament seeking the removal of Justice Yashwant Varma.

Constitutional Provisions on Removal of Judges

- **Article 124(4):** This article provides that a judge of the Supreme Court can be removed from office only on the grounds of: Proven misbehavior, or Incapacity (inability to perform duties). The removal can be done only after an address by Parliament supported by a special majority in both Houses.
- **Article 124(5):** Parliament to regulate the procedure for investigation and proof of misbehavior or incapacity under clause (4). Under this article, Parliament enacted the Judges (Inquiry) Act, 1968, which lays down the procedure for inquiry and removal.
- **Article 217(1)(b):** States that a High Court judge may be removed by the President in the same manner as a Supreme Court judge under Article 124(4).
- **Article 218:** Extends the applicability of Articles 124(4) and 124(5) to High Courts.

Steps in the Removal Process

1. **Initiation:** A motion for removal must be signed by at least 100 Lok Sabha members or 50 Rajya Sabha members and submitted to the Speaker/Chairman.
2. **Committee Formation and Investigation:** If the motion is admitted, a three-member committee is constituted to investigate the charges. Composition: One Supreme Court judge, one Chief Justice of a High Court, and one distinguished jurist. If found guilty of misbehavior or incapacity, the motion is taken up for consideration in the House.
3. **Parliamentary Approval:** The House where the motion originated must pass it by a special majority, i.e., a majority of the total membership and at least two-thirds of members present and voting. It is then sent to the other House, which must pass it with the same special majority.
4. **Presidential Order:** After both Houses pass the motion, an address is presented to the President in the same session. The President issues the order of removal accordingly.

SC VERDICT ON AGE CAP FOR SURROGACY

Context: The Supreme Court ruled that the age limits in the Surrogacy Act, 2021 do not apply to couples who began the surrogacy process before the law came into force on January 25, 2022.

What is Surrogacy?

Surrogacy means a situation where a woman becomes pregnant and gives birth to a child for another couple, and then hands over the child to them after birth.

There are two main forms of surrogacy

- **Traditional surrogacy:** The **surrogate's own egg is used** (usually via artificial insemination), so she is genetically related to the child and then relinquishes parental rights to the intended parent(s).
- **Gestational surrogacy:** An **embryo created using the egg and sperm of the intended parent(s) and/or donors through IVF is transferred to the surrogate's uterus**, so she has no genetic link to the child.

About Surrogacy (Regulation) Act, 2021

1. Regulation of Surrogacy:

- **Only altruistic surrogacy is allowed.** (Altruistic means the surrogate mother is not paid, except for medical expenses and insurance.)
- Commercial surrogacy (where a woman is paid to carry the baby) is completely banned. Surrogacy clinics must be registered and follow government rules.

2. Eligibility Criteria for the Surrogate Mother:

- Must be a **married woman, aged 25–35 years.** Must have **at least one biological child of her own.** Can act as a surrogate **only once in her lifetime.**
- Must have a medical and psychological fitness certificate from a registered doctor. Must give written, informed consent.

3. Eligibility Criteria for the Intending Couple:

- The couple must: (i) Be **married** with Woman aged 23–50 years; man aged 26–55 years (ii) Have **no surviving child** (biological, adopted, or through surrogacy), except if the child has a serious incurable condition confirmed by a District Medical Board
- An Indian woman who is a widow or divorcee, aged 35–45 years, can also opt for surrogacy if she meets all the conditions.

4. Rights of the Surrogate Child

- The child born through surrogacy is treated as the biological child of the intending couple or intending woman.
- The child has the same rights, privileges, and legal status as any naturally born child.

5. Protection Against Forced Abortion

- No person or clinic can force a surrogate mother to undergo an abortion at any stage.
- Abortion is allowed only if it follows legal and medical rules.

6. Institutional Framework

- **National Assisted Reproductive Technology and Surrogacy Board:** Headed by the Union Health Minister. It advises the government on surrogacy policy, and monitors how the Act is implemented across India. It guides State-level boards.
- **State Assisted Reproductive Technology and Surrogacy Boards:** Established in every State and Union Territory with a legislature. They help in monitoring and enforcing the Act at the state level.

NYAYA BANDHU (NB) LEGAL AID PROGRAMME

Context: The Rajya Sabha was informed that 14,888 women beneficiaries had registered on the Nyaya Bandhu app as of June 2025.

What is the Nyaya Bandhu (NB) Programme?

- The Government's flagship **Nyaya Bandhu** (**Pro Bono Legal Services initiative)**, launched in **2017,** implemented by the Department of Justice (Ministry of Law and Justice).
- It offers **free legal aid** by using mobile technology **to connect pro bono advocates with marginalized beneficiaries** eligible under ***Section 12 of the Legal Services Authorities Act, 1987.***
- **In 2021, Nyaya Bandhu was integrated into the DISHA scheme**, which brings together several legal aid initiatives.

About DISHA Scheme (2021–2026)

- DISHA (Designing Innovative Solutions for Holistic Access to Justice in India) aims to provide accessible, affordable, citizen-focused legal services through three initiatives:
  - **Tele-Law** (pre-litigation legal advice)
  - **Nyaya Bandhu** (Pro Bono Legal Services)
  - **Legal Literacy and Awareness Programmes**
- It is a central sector scheme under the Ministry of Law and Justice.

Criteria for giving Legal Services

Section 12 of the Legal Services Authorities Act, 1987, specifies the criteria for entitlement to legal services. According to this section, every person who has to file or defend a case is entitled to legal services under the Act if they satisfy any of the following criteria:

- Being a member of a **Scheduled Caste or Scheduled Tribe.**
- Being a victim of trafficking in human beings or begar (forced labor)
- Being a woman or a child.
- Being a person with disability as defined under the Persons With Disabilities Act, 1995.
- Being under circumstances of undeserved want such as being a victim of mass disaster, ethnic violence, caste atrocity, flood, drought, earthquake, or industrial disaster.
- Being an industrial workman.
- Being in custody, including protective homes, juvenile homes, or psychiatric hospitals.
- Having an annual income below a prescribed limit (e.g., less than Rs. 9,000 for courts other than the Supreme Court, and less than Rs. 12,000 for Supreme Court cases).

COLLUSIVE LITIGATION

Context: The Supreme Court (SC) has taken suo motu notice of collusive litigation involving Bengaluru Development Authority (BDA).

What is Collusive Litigation?

- It is a type of lawsuit in which the **parties pretend to be opponents, but actually work together secretly to obtain a favourable court order** or to test the validity of a law. These are not real disputes; they function as sham court proceedings.

Key Concerns About Collusive Litigation

- **Abuse of the judicial process:** Used to exploit the court system for private benefit. Example: In land acquisition cases, false lawsuits may be created to gain inflated compensation or obtain fraudulent land titles.
- **Weakens the adversarial system:** Courts depend on genuine disagreements between parties. Without this, justice becomes unreliable.
- **Bypasses democratic processes:** Collusion can be used to secure outcomes that should normally come through legislation or proper administrative procedures.

Legal Position in India

- A collusive decree can be cancelled if a third party proves that there was fraud or collusion.
- High Courts can act under Article 227 (supervision over all courts and tribunals) when collusion is shown.
- Parties who take part in the collusion cannot later challenge the decree themselves.
- The burden of proof lies on the person who claims that collusion occurred.
- Courts may cancel a collusive decree even without a specific request, if doing so is necessary for justice.

DOCTRINE OF CONTRIBUTORY NEGLIGENCE

Context: The Andhra Pradesh High Court recently held that the doctrine of contributory negligence cannot be applied in criminal cases.

What is the Doctrine of Contributory Negligence?

- Contributory negligence refers to a **situation where a person suffers harm partly because they failed to take reasonable care for their own safety**, along with another person's negligent or wrongful act.
- It is linked to the principle volenti non fit injuria—"**no injury is done to one who consents to the risk.**"
- Example: A pedestrian crossing from the wrong side of the road and being hit by a speeding or careless driver.

Key Principles

- Individuals must take reasonable care to protect themselves from harm.
- If the injured person (plaintiff) contributed to their injury, the defendant may claim partial or complete defence based on contributory negligence.
- Courts determine the degree of fault of each party and allocate liability and damages accordingly.
- The defendant must show that the plaintiff's negligence contributed to the harm.
- **The doctrine does not apply if the defendant had a strict duty to ensure safety**, or if the plaintiff took all reasonable precautions.
- India does not have a separate statute on contributory negligence. Courts apply comparative negligence principles to divide liability based on each party's share of fault.

DOCTRINE OF ESCHEAT

Context: The SC recently held that a State cannot claim property under Section 29 of Hindu Succession Act, 1956, if a Hindu male has left a valid Will that has been granted probate by a competent court.

What is the Doctrine of Escheat?

- The doctrine of escheat ensures that **no property is left without an owner.** When a person dies intestate (without a Will) and without any legal heirs, or **when property is unclaimed or abandoned, the ownership of that property passes to the State.**

Historical Origins

- The term escheat comes from the Old French word eschete, meaning "to fall to."
- Its roots lie in medieval European feudalism, where land held by tenants would return to the feudal lord if the tenant died without heirs or committed certain crimes such as treason.

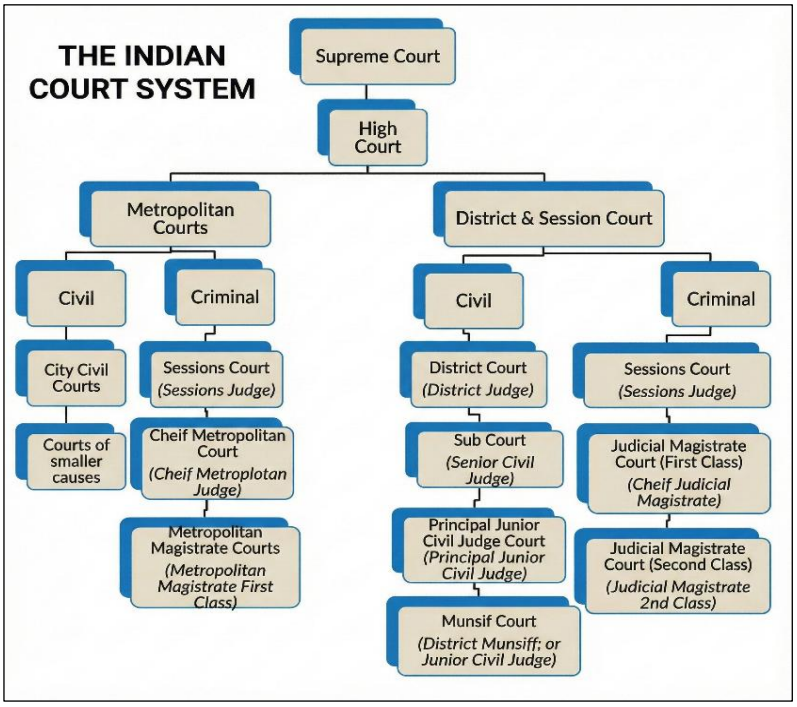
- Countries follow different rules; in India, escheat is governed by Section 29 of the Hindu Succession Act, 1956 and Article 296 of the Constitution, which deals with escheat and ownerless property.
- Under Section 29, escheat is a last-resort measure. If a valid Will exists, property must be distributed according to the testator's wishes, and the State cannot claim it.

JUDICIAL OFFICERS TO BE APPOINTED AS DISTRICT JUDGES

Context: In a significant decision, a five-judge Constitution Bench led by the CJI B.R. Gavai held that subordinate judges who have seven years of prior practice at the Bar can directly apply for posts of District Judge or Additional District Judge.

Framework for Appointment of District Judges

- **Article 233 (1)** states that the **Governor of the State appoints District Judges in consultation with the High Court** exercising jurisdiction over that State. It also includes posting, and promotion of District Judges.
- **Article 233(2)** specifies eligibility for direct recruitment from the Bar. It requires that the candidate must:
  - Not be in the service of the Union or the State at the time of appointment.
  - Have at least seven years of practice as an advocate or pleader.
  - Be recommended by the High Court for appointment.
- Courts have consistently held that consultation with the High Court is mandatory and decisive, meaning the executive cannot appoint anyone whom the High Court does not find suitable.
- **Article 234 governs the appointment of persons other than District Judges** (i.e., civil judges and magistrates). Recruitment is carried out by the Governor in consultation with the High Court and the State Public Service Commission, according to rules framed by the Governor.
- **Under Article 235**, the **High Court exercises complete administrative and disciplinary control over the subordinate judiciary.** This includes authority over postings, transfers, promotions, and disciplinary inquiries involving judicial officers. Although the High Court conducts disciplinary proceedings, the **dismissal or removal of a District Judge ultimately requires the formal approval of the Governor**.



DOCTRINE OF CLEAN STATE

Context: The Delhi High Court reaffirmed that a successful resolution applicant under the Insolvency and Bankruptcy Code (IBC), 2016 cannot be held liable for criminal offences or liabilities linked to the former management of a corporate debtor, strengthening the clean slate principle.

What Is the Clean Slate Doctrine under the IBC?

- The Clean Slate Doctrine means that **once a** company completes the insolvency resolution process and **a new buyer takes control, the company begins with a fresh start.**
- All past debts, penalties, and liabilities are cleared, allowing the company to function without old burdens.
- **Legal Basis:** Derived from Section 31 of the IBC, which makes the approved resolution plan binding on all stakeholders, including government bodies.

NOTARIES (AMENDMENT) RULES, 2025

Context: The Department of Legal Affairs, Ministry of Law and Justice has notified the Notaries (Amendment) Rules, 2025 under Section 15 of the Notaries Act, 1952.

What is a Notary?

- A notary is **a public official authorized to verify, authenticate, and certify the execution of documents, witness signatures, and administer oaths.**
- **Primary Purpose of Notary:** To prevent fraud and maintain the integrity of legal and official transactions.
- **Duties of Notary:** Attesting documents, preparing and certifying affidavits, and facilitating the execution of both domestic & international legal and commercial documents.

INCOME TAX APPELLATE TRIBUNAL (ITAT)

Context: The Income Tax Appellate Tribunal (ITAT) organized a Symposium on 'Income Tax Appellate Tribunal-Role, Challenges and Way Forward'.

About Income Tax Appellate Tribunal (ITAT)	
Establishment	Formed on 25 January 1941 under Section 5A of the Income Tax Act, 1922. Known as the "Mother Tribunal", the oldest and most respected tribunal in India.
Current Basis	Operates under Section 252, Income Tax Act, 1961.
Nature	**Quasi-judicial appellate body for direct tax disputes**; final fact-finding authority.
Objectives	• Provide expert and affordable justice • Ensure speedy and fair dispute resolution • Reduce High Court litigation • Act as second appellate forum after Commissioner of Income Tax (Appeals) (CIT-A)
Functions	• Hears appeals against orders of income-tax authorities • Functions under regional High Court jurisdiction and follows its procedures.
Who Can Appeal?	• Taxpayers dissatisfied after CIT(A) orders • Income Tax Department against CIT(A) orders. • Further appeal to the High Court allowed only on substantial questions of law.
Structure of Benches	• Started with 3 benches (Delhi, Kolkata, Mumbai) • Now 63 benches in 27 cities, covering most High Court locations.
Composition	• 126 members • Each bench has 1 Judicial Member + 1 Accountant Member • Benches are constituted by the ITAT President.
Service Rules	Governed by the Income-tax Appellate Tribunal Members (Recruitment and Conditions of Service) Rules, 1963.

EXECUTION PETITIONS

Context: The Supreme Court (SC) described the pendency of over 8.82 lakh execution petitions across India as "highly disappointing" and "alarming."

What is an Execution Petition?

- An execution petition is a **request filed by the winner of a civil case** (the decree-holder) **to ensure that the court's order is actually implemented.** This **enforcement process is governed by Order 21 of the Civil Procedure Code (CPC), 1908.**
- After a court passes a judgment (such as directing payment of money, handing over property, or performing a specific act) the winning party may return to the court to enforce the decision.
- Execution is considered the final and most crucial stage of a civil case because it enables the decree-holder to secure the real benefit of the judgment, often described as "reaping the fruits of the decree."

TRIBUNALS

Context: Recently, the Supreme Court struck down provisions of the Tribunal Reforms Act, 2021 related to the appointment, tenure, and service conditions of members of various tribunals.

About Tribunals in India

- Tribunals are **judicial or quasi-judicial bodies created by law** to ensure quicker adjudication than conventional courts and to provide subject-matter expertise in specific areas.
- The evolution of tribunals in India began in 1941 with the establishment of the first tribunal, the Income-Tax Appellate Tribunal.

- **Constitutional Status:** The original Constitution did not contain provisions with respect to tribunals. The 42nd Constitutional Amendment Act, 1976 introduced Articles 323-A and 323-B to provide a framework for tribunals.
    - **Article 323-A: empowers Parliament to set up administrative tribunals** (at both central and state levels) for **matters related to recruitment and service conditions of public servants.**
    - **Article 323-B:** lists **specific areas,** such as taxation and land reforms, for which **Parliament or state legislatures** may establish tribunals through legislation.
- **Appeals: Generally filed before the respective High Court.** In the ***Chandra Kumar case (1997),*** the Supreme Court held that appeals arising from tribunal decisions should be heard by a **Division Bench of the concerned High Court.**

Key Features

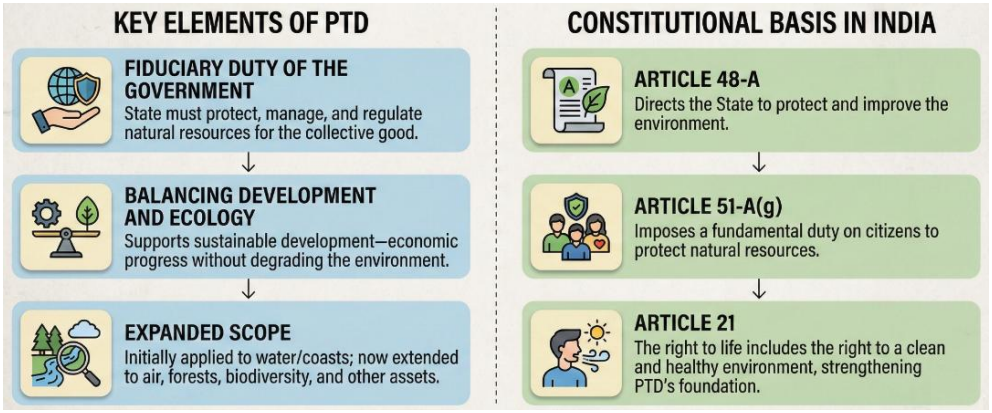
- Tribunals in India operate on the **principle of natural justice,** ensuring a fair and impartial hearing for all parties, and preventing anyone from judging a case in which they have a personal interest.
- They are not strictly bound by the **Civil Procedure Code (CPC)**, allowing them to function with greater procedural flexibility.
- Tribunals **include members with subject-specific expertise** and exercise quasi-judicial powers, such as examining evidence, hearing witnesses, determining facts, applying the law, and issuing binding decisions.

PUBLIC TRUST DOCTRINE

Context: The Supreme Court (SC) held that the Public Trust Doctrine (PTD) also applies to man-made waterbodies that serve ecological functions.

What is the Public Trust Doctrine (PTD)?

- It is a **principle in environmental law which states that natural resources** (such as air, water, forests, and wildlife) **are held by the State in trust for the public.**
- These resources **cannot be privately owned or exploited in a way that harms public welfare.** The **government acts as a trustee**, ensuring that natural resources are preserved for present and future generations.



Historical Background

- The doctrine traces its roots to the **Justinian Code of Roman law**, which recognised public rights over common resources like seas and shores.
- It later evolved through **English common law** and became central to environmental jurisprudence in the United States.
- **Indian courts subsequently adopted and expanded the doctrine** to safeguard ecological interests. It was first explicitly applied in India in M.C. Mehta v. Kamal Nath (1997).

CONTEMPT OF COURT

Context: Recently, the SC while closing contempt proceedings, cautioned against the growing tendency of making scandalous allegations against judges when judicial decisions are unfavourable.

What Is Meant by Contempt of Court?

- Contempt of court refers to any act, behaviour, or publication that disrespects, disobeys, or obstructs the authority, dignity, or functioning of a judicial body, and thereby interferes with the administration of justice.

Constitutional Provisions

- **Article 129:** Declares the Supreme Court as a court of record with the power to punish for contempt of itself.
- **Article 215:** Declares High Courts as courts of record with the power to punish for contempt of themselves.

- **Article 142(2):** Empowers the Supreme Court to make orders to secure attendance, production of documents, or punishment for contempt.
- **Article 19(2):** Recognizes contempt of court as a valid ground for imposing reasonable restrictions on freedom of speech and expression.

***Note**: The Constitution does not define the term "contempt of court."*

Statutory Backing: Contempt of Courts Act, 1971

- Enacted on the recommendations of the **H.N. Sanyal Committee,** the Act provides a uniform legal framework for exercising contempt powers.
- **The 1971 Act** classifies contempt into **two categories:**
  - **Civil Contempt [Section 2(b)]:** Wilful disobedience of any judgment, decree, direction, order, or breach of an undertaking given to a court.
  - **Criminal Contempt (Section 2(c))**: Acts or publications that scandalize or lower the authority of a court, prejudice judicial proceedings, or obstruct the administration of justice.
- The **2006 Amendment** refined the law by: (a) Requiring that contempt must "**substantially interfere with the administration of justice",** and (b) Recognizing "**truth in public interest**" **as a valid defence.**
- **Who may initiate proceedings:**
  - The Supreme Court or High Courts suo motu,
  - On a motion by the Attorney General or Advocate General, or
  - By a private individual with the written consent of the Attorney General or Advocate General, where statutorily required.
- **Punishment:** Simple imprisonment for up to six months, or a fine of up to ₹2,000, or Both. Courts may waive punishment if a genuine apology is accepted.

DOCTRINE OF SEVERABILITY

Context: The Supreme Court (SC) clarified that the Doctrine of Severability must be applied sparingly and only in exceptional circumstances.

What Is Meant by the Doctrine of Severability?

- Also known as the Doctrine of Separability, the Doctrine of Severability means that **if a part of a statute or a contract is found to be invalid** (for example, unconstitutional) **the invalid portion can be "severed" or removed, while the remaining part continues to be vali**d, provided the rest of the law or agreement can function independently.
- Under **Article 13** of the Constitution of India, **any law that is inconsistent with fundamental rights is void only to the extent of such inconsistency.**

DOCTRINE OF PARTY AUTONOMY

Context: The Supreme Court (SC) has held that the Doctrine of Party Autonomy is not absolute or limitless. At the same time, the Court reaffirmed that it remains the bedrock of the arbitral process.

What Is the Doctrine of Party Autonomy?

- The Doctrine of Party Autonomy is a core principle of arbitration that **gives disputing parties the freedom to decide how their disputes will be resolved.** It reflects the consensual and flexible nature of arbitration.
- Under this doctrine, parties are free to choose: the applicable law, the seat or place of arbitration, the procedural rules, the language of proceedings, and the method of appointment of arbitrators.
- The Doctrine of Party Autonomy is widely recognized and accepted in international and domestic arbitration frameworks, including: New York Convention (1958), UNCITRAL Model Law (1985), Indian Arbitration and Conciliation Act, 1996, and ICC Arbitration Rules.

'CLEAN HANDS' DOCTRINE

Context: The Delhi High Court (HC) held that once a petitioner proves cruelty, relief cannot be denied merely by invoking the Clean Hands Doctrine on the basis of unproven counter-allegations made by the respondent.

What Is the Clean Hands Doctrine?

- The Clean Hands Doctrine is an equitable principle **which requires that a person seeking relief from a court must act honestly and fairly in relation to the dispute.**

- A litigant must not be guilty of: Fraud, Misrepresentation, Suppression of material facts, or Any other dishonest or unfair conduct connected with the case.
- Courts may deny relief if a party has abused the judicial process or acted in a manner that is inequitable.
- However, the doctrine cannot be applied mechanically and must be based on proved misconduct, not on mere or unsubstantiated allegations.

PRIVILEGED COMMUNICATIONS

Context: The SC ruled that a lawyer cannot be summoned merely to disclose communications made by a client, except in situations where legal advice is used to commit or conceal a crime.

What Are Privileged Communications?

- It refers to confidential exchanges that legally cannot be made public without the communicator's consent, except in rare circumstances. Common examples of privileged communication are between a client and attorney, also known as attorney-client privilege, or between a patient and their doctor.
- The purpose of such privilege is to preserve trust, encourage honesty, and ensure the effective functioning of the justice system.

Under the Bharatiya Sakshya Adhiniyam (BSA), 2023, key provisions include:

- **Section 128 (Marital Communications):** Spouses cannot be compelled or permitted to disclose communications made during marriage, even after divorce, unless the case involves a crime committed by one spouse against the other, or a legal dispute between them.
- **Section 129 (Official Communications):** Unpublished official records of the State cannot be disclosed without departmental permission, in order to protect public and national interests.
- **Section 132 (Advocate–Client Communications):** Advocates are prohibited from disclosing professional communications with their clients, except where the advice is sought or used for an unlawful purpose.

CURATIVE PETITION

Context: Acting on Surendra Koli's curative petition, the Supreme Court (SC) acquitted him in a Nithari case, reversing its 2011 judgment.



What Is a Curative Petition?

- A curative petition is the **last and most extraordinary judicial remedy**, available **after the dismissal of a review petition.**
- **It does not re-argue the merits of the case.** Instead, it questions the fairness, integrity, and correctness of the judicial process that led to the final judgment.
- **What It Is Not:** It is not a second appeal; It is not a second review; **It is not meant to correct ordinary legal or factual errors.**

Evolution of the Curative Petition

- The concept originated in **Rupa Ashok Hurra vs Ashok Hurra (2002).** The central question was whether relief could be sought after the dismissal of a review petition.
- A five-judge Constitution Bench held that, in rare and exceptional cases of grave injustice, the Supreme Court may reconsider its own final judgment through a curative petition.

Constitutional Framework: This power was derived from the Court's inherent jurisdiction under:

- **Article 137:** Power of the Supreme Court to review its judgments.
- **Article 142:** Power to pass orders necessary to do "**complete justice."**
- Although curative petitions are not expressly mentioned in the Constitution, they are treated as an extension of these constitutional powers.

INSTITUTIONS AND BODIES

AIRCRAFT ACCIDENT INVESTIGATION BUREAU (AAIB)

Context: The Aircraft Accident Investigation Bureau (AAIB) has launched a formal investigation into the June 2025 Air India plane crash in Ahmedabad.

About Aircraft Accident Investigation Bureau (AAIB)	
Established	2012, under the **Ministry of Civil Aviation**
Role	Investigates aircraft accidents and incidents in Indian airspace or involving Indian-registered aircraft, in compliance with Annex 13 of the Chicago Convention (ICAO)
Legal Basis	Section 7, Aircraft Act 1934 Aircraft (Investigation of Accidents and Incidents) Rules, 2012 (amended 2017 & 2021)
Objective	Ensure independent investigations separate from DGCA, focusing on prevention rather than assigning blame
Functions	• **Classification of Safety Occurrences:** ○ **Accidents**: Events causing fatal/serious injuries, significant aircraft damage, or loss of aircraft. ○ **Serious Incidents**: Near-accidents with high probability of becoming accidents (e.g., airprox, aborted takeoffs on taxiways). ○ **Incidents**: Minor safety events not leading to accidents. • **Scope of Investigation:** ○ Covers accidents and serious incidents involving aircraft with All-Up Weight (AUW) > 2,250 kg or turbojet aircraft. ○ Other incidents may be investigated at AAIB's discretion if necessary. ○ Investigations aim to prevent accidents by identifying causes and contributing factors, without assigning blame or liability (Rule 3, 2017 Rules). ○ AAIB has unrestricted access to evidence, without court or government approval. • **Additional Responsibilities:** ○ Conduct safety studies. ○ Support court- or assessor-led investigations (Rule 12, 2017 Rules). ○ Strengthen India's State Safety Programme (SSP).

QUALITY COUNCIL OF INDIA (QCI)

Context: The Minister of State for Commerce and Industry inaugurated the new unified headquarters of the Quality Council of India (QCI) at the World Trade Centre, New Delhi.

About Quality Council of India (QCI)	
Mission	To lead a nationwide quality movement and enhance India's global competitiveness.
Establishment	• Founded in 1996 as India's national accreditation body to promote quality across sectors. • It is a Public–Private Partnership (PPP) supported by the Government of India and ASSOCHAM, CII, and FICCI. • The Chairman of QCI is appointed by the Prime Minister, based on industry recommendations.
Legal Status	A non-profit organization (NPO) registered under the Societies Registration Act XXI of 1860.
Nodal Agency	Department for Promotion of Industry and Internal Trade (DPIIT)
Key Functions	• Develops and operates national accreditation programs. • Serves as the implementing agency for Swachh Survekshan under the Swachh Bharat Mission. • Builds capacity to address SPS (Sanitary and Phytosanitary) and TBT (Technical Barriers to Trade) issues. • Promotes third-party quality assessments. • Strengthens quality awareness among governments, institutions, and enterprises. • Encourages research and innovation in quality standards.

LOKPAL OF INDIA

Context: The Lokpal of India has adopted a new Motto- "*Empower Citizens, Expose Corruption*" replacing the old one- *Ma Gridhah Kasyasvid Dhanam (Do not be greedy for anyone's wealth).*

About Lokpal

- The Lokpal is an independent **statutory body established under the Lokpal and Lokayuktas Act, 2013,** to **investigate and prosecute corruption cases** involving **public officials at the central level**. It acts as an **anti-corruption ombudsman for India.**
- **State Lokayuktas:** States must establish them within 365 days of the Act's enforcement.
- **Composition: Chairperson** + up to **8 members** (50% judicial; 50% from SC/ ST/ OBC/ minorities/ women).
- **Term**: 5 years or till the age of 70 years.
- **Appointment**: By the **President** based on the recommendations of a Selection Committee
- **Selection Committee:** Includes PM, Lok Sabha Speaker, Leader of Opposition (or Leader of Largest Opposition Party), CJI (or nominee), and an eminent jurist.
- **Jurisdiction:**
  - Covers PM, Ministers, MPs, and Group A-D officers in Central Government.
  - Covers chairpersons, members, officers and directors of any board, corporation, society, trust or autonomous body either established by an Act of Parliament or wholly or partly funded by the Union or State government.
  - Covers any society or trust or body that receives foreign contribution above ₹10 lakh.
- **Exception**: Cannot probe the Prime Minister in cases related to international relations, security, public order, atomic energy, and space.

Powers & Functions of Lokpal

- Investigates corruption complaints against public servants.
- The Inquiry Wing or any other agency will have to complete its preliminary inquiry and submit a report to the Lokpal within 60 days.
- Supervises CBI investigations in cases referred by it.
- Has powers of a civil court under the Code of Civil Procedure, 1908 for inquiries.
- Can seize documents and order searches for investigations.
- Directs the Central Vigilance Commission (CVC) to take action on complaints.

CENTRAL ADOPTION RESOURCE AUTHORITY (CARA)

Context: The Central Adoption Resource Authority (CARA) recently clarified that digitally certified adoption orders sent via email are legally valid, and hard copies are not required.

About CARA (Central Adoption Resource Authority)

- **Establishment:** Formed in 1990 as an autonomous body; attained statutory status under Section 68 of the Juvenile Justice (Care and Protection of Children) Act, 2015.
- **Role:** Serves as the nodal agency for monitoring, regulating, and facilitating the adoption of orphaned, abandoned, and surrendered children in India.
- **Status:** Statutory body under the Ministry of Women and Child Development (MoWCD).
- **Objectives of CARA**
  - Promote in-country adoption so children can grow within their own cultural and social environment.
  - Regulate inter-country adoptions in line with the Hague Convention on Inter-country Adoption (1993).
  - Ensure the best interests of the child through transparency, legality, and accountability in adoption procedures.
  - Encourage deinstitutionalization by promoting family-based care.

- Implement digital adoption procedures via **CARINGS** (Child Adoption Resource Information and Guidance System) — a web-based platform ensuring transparency and reducing delays.

- **Key Functions of CARA**
  - **Regulation and Policy:** Frames, revises, and enforces adoption regulations consistent with national laws and international conventions.
  - **International Coordination:** Acts as India's Central Authority under the 1993 Hague Convention (ratified by India in 2003) to facilitate safe, legal, and ethical inter-country adoptions.
  - **Database Management:** Maintains a centralized database through CARINGS
  - **Certification:** Issues No Objection Certificates (NOCs) and Conformity Certificates under Article 23 of The Hague Convention for inter-country adoptions.
  - **Coordination with Stakeholders:** Collaborates with State Adoption Resource Agencies (SARAs), Specialized Adoption Agencies (SAAs), Child Welfare Committees (CWCs), District Child Protection Units (DCPUs), and Authorized Foreign Adoption Agencies (AFAAs).
  - **Capacity Building:** Organizes training programs, workshops, and awareness campaigns for adoption agencies, social workers, and the public.
  - **Research and Documentation:** Undertakes and supports studies and publications on adoption trends, challenges, and best practices to inform policy decisions.

PRATIBHA SETU

Context: UPSC launched PRATIBHA Setu (Professional Resource and Talent Integration – Bridge for Hiring Aspirants).

- **PRATIBHA Setu**, earlier known as the Public Disclosure Scheme (PDS), is an **interactive recruitment platform launched by the Union Public Service Commission (UPSC).**
- It **connects highly qualified candidates**, those who cleared all stages of UPSC exams but didn't make the final merit list, **with verified employers from government ministries, PSUs, autonomous bodies, and the private sector.**

Distinct Features

- Shifts from passive data sharing (PDS) to active recruitment engagement.
- Offers government-assessed talent to diverse employers.
- Enhances efficiency, transparency, and resource optimization in India's recruitment system.
- Aligns with the 2nd Administrative Reforms Commission's vision of effective talent utilization.

NATIONAL INSTITUTE OF RURAL DEVELOPMENT AND PANCHAYATI RAJ (NIRD&PR)

Context: A parliamentary panel has urged an immediate overhaul of the National Institute of Rural Development and Panchayati Raj, a think tank under the Ministry of Rural Development (MoRD).

About National Institute of Rural Development and Panchayati Raj (NIRD&PR)

- An autonomous institute headquartered in Hyderabad, with a regional centre in Guwahati, it is India's leading centre for rural development and decentralized governance.
- Recognized by the UN-ESCAP as a Centre of Excellence, it serves as a policy think tank for the government on rural governance and development.

Historical Background

- The Institute was originally established in 1958 as the National Institute of Community Development at Mussoorie.
- In 1965, it was shifted to its Hyderabad campus and was renamed the National Institute of Rural Development (NIRD) in 1977.
- In 2013, it was renamed the NIRD&PR to expand its mandate, integrate the Panchayati Raj system, and strengthen capacity building of functionaries of Panchayati Raj Institutions.

Core Objectives

- **Capacity Building & Training:** Trains officials, PRI representatives, NGOs, and other stakeholders for effective local governance.
- **Research & Policy Support:** Undertakes research on rural development, decentralization, and poverty reduction.

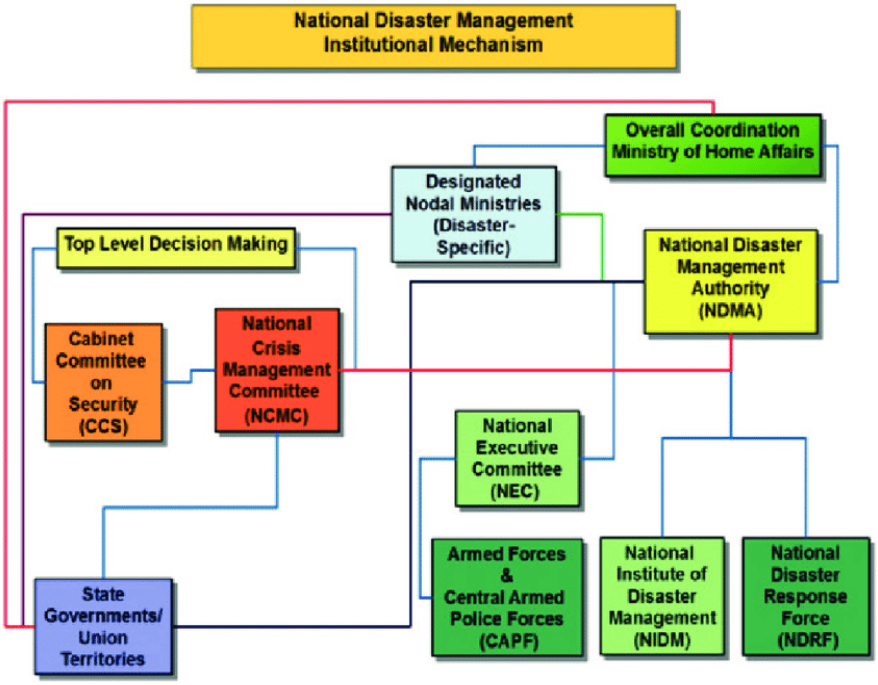
- **Technology Transfer & Innovation:** Promotes sustainable rural technologies through Technology Parks and social laboratories.
- **Consultancy & Advisory:** Provides expert support to national and international agencies on rural programmes and strategies.
- **Knowledge Dissemination:** Publishes training modules, e-content, and periodicals to share best practices in rural governance.

NATIONAL CRISIS MANAGEMENT COMMITTEE (NCMC)

Context: The Centre constituted the NCMC, headed by the Cabinet Secretary, to handle major disasters with national impact, under Section 8A(2) of the Disaster Management Act, 2005.

About the National Crisis Management Committee (NCMC)

- NCMC was established under the **Disaster Management Act, 2005** by the Central Government. It serves as the **apex coordinating body responsible for managing and directing responses to major disasters in India.**



Composition of NCMC

- **Chairperson:** Cabinet Secretary
- **Members:** Union Home Secretary, Defence Secretary, Secretary (Coordination) at the Cabinet Secretariat, Member and Head of Department (NDMA)
- The Union Home Secretary represents the Ministry of Home Affairs, the nodal ministry for disaster management.
- The Chairperson may co-opt experts or officials from the Centre, States, or specialized organizations, depending on the nature of the crisis.

Roles and Functions

- **Assess Preparedness:** Review the nation's readiness to deal with potential or ongoing disasters.
- **Issue Directions:** Provide strategic guidance to improve disaster preparedness, mitigation, and response.
- **Coordinate Efforts:** Oversee and coordinate actions among Central and State Governments, NDMA and SDMAs, NGOs and other stakeholders
- **Ensure Unified Response:** Facilitate smooth coordination and prompt decision-making for effective national-level disaster management.
- **Strategic Alignment:** Supports India's disaster risk reduction efforts in line with international frameworks such as the Sendai Framework for Disaster Risk Reduction (2015–2030).

DIRECTORATE OF REVENUE INTELLIGENCE (DRI)

Context: Under Operation Weed Out, the Directorate of Revenue Intelligence (DRI) recently seized 39.2 kg of hydroponic weed at Mumbai's Chhatrapati Shivaji Maharaj International Airport.

About Directorate of Revenue Intelligence (DRI)

- DRI is an apex **anti-smuggling intelligence, investigations, and operations agency,** operating **under the Central Board of Indirect Taxes and Customs (CBIC),** Ministry of Finance, Government of India. It is headquartered in New Delhi.
- It was constituted on December 4, 1957, and is **tasked with preventing the smuggling of contraband** such as narcotics, gold, foreign currency, fake Indian currency notes, arms, wildlife, and other prohibited items.

Functions and Mandate

- DRI **enforces provisions of the Customs Act, 1962,** and over 50 other allied statutes, including the Arms Act, NDPS Act, Wildlife Act, and COFEPOSA.
- Its main roles include intelligence gathering, investigation, prosecution, and coordination of anti-smuggling operations across India.
- DRI monitors and analyzes trends in smuggling, keeps statistics on seizures, and suggests legal and procedural improvements to plug loopholes.

Organizational Structure

- **Headed by a Director General,** it operates through 12 zonal units, each led by an Additional Director General.
- DRI is the **lead agency for S-CORD (National Anti-Smuggling Coordination Centre)** and collaborates internationally via Customs Mutual Assistance Agreements with over 60 countries.
- DRI officers posted in select missions/consulates under the Customs Overseas Intelligence Network (COIN) to gather trade intelligence and curb trade-based money-laundering and mis-declaration.

CENTRAL BOARD OF FILM CERTIFICATION (CBFC)

Context: Recently, several films faced significant cuts by the Central Board of Film Certification (CBFC) due to references to caste, mythology, and politics.

About CBFC (Censor Board)		
About	• Statutory body under the Ministry of Information & Broadcasting • Regulates public exhibition of films under the Cinematograph Act, 1952. • Certification is mandatory for film release in India.	
Legal Framework	• Cinematograph (Amendment) Act, 2023 • Cinematograph (Certification) Rules, 2024 • Guidelines issued under Section 5(B)	
Offices	Head Office: Mumbai; 9 regional offices: Delhi, Kolkata, Chennai, Bengaluru, Hyderabad, Thiruvananthapuram, Cuttack, Guwahati, Mumbai	
Compo- sition	Chairperson (generally, with 3 years of tenure) + 12–25 non-official members appointed by the Central Government	
Key Changes (2023)	• Anti-piracy provisions (up to 3 years' imprisonment) • Perpetual validity of certificates • Age-based sub-categories introduced	
Certification Categories	• U: Universal • U/A: Parental guidance below 12 • A: Adults only (18+) • S: Restricted to special classes (e.g., doctors)	New Sub-categories (2023): UA 7+, UA 13+, UA 16+ (age-based, aligned with global norms)
Time Limit	The Cinematograph (Certification) Rules, 2024 describes the time limits applicable for certification under various circumstances.	
Landmark Judgments	• **K.A. Abbas (1970):** SC upheld pre-censorship as constitutional. • **Anand Patwardhan cases:** Certificates cannot be denied on vague grounds. • **S. Rangarajan (1989):** Expression can be restricted only if film poses clear and present danger to public order.	

UPSC TURNS 100

Context: The Union Public Service Commission (UPSC) Centenary Year celebrations will begin on 1st October 2025 and continue until 1st October 2026.

About Union Public Service Commission (UPSC)

- UPSC is India's **central recruiting agency.** It is an **independent constitutional bod**y, created directly by the Constitution of India.
- **Articles 315 to 323 in Part XIV** of the Constitution lay down detailed provisions regarding its composition, the appointment and removal of its members, and its powers, functions, and independence.

Historical Background

- **Macaulay Report (1854):** Introduced a merit-based civil service, replacing the old patronage-based system of the East India Company.
- **First Competitive Examination (1855):** Held in London. Satyendra Nath Tagore became the first Indian to qualify in 1864, marking a major milestone in Indian participation.
- **Government of India Act (1919):** Provided for the creation of a Public Service Commission under Section 96(C), laying the foundation for an independent recruitment body.
- **Lee Commission (1924):** Strongly recommended the establishment of such a commission to protect civil services from political pressures.
- **First Public Service Commission (1926):** Set up on October 1, 1926, with Sir Ross Barker as its first Chairman.
- **Federal Public Service Commission (1935):** Constituted under the Government of India Act, 1935, giving Indians a greater administrative role.
- **UPSC (1950):** On January 26, 1950, with the adoption of the Constitution, the Federal PSC was transformed into the Union Public Service Commission, now a constitutional authority.

Related Constitutional Provisions

- **Article 315:** Establishment of Union and State PSC (Public Service Commission).
- **Article 316-317:** Appointment, tenure, and removal of members.
  - ✓ A member of a PSC cannot be reappointed after completing their term.
- **Article 320:** Functions of PSCs- conduct of exams, recruitment, promotions, disciplinary matters.
- **Article 321-323:** Extension of functions, expenses (from the Consolidated Fund of India/ State), and submitting annual reports to President/Governor.

COMPOSITION	REMOVAL
• **Structure:** The UPSC consists of a Chairman and members appointed by the President of India. • **Strength:** No fixed number is prescribed by the Constitution; the President decides the total strength. Typically, UPSC has 9–11 members. • **Qualification:** At least half of the members must have held government office (Union or State) for a minimum of 10 years. • **Tenure:** They hold office for 6 years or until age 65, whichever is earlier. • **Resignation:** May resign by writing to the President.	The President can remove the UPSC Chairman or any member in the following situations: • If the person is declared insolvent (bankrupt) • If the person takes up any paid job outside UPSC duties during the term • If the person is found mentally or physically unfit to continue in office Additionally, a member can be removed for misbehaviour, but in this case: • The matter is first sent to the Supreme Court for enquiry. • If the Court confirms the misbehaviour and advises removal, the President must remove the person. • During the enquiry, the President may suspend the member.

Functions of UPSC

- **Conduct of Examinations:** The UPSC conducts examinations for recruitment to the All-India Services, the Central Services, and the public services of Union Territories.
- **Assistance to States in Recruitment:** The UPSC assists states, when requested by two or more of them, in designing and operating joint recruitment schemes for services that require candidates with special qualifications.
- **Service to Individual States:** The UPSC may serve the needs of any state government when requested by the Governor and approved by the President of India.
- **Advice on Recruitment Methods:** The UPSC advises the government on all matters relating to recruitment methods for civil services and civil posts.
- **Advice on Appointments, Promotions, and Transfers:** The UPSC provides guidance on the principles to be followed while making appointments, promotions, and transfers from one service to another.

The Supreme Court has held that failure to consult the UPSC does not invalidate a government decision. Consultation is therefore considered directory and not mandatory.

- **Advice on Disciplinary Matters:** The UPSC advises the government in all disciplinary cases involving civil servants.
- **Annual Report Submission:** The UPSC submits an annual report to the President describing its work during the year. The President places this report before both Houses of Parliament.

MONUMENT CONSERVATION TO OPEN UP TO PRIVATE PLAYERS

Context: For the first time, the government plans to let private players, such as corporates and Public Sector Undertakings (PSUs), help conserve protected monuments. Until now, this work was done only by the Archaeological Survey of India (ASI).

About Archaeological Survey of India (ASI) (HQ: New Delhi)	
About	• ASI is India's premier agency for archaeological research and protection of tangible cultural heritage. • It is a statutory body under the Ancient Monuments and Archaeological Sites and Remains Act, 1958 (AMASR Act).
Establishment	Founded in 1861 by Sir Alexander Cunningham
Nodal Ministry	Ministry of Culture
Core Mandate	Maintains and preserves ancient monuments, archaeological sites, and remains of national importance across India.
Regulatory Role	Enforces archaeological activities under the AMASR Act, 1958 and oversees antiquities under the Antiquities and Art Treasure Act, 1972.
Protected Monuments	The Central Government has declared 3,679 monuments and sites as of national importance; ASI manages their protection and conservation.
Workforce & Expertise	Employs trained archaeologists, conservators, epigraphists, architects, and scientists.
Major Wings & Branches	Circles, Museums, Excavation Branches, Prehistory Branch, Epigraphy Branches, Science Branch, Horticulture Branch, Building Survey Project, Temple Survey Projects, and Underwater Archaeology Wing.

NATIONAL MEDICAL COMMISSION

Context: National Medical Commission (NMC) has completed five years since its establishment.

About the National Medical Commission

- The NMC is a **statutory body set up under the National Medical Commission Act, 2019,** which came into effect on 25 September 2020. It **replaced the Medical Council of India** (MCI), leading to the dissolution of the Board of Governors.
- The Act's objectives include improving access to quality and affordable medical education, ensuring availability of high-quality medical professionals across regions, and promoting universal healthcare with a community health perspective.
- **Composition:** One Chairperson, Ten ex officio members, Twenty-two part-time members; appointed by the Central Government:
- **Autonomous Boards under NMC:** Undergraduate Medical Education Board, Postgraduate Medical Education Board, Medical Assessment & Rating Board, Ethics and Medical Registration Board
- **Functions of the NMC**
  - Formulates policies to uphold quality in medical education and regulate institutions, research, and professional practice.
  - Identifies healthcare needs and maps available resources to support effective planning.
  - Facilitates smooth functioning and alignment among its boards and related councils.
  - Ensures regulatory compliance and manages appeals in a structured manner.
  - Enforces strict standards of professional conduct for medical practitioners.
  - Regulates fees for 50% of seats in private and deemed medical colleges.
  - Issues limited licences to Community Health Providers to support service delivery in underserved areas.

8TH CENTRAL PAY COMMISSION

Context: The Union Cabinet, chaired by the Prime Minister, has approved the Terms of Reference (ToR) of the 8th Central Pay Commission (CPC).

About Central Pay Commission (CPC)

- CPC is a **body constituted by the Government of India every ten years** to **review and recommend changes in the salary structure**, allowances, pensions, and service conditions for central government employees, including civilian and defense personnel.
- The Department of Expenditure is responsible for the implementation of the recommendations of the Finance Commission and Central Pay Commission.

About 8th Central Pay Commission (CPC)

- **Chairperson**: Justice Ranjana Prakash Desai (retired Supreme Court Justice)
- **Members**: One Part-time Member, One Member-Secretary [Pankaj Jain (IAS) as Member-Secretary and Professor Pulak Ghosh (IIM Bangalore) as Part-time Member]
- **Timeline:** The Commission is required to submit its recommendations within 18 months.

8th CPC Terms of Reference

- Pay and pension revisions must be structured in a manner that does not disturb fiscal stability.
- The extent of salary and pension increases will largely depend on the fitment factor, which is **a multiplier applied to existing pay scales when revising salaries.**
- Salary increases should not crowd out expenditure on capital investment and social welfare schemes.
- The Commission must examine the long-term sustainability of existing pension liabilities.
- Since States usually adopt CPC recommendations, the fiscal impact on State governments must be carefully assessed.
- Pay structures should remain competitive and fair in comparison with Central Public Sector Undertakings (CPSUs) and the private sector.

ELECTIONS

ECINET

Context: The Election Commission of India (ECI) will soon be launching a new user-friendly single-point digital interface "ECINET".

What is ECINET?

- It is a major **digital initiative by ECI aimed at creating a user-friendly, unified digital platform for all stakeholders** in the electoral process- including electors, election officials, political parties, and civil society organizations.
- Currently, it is in an advanced stage of development, undergoing rigorous trials to ensure smooth functionality, ease of use and strong cybersecurity protections.

Legal Framework

- Operates under the Representation of the People Acts, 1950 & 1951, Registration of Electors Rules, 1960, Conduct of Election Rules, 1961, and other ECI guidelines.

Key Features of ECINET

- **One-Stop Platform**: ECINET will integrate over 40 existing ECI mobile and web applications like Voter Helpline App, Voter Turnout App, cVIGIL, etc.
- **Enhanced User Experience:** Modern UI/UX removes multiple downloads and logins, reducing user fatigue.
- **Accurate and Official Data:** Only authorized ECI officials can update records; statutory forms prevail in case of discrepancies.
- **Wide Accessibility:** Available on smartphones and desktops, ensuring inclusivity.

COURTS ORDERED RECOUNT OF VOTES

Context: The Supreme Court (SC) recently overturned the November 2022 sarpanch election in Buana Lakhu village, Haryana, after recounting all Electronic Voting Machine (EVM) votes. This is believed to be the first instance where the SC ordered an EVM recount.

Legal Framework for Challenging an Election	
Where to File?	**Parliament/Assembly/State Council**: State High Court **Local government elections**: District civil courts
Who Can File?	Only a candidate or an elector related to that election
Time Limit	Must be filed within 45 days of result declaration
Contents of Petition	Must include all essential facts Allegations of corrupt practices must specify names, dates, locations
Standard of Proof	Corrupt practice allegations are quasi-criminal; vague or unsupported petitions can be dismissed

Grounds for declaring an election void (Section 100, Representation of the People Act, 1951): An election may be declared void by the High Court if:

- The candidate was not qualified or was disqualified on the date of election.
- Corrupt practices (Bribery, Undue influence, Use of Force/coercion etc.) were committed by the candidate, election agent, or with their consent.
- The nomination was improperly accepted.
- There was improper acceptance, rejection, or counting of votes, including void votes.
- There was non-compliance with the Constitution, the RPA, or rules made under it.

When Can Courts Order a Recount of Votes?

- Courts order a recount only in **rare and exceptional situations** because it may affect the secrecy of the ballot. The petitioner must present specific, credible facts showing a strong possibility of counting errors. A prima facie case must be established before the court agrees to a recount.
- Generally, recounts are done at the original counting centre. However, exceptional case may involve recounting at a different location.

POSTAL BALLOT

Context: According to a notification issued by the Election Commission of India (ECI), the penultimate round of Electronic Voting Machine (EVM) counting will be taken up only after the complete counting of postal ballots.

About Postal Ballot in India:

- A postal ballot allows eligible voters to cast their vote remotely without visiting a polling station.
- **Legal Framework:** Governed by the Representation of the People Act, 1951 and the Conduct of Election Rules, 1961.
- **Eligibility:**
  - **Service voters:** Members of the Armed Forces, Central Armed Police Forces, and government servants posted abroad.
  - **Special voters:** The President, Vice President, Governors, Cabinet Ministers, other high constitutional dignitaries, and their spouses.
  - **Absentee voters:** Senior citizens above 85 years, persons with disabilities, and others notified by the ECI.
  - **Others:** Persons under preventive detention and personnel deployed on election duty.

About Electronically Transmitted Postal Ballot System (ETPBMS)

- Introduced in the 2019 Lok Sabha elections, ETPBMS **enables service voters to receive and cast postal ballots electronically,** streamlining the process for those stationed away from their constituencies.
- Developed by the Election Commission of India (ECI) with C-DAC, it maintains alignment with existing postal ballot rules.

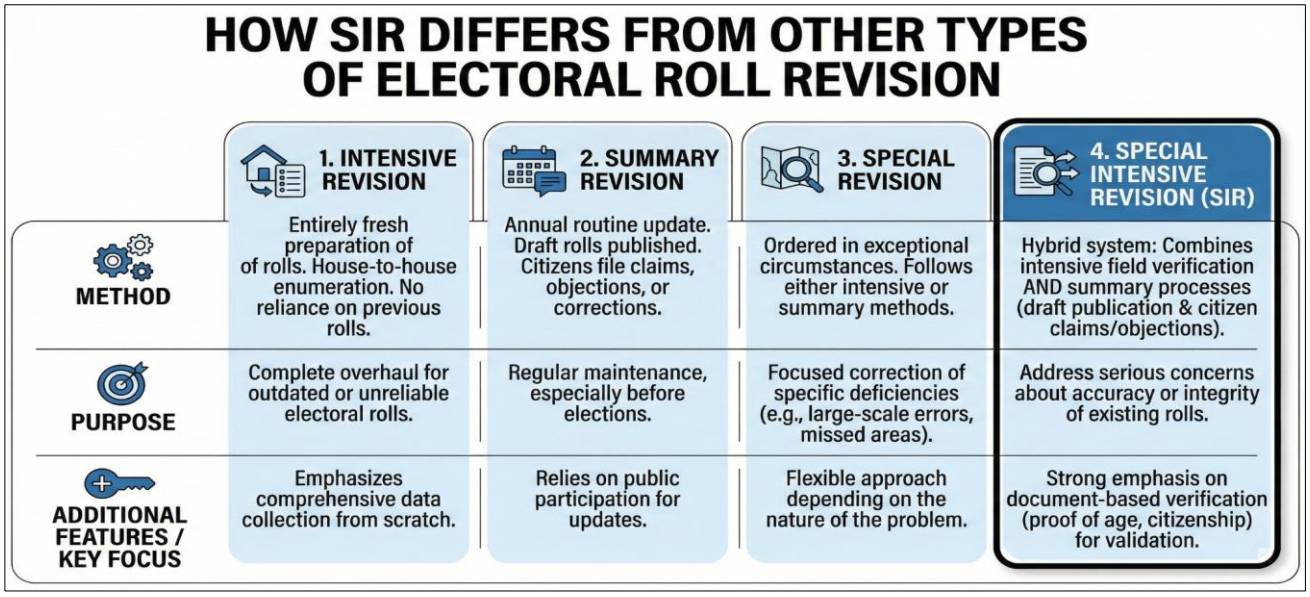
PAN-INDIA SIR OF ELECTORAL ROLLS

Context: The Election Commission of India has launched the second phase of the Special Intensive Revision (SIR) of electoral rolls in 12 States and Union Territories, after Bihar.

About the Special Intensive Revision (SIR)

- The SIR is conducted by the ECI under **Section 21(3) of the Representation of the People Act (RPA), 1950,** which empowers the Commission to revise electoral rolls "in such a manner as it thinks fit."

- The SIR is designed as a **hybrid revision method, combining elements of both intensive and summary revision**s to ensure high accuracy and transparency.
- It involves:
  - Door-to-door field verification by Booth Level Officers (BLOs), similar to an intensive revision.
  - Use of existing electoral rolls as draft rolls, allowing citizens to submit claims and objections, similar to a summary revision.
- In the Bihar SIR, BLOs conducted house-to-house verification and voters were required to provide documentary proof of citizenship or age at the enumeration stage—an additional layer of verification not present in routine revisions.



GOVERNANCE

MODEL YOUTH GRAM SABHA INITIATIVE

Context: The Centre launched the first phase of the Model Youth Gram Sabha (MYGS), inspired by the Model United Nations.

About Model Youth Gram Sabha (MYGS)

- The Model Youth Gram Sabha familiarizes students with the structure and functioning of Panchayati Raj Institutions through participatory and experiential learning.
- The vision of the Model Youth Gram Sabha is "to nurture empowered, responsible, and empathetic young citizens who actively participate in democratic processes and contribute to sustainable and inclusive national development."
- **Implemented by:** Ministry of Panchayati Raj (MoPR), with NIRDPR, Ministry of Education, and Ministry of Tribal Affairs.
- **Objectives:**
  - Educate rural and tribal students about democratic processes, rights, and duties.
  - Make grassroots democracy a real and relatable experience for young learners.
  - Encourage future interest in local governance and public service.
  - Strengthen participation in Gram Sabhas and promote community-based decision-making.

Key Features of MYGS

- **Simulation-based learning:** Students hold mock Gram Sabha meetings, discuss village issues, debate resolutions, and prepare simple development plans or budgets.
- **Role-play:** Students take positions such as Sarpanch, Ward Member, Village Secretary, ANM, Anganwadi Worker, and Junior Engineer.
- **Training Cascade:** National Level Master Trainers train teachers, who then facilitate student sessions.

- **Competitions & Rewards:** Regional and national competitions for JNVs and EMRSs with prizes—₹1 crore (1st), ₹75 lakh (2nd), ₹50 lakh (3rd); participation certificates for all schools.

Implementation

- **Phase I:** Around 620 Jawahar Navodaya Vidyalayas (JNVs) and 200 Eklavya Model Residential Schools (EMRSs) (total 1,100–1,200 schools). Maharashtra and Karnataka will also participate voluntarily through government schools.
- **Phase II:** Expansion to more schools across India.

GIS-INTEGRATED DECISION SUPPORT PLATFORM

Context: The **Department of Drinking Water & Sanitation (DDWS)** has signed a Memorandum of Agreement (MoA) with the **Bhaskaracharya National Institute for Space Applications and Geo-informatics (BISAG-N)** to develop a GIS-integrated decision-support platform for the **Jal Jeevan Mission (JJM) and Swachh Bharat Mission (Grameen) [SBM(G)].**

Key Features of the Proposed Platform

- GIS-based tools enabling real-time visualization, analytics, and informed decision-making.
- Mapping and creation of Rural Piped Water Supply Schemes (RPWSS), each with a unique ID for household-level tracking.
- End-to-end technical support from BISAG-N, including database design, data migration, software development, and system integration.
- Use of advanced geospatial techniques, such as ground surveying, photogrammetry, and thematic mapping.
- Integration with PM GatiShakti to align water and sanitation projects with broader rural infrastructure initiatives.

About BISAG-N (Gandhinagar, Gujarat)

- BISAG-N is an autonomous scientific **society registered under the Ministry of Electronics & Information Technology (MeitY).**
- It specializes in **satellite communication, geo-informatics, and geo-spatial technology,** providing advanced solutions for mapping, remote sensing, disaster management, and digital infrastructure development.

About Jal Jeevan Mission (JJM)	
Launch	Launched in 2019 to provide Functional Household Tap Connections (FHTC).
Scheme Type	Centrally Sponsored Scheme.
Nodal Ministry	Department of Drinking Water & Sanitation, Ministry of Jal Shakti.
Key Objectives	• Providing Functional Household Tap Connection (FHTC) to every rural household. • Ensuring functional tap connections in schools, Anganwadi centers, gram panchayat buildings, health and wellness centers, and community buildings. • Ensuring the sustainability of water supply systems, including water sources, infrastructure, and funding for regular operations and maintenance.
Planning Approach	• Focus on village-level planning and community participation in water supply decisions. • At least 50% members of the Village Water & Sanitation Committee / Pani Samiti must be women.
Key Components	• Convergence of funds from multiple programmes. • In-village piped water systems for household tap connections. • Development and strengthening of reliable water sources. • Bulk water transfer, treatment plants, and distribution networks where required. • Technology-based solutions for removal of contaminants. • Retrofitting existing schemes to ensure 55 liters per capita per day (lpcd) service level. • Greywater management. • Support activities — IEC, training, labs, R&D, and community capacity building.

VIKSIT BHARAT BUILDATHON 2025

Context: In a major step toward fostering innovation in schools, more than three lakh schools across India participated in the Viksit Bharat Buildathon 2025, the country's largest synchronized school innovation challenge.

What is the Viksit Bharat Buildathon 2025?

- It is a nationwide initiative that invites schools and teachers to encourage students from classes 6 to 12 to demonstrate their creativity and problem-solving abilities.
- The event aims to strengthen the culture of innovation at the school level by motivating students to develop ideas or create prototypes based on four themes — Atmanirbhar Bharat, Swadeshi, Vocal for Local, and Samriddh Bharat.
- The event is being organised by the Ministry of Education, in collaboration with the Atal Innovation Mission (AIM) and NITI Aayog.
- The Buildathon includes an award pool of 1 crore rupees, which will be distributed among 10 national-level winners, 100 state-level winners, and 1,000 district-level winners.
- **Objectives**
  - Promote innovation, creativity, and problem-solving aligned with Viksit Bharat @2047 and NEP 2020.
  - Encourage students to address community problems using technology and design thinking.
  - Build an innovation ecosystem by linking schools with mentors, incubators, and industry.

PM-SETU SCHEME

Context: PM launched PM-SETU (Pradhan Mantri **Skilling and Employability Transformation through Upgraded ITIs)**, a Centrally Sponsored Scheme with an outlay of ₹60,000 crore.

About PM-SETU Scheme	
Objective	• Transform 1000 Government ITIs through upgraded infrastructure, industry partnership, and outcome-based skilling
Hub-and-Spoke Model	• 200 Hub ITIs linked to 800 Spoke ITIs (1 hub : 4 spokes on average) • **Role of Hub ITIs:** Innovation centres, Training-of-trainers facilities, Production units, Placement services • **Role of Spoke ITIs:** Expand access to training, Deliver updated trades and courses
Key Features	• Advanced infrastructure, Digital learning, Modern trades, Incubation facilities
Industry Participation	• Special Purpose Vehicles (SPVs) formed with credible Anchor Industry Partners to manage clusters
Curriculum Reform	• New demand-driven courses, Revamping of existing courses, Collaboration with industry
Learning Pathways	• Long-term diplomas, short-term courses, executive programmes
Centres of Excellence	• Five National Skill Training Institutes strengthened in: Bhubaneswar, Chennai, Hyderabad, Kanpur, Ludhiana
Phase-I Coverage	• 15 Hub-and-Spoke ITI clusters across diverse regions and industrial ecosystems
International Support	• Global co-financing from World Bank and Asian Development Bank

TRAI DIGITAL RADIO BROADCAST POLICY FOR PRIVATE BROADCASTERS

Context: The Telecom Regulatory Authority of India (TRAI) has released recommendations for a Digital Radio Broadcast Policy for private radio broadcasters.

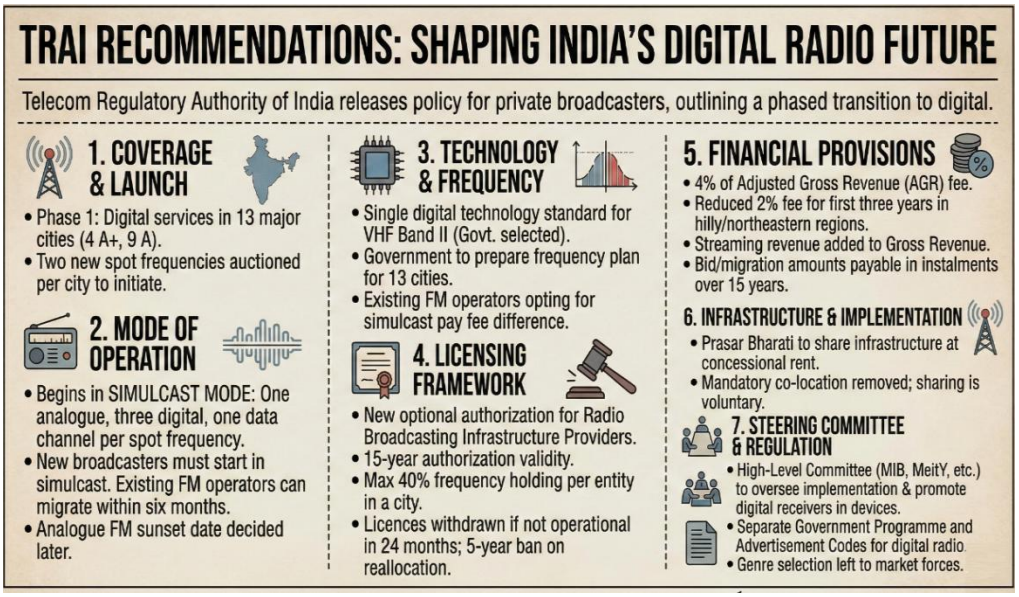
What is Digital Radio?

- Digital Radio is a modern form of radio broadcasting in which sound is transmitted in digital (binary) signals instead of analogue signals used in traditional FM/AM radio. Example: HD Radio Standard used primarily in the US, Canada, Mexico.

About Telecom Regulatory Authority of India (TRAI) (HQ: New Delhi)

- A Statutory Body established under the **Telecom Regulatory Authority of India Act, 1997**.
- **Primary mandate:** To regulate telecom services in India, including tariff fixation/revision, which was earlier the domain of the Central Government.
- **Scope of regulation:** Covers areas like tariffs, quality of service, interconnection, spectrum management, and consumer protection in the telecom sector.

- **Policy role:** Issues regulations, recommendations, and orders that guide telecom policy-making and market practices.
- **Composition of TRAI:** Consists of a Chairperson, a maximum of two full-time members, and two part-time members. Appointments are made by the Central Government.
- **Tenure:** Members serve for three years or until the age of 65 years, whichever is earlier.
- **Removal:** The Central Government may remove a member on grounds such as insolvency, conviction for offences involving moral turpitude, physical or mental incapacity, abuse of position, or actions prejudicial to public interest.



SWACHH SHEHAR JODI

Context: The Ministry of Housing and Urban Affairs (MoHUA) has launched the Swachh Shehar Jodi (SSJ) initiative under the Swachh Bharat Mission–Urban (SBM-U).

About Swachh Shehar Jodi (SSJ)

- Swachh Shehar Jodi (SSJ) is a structured mentorship and collaborative action program to improve urban sanitation and waste management across India.
- The initiative pairs 72 high-performing "mentor" cities with nearly 200 low-performing "mentee" cities based on Swachh Survekshan rankings.
- Mentor cities are selected from the top three performers in Swachh Survekshan 2024 and members of the Super Swachh League.
- The program is time-bound, with a 100-day action plan during which mentor and mentee cities jointly develop customized action plans, conduct workshops, and share best practices.

50TH ANNIVERSARY OF SIKKIM'S STATEHOOD

Context: The 50th anniversary of Sikkim's statehood marks a significant milestone in India's history.

- Sikkim became a full-fledged state of the Union of India in **1975** through the **Constitution (36th Amendment) Act**.
- Prior to 1975, **Sikkim was a protectorate of India under the Indo-Sikkim Treaty of 1950**. While the Chogyal (monarch) retained internal autonomy, India was responsible for its defense, external affairs, and communications.
- **The Constitution (35th Amendment) Act of 1974 had granted Sikkim the status of an "Associate State" under Article 2A**, which was later repealed by the 36th Amendment.
- With this change, Sikkim officially became the 22nd state of India, and abolished the institution of the Chogyal.
- The state also enjoys certain special provisions under **Article 371F of the Constitution,** reflecting its unique historical and cultural context.



POPULATION CENSUS - 2027

Context: India will conduct its next population census by March 1, 2027, after a 16-year gap. Announced by the Union Ministry of Home Affairs, this will be **India's first digital census.**

Key Details of the 2027 Census

- This will be the 16th decennial census since 1872, when the first systematic census was conducted. It will be the 8th successive census after Independence.
- **Timeline and Phases:** The census will begin on April 1, 2026 and conclude by February 28, 2027. It will be conducted in two phases:
  - **House Listing and Housing Schedule:** Recording information about homes and households.
  - **Population Enumeration:** Counting people and collecting demographic details, including caste.
- **Legal and Procedural Aspects:** Conducted under the Census Act, 1948, and Census Rules, 1990. A gazette notification under Section 3 of the Census Act will formally announce the schedule soon.
- **Political Implications:** Constitutionally, the first census after 2026 can be used for **delimitation of Lok Sabha constituencies.** This data may help restructure electoral boundaries before the 2029 General Elections.
- **Impact on Women's Reservation:** The 33% reservation for women in the Lok Sabha and State Assemblies, as per the Women's Reservation Act, will apply only after the new delimitation based on the 2027 census.

Census in India

- **Constitutional Mandate:** Article 246 of the Constitution (7th Schedule, Union List entry 69).
- **Legal Provisions:** Conducted under the Census Act, 1948, and Census Rules, 1990.
- **Organization**: Headed by the Registrar General and Census Commissioner.
- **Historical Context**: The first synchronous census in India was conducted in 1881 under W.C. Plowden and has continued regularly since.
- **Significance:** The census is the main source of official demographic and socioeconomic data, forming the basis for government schemes, policies, and planning.

SECC 2011 AND CASTE CENSUS

Context: The Cabinet Committee on Political Affairs has approved the collection of caste data in the upcoming population census. The Centre has announced that the next decennial census will begin in Ladakh from October 2026 and across the rest of India from March 2027, including a caste census.

Key Highlights of Caste Census

- **Historical Background:** The 1931 Census remains the most recent source of publicly available national-level caste data. The 1941 Census did collect caste information, but the results were not released due to World War II.
- **First Since Independence:** This will be the first time that caste data beyond Scheduled Castes (SCs) and Scheduled Tribes (STs) will be collected officially as part of the national census.
- **State-Level Surveys:** Several states, including Bihar and Karnataka, have conducted caste surveys recently. However, these surveys often lacked uniformity, transparency, and credibility, raising questions about their reliability.
- **Census vs. Survey:** Unlike surveys, a census is a constitutionally mandated exercise and has nationwide legal backing.
- **Digital Integration**: The 2026–27 census will use a mobile application to record data digitally, alongside traditional pen-and-paper collection.

What is Socio-Economic and Caste Census (SECC), 2011?

- Launched in June 2011 by the Ministry of Rural Development as a nationwide door-to-door survey.
- **Purpose:** Assess the socio-economic conditions of households in rural and urban areas to aid policy-making, research, and development programs.
- Covered 24 lakh enumeration blocks, each with ~125 households.

Data Collected Under SECC

- Gender, age, literacy, religion, marital status
- **Caste and tribe details** (SC, ST, Other, No caste/tribe)
- **Health**: Disabilities and diseases
- **Economic status:** Assets, housing, lighting, sanitation, kitchens
- **Employment & income:** Urban income sources, rural landholding, equipment, bonded labour, tribal status

- Socio-economic data was published in 2016, while **caste-specific data was withheld.**

UNIFIED DATA HUB (UDH)

Context: The Delhi government plans to create a Unified Data Hub (UDH) to centralize citizen data and ensure welfare benefits reach only eligible residents.

What is the Unified Data Hub (UDH)?

- A centralized digital platform integrating citizen data from multiple government departments.
- Aims to produce verified, deduplicated, and accurate records for beneficiaries of welfare schemes (subsidies, pensions, financial assistance).

Examples from Other States

- **Andhra Pradesh (Real-Time Governance System (RTGS))**: Integrates departmental data to monitor schemes and disaster management, improving response and transparency.
- **Kerala (K-SMART):** Centralizes citizen data to speed up service delivery and reduce bureaucratic delays**.**
- **Puducherry (UDH):** Validates beneficiaries across 24 departments and 150 central and state welfare schemes, removing duplicates.

E-PASSPORT

Context: The Government of India has introduced the ePassport, a biometric chip-enabled travel document, aligning with over 120 countries such as the US, Canada, France, Australia, and Japan to improve digital travel and border security.



What is an ePassport?

- ePassport is a modern, secure version of the traditional passport. It combines a physical booklet with an embedded Radio Frequency Identification (RFID) chip and antenna.
- It is developed under the Passport Seva Programme (PSP) 2.0, a collaboration of the Ministry of External Affairs (MEA) and Tata Consultancy Services (TCS).
- **The RFID chip** (identified by a small gold chip symbol on the front cover) **stores:**
  - **Personal details:** Name, Date of Birth, Passport Number, etc.
  - **Biometric data:** Facial features, fingerprints.
- **Software developed by:** IIT Kanpur and National Informatics Centre (NIC)
- ePassports will be introduced gradually, depending on the readiness of passport offices.
- ePassport meets International Civil Aviation Organization (ICAO) Document 9303 requirements, which includes multi-layered security.

About Passport Seva Programme (PSP) V2.0

- PSP V2.0 was implemented in May 2025 across 37 Passport Offices, 93 Passport Seva Kendras (PSKs), and 450 Post Office PSKs.
- Global Passport Seva Programme (GPSP) V2.0 was launched in October 2025 across Indian Embassies and Consulates worldwide.
- PSP V2.0 aims to create a digitally integrated service ecosystem through the following features:
  - AI-powered chat and voice bots to assist applicants
  - A redesigned web portal and mobile application
  - Auto-filled application forms
  - Simplified document upload processes
  - Online payment options using UPI and QR codes

OVERSEAS CITIZEN OF INDIA (OCI)

Context: Union Home Minister Amit Shah launched a redesigned Overseas Citizen of India (OCI) portal to simplify the registration process for overseas Indians.

About Overseas Citizen of India (OCI)

- Overseas Citizen of India (OCI) is a **form of permanent residency available to people of Indian origin**, allowing them to live and work in India indefinitely.

- Citizenship Act, 1955 as amended in 2005 (Section 7A) defines eligibility for registration as OCI, sets out rights, and restrictions of OCI cardholders.
- It grants multiple entry, lifelong visa-free visits, exemption from certain registrations, and parity with Non-Resident Indians (NRIs) in various economic, financial, and educational fields, except in agricultural property ownership.
- However, **OCI holders are not Indian citizens constitutionally** and cannot vote, hold public office, or hold government jobs.
- **OCI is not dual citizenship** but offers many privileges similar to those of Indian citizens.
- OCI holders can apply for Indian citizenship under Section 5(1)(g) of the Citizenship Act, 1955, after residing in India for one year out of five years of OCI registration.
- As of January 2015, PIO cards were merged and deemed as OCI cards.
- There are over 45 lakh registered OCI cardholders across 129 countries as of 2023.



Eligibility	Privileges	Restrictions
• Persons who were Indian citizens on or after January 26, 1950. • Persons who belonged to a territory that became part of India after August 15, 1947. • Children, grandchildren, or great-grandchildren of such persons. • Minor children of such persons. • Spouses of Indian citizens or OCI holders (married for at least two continuous years). • Ineligible if or if ancestors were citizens of Pakistan or Bangladesh. • Persons who served in foreign military are generally ineligible, except exceptions like Israeli citizens of Indian origin.	• Multiple entry, multi-purpose lifelong visa for India. • Exemption from registering with Foreigners Regional Registration Officer (FRRO) in India. • Parity with Indian citizens for domestic airfares and entry fees to national parks, monuments, and museums. • Parity with NRIs in most economic, financial, and educational fields (except agricultural land ownership). • Treated at par with NRIs for inter-country adoption of Indian children. • Can own residential and commercial properties.	• No right to vote or contest elections. • Cannot hold government jobs or public offices. • Cannot acquire agricultural or plantation properties (can inherit such properties). • Not eligible for certain permits like Inner Line Permit without special clearances. • OCI registration may be cancelled if a person is sentenced to 2 years or more in prison or charged with an offence punishable by 7 years or more. *(added in 2025)*

DHRUVA

Context: The Department of Posts (Ministry of Communications) has launched DHRUVA, a digital initiative to make address data a vital part of India's Digital Public Infrastructure (DPI).

What is DHRUVA: Digital Hub for Reference and Unique Virtual Address?

- DHRUVA **allows users to create, share, and manage their addresses securely using geo-coding.**
- It replaces confusing address formats with a simple digital system, much like barcodes for products. This standardization improves service delivery, saves time, and ensures privacy.

Key Layers of DHRUVA

1. DIGIPIN Layer

- **Meaning**: A 10-character alphanumeric code representing a precise 4x4 metre location (house, shop, etc.) across India.
- **Purpose**: Adds accuracy to the traditional 6-digit PIN, not replacing it.
- **Developed by:** Department of Posts, IIT Hyderabad, and ISRO–NRSC.
- **How it works:** Created from satellite geo-coordinates (latitude and longitude) and encoded into a 10-character format.

2. Digital Address Layer

- **Meaning**: Lets users create custom address labels (like name@domain) linked to their DIGIPIN.

- **Purpose**: Instead of typing full addresses, users can simply share their Digital Address — similar to a UPI ID for location

In Short:

- **DIGIPIN:** Exact digital location of a place (like GPS coordinates).
- **Digital Address:** Simple, shareable name for that location (like an email ID).

ZUDPI SCRUB LANDS AND DEFINITION OF FOREST

Context: After decades of litigation over 86,000 hectares of Zudpi lands in eastern Vidarbha, the SC ruled that these lands are "forest" under the Forest (Conservation) Act (FCA), 1980.

What Are Zudpi Lands?

- Zudpi (Marathi for "bushy" or "scrubby") refers to wastelands with sparse vegetation, mainly in six districts of eastern Vidarbha: Nagpur, Chandrapur, Gadchiroli, Bhandara, Wardha, and Gondia.

Various Definitions of Forest Lands in India	
Indian Forest Act, 1865	Defined forest as land covered with trees, brushwood, and jungle.
Forest Act, 1878	• Expanded the definition of forest to any land that could be designated as forest. • Categorized forests into State/Reserved Forests, Protected Forests, and Village Forests.
Forest Conservation Act, 1980	• Made central government approval mandatory for diverting forest land for non-forest use. • Applies mainly to forest tracts recognized by States.
T.N. Godavarman Case, 1996	Expanded the definition of forest to include: • All areas recorded as "forest" in any government record (Union or State), regardless of ownership or classification. • Areas conforming to the dictionary meaning of forest. • Areas identified as forest by expert committees appointed by States.
Forest Conservation (Amendment) Act, 2023	Defined forest land as: • Land declared or notified as forest under the Indian Forest Act, 1927 or other laws. • Land recorded in government records as forest on or after 1980. • Excludes land officially converted to non-forest use on or before 1996.

Key Provisions of Forest Conservation (Amendment) Act, 2023

- Renamed Van (Sanrakshan Evam Samvardhan) Adhiniyam to highlight forest conservation, afforestation, and reforestation.
- **Expands applicability to:**
  - Forests declared/notified under Indian Forest Act, 1927 or other laws.
  - Lands recorded as forest in government records on or after 25 October 1980.
  - Excludes lands converted from forest to non-forest use before 12 December 1996, narrowing scope compared to the Godavarman judgement.
- **The 2023 Amendment Act does not apply to certain types of land, such as:**
  - Small forest land near roads or railways used for village access or public amenities, limited to 0.10 hectare.
  - Trees and plantations on non-forest land, including afforestation outside forest areas.
  - Forest land for security and defence purposes, such as:
    - Strategic projects within 100 km of international borders or the Line of Control, or the Line of Actual Control.
    - Security infrastructure up to 10 hectares.
    - Defence, paramilitary, or public utility projects up to 5 hectares in Left Wing Extremism–affected areas.
- **Activities exempt from forest clearance**: silviculture, government zoos/safaris (outside protected areas), eco-tourism, wireless networks, fire lines, fencing, and check posts.
- The Central Government can set conditions for survey activities (exploration, seismic surveys) without treating them as forest diversion.

GYAN POST

Context: Department of Posts (DoP), under the Ministry of Communications, has launched 'Gyan Post'.

About Gyan Post

- It is a dedicated **postal service for the affordable delivery of educational, cultural, social, and religious books**.
- The initiative aims to promote access to educational and cultural materials across India.

Key Features:

- **Marking Requirement:** Outer packets must be clearly labeled "Gyan Post".
- **Tracking Facility:** Real-time tracking available through standard India Post systems.
- **Strict eligibility:** Only books without commercial ads or promotional content are accepted. Each item must bear the name of the printer or publisher. Periodicals like magazines will not be covered under the scheme.
- **Withdrawal/Recall Option:** Sender can recall or change the delivery address if the item has not been invoiced for delivery.
- **Public-Private Synergy:** Planned integration with the Open Network for Digital Commerce (ONDC) could enhance reach and efficiency.
- **Cost:** Ranges from ₹20 (up to 300 gms) to ₹100 (up to 5 kg), excluding taxes.

PRADHAN MANTRI GRAM SADAK YOJANA (PMGSY)

Context: The Ministry of Rural Development has asked states to attach QR codes on all maintenance information display boards for roads built under PMGSY.

About Pradhan Mantri Gram Sadak Yojana (PMGSY)

- Launched in 2000 under the MoRD, it aims to provide **all-weather road connectivity to unconnected rural habitations,** thereby enhancing access to markets, healthcare, and education.
- **Funding Pattern:** Initially a 100% Centrally Sponsored Scheme. From 2015–16, the funding ratio was revised to 60:40 between the Centre and States. For Northeastern and Himalayan States, the ratio is 90:10.
- The latest phase, **PMGSY–IV (launched in 2024),** aims to provide all-weather connectivity to 25,000 unconnected habitations (as per Census 2011).
- **Population criteria:** 500+ in plains, 250+ in North East, Hill States/UTs, and Special Category Areas (Tribal, Aspirational, Desert regions), 100+ in LWE-affected districts

NORTH EASTERN REGION DISTRICT SDG INDEX (2023-24)

Context: The NITI Aayog, in collaboration with the Ministry of Development of North Eastern Region (MoDoNER) and with support from the United Nations Development Programme (UNDP), has released the second edition of the North Eastern Region (NER) District SDG Index 2023–24.

About North Eastern Region District SDG Index (2023-24)

- The NER District SDG Index measures the progress of Sustainable Development Goals (SDGs) across districts in India's eight North Eastern States.
- The 2023–24 edition covers 121 out of 131 districts (around 92% of the region)
- The first edition of the Index was launched in 2021.
- Districts are categorized into four groups based on their composite SDG scores: Achievers (score of 100), Front Runners (65–99), Performers (50–64), and Aspirants (below 50).

Key Findings (2023–24 Edition)

- **Overall Range of Scores:** Lowest: 58.71 – Longding (Arunachal Pradesh); Highest: 81.43 – Hnahthial (Mizoram)
- **Category Distribution:** No district achieved "Achiever" status (Score = 100). No district fell into the "Aspirant" category (Score < 50).
- **Top-Performing Districts:** Hnahthial (Mizoram), Champhai (Mizoram), Gomati (Tripura), Mokokchung (Nagaland)

SWACHH BHARAT MISSION (SBM)

Context: President Murmu presented the Swachh Survekshan 2024–25 Awards at Vigyan Bhawan, New Delhi, in a ceremony organized by the Ministry of Housing and Urban Affairs (MoHUA). Ahmedabad, Bhopal and Lucknow emerged as top Swachh Shehar.

About Swachh Bharat Mission (SBM)

- SBM is a flagship campaign by the Government of India **launched on 2 October 2014** to eliminate open defecation, improve solid and liquid waste management, and **transform sanitation habits across rural and urban India.**
- **SBM has two components:** SBM Grameen and SBM Urban

Swachh Bharat Mission (Grameen)	Swachh Bharat Mission (Urban)
• The SBM-G was launched with the goal of making all rural areas in India Open Defecation Free (ODF) by October 2, 2019. • The mission focused on providing access to toilets for every rural household to improve sanitation and hygiene. **Funding Pattern** • **Normal States:** Centre–State share is 60:40. • **Northeastern States and Hill States and UT of Jammu & Kashmir:** 90:10 share. • **Other Union Territories:** 100% funded by the Central Government. **Phase I (2014–2019): Achieving ODF Status** • Sanitation coverage in rural India increased from 39% in 2014 to 100% in 2019. • Over 10 crore Individual Household Latrines (IHHLs) were constructed. • By October 2, 2019, all villages in India had declared themselves Open Defecation Free (ODF). **Phase II (2020–2025): Sustaining ODF Status and Moving to ODF Plus** • Phase II began on April 1, 2020, focusing on ODF sustainability and Solid and Liquid Waste Management (SLWM) • The goal is to convert ODF villages into ODF Plus (Model) villages by 2025–26. • Progress is classified into three categories: Aspiring, Rising, Model (final stage)	• SBM-U is the flagship initiative to eliminate open defecation and achieve scientific management of municipal solid waste across urban India. • As of 2025, SBM-U has become a multi-phase mission aimed at making cities not just clean but sustainably "Garbage Free." **Funding Pattern** • **Normal States:** Centre–State share is 25:75 for cities with populations over 10 lakh, 33:67 for cities with 1–10 lakh population, and 50:50 for cities below 1 lakh population. • **Northeastern & Hill States, Union Territory of J&K:** 90:10 share. • **Other Union Territories**: 100% funded by the Central Government. **Phase I (2014–2019): Achieving ODF and Basic Urban Sanitation** • **Goal:** Make all urban areas Open Defecation Free (ODF) and ensure 100% door-to-door municipal solid waste collection. • **Achievements:** India was declared ODF in urban areas by October 2019. • Over 65 lakh individual household toilets and 6.3 lakh community/public toilets were constructed. **Phase II/Urban 2.0 (2021–2026): ODF Plus and Garbage-Free Cities** • **Focus:** Sustain ODF status and move to "ODF Plus" and "ODF++" levels, eliminate hazardous entry into sewers, and achieve 100% scientific waste processing. • **New Targets:** ○ **Solid Waste Management (SWM):** Achieve 100% segregation of waste at source, 100% door-to-door collection, and 100% scientific processing of municipal solid waste. ○ **ODF Plus/ODF++:** Ensure safe sanitation infrastructure and proper management of faecal sludge in all urban areas. Address used water management, particularly in small cities not covered under AMRUT. ○ **Garbage-Free Cities:** All cities to achieve at least 3-star garbage-free status by 2026.

ODF, ODF+ and ODF++ Criteria		
ODF (Open Defecation Free)	A village, town, or city where no one defecates in the open, and toilets are available and used by all households and institutions.	• No visible feces in the environment. • All households and institutions use safe toilet technology (no contamination of water sources). • Consistent use of toilets by all members.

ODF+ (Open Defecation Free Plus)	Area sustains ODF status and ensures proper management of solid and liquid waste.	• Sustained ODF status. • All households/public places have functional toilets. • Visible cleanliness in public spaces. • Basic solid and liquid waste systems in place. • Community self-declaration with third-party verification for Model villages.
ODF++ (Open Defecation Free Plus Plus)	Focuses on safe management and treatment of faecal sludge and sewage, mainly in urban areas.	• Meets all ODF+ standards. • No discharge of untreated sludge/septage into the environment. • Complete faecal sludge and sewage treatment systems are functional. • Ensures scientific processing and no health/environmental hazards.

R E C L A I M FRAMEWORK

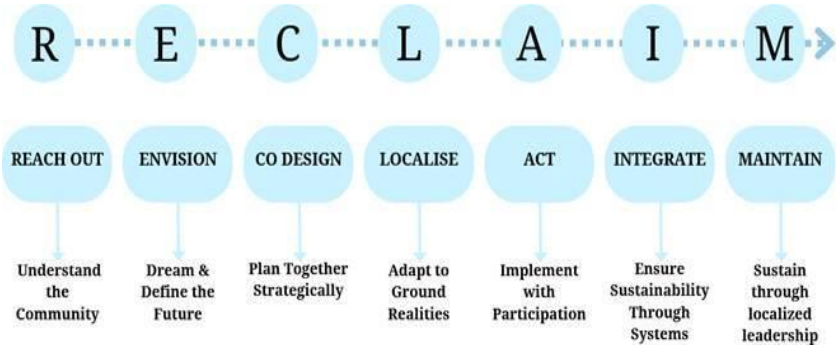
Context: The Ministry of Coal launched the RECLAIM Framework.

RECLAIM Framework

- It is a **community engagement and development initiative to guide the sustainable closure of coal mines in India.**
- **Objective:** To address the social and environmental challenges that arise from coal mine closures and to ensure a just and sustainable transition for communities that have long depended on mining for their livelihoods and development.
- **Developed By:** The Coal Controller Organization, in collaboration with the Heartfulness Institute — a non-profit, volunteer-based educational organization focused on meditation and holistic well-being.

About Coal Controller Organization (CCO)

- The CCO is a subordinate office under the Ministry of Coal, Government of India.
- It serves as the statutory authority for regulating coal production, quality, and distribution across the country.
- **Headquarters**: Kolkata
- **Functions and Responsibilities**
  - **Data Collection:** Collects monthly coal production data from all public and private sector coal mines.
  - **Quality Control:** Inspects collieries to verify coal grade, class, and size. Ensures quality surveillance during loading and dispatch.
  - **Regulation and Dispute Resolution:** Issues directives and resolves disputes related to coal grading and classification.
  - **Production Oversight:** Regulates coal stock disposal and monitors expected output from mines.
  - **Mine Operations:** Grants permissions for opening or reopening of mines and coal seams.
  - **Revenue Collection:** Assesses and collects excise duty on raw coal.
  - **Data Sharing:** Shares verified coal production and quality data with national and international agencies.



MERI PANCHAYAT APP

Context: The "Meri Panchayat" mobile app has been honoured with the World Summit on the Information Society (WSIS) Prizes 2025 – Champion Award in Geneva, Switzerland, for promoting cultural and linguistic diversity through local digital content.

About Meri Panchayat App	
Launched	August 2023

Developed by	Ministry of Panchayati Raj and the National Informatics Centre (NIC) under the Ministry of Electronics & IT (MeitY)
Part of	Government's Digital Governance initiative under the e-Panchayat Mission Mode Project
Aim	To digitally empower 2.65 lakh Gram Panchayats, 25+ lakh elected representatives, and 950 million rural citizens across India
Key Objectives	• Promote transparency, accountability, and citizen participation in local governance • Provide real-time access to Panchayat-level data and services • Strengthen participatory democracy and digital inclusion in rural India
Key Features	• Real-time Panchayat budgets, receipts, payments and development plans • Details of elected representatives and functionaries • Information on public infrastructure and civic services in their Panchayat • Gram Panchayat Development Plans (GPDPs) and track project proposals • Weather forecasting at Gram Panchayat level • Social audit tools, fund utilization data, and grievance redressal with geo-tagged and geo-fenced features • Multilingual interface supporting 12+ Indian languages to ensure inclusiveness

ENFORCEMENT CASE INFORMATION REPORT (ECIR)

Context: The Enforcement Directorate (ED) has filed an Enforcement Case Information Report (ECIR) against 29 celebrities, influencers, and YouTubers for promoting illegal betting platforms.

What is an ECIR?

- An ECIR is an **internal document prepared by the ED when it begins an investigation under the PMLA, 2002, based on a predicate (scheduled) offence.**
- The ED enforces both PMLA (2002) and the Foreign Exchange Management Act (FEMA, 1999) to combat economic crimes.

Key Characteristics

- Marks the beginning of an ED investigation into suspected money laundering.
- Not defined in the PMLA or its Rules — hence, a non-statutory document.
- Comparable to an FIR in function but not legally equivalent

Feature	ECIR	FIR
Statutory Basis	Not mentioned in PMLA	Section 173 of BNSS
Copy to Accused	Not mandatory	Must be given to accused
Purpose	Internal ED record to initiate PMLA proceedings	Police complaint on a cognizable offence
Disclosure Obligation	No legal duty to share with accused	Mandatory disclosure

- Once an ECIR is filed, the ED may: Attach properties identified as proceeds of crime; Conduct searches and seizures; Arrest individuals under Section 19 of the PMLA.
- However, the **ED is not legally required to share the ECIR with the accused.**

Judicial Precedents

- **Vijay Madanlal Choudhary v. Union of India (2022):** The Supreme Court held that the ECIR need not be furnished to the accused and is not equivalent to an FIR, as ED officers are not police officers.
- **Pankaj Bansal v. Union of India (2023):** The Court ruled that written grounds of arrest and a copy of the ECIR (with sensitive details redacted) must be provided to the accused.
- **Ram Kishore Arora v. ED (2023):** Declared the Pankaj Bansal judgment per incuriam (lacking due consideration), reaffirming Vijay Madanlal as the binding precedent.

BAIL

Context: The US President Trump signed an executive order cutting federal funds to jurisdictions that allow cashless bail. The move has sparked discussions on bail reforms in India.

Meaning of Bail

- Bail allows an accused person to stay outside jail during trial by promising to appear in court whenever required. Usually, the person must deposit a certain amount of money as a guarantee.
- Chapter 35 of the Bhartiya Nagarik Suraksha Sanhita (BNSS), 2023 lays down the bail process.

Bail Bond

- A bail bond is a **security guarantee** that ensures an accused person appears before the court for all hearings. If they violate bail conditions, they may lose the bond amount or have their bail cancelled. Courts verify the surety's financial capacity and personal reliability.
- Bail bonds are mainly of two types:
  - **Cash Bail**, where a cash amount is deposited with the court as security and is refunded if all conditions are followed
  - **Surety Bond**, where a surety bond is given instead of cash. A surety is a responsible person who guarantees the accused will follow bail conditions and attend court. If the accused absconds, the surety must pay the bail amount and their assets may be attached.

Personal Recognisance (PR) Bond

- Under a PR bond, a person is released without paying money upfront. They are given a short time to arrange the required amount later, making bail more accessible.

Types of Bail in India

Bail Type	Description
Regular Bail	Governed by Sections 480 and 483 of the BNSS, this bail is granted when a person under arrest is released on bail after furnishing a bond, usually **applicable in bailable and some non-bailable offenses.**
Anticipatory Bail	Provided under Section 482 of the BNSS , this bail allows an individual to seek bail in **anticipation of an arrest for a non-bailable offense.**
Interim Bail	Exercised under the court's inherent powers as per Section 528 of the BNSS, this is temporary bail granted pending final orders on a bail application.
Bail on Personal Bond	Under Section 478 of the BNSS, this type of bail applies mainly to **bailable offenses** where the accused may be released on personal bond **without sureties.**
Statutory (Default) Bail	Under Section 187(2) of BNSS, if the **police fail to complete the investigation** within a prescribed time, the accused is entitled to default bail.

SABHASAAR AI TOOL

Context: The Ministry of Panchayati Raj (MoPR) has launched SabhaSaar, an AI-powered tool designed to simplify and standardize the documentation of Panchayat meetings.

What is SabhaSaar?

- SabhaSaar is an **Artificial Intelligence-based meeting summarization system that uses Natural Language Processing (NLP)** to automatically **generate structured Minutes of Meetings (MoM)** from audio and video recordings of Gram Sabha and Panchayat meetings.
- The tool was initially rolled out in Tripura on 15 August 2025 and has since been extended to all states

How It Works

- **Upload Media:** Panchayat officials upload meeting audio or video files (MP4, WAV, MP3, MPEG4) through their e-GramSwaraj login.
- **AI Processing:** Converts speech to text. Translates content using *Bhashini* and Identifies key decisions, issues, and action points through contextual analysis.
- **MoM Generation:** Produces structured and uniform Minutes of Meetings in multiple formats.

Bhashini

- **BHASHa INterface for India (Bhashini)** is an AI-based multilingual translation platform launched in 2022 under the National Language Translation Mission.
- Bhashini provides a digital platform with over 300 pre-trained AI models that support translation, automatic speech recognition, text-to-speech, optical character recognition, for 20+ languages.

WAQF ACT

Context: The Supreme Court (SC) refused to stay the entire Waqf (Amendment) Act, 2025, but it did put a hold on certain key provisions that appeared prima facie arbitrary.

What is a Waqf?

- A Waqf is a permanent donation of property (such as land, buildings, or even movable assets) for purposes recognised as religious, charitable, or socially useful under Islamic traditions.
- The idea is that the property is dedicated "in the name of God," and whatever income it generates should help people in need.
- In India, many Waqf properties support community services like schools, graveyards, mosques and accommodation for the poor.
- All Waqf institutions in the country are governed by the Waqf Act, 1995.

How a Waqf is Created and Managed?

- A property is first identified and recorded as Waqf through a survey conducted by the Survey Commissioner, who inspects the land, gathers local information, and verifies official documents.
- Once declared, the Waqf is managed by a mutawalli, who works like a caretaker or manager.
- Waqfs differ from ordinary trusts under the Indian Trusts Act, 1882. Trusts may cover many purposes and can be dissolved, but Waqfs are meant to be permanent and are tied strictly to religious or charitable uses.
- Waqfs can be:
  - **Public** – serving larger community needs, or
  - **Private** – supporting the descendants of the person who created the Waqf.
- A Waqf can be set up only by someone who is mentally sound and legally owns the property. Interestingly, the person creating the Waqf (called the Waqif) does not necessarily have to be a Muslim, as long as they follow Islamic beliefs while making the endowment.

Role of Waqf Boards

- A Waqf Board is a state-level statutory body that can own and manage property. It also has the authority to go to court or be taken to court.
- The board supervises Waqf properties, tries to recover any land that has been encroached upon, and approves the transfer of immovable Waqf assets (such as through sale, gift, mortgage, exchange, or lease) only when two-thirds of its members agree.
- At the national level, the Central Waqf Council (CWC), created in 1964, guides and advises all state Waqf Boards.

Waqf Properties in India

- Waqf Boards are among the largest public landholders in the country, after the Indian Railways and the Ministry of Defence.
- India has 8,72,292 registered Waqf properties, covering nearly 8 lakh acres. These collectively generate around ₹200 crore in annual income.
- Once a property becomes Waqf, it cannot be sold off like ordinary land. It is considered permanently dedicated to God, and its use must continue to serve charitable or religious purposes.

VISAKHAPATNAM DECLARATION ON E-GOVERNANCE

Context: The Visakhapatnam Declaration was adopted at the 28th National Conference on e-Governance (NCeG) in Visakhapatnam.

About 28th National Conference on e-Governance (NCeG)

- 28th NCeG was was co-hosted by the Department of Administrative Reforms and Public Grievances (DARPG), the Ministry of Electronics and IT (MeitY), and the Government of Andhra Pradesh, concluded in Visakhapatnam
- The National Conference on e-Governance has been organized every year in partnership with one State Government since 1997.

Some Core Elements of the Declaration

- **Whole-of-Government Digital Approach:** Strengthen civil services with digital skills, agile processes, and data-driven decision-making across ministries and departments.

- **Citizen-Centric and Inclusive Governance:** Ensure that digital services are transparent, accessible, multilingual, and equitable—reaching remote regions, including the North-East and Ladakh.
- **Ethical and Responsible Use of Emerging Technologies:** Promote AI, ML, Blockchain, GIS, IoT, and analytics for governance while ensuring ethical, transparent, and secure adoption.
- **Replication of Successful Digital Models:** Scale up proven initiatives such as: SAMPADA 2.0 (MP), eKhata (Bengaluru), Rohini Gram Panchayat (Maharashtra), NHAI's Drone Analytics Monitoring System

GEOTAGGING BUILDINGS IN CENSUS

Context: India's 2027 Census will introduce digital enumeration, self-enumeration, and caste counting after 1931 and the geotagging of all buildings.

About Geotagging

- Geotagging refers to **marking a building's exact latitude–longitude coordinates** on a Geographic Information System (GIS) map.
- During the Houselisting Operations (first phase of Census 2027), enumerators will visit each building in their assigned Houselisting Block and use a mobile app with GPS/location services to geotag it.
- Digital Layout Mapping (DLM) will automatically generate layout maps from these geotagged points, replacing earlier hand-drawn sketch maps.

ADI SANSKRITI AND ADI KARMYOGI

Context: The Ministry of Tribal Affairs has launched the Beta Version of Adi Sanskriti during the National Conference on Adi Karmayogi Abhiyan in New Delhi.

What is the Adi Sanskriti Platform?

- Adi Sanskriti is designed to become the **world's first Digital Tribal University** and an **online marketplace where global users can access products created by tribal artisans.**
- The platform aims to preserve and promote tribal culture, traditional knowledge, and artistic practices, while also helping create sustainable livelihoods through digital outreach.

Key Components of the Adi Sanskriti Platform

- **Adi Vishwavidyalaya (Digital Tribal Art Academy):** Offers 45 online courses on tribal dance, painting, crafts, music, and folklore.
- **Adi Sampada (Socio-Cultural Repository):** A collection of over 5,000 curated documents covering tribal paintings, dance traditions, textiles, artefacts, and livelihood practices.
- **Adi Haat (Online Marketplace):** Connected with TRIFED, and gradually developing into a global e-marketplace for tribal products.

About Adi Karmyogi Programme

- The Ministry of Tribal Affairs launched the Adi Karmyogi Programme envisaged as the world's largest tribal grassroots leadership programme, **aimed at empowering tribal communities, strengthening responsive governance, and creating local leadership opportunities across the country.**

Objectives

- Strengthen people-centric and responsive governance in tribal regions.
- Conduct multi-departmental Governance Labs at state, district, block, and village levels to build capacity and improve coordination.
- Co-create the "1 Lakh Tribal Villages – Vision 2030", involving detailed development plans and investment strategies.
- Build a network of 20 lakh change leaders across 550 districts in 30 States/UTs.

Key Outcomes

- **Adi Sewa Kendra:** Single-window centres in tribal villages where officers and community members give 1–2 hours fortnightly (Adi Sewa Samay) to address issues and mentor youth.
- **Governance Lab Workshops:** Collaborative process labs for co-creating tribal development solutions.
- **Tribal Village Action Plan:** Jointly prepared Village Vision 2030 aligned with national and global development goals.
- **Saturation of schemes:** Ensuring complete coverage of key government services in tribal regions.
- **Community Participation**

- **Adi Sahyogi:** Teachers, doctors, and professionals mentoring communities.
- **Adi Saathi:** SHGs, NRLM members, youth, elders, and local leaders supporting implementation.
- **Leadership Training:** Capacity building for tribal youth, women, and community leaders in governance and social mobilisation.

Participation & Outreach

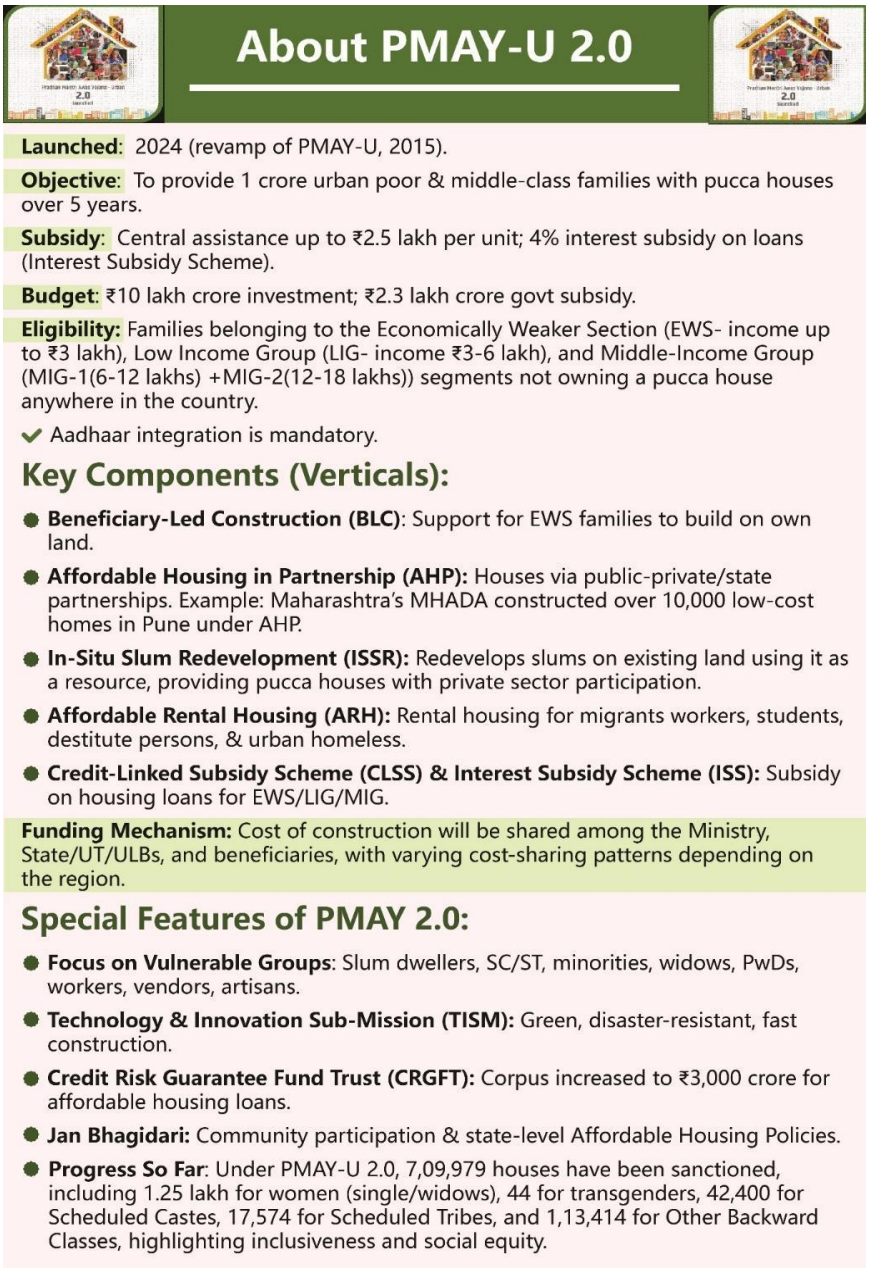
- Reaching 1 lakh+ tribal villages and mobilising 20 lakh change leaders across 50 districts and 30 States/UTs, the Abhiyan builds on initiatives like: Dharti Aaba Janjatiya Gram Utkarsh Abhiyan, PM JANMAN, National Sickle Cell Anaemia Elimination Mission`

ANGIKAAR 2025

Context: The Minister of Housing and Urban Affairs (MoHUA) has launched Angikaar 2025.

What is Angikaar 2025?

- Angikaar 2025 aims to **boost the implementation of PMAY-U 2.0** by creating widespread **awareness** about the scheme, along with **fast-tracking the verification** of applications under the scheme and **facilitating the completion of already sanctioned houses** under PMAY-U.
- It will be conducted across 5,000+ Urban Local Bodies (ULBs) from 4 September to 31 October 2025, in two phases:
- A **National Level Monitoring Committee will be set up, chaired by the Joint Secretary & Mission Director (Housing for All, MoHUA)**, with representatives from the Ministry of New & Renewable Energy (MNRE) and the Department of Financial Services, Ministry of Finance.
- District Coordination Committees will oversee execution, run awareness drives, and monitor **PM Awas Mela – Shehri.**
- An **Online Monitoring Module for Angikaar 2025** has been added to the PMAY-U 2.0 portal for uploading progress reports, photographs, videos, and beneficiary stories.



FOREIGN CONTRIBUTION (REGULATION) ACT (FCRA)

Context: The Union Home Ministry has cancelled the Foreign Contribution (Regulation) Act (FCRA) registration of Sonam Wangchuk's organisation.

What is Foreign Contribution (Regulation) Act (FCRA)?

- The FCRA is a law that **regulates how individuals, associations, and NGOs in India receive and use funds from foreign sources.** Its objective is to ensure that such funds are not misused and do not adversely affect national interests such as sovereignty, integrity, security, or democratic processes.
- **Originally enacted in 1976** and substantially **revised in 2010**, the Act establishes registration requirements and spending restrictions for Indian nonprofit organizations receiving foreign donations.
- "Foreign contribution" refers to any donation, transfer of currency, security, or article received from a foreign source.

Key Provisions (Foreign Contribution Regulation Amendment Act, 2020)

- **Registration Requirement:** Any NGO or individual must be registered under the FCRA to receive foreign funds.
- **Designated Bank Account:** All foreign contributions must be received only in a **single FCRA account at the State Bank of India, New Delhi.**
- **Utilization of Funds:** Money received from abroad can be used only for the purpose for which it was approved.
- **Annual Returns:** Every registered entity must file annual statements showing the receipts and use of foreign funds.
- **Prohibited Recipients:** Certain individuals and groups cannot receive foreign contributions. These include election candidates, legislators, political parties, judges, government servants, journalists, media houses, and organisations of a political nature.
- **No Transfer Rule:** Registered organisations cannot transfer foreign funds to any other person or NGO. (Earlier, transfer was allowed with prior approval.)
- **Administrative Expenses Cap:** Administrative spending has been reduced from 50% to 20% of received foreign funds. Administrative costs include salaries, travel, and office expenses; the rest must be spent on core activities.
- **Mandatory Identification:** Key office bearers must provide Aadhaar, Passport, or OCI card details when applying for registration.

2022 Rule Changes (Updates to FCRA 2020)

The amendments primarily aim to relax compliance provisions by extending reporting timelines and modifying procedural requirements.

- **Foreign Funds from Relatives Abroad:** Earlier, individuals had to inform the government if they received more than ₹1 lakh from relatives overseas. In 2022, this limit was raised to **₹10 lakh.**
- **Compoundable Offences:** The number of violations that can be settled by paying a penalty (instead of facing prosecution) increased from 7 to 12.
- **Electronic Filing for Revision of Orders:** Applications for revision of orders must now be submitted electronically in the prescribed form, instead of on plain paper.
- **Intimation of Bank Accounts**: The timelines for informing authorities about bank account details were relaxed to give NGOs more flexibility.
- **Prohibited Persons:** Politicians, judges, government servants, journalists, media houses, etc., earlier faced prosecution for receiving foreign funds even from relatives. Under the 2022 rules, no prosecution occurs if the money comes from relatives. If they fail to inform within 90 days, only a penalty of 5% of the amount or ₹1 lakh (whichever is higher) applies.

INTEGRATED SOHRA CIRCUIT DEVELOPMENT

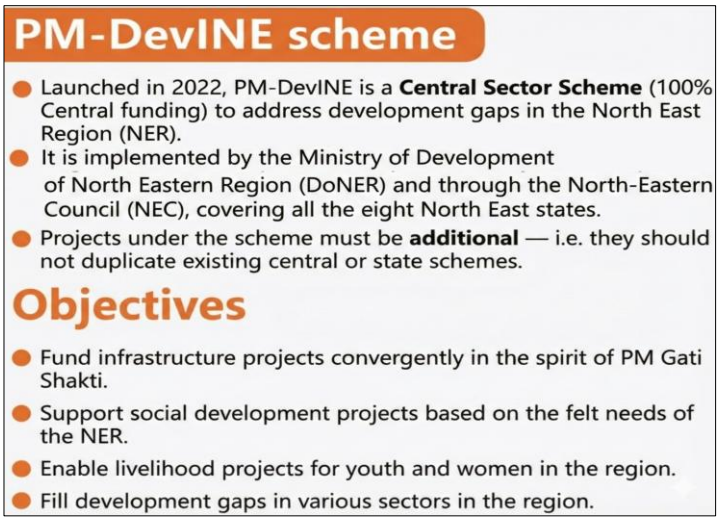
Context: The Ministry of Development of North Eastern Region (MDoNER) has laid the foundation stone for the Integrated Sohra Circuit Development under the **Prime Minister's Development Initiative for North Eastern Region (PM-DevINE) scheme.**

About Sohra (Cherrapunji), Meghalaya

- Sohra is a **major tourist hub**, famous for its waterfalls like Nohkalikai, Kynrem, and the Seven Sisters Falls, as well as its unique living root bridges created by the Khasi people over centuries. It is renowned for its exceptionally high rainfall.
- It is the traditional capital of the Khasi tribal kingdom. It is also a gateway to caves, viewpoints, and other natural wonders, making it a popular eco-tourism destination.

About Integrated Sohra Circuit Development

- Conceptualized jointly by **MDoNER and the Government of Meghalaya**, the circuit seeks to transform **Sohra** into a **multi-day experiential tourism destination** anchored in sustainability and local livelihoods.
- The **Sohra Experience Centre will function as the cultural nucleus of the circuit**, highlighting Meghalaya's rich and diverse tribal heritage.
- Key tourist sites being upgraded are Nohkalikai Falls, Mawsmai Eco Park, Arwah and Mawsmai Caves, Nohsngithiang Falls, Wah Kaba Falls, Shella Riverside, and Wah Kaliar Canyon viewpoint.



VB GRAM G REPLACES MGNREGA

Context: Viksit Bharat–Guarantee for Rozgar and Ajeevika Mission (Gramin) (VB-G RAM G) Act, 2025 has been passed to replace the Mahatma Gandhi National Rural Employment Guarantee Act, 2005 (MGNREGA).

Theme	MGNREGA	VB-G RAM G Act
Guaranteed Days of Employment	Minimum 100 days per rural household	Increased to 125 days
Unemployment Allowance	Payable if work not given within 15 days	Payable if work not given within 15 days
Nature of Scheme	**Central Sector Scheme**, with defined cost-sharing for components	**Centrally sponsored scheme**; States must notify scheme within 6 months
Fund-Sharing Pattern	• **Centre**: full unskilled wages + up to 75% material cost; • **State**: 25% material + admin + unemployment allowance	• **Uniform sharing**= 60:40 (Centre:State), 90:10 for NE & Himalayan states • Wages, materials, admin shared in same ratios
Expenditure Beyond Normative Allocation	No explicit provision	States must bear costs exceeding central allocation
Pause During Agricultural Season	No such provision	States must declare up to 60-day pause during peak sowing/harvesting
Role of Gram Panchayats (GPs)	Identify works and implement projects	Continue role GPs, who must prepare plans in four focus areas: Water security, Rural infrastructure, Livelihood infrastructure, Extreme weather mitigation
Planning Integration	Local planning focus	Plans aggregated at state & national level
Implementation and monitoring	Councils at the central and state levels to undertake implementation and monitoring.	• National Level Steering Committee which will provide high-level oversight, and recommend normative allocations. • State Steering Committee with functions such as overseeing convergence with other programmes, aggregation of district plans into state plans, and coordinating with the National Committee.

NATIONAL FORENSIC INFRASTRUCTURE ENHANCEMENT SCHEME (NFIES)

- NFIES is a central scheme approved in 2024, with a total financial outlay of ₹2,254.43 crore, to be implemented from the financial year 2024–25 to 2028–29.
- **Funding**: Provided by the Ministry of Home Affairs (MHA).

- **Aim:** To help create a sound forensic laboratory infrastructure and prepare world class trained forensic professionals in the country, which will contribute to an efficient and effective criminal justice system based on timely and scientific forensic examination of evidence.

Key Components of the Scheme:

- **Expansion of NFSU (National Forensic Sciences University):** Establishment of 9 new campuses across India, along with the upgradation of the existing NFSU Delhi campus, with the objective of producing trained forensic manpower.
- **Establishment of New CFSLs (Central Forensic Science Laboratories):** Approval of 7 new CFSLs under NFIES. In addition, 8 CFSLs approved earlier (2023–24) aim to reduce case pendency and improve access to forensic services.

NATIONAL FILM HERITAGE MISSION (NFHM)

Context: The Ministry of Information and Broadcasting (MIB) informed the Lok Sabha that 1,469 film titles have been digitized so far under the National Film Heritage Mission (NFHM).

About National Film Heritage Mission (NFHM)

- **Launched**: 2015
- **Ministry**: Ministry of Information and Broadcasting
- **Implemented by:** National Film Development Corporation–National Film Archive of India (NFDC–NFAI)
- **Objective**: To preserve, restore, and digitise India's cinematic heritage that is threatened by physical decay.

Key Components:

- Assessment of the physical condition of film reels.
- 2K/4K restoration of picture and sound.
- Digitisation and creation of secure archival vaults.
- Training, capacity building, and IT-based archiving.

About National Film Development Corporation–National Film Archive of India (NFDC–NFAI)

- Headquartered in Pune, the NFDC–NFAI is the national custodian of India's cinematic heritage, housing over 30,000 film titles.
- It collects, preserves, restores, and digitises films using modern archival facilities under the NFHM. It also functions as a centre for film research, education, and public access.

SAHYOG PORTAL

Context: Over 2,300 blocking orders were issued to 19 online platforms including WhatsApp, Facebook, via the Union Home Ministry's Sahyog portal between October 2024 and October 2025.

What is the Sahyog Portal?

- SAHYOG is a **centralized digital platform** launched in 2024 **by the Ministry of Home Affairs** to **speed up the issuance of notices for blocking or removing unlawful online content.**
- These actions are carried out under **Section 79(3)(b) of the Information Technology Act, 2000,** which deals with the responsibilities of online platforms.
- The portal is **maintained by the Indian Cyber Crime Coordination Centre (I4C).**

How It Works?

- **Flagging**: Authorized agencies (Centre, State Police, LEAs) flag objectionable content.
- **Notice Issuance:** Directly to **IT intermediaries/social media platforms**, or routed via **Department of Telecommunications (DoT)** for action by **ISPs**.
- **Action & Reporting**: Platforms take action and update status on a **national dashboard**; intermediaries may seek additional information if required.

SUJALAM BHARAT APP

Context: The Union Ministry of Jal Shakti has launched the Sujalam Bharat App.

About Sujalam Bharat App

- It is a **national digital platform** launched under the **Jal Jeevan Mission (JJM).** It uses **real-time, location-based (geo-referenced) data** to strengthen rural drinking water governance.
- The platform **helps officials and communities clearly see where water comes from, how it is supplied, and how well systems are functioning.**

- It is developed by the **Department of Drinking Water and Sanitation (DDWS).** Technical support provided by the **Bhaskaracharya National Institute for Space Applications and Geo-informatics (BISAG-N).**
- **It is implemented across all States and Union Territories.**

Core Objectives

- Improve transparency and accountability in rural water supply.
- Strengthen community ownership, so villages can oversee their own water systems.
- Enable data-based planning, monitoring, and maintenance of water infrastructure.

Key Features

- **Sujalam Bharat Database:** Brings together information on water sources, infrastructure, supply performance, water quality, maintenance records, and community feedback.
- **Sujal Gaon ID:** A unique digital identity for every village and water scheme, clearly showing which scheme supplies water to which households.
- **Advanced Geo-referencing:** Uses GIS-based mapping of rural water assets, integrated with PM Gati Shakti GIS, for better infrastructure coordination.
- **Real-time Monitoring:** Helps States and districts manage daily operations and maintenance in a structured digital manner.

MISCELLANEOUS

INDIA'S LINGUISTIC LANDSCAPE

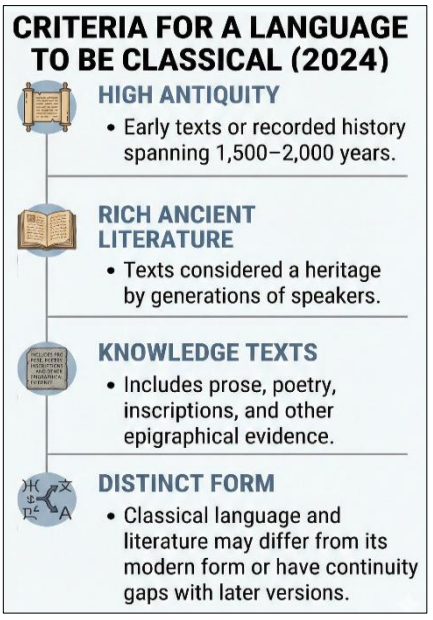
Context: J&K LG Manoj Sinha said that India's rich linguistic landscape is a source of strength.

Language in Constitution of India	
Eighth Schedule	• The Constitution includes **22 officially recognized languages:** Assamese, Bengali, Bodo, Dogri, Gujarati, Hindi, Kannada, Kashmiri, Konkani, Maithili, Malayalam, Manipuri, Marathi, Nepali, Odia (formerly Oriya), Punjabi, Sanskrit, Santali, Sindhi, Tamil, Telugu, and Urdu. • **Initially, however, the schedule included 14 languages.** Sindhi was added through the 21st Amendment Act of 1967; Konkani, Manipuri, and Nepali were added by the 71st Amendment Act of 1992; and Bodo, Dogri, Maithili, and Santhali were included through the 92nd Amendment Act of 2003. • The Constituent Assembly did not lay down any formal criteria for the inclusion of languages in the Eighth Schedule. • These languages are entitled to representation on the Official Languages Commission and receive government measures for development.
Official Language of the Union	• The Official language is Hindi in Devanagari script as per Article 343. • English, initially used for 15 years after the Constitution came into effect, continues to be used for official purposes as authorized by the President and Parliament (Official Languages Act, 1963)
Official Language of States	• It allows each state to choose one or more languages for official purposes. • The state can adopt any language already in use or Hindi, as long as it complies with Articles 346 and 347.
Education in Mother-Tongue (Article 350A)	• Children belonging to linguistic minority groups have the right to receive primary education in their mother tongue. • The President can direct states to ensure such facilities are provided.
Special Officer for Linguistic Minorities	• Article 350B provides for a Special Officer to monitor safeguards for linguistic minorities, report to the President, and ensure these reports reach Parliament and state governments.
Promotion of Hindi (Article 351)	• The Union government is tasked with promoting Hindi so that it can serve as a medium for expressing India's diverse culture. This must be done without affecting the uniqueness, style, or expression of other languages.

Language to be used in Parliament (Article 120)	• Parliamentary proceedings in India are primarily conducted in Hindi and English. • However, the Speaker of the Lok Sabha or the Chairman of the Rajya Sabha can permit a member to address the House in their mother tongue.
Language to be used in Higher Judiciary (Article 348)	• By default, all proceedings in the Supreme Court and in every High Court are conducted in English, unless Parliament decides otherwise by law. • However, a state Governor may, with prior approval from the President, allow the use of Hindi or any other official language in High Court proceedings.

Classical Languages of India

- A classical language in India is a language that **represents the country's ancient cultural and literary heritage.** These languages are considered **custodians of history, literature, and traditions**, preserving the achievements of past generations.
- The classical language status was introduced in 2004. **A Linguistic Experts Committee (LEC)** examines languages based on strict criteria before granting this status.
- So far, the languages given classical status include: **Tamil (2004), Sanskrit (2005), Kannada (2008), Telugu (2008), Malayalam (2013), Odia (2014)**
- In 2024, the LEC revised the criteria and recommended **Marathi, Pali, Prakrit, Assamese, and Bengali for classical status,** taking total classical languages to 11. Interestingly, Pali and Prakrit are classical but not included in the Eighth Schedule of the Constitution.



Benefits of Classical Language Status:

- **Financial assistance:** Promotes research, academic exploration, and preservation of the language.
- **Documentation and conservation:** Encourages digitisation and preservation of manuscripts and ancient texts for future generations.
- **Enhanced cultural identity:** Strengthens pride in the language and its contribution to national and global culture.
- **Employment opportunities:** Creates jobs in archiving, translation, publishing, digital media, tourism, and event management.
- **Study centres:** Universities receive funding to establish dedicated centres for research and teaching, e.g., the Central Institute of Classical Tamil

'SUPPORT TO POOR PRISONERS' SCHEME

Context: The Ministry of Home Affairs (MHA) has expressed concern over States and UTs not utilising funds under the Support to Poor Prisoners' Scheme.

About the Scheme

- Launched in May 2023, this Central Government initiative seeks to help economically disadvantaged prisoners who remain in jail because they cannot: Furnish bail bonds or sureties; Pay fines imposed after conviction.

Key Features

- **100% Centrally Funded**: ₹20 crore allocated annually for FY 2023–24, 2024–25, and 2025–26.
- **Implementing Agency**: National Crime Records Bureau (NCRB) acts as the Central Nodal Agency.
- **Eligibility**: Undertrials or convicts unable to pay bail/fines. Excludes those charged under strict laws such as PCA, PMLA, NDPS, and UAPA.

Objective of the Scheme

To secure the release of poor prisoners by:

- Paying bail amounts (up to ₹40,000 for undertrials).
- Paying fines (up to ₹25,000 for convicts).
- Providing legal aid and easing prison overcrowding.

APNA GHAR INITIATIVE

Context: In line with the Government's vision to improve truckers' safety and well-being, the Ministry of Petroleum and Natural Gas has launched the 'Apna Ghar' initiative.

What is the Apna Ghar Initiative?

- It is a welfare programme **implemented by Public Sector Oil Marketing Companies (OMCs) to provide safe and hygienic resting facilities for truck drivers at fuel retail outlets along national highways.**
- As of July 2025, 368 Apna Ghar centres with 4,611 beds and other essential facilities have been established across highways in the country.

REFUGEES

Context: The SC will soon decide whether the Rohingya living in India should be recognised as refugees entitled to basic rights and protection, or as illegal entrants who can be deported.

What is a Refugee?

According to the United Nations (UN), a refugee is a person who is forced to leave their country because of a well-founded fear of persecution based on their identity, beliefs, or background.

International Refugee Law

- The 1951 UN Refugee Convention (ratified by 149 countries) requires states to protect refugees and provide minimum humanitarian support.
- **India is not a signatory to the 1951 Convention or its 1967 Protocol.**

Status of Refugees in India

- **Refugee Presence:** India hosts over 2,09,000 refugees from Sri Lanka, Tibet, Myanmar, and Afghanistan (NHRC, 2024).
- **Legal Position:** India has no national refugee law. Refugees are legally treated the same as other foreign nationals. Their treatment depends on government policy rather than a uniform legal framework.

Major Refugee Groups in India

- **Tibetans (since 1959):** Allowed to form a government-in-exile in Dharamshala and receive official support.
- **Sri Lankan Tamils**: Around 58,600 refugees living in 104 camps across 26 districts in Tamil Nadu.
- **Rohingya, Chin (Myanmar):** About 30,000 Rohingya and Chin
- **Afghans:** About 14,500 Afghans. Most hold only UNHCR refugee certificates, not Indian government-issued documents.

How Indian Law Treats Refugees

1. Immigration and Foreigners Act, 2025

- This Act replaced four older laws to modernize India's immigration framework. It introduces **structured categories of foreigners, including refugees and asylum seekers**.
- All non-citizens (including refugees) are treated as foreigners, similar to tourists or economic migrants. Entry and stay require valid travel documents like a passport and visa.

Violations:

- **Entering India without documents:** Up to 5 years imprisonment or ₹5 lakh fine
- **Overstaying a visa:** Up to 3 years imprisonment or ₹3 lakh fine.
- No special exemptions exist for refugees, even though they often flee without documents.

2011 Standard Operating Procedure (SOP)

- Allowed long-term visas for people fleeing persecution.
- Those denied visas could still face detention or deportation

2. Citizenship Act, 1955

- Defines an illegal immigrant as someone who enters India without valid documents or overstays a visa. Illegal immigrants cannot apply for Indian citizenship.
- The **Citizenship (Amendment) Act, 2019 (CAA 2019) relaxes rules for obtaining citizenship for certain religious communities** (Hindus, Sikhs, Buddhists, Jains, Parsis, Christians) from Afghanistan, Bangladesh, and Pakistan who entered before 31 December 2014.
- **Rohingya are not included in the CAA 2019 list,** so they remain classified as illegal migrants and are ineligible for citizenship.

HINDI DIWAS

Context: The country celebrated Hindi Diwas, which is observed annually on 14th September.

About Hindi Diwas (हिंदी दिवस)

- Hindi Diwas is celebrated t**o commemorate the adoption of Hindi as one of the official languages of India by the Constituent Assembly on 14 September 1949**.
- This day marks the historic decision **to recognize Hindi written in the Devanagari script as the official language of the Union government.**
- **The first Hindi Diwas was celebrated in 1953.**

Historical Background

- The Constituent Assembly (1946–49) held major debates on India's future language policy—questions included the choice of official language, script, numerals, and the role of English. Options such as Hindi, Hindustani, Sanskrit, and English were considered.
- A compromise called the **Munshi–Ayyangar Formula** led to Article 343 (1950), which declared: **Hindi in Devanagari script as the official language; International numerals for official use; English to continue for 15 years.**
- Strong protests from non-Hindi-speaking states in 1965 resulted in the Official Languages Act, 1963 (amended 1967), which allowed English to continue indefinitely along with Hindi.
- **Article 344** provides for a commission and parliamentary committee on official language**,** while **Article 351** directs the Union to promote and develop Hindi.
- In practice, Hindi is used in Hindi-speaking states, while English is used for communication between Hindi-speaking and non-Hindi-speaking states to maintain linguistic balance.



NATIONAL UNITY DAY 2025 (RASHTRIYA EKTA DIWAS 2025)

Context: Rashtriya Ekta Diwas was observed on 31st October.

- Rashtriya Ekta Diwas, observed every year on 31st October since 2014, marks the **birth anniversary of Sardar Vallabhbhai Patel**, India's first Deputy Prime Minister and Home Minister, known as the Iron Man of India.
- The day **celebrates national unity, integrity, and cohesion**, honouring Patel's role in integrating over 560 princely states into a united India.
- The 2025 celebration commemorates the 150th birth anniversary of Sardar Patel.
- **Run for Unity,** a nationwide marathon, is organised annually to honour his vision of a strong and unified nation.

AABHAR ONLINE STORE

Context: The Indian Railways (IR) has directed its units to make use of the newly launched 'Aabhar' online store to promote indigenous craftsmanship and support local artisans.

About Aabhar Online Store

- Aabhar Online Store is an **e-commerce platform hosted on the Government e-Marketplace (GeM) portal**, **to promote products crafted by local artisans**, handloom weavers, tribal groups, and women-led enterprises.
- The store primarily features gift items, hampers, and souvenirs, including One District One Product (ODOP) and Geographical Indication (GI) tagged goods that represent India's cultural heritage and craftsmanship.
- The store sources its products exclusively from trusted public institutions such as the **Central Cottage Industries Emporium (CCIE)**, the **Khadi and Village Industries Commission (KVIC),** and various Central and State Handicraft and Handloom Emporiums.

ELECTRONIC DETAILED ACCIDENT REPORT AND IRAD

Context: The Ministry of Road Transport and Highways (MoRTH) will soon publish National Highway (NH) black spot data for 2023–24 using its Electronic Detailed Accident Report (e-DAR) and Integrated Road Accident Database (iRAD) system.

- A black spot on National Highways is defined as a 500-metre stretch where either five or more serious accidents or ten deaths occur within a three-year period.

iRAD (Integrated Road Accident Database)	• iRAD is a mobile and web-based application that **enables police personnel and other stakeholders to record detailed information about road accidents at the scene,** including GPS location, photos, videos, and severity classification. • The data is **collected in real-time and forms a national database**, allowing for comprehensive analysis and evidence-based policymaking.
e-DAR (Electronic Detailed Accident Report)	• e-DAR is an **extension of the iRAD platform**, designed to **digitize and streamline the process of motor accident compensation claims**. • It uses the data collected via iRAD to generate detailed reports required by Motor Accident Claims Tribunals (MACT) and insurance companies, making claim settlement faster and more efficient.

NATIONAL PRESS DAY 2025

Context: India observed National Press Day on 16 November 2025, honouring the vital role of a free, independent, and responsible press, widely regarded as the fourth pillar of democracy.

- National Press Day **marks the establishment of the Press Council of India (PCI)** in 1966 under the **Indian Press Council Act, 1965.** The Act was repealed during the Emergency in 1975, and the PCI was subsequently reconstituted in 1979 under a new law.
- The idea for the Council was first proposed by the First Press Commission in 1956, which emphasized the need to protect press freedom and promote ethical reporting."
- It is (The Day) commemorated through various activities, including the National Awards for Excellence in Journalism and the release of a Souvenir.

Media Governance in India

- **Press Registrar General of India (PRGI):** Established in 1956, the PRGI oversees the registration of periodicals and supports the growth of print media. It is now a **statutory body under the Press and Registration of Periodicals (PRP) Act, 2023.**
- **Press Council of India (PCI):** The PCI is a statutory autonomous body under the **Press Council Act, 1978,** primarily tasked with **safeguarding press freedom and maintaining ethical and professional standards in print media.**
    - Under Section 13, it can hear complaints relating to attacks on or curtailment of press freedom and may also take suo motu action.
    - Under Section 14, it may warn, admonish, or censure newspapers for violating journalistic ethics, such as publishing fake or misleading news.
    - The Norms of Journalistic Conduct issued by the PCI serve as the guiding framework for ethical reporting and discourage the publication of defamatory, false, or misleading content.
- **Press and Registration of Periodicals (PRP) Act, 2023:** The Act modernizes the colonial-era PRB Act, 1867. It introduces a fully online system for simultaneous title allotment and registration through the Press Sewa Portal (PSP). The law streamlines procedures, removes physical interfaces, reduces compliance burdens, and decriminalizes procedural lapses.

DEVELOPMENT COMMUNICATION AND INFORMATION DISSEMINATION SCHEME

Context: Recently, the Minister of State for Information and Broadcasting informed the Lok Sabha about the Development Communication and Information Dissemination Scheme.

About the DCID Scheme:

- DCID is a Central Sector Scheme of the Ministry of Information and Broadcasting (MIB). It supports the information dissemination and citizen outreach of Government programmes/ schemes/initiatives.

- The scheme is implemented by MIB through its media units - Central Bureau of Communication (CBC), Press Information Bureau (PIB), and New Media Wing (NMW).
- **Coverage**: Rural, tribal, remote, and urban populations across the country.
- **Key Role:** Conducts multimedia campaigns for flagship schemes such as Swachh Bharat, PMAY, and the Jal Jeevan Mission.

About Central Bureau of Communication

- The Central Bureau of Communication is a media outreach unit under the MIB.
- It was formed in 2017 by merging the Directorate of Advertising and Visual Publicity (DAVP), the Directorate of Field Publicity (DFP), and the Song & Drama Division (S&DD), to provide integrated communication and disseminate government policies and programmes.

SOCIAL ISSUES

HEALTH

SAMPLE REGISTRATION SYSTEM (SRS) REPORT 2021

Context: The Sample Registration System (SRS) Report 2021, released by the Registrar General of India, provides demographic, fertility, and mortality indicators for India and its states.

About the Sample Registration System (SRS)

- The SRS is a large-scale demographic survey conducted regularly to produce reliable estimates of: Birth rate, Death rate, Other fertility and mortality indicators at both national and sub-national levels.
- The sampling framework of SRS is revised every ten years, based on the latest Census data.

Key Findings of the SRS Report 2021

Parameter	Definition	Trends and Observations (2021)
Crude Birth Rate (CBR)	Number of live births in a year per 1,000 people.	• Declined by 11%, from 21.8 (2011) to 19.3 (2021). • Highest: Bihar (25.6); Lowest: Kerala (12.9).
Population Composition	Share of population by age groups.	• 0–14 years: Decreased from 36.3% (1991) to 24.8% (2021). • 15–59 years (working age): Increased from 57.7% to 66.2%. • Elderly (60+ years): Now 9%; 65+ years: 5.9%. • Mean age at marriage (females): Rose from 19.3 years (1990) to 22.5 years (2021).
Maternal Mortality Ratio (MMR)	Maternal deaths per 100,000 live births.	• Declined from 130 (2014–16) to 93 (2019–21). • India is approaching the SDG target of ≤70 by 2030.
Neonatal Mortality Rate (NMR)	Deaths of newborns (0–29 days) per 1,000 live births.	• Reduced from 26 (2014) to 19 (2021). • Lowest: Kerala; Highest: Madhya Pradesh. • SDG target: ≤12 by 2030.
Infant Mortality Rate (IMR)	Deaths of infants (under 1 year) per 1,000 live births.	• Declined from 39 (2014) to 27 (2021). • Lowest: Kerala (6); Highest: Madhya Pradesh (41)
Under-Five Mortality Rate (U5MR)	Deaths of children under five years per 1,000 live births.	• Declined from 45 (2014) to 31 (2021). • SDG target: ≤25 by 2030. • Lowest: Kerala; Highest: Madhya Pradesh.
Sex Ratio at Birth (SRB)	Number of female births per 1,000 male births.	• Improved from 907 (2018–20) to 913 (2019–21). • Highest: Kerala (962); Lowest: Uttarakhand (852). • Rural: 912; Urban: 918.
Total Fertility Rate (TFR)	Average number of children a woman is expected to have during her reproductive life.	• Declined to 2.0 at the national level (2016–21). • Highest: Bihar (3.0); Lowest: Delhi & West Bengal (1.4). • Replacement level (2.1) achieved nationally and in 16 States/UTs. • Rural: 2.2; Urban: 1.6.
Life Expectancy at Birth	The average number of years a newborn is expected to live.	• 69.8 years (2017–21) • Males: 68.2 years; Females: 71.6 years.
Institutional Deliveries	Percentage of births occurring in hospitals or health institutions.	• Around 91.1% of deliveries were institutional in 2021. • Urban: 95.5%; Rural: 89.7%.

NATIONAL ACTION PLAN FOR DRUG DEMAND REDUCTION (NAPDDR)

Context: As part of the National Action Plan for Drug Demand Reduction (NAPDDR), the Ministry of Social Justice and Empowerment has invited proposals to establish District De-Addiction Centres (DDACs) in 291 "gap" districts across 30 States/UTs.

About National Action Plan for Drug Demand Reduction (NAPDDR)

- The NAPDDR is a centrally sponsored umbrella scheme (FY 2021-22 to FY 2025-26) implemented by the Ministry of Social Justice & Empowerment (MoSJE) aimed at reducing drug demand through prevention, treatment, rehabilitation, and awareness.
- **Objective:** To create a drug-free society through community engagement, education, treatment, and rehabilitation, minimizing harm to individuals, families, and society.
- **Support Under the Scheme:**
  - **To States/UTs:** Funding for awareness, prevention, and capacity building.
  - **To NGOs/Voluntary Organizations (VOs):** Support to Integrated Rehabilitation Centres for Addicts (IRCAs), Addiction Treatment Facilities (ATFs) in government hospitals, District De-addiction Centres (DDACs) and Outreach and Drop-in Centres (ODICs)
  - **Government Hospitals:** Funds for Addiction Treatment Facilities (ATFs).
- **Key Activities:**
  - Implements initiatives like Nasha Mukt Bharat Abhiyaan (NMBA, 2020) covering all districts.
  - Operates a National Toll-Free Helpline (14446) for counselling and referrals.
  - Integrated with Tele-MANAS, providing 24/7 free tele-mental health support.

SWASTH NARI SASHAKT PARIVAR ABHIYAN

Context: The Prime Minister has launched the Swasth Nari Sashakt Parivar Abhiyan to improve women's health and strengthen family well-being.

About the Swasth Nari Sashakt Parivar Abhiyan

- Over one lakh health camps will be organised to screen women for anaemia, hypertension, diabetes, and cancers, along with supporting immunisation and nutrition efforts to reduce maternal and child mortality.
- The campaign focuses on improving the health and nutrition of women, adolescent girls, and children, with the objective of strengthening early detection, ensuring access to essential health services, and empowering families to adopt healthier lifestyles for a stronger and healthier India.
- **Collaborating Ministries:** Ministry of Health & Family Welfare and Ministry of Women & Child Development.
- The **SASHAKT portal** will monitor progress and ensure real-time accountability.
- Anganwadi centres, Nikshay Mitras, private hospitals, and other local institutions will contribute to outreach and service delivery.

DRAVYA PORTAL

Context: The DRAVYA Portal (**Digitized Retrieval Application for Versatile Yardstick of AYUSH Substances)** was launched on National Ayurveda Day, 23 September 2025.

About the DRAVYA Portal

- The DRAVYA Portal is a digital initiative by the Ministry of Ayush, developed by the **Central Council for Research in Ayurvedic Sciences (CCRAS), aimed at modernizing and standardizing India's traditional medicine knowledge.**
- It is a centralised digital repository cataloguing medicinal substances in Ayurveda.
- Serves as the largest publicly accessible repository of information on Ayurvedic ingredients and formulations.
- Designed as a continuously expanding database, integrating knowledge from classical Ayurvedic literature, modern scientific research, and field-based studies.

GLOBAL TOBACCO EPIDEMIC 2025

Context: The World Health Organization (WHO) released its tenth report on the Global Tobacco Epidemic in 2025, focusing on the "Warn about the dangers of tobacco" component of MPOWER.

MPOWER Measures

- MPOWER is a package of **six proven tobacco control measures** introduced by the **WHO** in **2008** to help countries implement effective policies to reduce tobacco use and demand.
- It is aligned with the WHO Framework Convention on Tobacco Control (FCTC). The six components of MPOWER are:
  - **M: Monitor tobacco use and prevention policies**
  - **P: Protect people from tobacco smoke**
  - **O: Offer help to quit tobacco use**
  - **W: Warn about the dangers of tobacco**
  - **E: Enforce bans on tobacco advertising, promotion, and sponsorship**
  - **R: Raise taxes on tobacco**

About Tobacco	
Species	Over 60 species, commonly cultivated: N. tabacum and N. rustica (Aztec tobacco). Belongs to the nightshade family; indigenous to South America.
Climate	Frost-free period of 90–120 days from transplanting to harvest.
Temperature	• Mean daily temperature of 20–30°C • Dry period required for harvesting.
Soil	• Prefers sandy or sandy loam; sensitive to waterlogging • Requires well-aerated, well-drained soils.
Rainfall	Minimum 500 mm; unsuitable above 1200 mm.
Production	• **India is the world's 2nd largest producer** (after China) and 2nd largest exporter of unmanufactured tobacco (after Brazil). • **Major states**: Gujarat (45% of production, highest productivity), Andhra Pradesh, Uttar Pradesh, Karnataka, West Bengal, Telangana, Bihar. • **The Tobacco Board of India (HQ: Guntur, AP)** manages the farming system, ensures fair prices, and promotes exports.

KASHI DECLARATION UNDER MY BHARAT

Context: As a major initiative within the Mera Yuva (MY) Bharat framework, the Youth Spiritual Summit has launched a nationwide, youth-led anti-drug movement. The summit was organized by the Ministry of Youth Affairs and Sports.

About Mera Yuva (MY) Bharat

- MY Bharat is an autonomous national body established by the Government of India.
- It was launched on 31st October 2023 **under the Ministry of Youth Affairs and Sports,** providing a technology-driven institutional mechanism that connects young citizens to opportunities for volunteering, experiential learning, leadership, and skill development.

The Kashi Declaration

- The Youth Spiritual Summit concluded with the announcement of the Kashi Declaration, which:
  - Sets a 5-year national roadmap for a De-Addiction Movement across the country
  - Recognizes substance abuse as a multi-dimensional public health and societal challenge
  - Calls for collective participation of government, communities, families, and young individuals

RARE BLOOD DONOR REGISTRY AND E-RAKT KOSH

Context: Central Health Ministry is looking at integrating the Rare Donor Registry of India (RDRI) with e-Rakt Kosh, the national online platform for blood bank management.

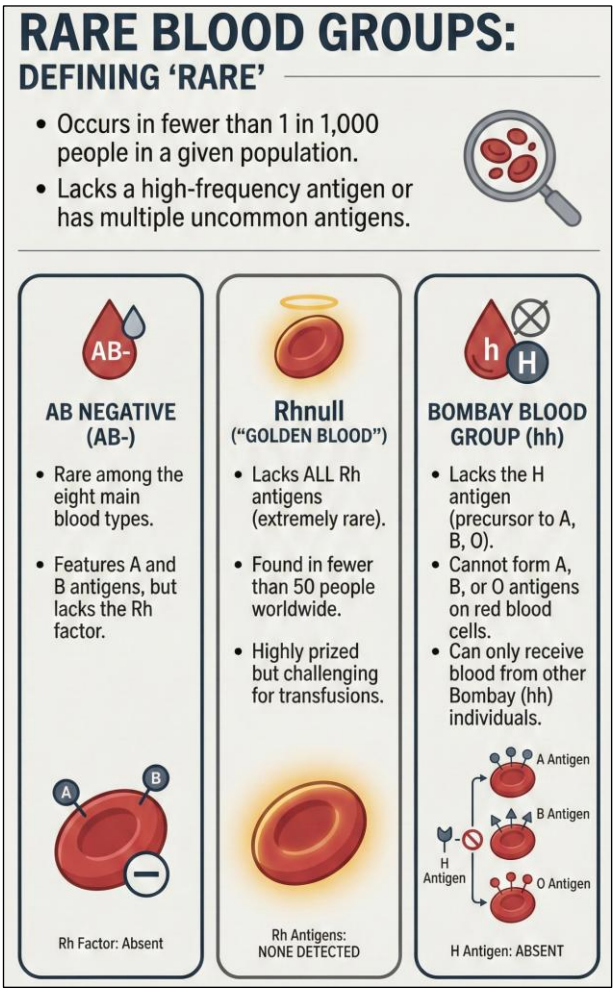
About Rare Donor Registry of India (RDRI)

- It is developed by **ICMR-National Institute of Immunohaematology (NIIH**) in collaboration with four partner institutes. It was launched in 2025.
- Maintains a screened database of ~4,000 donors, tested for over 300 rare blood markers.
- Supports alloimmunised patients, whose bodies reject common blood antigens, by providing highly specific donor matches.

- Key technology: DNA-based multiplex PCR test to quickly identify rare blood types, tailored to Indian patients.

About e-Rakt Kosh: Unified Digital Blood Management

- It is a centralized digital blood bank management system developed by the **Centre for Development of Advanced Computing (CDAC)** under the National Health Mission, Ministry of Health and Family Welfare. It was launched in 2016.
- It serves as a national platform to connect, digitize, and streamline the workflow of blood banks across India.
- The system provides real-time information on blood availability, blood donation camps, and blood banks, enabling hospitals, donors, and patients to access and share blood resources.
- The integration will allow those with rare blood groups to access a centralized system developed under the National Health Mission (NHS), providing details on blood banks, blood availability, and blood donation camps across the country.



NEW RULES NOTIFIED FOR ORGAN TRANSPLANT ALLOCATION

Context: The Union Government has revised the organ transplant allocation policy to give priority to women patients and the relatives of deceased donors in order to address gender disparity and encourage higher donation rates.

Legal Framework

- The **Transplantation of Human Organs Act (THOA), 1994** was enacted to regulate the removal, storage, and transplantation of human organs for therapeutic purposes and to prevent commercial dealings in human organs.
- The Act was amended in 2011 to **Transplantation of Human Organs and Tissues Act (THOTA), 1994.**

National Organ and Tissue Transplant Organization (NOTTO)

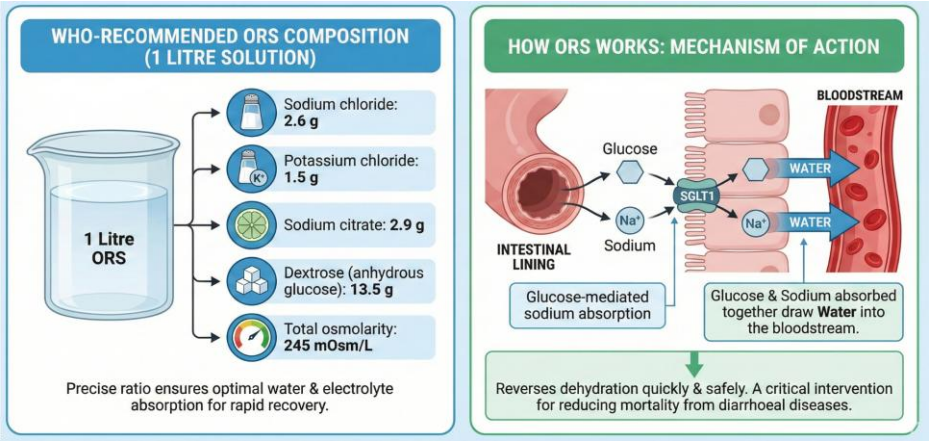
- NOTTO is **apex national body for coordinating organ and tissue donation and transplantation**, functioning under the **Directorate General of Health Services**, Ministry of Health & Family Welfare, and headquartered in **New Delhi.**
- It is a **national-level organisation under the National Organ Transplant Programme (NOTP),** with a three-tier network: NOTTO at the apex, five Regional Organ & Tissue Transplant Organisations (ROTTOs) and multiple State Organ & Tissue Transplant Organisations (SOTTOs).
- **Key functions of NOTTO**
  - **Maintains national registries of organ and tissue donors and recipients**, including the online organ donation/transplant registry and unique NOTTO-ID for every transplant case.
  - **Coordinates allocation and distribution of organs and tissues**, issuing detailed allocation policies and advisories (e.g., equity-oriented advisory prioritising women recipients and relatives of deceased donors).
  - **Monitors and supports implementation of** THOTA through the NOTP

FSSAI BAN ON FAKE 'ORS' DRINKS

Context: Following a campaign, the Food Safety and Standards Authority of India (FSSAI) has prohibited food and beverage companies from using the term "Oral Rehydration Salts (ORS)" on products that do not meet the WHO formulation standards.

About Oral Rehydration Salts (ORS)

- ORS is a scientifically developed mixture of essential electrolytes and glucose used to prevent and treat dehydration, particularly during diarrhoea, vomiting, and heat-related illnesses.
- It works by efficiently restoring fluid and salt balance in the body and is widely recommended in both clinical and community health settings.



About Food Safety and Standards Authority of India (FSSAI)	
Established	Created under the Food Safety and Standards Act, 2006 to unify and streamline food safety regulations in India.
Ministry	Functions under the Ministry of Health and Family Welfare.
Role / Mandate	Responsible for laying down science-based standards for food items and regulating their manufacture, storage, distribution, sale, and import to ensure safe and wholesome food for consumers.
Structure	Comprises a Chairperson (rank of Secretary to Government of India) appointed by the Central Government and 22 members, of whom one-third must be women, ensuring gender-balanced representation.

HEALTH SECURITY CESS

Context: The Health Security & National Security Cess Act, 2025 was notified by the Government.

About the Health Security & National Security Cess Act, 2025

- The Act establishes a **legal framework for levying and collecting a cess on the production of specified goods such as pan masala** and other notified items.
- The revenue collected will be used to **support public health spending and national security initiatives.**

Provisions	
Who Must Pay	Any person who owns, operates, or controls machines or processes used to manufacture specified goods, irrespective of tax status.
Monthly Cess Amounts	The cess will be calculated per machine installed or per unit of manual production and will be collected monthly. Interest will be payable on any cess that remains unpaid after the due date.
Use of Proceeds	Proceeds credited to the Consolidated Fund of India for expenditure on public health and national security.
Audits	Specified officers, not below the rank of a Commissioner, may conduct audits to verify the correctness of cess paid.
Multi-tier Appeal mechanism	Appellate Authority → Customs, Excise, and Services Tax Appellate Tribunal → High Court → Supreme Court.
Government Powers	The government may increase cess up to 2 times in public interest, exempt specified persons, and add goods in ambit
Power of inspection, search, and seizure	Officers of Joint Commissioner rank or above will inspect premises and to search and seize goods, machinery, documents, or records in cases of suspected evasion.

NATIONAL PHARMACEUTICAL PRICING AUTHORITY (NPPA)

Context: A Parliamentary Standing Committee (PSC) has directed the NPPA to urgently formulate a policy to address absence of effective regulation over non-scheduled drugs.

About National Pharmaceutical Pricing Authority (NPPA)

- NPPA was constituted through a Government Resolution in 1997 as an **attached office** of the Department of Pharmaceuticals (DoP), Ministry of Chemicals & Fertilizers as **independent regulator for pricing of drugs** and to ensure **availability and accessibility of medicines** at **affordable prices.**
- **Functions:**
  - Implements the Drugs (Prices Control) Order, 2013 (DPCO, 2013.)
  - Sets ceiling prices for **Schedule-I of DPCO** (over 928 formulations).
  - Fixes retail prices of new drugs (over 3,000).
  - Uses powers under **Para 19 of the DPCO (public interest clause)** to regulate prices of key non-scheduled drugs and medical devices, such as stents, knee implants, and anti-diabetic and anti-cancer medicines.
  - Monitors drug availability and ensures compliance with pricing regulations.
- **Key Initiatives:**
  - Trade margin rationalisation, particularly for anti-cancer drugs.
  - Imposition of price caps on essential medical devices during the COVID-19 pandemic, including oxygen concentrators and oximeters.
  - Digital platforms for transparency and grievance redressal, such as ***Pharma Sahi Daam*** *(search tool for checking prices)*, ***Pharma Jan Samadhan*** *(a grievance redressal system)*, and the **Integrated Pharmaceuticals Database Management System (IPDMS) 2.0.**
  - Establishment of **Price Monitoring and Research Units (PMRUs)** in 36 States and Union Territories to monitor drug prices at the grassroots level.

EDUCATION

TALASH INITIATIVE

Context: The National Education Society for Tribal Students (NESTS), in collaboration with UNICEF India, has launched TALASH (Tribal Aptitude, Life Skills and Self-Esteem Hub).

- NESTS is an autonomous organization under the Ministry of Tribal Affairs, responsible for ensuring quality education for tribal students through the Eklavya Model Residential Schools (EMRSs) network across India.

About TALASH (Tribal Aptitude, Life Skills and Self-Esteem Hub)

- It is a pioneering initiative for the **holistic development of tribal students studying in Eklavya Model Residential Schools (EMRSs)**. It seeks to benefit over 1.38 lakh students across 28 States and 8 Union Territories.
  - EMRSs (launched in 1997–98) **aim to provide quality residential education from Class VI to XII for students belonging to Scheduled Tribes (STs).**
- **Key Objectives**
  - Promote self-awareness, life skills, and career clarity among tribal youth.
  - Prepare students to handle real-world challenges through academic and personal development.
  - Support the goals of the National Education Policy (NEP) 2020 by encouraging inclusive and holistic learning.
  - Contribute to Sustainable Development Goal (SDG) 4 – Quality Education.

Main Components of TALASH

- **Psychometric Assessments:**
  - Inspired by NCERT's Tamanna (Try and Measure Aptitude and Natural Abilities) test.
  - Helps students identify their strengths, interests, and suitable career paths through personalized Career Cards.
  - The Tamanna test, developed by CBSE and NCERT, is a voluntary aptitude test for Classes IX–X.
  - It has no pass or fail outcome and serves as a guidance tool for students, teachers, and parents.
- **Career Counselling:**
  - Enables students to make informed career decisions based on their aptitudes, aspirations, and potential.
- **Life Skills and Self-Esteem Modules:**

- Focus on building communication, problem-solving, and emotional well-being.
- Aims to enhance confidence and self-worth among tribal students.

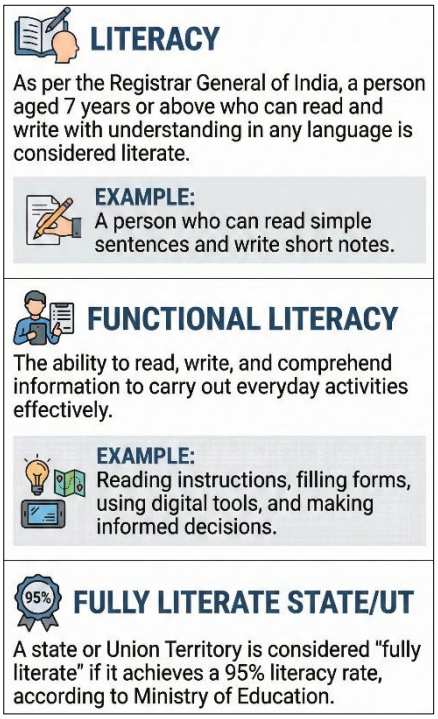
- **Teacher Training and E-Learning:**
  - Includes a dedicated online portal for educators.
  - So far, 189 teachers from 75 EMRSs have been trained to serve as student mentors.

KERALA'S DIGITAL LITERACY

Context: Kerala has officially been declared the **first fully digitally literate state** in India following the completion of the first phase of the **Digi Kerala programme.**

About Digi Kerala programme

- The Digi Kerala programme, launched in 2023, is a pioneering digital literacy initiative aimed at making Kerala the first fully digitally literate state in India.
- The Digi Kerala campaign was inspired by the Digi Pullampara model, which made Pullampara the first fully digitally literate panchayat in the country in 2022.
- The training focused on the use of smartphones for essential digital tasks, enabling citizens to interact online, avail themselves of government services, and make digital payments for electricity, LPG, and other services.
- As part of the campaign, over 80 lakh households were surveyed, identifying more than 21 lakh digital illiterates, of whom 99.98% were successfully trained and passed evaluations.



MIZORAM'S FULL FUNCTIONAL LITERACY

Context: Mizoram achieved full functional literacy officially on May 20, 2025, becoming the first Indian state to reach this milestone. The literacy rate in Mizoram of 98.20% was confirmed by the Periodic Labour Force Survey (PLFS) 2023-24.

- Himachal Pradesh has been declared 'fully literate', joining Goa, Ladakh, Mizoram, and Tripura.
- In June 2024, Ladakh became the first Union Territory to achieve full functional literacy.
- These achievements are largely attributed to the implementation of the ULLAS – Nav Bharat Saaksharta Karyakram (New India Literacy Programme).

About ULLAS – Nav Bharat Saaksharta Karyakram (New India Literacy Programme – NILP)	
Objective	To provide foundational, digital, and financial literacy to all adults who missed formal education.
Type	Centrally Sponsored Scheme
Duration	2022–23 to 2026–27
Target Group	Adults aged 15 years and above, irrespective of gender, caste, or socio-economic background.
Target	To cover 5 crore learners (1 crore learners per year) through an Online Teaching, Learning and Assessment System (OTLAS).
Technology Support	OTLAS is a digital platform developed by the National Informatics Centre (NIC), accessible via the ULLAS Web Portal and Mobile App.
Core Components	1. Foundational Literacy and Numeracy (FLN) 2. Critical Life Skills – digital, financial, and legal literacy 3. Basic Education 4. Vocational and Skill-based Education 5. Continuing Education

Implementation Approach	Promotes volunteerism to instill a sense of social duty (Kartavya Bodh). Schools and local institutions act as implementation hubs known as Samajik Chetna Kendras.
Language Access	Learning materials are available in regional languages through DIKSHA Portal and the ULLAS Mobile App.
Assessment & Certification	Conducted through the Foundational Literacy and Numeracy Assessment Test (FLNAT) twice a year, or on demand, at local schools.

WORLD YOUTH SKILLS DAY

- The United Nations General Assembly proclaimed **July 15** as World Youth Skills Day in November 2014 to stress the need for equipping young people with skills essential for employment, entrepreneurship, and dignified work.
- The 2025 theme focuses on empowering youth through AI and digital skills, highlighting how developing future-ready competencies can help tackle global challenges and promote a more inclusive and sustainable world.

NATIONAL CAREER SERVICE (NCS) PORTAL

Context: The Minister of State for Labour and Employment informed the Lok Sabha that over 48 lakh employers were registered on the NCS portal as of July 2025.

About the National Career Service (NCS) Portal

- Launched in 2015 as a five-year Mission Mode Project (continuously upgraded).
- **Implementing Agency:** Directorate General of Employment, Ministry of Labour & Employment.
- **Objective:** To serve as a one-stop digital platform connecting jobseekers with employers.

Key Services Provided

- **Employment:** Job listings from government, private, and public sector organisations.
- **Career Guidance:** Online/offline counselling and vocational guidance.
- **Skill Development:** Information on training programmes and employability enhancement.
- **Job Fairs:** Updates on online and offline job fairs.
- **Local Services**: Listings for household service providers such as drivers and plumbers.

CAPACITY BUILDING AND HUMAN RESOURCE DEVELOPMENT (CBHRD) SCHEME

Context: The Cabinet, chaired by the Prime Minister, has approved the CBHRD Scheme with a total outlay of ₹2,277.39 crore for the period of the 15thFinance Commission (2021–22 to 2025–26).

What is the CBHRD Scheme?

- The CBHRD Scheme is a **flagship initiative of the Council of Scientific and Industrial Research (CSIR).** It seeks to nurture scientific talent, strengthen India's research ecosystem, and enhance the country's global competitiveness in science and technology.
- It aims to increase the number of researchers per million population and contribute to India's Sustainable Development Goals (SDGs) in the science and technology sector.
- It provides a **structured platform for young researchers** to pursue careers in universities, industry, national R&D laboratories, and academic institutions.
- **Coverage:** The scheme applies to all R&D institutions, national laboratories, Institutes of National Importance, Institutes of Eminence (IoE), and universities across India.

Objectives

- Create opportunities for young researchers to build careers in academia, industry, and national R&D laboratories.
- Support students and scholars under the guidance of leading scientists and professors, especially in STEMM fields (Science, Technology, Engineering, Medical, and Mathematical sciences).

Sub-schemes under CBHRD

- **Doctoral and Postdoctoral Fellowships:** to support early-stage and advanced researchers.
- **Extramural Research Scheme (ERS), Emeritus Scientist Scheme (ESS), and Bhatnagar Fellowship Programme (BFP):** to promote high-quality independent research.
- **Promotion and Recognition of Excellence (Award Scheme):** to recognise outstanding scientific contributions.

- **Knowledge Sharing (Travel & Symposia Grants):** to facilitate collaboration, scientific exchange, and interaction among Indian and international researchers.

SCHEME TO ATTRACT 'STAR FACULTY'

Context: The Union government is developing a new initiative aimed at encouraging high-achieving Indian-origin researchers and academic leaders working abroad to return to India.

Existing Initiatives to Attract or Engage Indian-Origin Researchers

1. Visiting Advanced Joint Research (VAJRA) Faculty Scheme

- The VAJRA Faculty Scheme is an initiative **aimed at bringing overseas scientists,** including Non-resident Indians (NRIs), Persons of Indian Origin (PIOs), and Overseas Citizen of India (OCIs), t**o Indian public-funded academic and research institutions for a fixed duration each year.**
- The scheme promotes collaborative research in cutting-edge areas of science and technology, with the **visiting faculty working as adjunct or visiting faculty for a minimum of 1 month and a maximum of 3 months per year.**
- The visiting faculty receive a lump-sum amount (US$15,000 in the first month and US$10,000 per month for the next two months) to cover travel and honorarium.
- The scheme is **implemented by the Science and Engineering Research Board (SERB)** under the **Department of Science and Technology (DST).**

2. Ramanujan Fellowship

- The Ramanujan Fellowship is **designed for brilliant Indian scientists and engineers from abroad who wish to return to India and take up scientific research positions.**
- The fellowship provides **a consolidated monthly amount** (Rs. 1,35,000 including HRA), a **research grant of Rs. 7 lakh per annum**, and institutional overhead charges of Rs. 60,000 per annum.
- Candidates who are doing Post Doctoral abroad are eligible. People who already have permanent positions in a scientific organization in India are not eligible.
- The fellowship is for a **duration of five years** and is very selective. **Fellows can work in any scientific institution or university in India and are eligible for additional extramural research grants. The scheme is implemented by the SERB.**

3. Ramalingaswami Re-entry Fellowship

- The scheme **by the Department of Biotechnology (DBT),** is for Indian nationals working overseas in life sciences, biotechnology, bio-engineering, healthcare, agriculture, and related fields who wish to return to India and pursue scientific research.
- **Applicants must have a Ph.D. or equivalent and at least three years of post-doctoral research experience,** with the last two years from an overseas laboratory.
- The fellowship **duration is five years,** extendable for two more years under specific conditions, and provides a research/contingency grant (Rs. 10 lakh in the first year, Rs. 7.5 lakh in the second, and Rs. 5 lakh for subsequent years).
- The scheme aims to build a pool of highly skilled researchers in India and strengthen biotechnology research capacity.

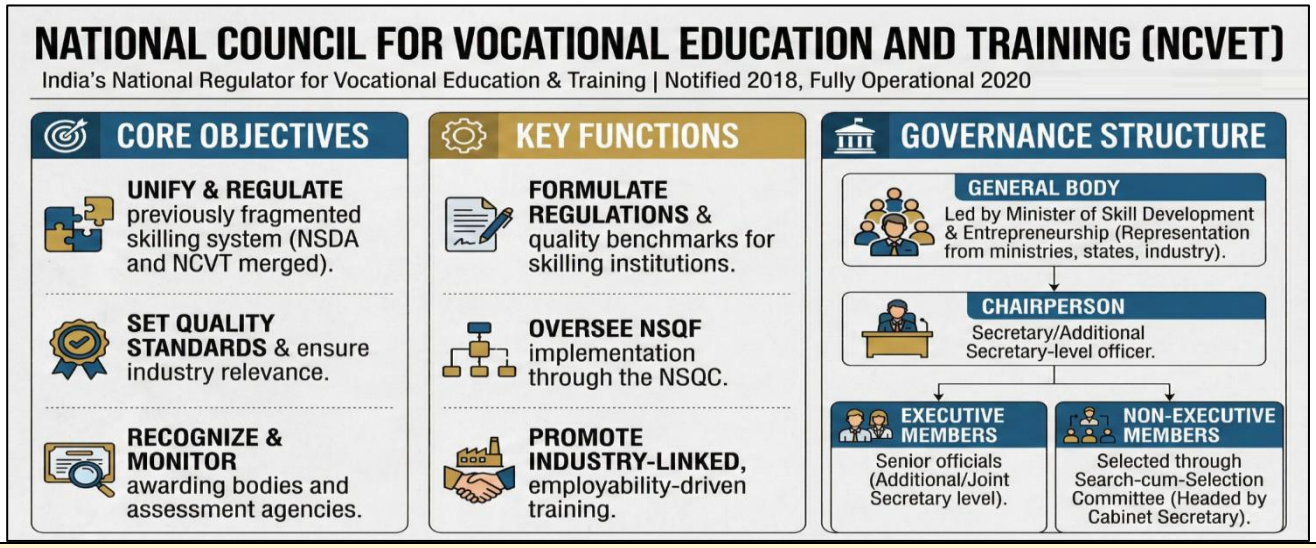
NATIONAL SKILLS QUALIFICATIONS COMMITTEE (NSQC)

Context: The 44th meeting of the NSQC was held under the National Council for Vocational Education and Training (NCVET).

About National Skills Qualifications Committee (NSQC)

- The NSQC is a key **committee under NCVET.** It **ensures that all skill qualifications in India follow the National Skills Qualifications Framework (NSQF)**.
- **Role and Functions**
  - Evaluates and approves qualifications proposed by Awarding Bodies and sectoral agencies.
  - Ensures NSQF alignment to maintain national quality standards.
  - Enables vertical and horizontal mobility across vocational, academic, and professional streams.
  - Links training with industry needs to improve employability.

- **Composition:** Includes representatives from central ministries, state skill missions, UGC, AICTE, NSDC, DGT, industry bodies, and subject experts.



About National Skills Qualifications Framework (NSQF)

- NSQF is a nationally integrated education and competency-based framework that enables persons to acquire desired competency levels.
- NSQF organizes qualifications according to a series of levels of knowledge, skills and aptitude.
- These levels, graded from one to ten, are defined in terms of learning outcomes which the learner must possess regardless of whether they were acquired through formal, non-formal or informal learning.

PRADHAN MANTRI KAUSHAL VIKAS YOJANA (PMKVY)

Context: The Comptroller and Auditor General (CAG) has flagged serious implementation gaps in the PM Kaushal Vikas Yojana (PMKVY) in an audit report tabled in Parliament.

About Pradhan Mantri Kaushal Vikas Yojana (PMKVY)

- PMKVY is the flagship skill development programme, launched in July 2015 under the **Skill India Mission.**
- It is implemented by the **Ministry of Skill Development and Entrepreneurship (MSDE)** through the **National Skill Development Corporation (NSDC).**
- The main aim of the scheme is **to help young people acquire industry-relevant skills, improve their employability, and reduce educated unemployment.**
- The programme focuses on: Short-term skill training, Recognition of Prior Learning (RPL), Certification of skills, Placement and career support
- PMKVY has been implemented in phases such as: PMKVY 1.0 (FY2015–16), PMKVY 2.0 (FY2016–20), PMKVY 3.0 (FY2021–22), PMKVY 4.0 (FY2022-2026)
- Across all phases, training and certification are aligned with the National Skills Qualification Framework (NSQF).

PMKVY 4.0: Key Focus Areas

- Promotes new-age skills such as Industry 4.0, Web 3.0, AR/VR, climate action, circular and green economy.
- Increases emphasis on On-the-Job Training (OJT) for practical learning.
- Prioritises re-skilling and up-skilling under Recognition of Prior Learning (RPL).
- Encourages industry-linked courses with flexible curricula.

Components of PMKVY 4.0

	Short Term Training	Special Projects	Recognition of Prior Learning
Target Group	Candidates looking for fresh skilling, re-skill/upskill, out of education candidates, school/ college dropouts or unemployed youth of India nationality	Marginalized, vulnerable groups, etc. requiring special attention or jobs -roles with focus on future skills.	Candidates with prior learning experience or skills and willing to get assessed and certified.
Eligibility	Indian nationals possessing valid Aadhaar and fulfullling eligibility criteria of respective job role. In case of RPL, prior experience will be required in the job role for which RPL certification is being sought and as specified in the job role.		
Age Group	15-45 years	15-45 years	18-59 years
Geograp -hical coverage	Special attention to aspirational, backward, border, tribal and Left-Wing Extremism (LWE) affected districts, including skilling requirement for other countries.		

- Enables shared use of infrastructure in institutions such as schools, colleges, universities, and national institutes.
- Aligns training with national priority sectors including semiconductors, AI, green hydrogen, electric vehicles, solar energy, healthcare, and tourism.

INDIAN STATISTICAL INSTITUTE

Context: The draft Indian Statistical Institute Bill, 2025 has been released by the Ministry of Statistics and Programme Implementation (MoSPI).

About the Indian Statistical Institute (ISI)

- Established in Kolkata in **1931** by **P. C. Mahalanobis**, a pioneer of modern statistics in India. ISI has centres in Delhi, Bangalore, Chennai, Tezpur (North East).
- **Academic Focus:** Specialises in statistics, mathematics, economics, and data-based sciences.
- The institute gained the status of an Institution of National Importance by an act of the Indian Parliament in 1959.
- The National Sample Survey Organisation (NSSO) originated at ISI, which did surveys to help the government understand issues like poverty, employment, and living standards.
- ISI has produced internationally respected scholars such as C. R. Rao and S. R. S. Varadhan.

PM INTERNSHIP SCHEME (PMIS)

Context: Despite exceeding its target of 1.25 lakh internship opportunities, the pilot phase of the PMIS has witnessed low participation among youth, as informed to Parliament.

About PMIS

- **Launched**: By the **Ministry of Corporate Affairs** under **Budget 2024.**
- **Scope**: Aims to provide 1 crore internship opportunities over five years across India's top 500 companies. The scheme operates independently of existing skilling, apprenticeship, or student-training programmes.
- **Internship Duration:** 12 months, with at least 50% of the period to be spent in real workplace settings.
- **Objective**: To provide youth with exposure to real business environments, bridge the gap between academic learning and industry requirements, and enhance employability through hands-on experience.
- **Who Can Apply?: Indian citizens aged 21-24** with at least **secondary education (ITI, diploma, or degree),** not in full-time jobs or premier institutes like IITs/IIMs. Family income must not exceed ₹8 lakh annually, and no immediate family in government jobs.
- **Benefits:** Financial assistance of Rs. 5,000 per month, with Rs. 4,500 coming from the government and Rs. 500 from the company offering the internship. The government provides a one-time grant of Rs. 6,000 to start the internship.

FOOD AND NUTRITION

AYURVEDA AHARA

Context: The FSSAI, in collaboration with the Ministry of Ayush, has released an official list of recognised Ayurveda Ahara products.

About Ayurveda Ahara

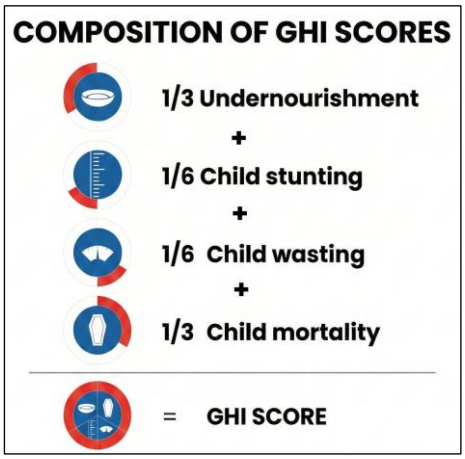
- Ayurveda Ahara refers to the dietary principles and food choices recommended in Ayurveda, the traditional Indian system of medicine.
- **Defined under the Food Safety and Standards (Ayurveda Aahara) Regulations, 2022.**
- Provides clear standards for Food Business Operators (FBOs) producing Ayurvedic food items, ensuring that products are authentic, safe, and aligned with classical guidelines.
- Examples of approved preparations include Angarkarkati (baked wheat balls), Krishara (khichdi-like dish), Panaka (fruit-based beverages), Dadhi (curd preparations), and Gulkand (rose-petal preserve).

GLOBAL HUNGER INDEX

Context: The Global Hunger Index 2025 has placed India in the "serious" hunger category.

About Global Hunger Index (GHI)

- The GHI is an annual report that measures and tracks hunger at global, regional, and country levels using a composite score based on four key indicators.
- The index is **published by Concern Worldwide and Welthungerhilfe** and aims to highlight progress and setbacks in the fight against hunger worldwide.
- The GHI score is calculated on a 100-point scale, where 0 means no hunger and 100 means the worst possible hunger.
- The four indicators used are: **Undernourishment** (insufficient caloric intake); **Child stunting** (low height for age in children under five); **Child wasting** (low weight for height in children under five); **Child mortality** (deaths before the fifth birthday).
- The severity of hunger is classified as: extremely alarming (≥50), alarming (35–49.9), serious (20–34.9), moderate (10–19.9), and low (≤9.9).



- The global GHI score for 2025 is 18.3, indicating a moderate level of hunger. This shows only marginal improvement from 19.0 in 2016, with progress stalling in many regions.
- India is ranked **102nd out of 123 countries**, with a GHI score of **25.8**, placing it in the serious category.
  - The report highlights a major child nutrition challenge, noting that one out of every three Indian children is stunted.
  - It also estimates that 172 million people are undernourished, an increase of 13.5 million compared to 2016.

PM-POSHAN

Context: Centre has enhanced the material cost by 9.50% under the Pradhan Mantri Poshan Shakti Nirman (PM POSHAN) Scheme.

About Pradhan Mantri Poshan Shakti Nirman (PM POSHAN) Scheme

- PM POSHAN, earlier known as the Mid-Day Meal Scheme, is a **Centrally Sponsored Scheme** aimed at **providing one hot cooked meal to children in Government and Government-aided schools**. It is implemented by the **Ministry of Education.**
- It covers students from classes I to VIII and now includes pre-primary/Balvatika students.
- The scheme is designed to improve enrolment, attendance, retention, and nutritional levels among children.

Key Features

- **Community Participation:** Promotion of **Tithi Bhojan**, where communities provide special meals on festivals or occasions.
- **School Nutrition Gardens:** Over 3 lakh schools have gardens to grow vegetables, adding micro-nutrients to meals.
- **Social Audits:** Mandatory in all districts for transparency.
- **Special Nutrition:** Supplementary nutrition for children in aspirational districts and areas with high anemia prevalence.
- **Cooking Competitions:** From village to national level, promoting ethnic cuisine and innovative menus using local ingredients.
- **Local Sourcing:** Involvement of Farmer Producer Organizations (FPOs) and Women Self-Help Groups, supporting the "Vocal for Local" and Atmanirbhar Bharat initiatives.
- **Disaster Management:** Provision of hot cooked meals or Food Security Allowance to children when schools are closed due to disaster.
- **Responsibility:** Providing meals to the eligible children lies with the State Governments and UTs. The Central Government issues quality guidelines and releases funds, foodgrains, and targets.

POSHAN Abhiyaan

- POSHAN Abhiyaan (Prime Minister's Overarching Scheme for Holistic Nutrition) was launched in **2018**, as **India's flagship multi-ministerial mission to improve nutritional outcomes for children, adolescent girls, pregnant women, and lactating mothers.**
- POSHAN Abhiyaan is a **Centrally Sponsored Scheme.**
- Its holistic approach targets nutrition through convergence, technology, and mass community mobilization ("Jan Andolan").
- **Nodal Ministry:** Ministry of Women and Child Development (MWCD).

CAMPUS CALLING INITIATIVE

Context: Recently, the National Commission for Women (NCW) launched the 'Campus Calling' initiative.

About the Campus Calling Initiative

- Launched by the **National Commission for Women (NCW)** in collaboration with **Yuvamanthan**, a youth development platform.
- Aims **to create gender-sensitive and cyber-safe campuses across India.**
- **Aligned with:** SDG 5 (Gender Equality), National Cybersecurity Strategy 2020–25 Cybercrime Prevention against Women and Children (CCPWC) Scheme
- Educates students on the **POSH Act, 2013** (Sexual Harassment of Women at Workplace) to ensure safe educational spaces.
- Inspired by lessons from the #MeToo movement, which highlighted harassment in academic institutions.

Key Features

- **Campus Ambassadors**: Each institution appoints two male and two female ambassadors to lead sensitization efforts.
- **Scope**: Targets 1,000+ universities and colleges, making it one of NCW's largest student outreach programs.

About National Commission for Women (NCW)	
Type & Act	Statutory body set up under the National Commission for Women Act, 1990; Established in 1992.
Ministry	Functions under the Ministry of Women and Child Development.
Composition	• Chairperson • 5 Members (experience in law, welfare, economy, health, education, etc.; one each from SC & ST) • Member-Secretary
Term	Chairperson and members serve for 3 years.
Removal	Can be removed by Central Govt. for insolvency, unsound mind, conviction, abuse of office, or inability to act
Functions of NCW (Section 10, NCW Act, 1990)	• **Safeguards Review:** Examine constitutional & legal safeguards for women, recommend effective implementation, and suggest amendments. • **Reports:** Present annual & special reports to the Central Govt. on women's rights and conditions. • **Complaints & Suo Motu Action**: Investigate deprivation of rights, non-implementation of laws/policies, and take up cases with authorities. • **Studies & Research:** Conduct studies on discrimination, atrocities, socio-economic barriers, and suggest strategies for women's advancement. • **Advisory Role:** Participate in socio-economic planning, evaluate progress, and recommend reforms. • **Inspection Powers:** Visit jails, remand homes, and institutions housing women; suggest remedial measures. • **Litigation Support:** Fund legal cases affecting large groups of women. • **Other Duties**: Act on references from Central Govt.; submit reports to Parliament/State Legislatures. • **Civil Court Powers:** Summon witnesses, demand documents, receive affidavits, requisition records, and issue commissions.

POVERTY IN INDIA

Context: In April 2025, the government cited a World Bank report claiming 171 million Indians were lifted out of extreme poverty between 2011-12 and 2022-23.

About Poverty

- Poverty can be defined as a condition in which an individual or household lacks the financial resources to afford a basic minimum standard of living.
- Absolute poverty is when a household's consumption expenditure is below a certain level.
- Relative poverty refers to an individual or group's economic and social condition in comparison to the broader society in which they live.

Measurement of Poverty

- **Poverty Line:** The minimum income needed to meet basic needs. People below this level are considered poor. Example: As per World Bank estimates, people living below $3 per day, falls below the poverty line.
- **Headcount Ratio:** Percentage of people living below the poverty line. Example: A 30% ratio means 30% of the population is poor.
- **Poverty Gap:** Shows how far the poor are below the poverty line. Example: A 6% gap means average incomes of the poor are 6% less than the poverty line.

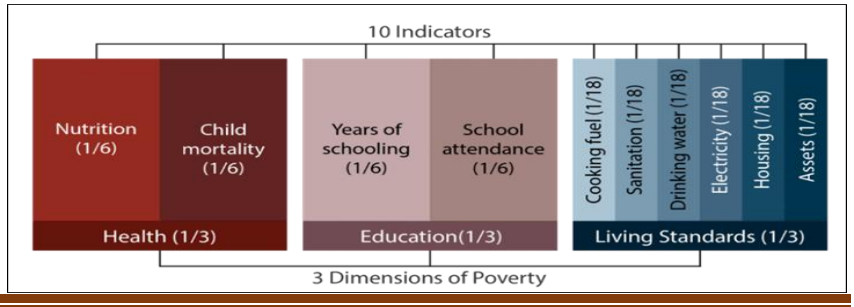
World Bank's Poverty Line

- In 1990, researchers used PPP exchange rates to compare national poverty lines of the world's poorest countries, setting the first global benchmark at $1 per day (1985 prices).
- As global prices rose, the World Bank periodically revised this line, most recently in June 2025, when it was raised to $3 per day to reflect extreme poverty.
- The World Bank updated its poverty estimates, stating that only 5.75% of Indians now live in abject poverty, down from 27% in 2011–12.

Poverty Estimation Efforts in India		
Committee	**Methodology**	**Findings**
Dandekar & Rath Committee (1962)	Defined poverty line based on income required to obtain 2250 calories/day in rural and urban areas.	Estimated 40% rural and 50% urban population below poverty line.
Alagh Committee (1979)	Linked poverty line to per capita consumption expenditure needed for 2400 kcal (rural) and 2100 kcal (urban).	Provided a calorie-based benchmark for later estimates.
Lakdawala Committee (1993)	Retained calorie-based approach but introduced state-specific poverty lines to account for price variations; used URP (Uniform Reference Period).	Estimated 54.9% below poverty line at all-India level.
Tendulkar Committee (2009)	Shifted focus from calorie norms to actual consumption and health outcomes; adopted urban PLB for both sectors and used MRP (Mixed Reference Period).	Estimated 37.2% below poverty line (2011–12); ₹816/month rural, ₹1000/month urban.
C. Rangarajan Committee (2014)	Used Modified MRP; included both food and non-food items (healthcare, education, transport) ensuring nutritional adequacy.	Suggested ₹972/month (rural) and ₹1407/month (urban); 29.5% below poverty line.

What is Multidimensional Poverty?

- Multidimensional poverty is a concept that encompasses various forms of deprivation beyond just income poverty. It captures multiple overlapping disadvantages in key dimensions of human well-being, including health, education, and living standards.
- The Multidimensional Poverty Index was first launched by the **UN Development Programme (UNDP) and Oxford Poverty and Human Development Initiative (OPHI) in 2010.**
- The global MPI captures the different types of disadvantages that



each poor person experiences at the same time in 10 indicators across three dimensions - education, health and living standards.

- A person is identified as poor if she is deprived in a third or more of the weighted indicators.

National Multidimensional Poverty Index

- It is an indigenized poverty measurement tool developed by NITI Aayog, India, in collaboration with the UNDP and the OPHI.
- The **12 indicators** cover Nutrition, Child and Adolescent Mortality, ***Maternal Health***, Years of Schooling, School Attendance, Cooking Fuel, Sanitation, Drinking Water, Electricity, Housing, Assets, and ***Bank Accounts***.
- As per the 2023 progress review based on NFHS data, India's multidimensional poverty has substantially declined from 29.17% in 2013-14 to 11.28% in 2022-23.

JAN SURAKSHA SCHEMES

Context: Three flagship Jan Suraksha Schemes- Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY), Pradhan Mantri Suraksha Bima Yojana (PMSBY), and Atal Pension Yojana (APY), completed 10 years since their launch in May 2015.

- These schemes aim to provide affordable social security to underserved citizens by offering life and accident insurance and pension benefits, thereby strengthening financial protection and resilience among vulnerable groups.

Feature	PMJJBY	PMSBY	APY
Objective	Provide life insurance cover at an affordable premium.	Offer accident insurance cover for death or disability.	Provide guaranteed pension to workers in the unorganised sector.
Type of Cover	Death due to any reason.	Accidental death and disability.	Monthly pension after age 60.
Administering Body	**LIC** and other life insurers through banks/post offices.	**Public/Private general insurers** via banks/post offices.	**Pension Fund Regulatory and Development Authority (PFRDA)**
Eligibility	**Age: 18–50 years** Savings account required Auto-debit consent Coverage till age 55	**Age: 18–70 years** Savings account required Auto-debit consent	**Age: 18–40 years** Must not be income tax payer (post Oct 2022) Savings account required Auto-debit consent
Premium Amount	₹436 per annum per member	₹20 per annum per member	Monthly/quarterly/half-yearly contribution based on age and pension: ₹42–₹210/month (if joining at 18 years); ₹291–₹1,454/month (if joining at 40 years).
Benefits Offered	₹2 lakh on death due to any cause (natural or accidental).	₹2 lakh on accidental death or total disability; ₹1 lakh on partial disability.	Monthly pension of ₹1,000–₹5,000 (based on contribution and joining age). The spouse continues to receive the same pension after the subscriber's death.
Coverage Period	1 year (June 1–May 31), renewable annually.	1 year (June 1–May 31), renewable annually.	Lifetime pension from age 60 onwards with a minimum of 20 years' contribution.
Enrollment Process	Bank/Post Office Online via Net Banking No medical exam Aadhaar-based KYC	Bank/Post Office Online via Net Banking Aadhaar-based KYC	Bank branch or digital portals (e-APY, net banking, mobile apps).

Exclusions	30-day lien period from enrolment (for new entrants).	Claim rejected if death/disability not due to accident.	Premature exit only in cases of terminal illness/death; voluntary exit allowed with deductions.
Government Contribution	Not applicable	Not applicable	Yes, for early joiners (2015–16): 50% of contribution or ₹1,000/year (whichever lower) for 5 years.
Tax Benefits	Not specified	Not specified	Eligible under Section 80CCD of the Income Tax Act.
Highlights	Covers all deaths (natural, accidental, pandemic-related) Pro-rata premium for late entry	Among lowest-cost global accident insurance schemes Covers both major and minor disabilities	Promotes retirement savings Extensive outreach by PFRDA via state/district campaigns, media, QR tools, and chatbot

NAVYA

Context: The Government launched NAVYA, a joint initiative of the Ministry of Women and Child Development and the Ministry of Skill Development and Entrepreneurship, to skill adolescent girls aged 16–18 years (minimum Class 10 qualification).

About NAVYA (Nurturing Aspirations through Vocational Training for Young Adolescent Girls)

- **Objective:** To equip girls with vocational training in non-traditional job roles such as Graphic Designer, Smartphone Technician, Drone Assembly Expert, CCTV Technician, and Professional Makeup Artist.
- **Implementation:**
  - Pilot project across 27 districts in 19 States, including aspirational and North-Eastern districts.
  - Implemented through the frameworks of PM Kaushal Vikas Yojana (PMKVY) and PM Vishwakarma Yojana.
- **Supplementary Training (7 hours):**
  - **Interpersonal Skills:** Hygiene, presentation, conflict management
  - **Communication Skills:** Active listening, effective communication
  - **Workplace Safety:** Awareness of POSH & POCSO laws
  - **Financial Literacy:** Budgeting, savings, and financial planning
- **Institutional Support:** District Skill Committees will link participants to local skill schemes, job fairs, and entrepreneurship opportunities.

NATIONAL MIGRATION SURVEY IN 2026 TO MAP INTERNAL MOBILITY

Context: The Ministry of Statistics and Programme Implementation (MoSPI) has announced a year-long National Migration Survey, to be conducted from July 2026 to June 2027.

About the National Migration Survey 2026

- The survey will be conducted under the aegis of the **National Sample Survey (NSS),** which has been India's principal source of household-level socio-economic data since 1950.
- The first dedicated migration survey was conducted from February 1963 to January 1964 with the most recent being from July 2007 to June 2008.
- It will **cover almost all States and Union Territories,** except villages Andaman and Nicobar Islands (as they are difficult to access)
- The primary **objective** of the survey is to generate reliable and up-to-date estimates on:
  - **Migration rates and trends,** including rural-to-urban, inter-state, and intra-state migration.
  - **Short-term and seasonal migration patterns.**
  - **Reasons for migration**, such as economic, social, educational, or marital factors.
  - **Employment and income profiles** of migrants.
  - **Return migration** and its socio-economic effects.
  - **The impact of migration on household welfare** and community development.
- A household member whose last usual place of residence differs from the current place is considered a migrant.

- **Changes in Data Collection**
  - A person will now be classified as a short-term migrant if they have stayed away from their usual place of residence for 15 days to six months during the last year for employment or job search.
  - The survey will focus primarily on individual migration patterns rather than household-level migration.

NAYI CHETANA 4.0

Context: The Ministry of Rural Development has initiated the campaign "Nai Chetana 4.0".

What is Nayi Chetana?

- Nayi Chetana is a national initiative **launched in 2021** under the **Deendayal Antyodaya Yojana–National Rural Livelihoods Mission (DAY-NRLM).**
- **Aims:** To promote safe mobility for women, encourage shared domestic responsibilities, recognise women's economic contributions, and strengthen community-level action against gender-based violence.
- The programme recognises that women's empowerment is essential for inclusive and sustainable national development.
- It is designed as a **people's movement,** not merely a government scheme, driven by **women-led Self-Help Groups (SHGs)** at the village level. It focuses on **community ownership**, where society collectively takes responsibility for stopping violence.

MISCELLANEOUS

HUMAN DEVELOPMENT INDEX (HDI)

Context: The **United Nations Development Programme** released its annual **Human Development Report 2025** which appreciated India for its progress in human development but also warned about rising inequality.

About Human Development Index (HDI)

- The Human Development Index (HDI) is a composite measure used to assess the average achievement of a country in three fundamental dimensions of human development:
  - **A long and healthy life** (measured by **life expectancy at birth**)
  - **Access to knowledge** (measured by **mean years of schooling for adults** and **expected years of schooling for children**)
  - **A decent standard of living** (measured by **gross national income per capita** adjusted for purchasing power parity)
- The HDI is **expressed on a scale from 0 to 1,** where higher values indicate better human development outcomes.
- It was first introduced in 1990, in the first Human Development Report authored by Mahbub ul Haq and Amartya Sen.
- **Top performers in 2025 Report:** Iceland (0.972), Norway (0.970), Switzerland (0.970).
- **India:** HDI Rank - 130 out of 193 countries (improved from 133 in 2022); HDI Value- 0.685 (up from 0.676 in 2022)

GLOBAL NETWORK OF AGE-FRIENDLY CITIES AND COMMUNITIES

Context: Kozhikode city has been granted membership in the WHO Global Network of Age-Friendly Cities and Communities (GNAFCC).

- The Global Network of Age-Friendly Cities and Communities (GNAFCC) is a **World Health Organization (WHO) initiative launched in 2010 to promote environments where older people can live healthy, active, and inclusive lives.**
- It **connects cities and communities worldwide** to share knowledge and implement local actions that respond to the challenges of population ageing and urbanization. Members commit to listening to older citizens, assessing progress, and collaborating across sectors to build age-friendly environments.
- As of mid-2025, the network includes over 1,739 cities (including Kozhikode and Kochi) and communities in 57 countries, covering more than 370 million people worldwide.

INTERNATIONAL RELATIONS

INDIA'S BILATERAL RELATIONS

UK-INDIA FREE TRADE AGREEMENT (FTA) SIGNED

Context: India and the UK have signed a FTA after nearly three years of talks. Tariffs will be reduced on 90% of traded goods. The pact is designed to promote trade, investment, job creation, and innovation.

Key Highlights of the UK–India Trade Deal

- **Trade Expansion:**
  - The deal is projected to increase annual bilateral trade by £25.5 billion ($32 bn) from 2040 onward.
  - In 2024, UK–India trade stood at £42.6 billion ($53.5 bn)(with UK exports at £17.1 billion ($21.5 bn) and imports from India at £25.5 billion ($32 bn)). India ranked as the UK's 11th-largest trading partner in 2024.
- **Tariff Reductions and Market Access**
  - **India's Gains:** 99% of Indian exports to the UK will enjoy zero-duty access. Boost expected for labor-intensive sectors such as textiles, marine products, leather, footwear, sports goods, toys, gems & jewelry, engineering goods, auto parts, and organic chemicals.
  - **UK's Gains:** India will cut duties on 90% of tariff lines, with 85% becoming fully tariff-free within 10 years.
- **Major Sectors Benefitting**
  - **Alcohol**: Tariffs on whisky and gin will fall from 150% to 75% initially, and further to 40% by the tenth year, giving a major boost to UK Scotch whisky exports.
  - **Automobiles**: India will reduce auto import tariffs to 10% under a quota system (down from over 100%).
  - **Other Goods:** Tariffs will be reduced on British exports such as cosmetics, aerospace components, lamb, medical devices, advanced machinery, salmon, electrical machinery, soft drinks, chocolate, and biscuits, making them more competitive in India.
- **Services and Workforce Mobility**
  - The deal increases quotas for Indian workers to take up employment in specific sectors in the UK, enhancing labour mobility and services trade cooperation.
  - Indian workers in the UK will receive a three-year exemption from social security payments, reducing financial burdens and improving mobility opportunities.

INDIA-KYRGYZSTAN BILATERAL INVESTMENT TREATY (BIT)

Context: The India-Kyrgyzstan Bilateral Investment Treaty (BIT), signed in June 2019, came into force on 5 June 2025, replacing the 2000 agreement to maintain continuity in investment protection.

- The treaty balances investor rights with sovereign regulatory powers, promoting a transparent and resilient investment climate.

Key Features of India Kyrgyz BIT

- **Definition of Assets:** Enterprise-based, with clear inclusion/exclusion lists, covering capital commitment, profit expectation, and risk assumption.
- **Policy Space Exclusions:** Local government, procurement, taxation, compulsory licenses, etc., are excluded to preserve policy flexibility.
- **Removal of Most Favoured Nation Clause**: Prevents investors from selectively importing favorable provisions from other treaties, ensuring consistent treatment.
- **General and Security Exceptions:** Safeguards states' rights on issues like environment, public health, and safety.
- **Dispute Resolution**: Investors must first seek local remedies before pursuing international arbitration, encouraging alternative dispute resolution

What is the Bilateral Investment Treaty (BIT)?

- A Bilateral Investment Treaty (BIT) is an agreement between two countries that provides legal protection to foreign investors from one country investing in the other. They are also called International Investment Agreements (IIAs).

- BITs allow investors or their home countries to pursue legal remedies against the host country for investment-related disputes, often through arbitration.
- India adopted a new Model BIT in 2015, replacing the 1993 Model BIT. Since then, India has signed BITs with Uzbekistan (2024), UAE (2024), Brazil (2020), and Belarus (2018).

PM MODI'S VISIT TO JAPAN

Context: PM Modi visited Japan to attend the 15th India–Japan Annual Summit.

Six Major Outcomes

1. Investment Target of $68 Billion

- Japan will invest 10 trillion yen (~₹5.96 lakh crore / $68 billion) in India over the next decade.
- Special emphasis on linking SMEs and start-ups from both countries.

2. AI, Semiconductors, and Digital Partnership 2.0

- Launch of the **Economic Security Cooperation Initiative** in strategic technologies.
- Priority areas include AI, semiconductors, and rare minerals.
- Implementation of **India–Japan Digital Partnership 2.0** to strengthen innovation and technology exchange.

3. Defence and Maritime Security Cooperation

- A **new Joint Declaration on Security Cooperation** establishes a framework for deeper defence ties.
- Focus on defence industry collaboration and technological innovation
- Creation of the first-ever institutionalised dialogue between the National Security Advisers (NSAs) of both countries.

4. Chandrayaan-5 Space Collaboration

- ISRO and JAXA signed an agreement to collaborate on the Chandrayaan-5 mission.

5. Green and Energy Partnerships

- **Joint Credit Mechanism (JCM) for carbon credits:** Japan will invest in low-carbon technologies in India, and the emission reductions will generate carbon credits for Japan's climate goals.
- **Sustainable Fuel Initiative:** To promote energy security, farmer livelihoods and advance R&D in technologies related to sustainable fuels such as biogas and biofuels

6. Resource and People-to-People Exchange

- 5 lakh participants from both countries will take part in exchange programmes over the next five years. This includes 50,000 skilled Indian workers contributing to Japan's workforce.

INDIA–US 2+2 DIALOGUE

Context: Amid tensions over India's purchase of Russian oil and the US move to impose additional tariffs, New Delhi and Washington held the India–US 2+2 Intersessional Dialogue virtually.

What is 2+2 Dialogue?

- The "2+2" format brings together **India's External Affairs Minister and Defence Minister with the US Secretary of State and Secretary of Defense** in a single meeting, instead of separate bilateral talks by each ministry.
- It institutionalises **strategic coordination on foreign policy and defence,** signalling that the partnership has moved beyond transactional issues to long-term alignment.
- The **India–US 2+2 Ministerial Dialogue has been held since 2018** and is intended to be conducted annually.

Other 2+2 Dialogues of India

- **India holds 2+2 dialogues with six countries:** the United States, Japan (2019), Australia (2021), Russia (2021), United Kingdom (2023), and Brazil (2024).

3RD INDIA–SINGAPORE MINISTERIAL ROUNDTABLE (ISMR)

Context: The third India-Singapore Ministerial Roundtable took place on August 13, 2025, in New Delhi, India.

- The previous editions were held in September 2022 (New Delhi) and August 2024 (Singapore).
- Around ten agreements were finalised covering connectivity, digitalisation, healthcare and medicine, skills development, and advanced technology.
- The meeting also discussed an **ambitious undersea cable project designed to transmit solar energy and improve data connectivity between India and Singapore.**

- Both sides reviewed cooperation under six key pillars: Advanced manufacturing, Connectivity, Digitalisation, Healthcare and medicine, Skills development, Sustainability

INDIA–BHUTAN CROSS-BORDER RAIL LINKS

Context: The Government of India has approved two new cross-border railway projects that will establish Bhutan's first-ever rail connectivity with India.

Approved Projects:

- **Kokrajhar (Assam) – Gelephu (Bhutan):** A 69 km line costing ₹3,456 crore.
- **Banarhat (West Bengal) – Samtse (Bhutan):** A 20 km line costing ₹577 crore.
- These projects mark nearly two decades of cooperation on cross-border rail connectivity, formally initiated through a **2005 Memorandum of Understanding.**
- The new lines will **connect two major Bhutanese hubs—Gelephu,** which is being developed as a "Mindfulness City," **and Samtse**, a key industrial town.
- Passenger and freight services will operate on these routes. Likely Bhutanese exports include dolomite, ferrosilicon, quartzite, and stone chips.

INDIA–NEPAL AMEND TREATY OF TRANSIT

Context: India and Nepal have amended the **Treaty of Transit** to facilitate the smooth movement of **rail-based freight,** including bulk cargo, between Jogbani (India) and Biratnagar (Nepal).

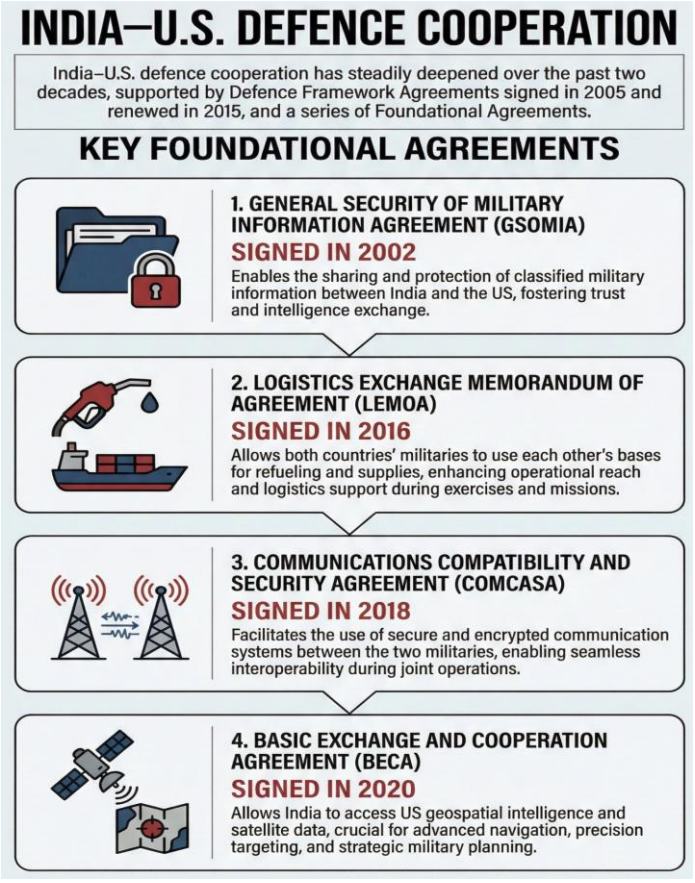
- Major transit corridors have been expanded, with the liberalised provisions now applying to the following routes: Kolkata–Biratnagar (via Jogbani); Kolkata–Nautanwa (Sunauli); Visakhapatnam–Nautanwa (Sunauli)
- The expanded arrangements enhance multimodal connectivity and strengthen Nepal's access to third-country trade through Indian ports.
- As Nepal's largest trade and investment partner, India expects the revised transit framework to further deepen economic and commercial linkages and promote regional integration.

INDIA–U.S. SIGN 10-YEAR MAJOR DEFENCE PARTNERSHIP FRAMEWORK

Context: India and the United States have signed a 10-year Framework for India–U.S. Major Defence Partnership on the sidelines of the 12th ASEAN Defence Ministers' Meeting Plus (ADMM-Plus) in Kuala Lumpur, marking a new phase in bilateral defence cooperation.

Key Highlights of the New Framework

- Establishes a strategic roadmap for deeper cooperation across operational, industrial, and technological domains.
- Promotes co-development and co-production of advanced defence systems under Make in India and Make for the World.
- Enhances intelligence sharing to address cyber, maritime, and emerging security threats.
- Expands joint military exercises, including Malabar, Yudh Abhyas, and Tiger Triumph.
- Reaffirms a shared commitment to a free, open, and rules-based Indo-Pacific.



INDIA OMAN COMPREHENSIVE ECONOMIC PARTNERSHIP AGREEMENT (CEPA)

Context: India and Oman signed a Comprehensive Economic Partnership Agreement (CEPA). It is Oman's first trade agreement since 2006 and India's second CEPA in the GCC, after UAE (2022).



Key Highlights

- Oman will provide India duty-free access to 98.08% of its tariff lines, which covers 99.38% of what India exports to Oman.
- India has offered liberalised tariffs on 77.79% of its total tariff lines, covering 94.81% of what India imports from Oman.
- Oman has offered wide-ranging commitments under Mode 4 Services Export such as Intra-Corporate Transferees quota raised from 20% → 50% and Stay for Contractual Service Suppliers extended from 90 days → 2 years (extendable).
- The CEPA provides for 100% FDI by Indian companies in major services sectors in Oman through commercial presence.

INDIA-RUSSIA RELOS AGREEMENT

Context: Russia has officially approved the Reciprocal Exchange of Logistics Support (RELOS) agreement with India.

About India-Russia Reciprocal Exchange of Logistics Support (RELOS) Agreement

- The Agreement enables mutual access to each other's military facilities for refueling, repairs, supplies, and maintenance to enhance joint operations and strategic reach.
- RELOS **lays down procedures** for the movement of military personnel, warships, and aircraft between India and Russia, along with arrangements for logistical support. It enables **mutual use of airspace and permits port calls** by naval vessels.
- The agreement covers **transport of troops and equipment,** refuelling, repairs, maintenance, and other support services during deployments.
- It **applies to joint exercises, training, humanitarian assistance,** and disaster relief, and may also be used in other situations with mutual consent.
- For India, RELOS provides structured access to Russian air and naval bases, from Vladivostok to Murmansk. For Russia, it enables greater access to Indian ports and airfields for logistics and operations

- RELOS is similar to an India-U.S. agreement called the Logistics Exchange Memorandum of Agreement (LEMOA).
- India has such military logistics agreements with Australia, Japan, the United States – the Quad countries – as well as with France, Singapore, and South Korea.

INDIA- NEW ZEALAND FTA

Context: India-New Zealand FTA was concluded in December 2025, becoming one of India's fastest-concluded FTAs. New Zealand is India's second-largest trading partner in Oceania.

Principal Outcomes of India- New Zealand FTA

- **Duty-Free Access for Indian Exports:** New Zealand will grant 100% duty-free access to all Indian exports across all tariff lines.
- **India's Calibrated Market Access Offer:** India has offered tariff concessions on 70.03% of tariff lines, covering 95% of bilateral trade value, while keeping 29.97% lines in exclusion to protect sensitive sectors
- **Protection of Sensitive Sectors:** Key exclusions include **dairy**, most animal products, select vegetables, sugar, fats and oils, arms and ammunition, gems and jewellery, copper, aluminium, and related products.
- **Agriculture Productivity Cooperation:** New Zealand will support Agriculture Productivity Action Plans for apples, kiwifruit, and honey through Centres of Excellence, improved planting material, research collaboration, capacity building.
- **Seasonal Tariff-Rate Quotas (TRQs) with Safeguards:** Market access for apples, kiwifruit, Manuka honey, and albumins is managed through TRQs with Minimum Import Prices, seasonal windows, and monitoring by a Joint Agriculture Productivity Council, ensuring farmer protection alongside consumer choice.

- **Long-Term Investment Commitment:** New Zealand will facilitate USD 20 billion investment in India over 15 years, supporting manufacturing, infrastructure, innovation, and jobs.
- **Student Mobility and Post-Study Work:** Dedicated pathways remove caps on Indian students, allow **20 hours of work per week, and provide post-study work visas of up to 3 years** for STEM graduates and 4 years for PhD holders.
- **Temporary Employment Entry (TEE) Visa:** A new TEE Visa allows up to 5,000 Indian professionals at a time, covering AYUSH practitioners, yoga instructors, chefs, teachers, and skilled workers in IT, healthcare, engineering, and construction.
- **Youth Mobility:** 1,000 Working Holiday Visas annually for young Indians, valid for 12 months, to promote skills, exposure, and people-to-people ties.
- **Services Market Access:** New Zealand has opened 118 services sectors and extended Most-Favoured-Nation treatment in 139 sub-sectors, covering IT, professional services, education, finance, telecom, tourism, construction, and environmental services

INDIA–RUSSIA SUMMIT 2025

Context: Russian President Vladimir Putin paid an official state visit to India to attend **23rd India–Russia Summit.**

- This year marks the 25th anniversary of the Declaration on Strategic Partnership between India and Russia, established during the first State Visit of President Putin to India in 2000.

Key Highlights of Summit 2025

- **Programme 2030:** India and Russia adopted Programme 2030 to deepen long-term strategic economic cooperation.
- **Trade in National Currencies:** Both sides agreed to promote trade settlement using rupee–ruble mechanisms.
- **Trade Target:** Bilateral trade of $100 billion by 2030
- **Labour Mobility Agreement:** A regulated pathway was launched to allow Indian workers to take up jobs in Russia safely.
- **Nuclear Energy Cooperation:** Cooperation expanded to include Small Modular Reactors, new Kudankulam Nuclear Power Plant units, and nuclear fuel and training.
- **Logistics Connectivity:** Progress was reviewed on the **Chennai–Vladivostok maritime corrido**r to improve trade links.
- **Tourism Boost:** India announced free 30-day double-entry e-tourist visas for Russian nationals.
- **Fertiliser Security:** An MoU was signed to set up a urea plant in Russia to ensure stable fertiliser supply for India.
- **International Alliances:** Both sides welcomed Russia's adoption of the Framework Agreement to join the International Big Cat Alliance (IBCA). The Indian side expressed hope for Russia's early joining of the International Solar Alliance (ISA) and the Coalition for Disaster Resilient Infrastructure (CDRI).
- **Consular Expansion:** The leaders welcomed the opening of two Consulates General of India in Yekaterinburg and Kazan.

SUMMITS AND ORGANISATIONS

WHO PANDEMIC AGREEMENT

Context: At the 78th World Health Assembly (WHA), Member States of the WHO unanimously adopted the world's first Pandemic Agreement.

- Article 19 of the Constitution of the World Health Organization empowers the World Health Assembly to adopt conventions or agreements on any matter within the competence of WHO, requiring a two-thirds majority for adoption.

About WHO Pandemic Agreement

- It is a **legally binding global treaty** aiming **to strengthen coordination and equity in preventing, preparing for, and responding to future pandemics.**
- It is only the second such treaty, after the WHO Framework Convention on Tobacco Control (2003).

- It institutionalizes lessons learned from COVID-19, aiming to address critical weaknesses in global health systems and international coordination exposed during recent pandemics.

Key Highlights

- **Pandemic Prevention and Surveillance:** Builds on the International Health Regulations (2005), which guide countries in preventing, detecting, and responding to cross-border disease outbreaks.
- **Global Supply Chain and Logistics Network:** Aims to guarantee fair and timely access to essential health products during declared international health emergencies.
- **Sustainable Financing:** A coordinated financial mechanism will be established under the IHR framework to support the agreement's implementation and long-term viability.
- **Pathogen Access and Benefit Sharing (PABS):**
  - A working group of governments has been tasked with finalizing the design of the PABS system, to be reviewed at the next World Health Assembly. PABS must be finalized by May 2026.
  - PABS will ensure rapid sharing of pathogen samples and genetic data with pandemic potential.
  - In exchange, pharmaceutical companies must provide the WHO with 20% of their real-time production of vaccines, medicines, and diagnostics (10% free, 10% at affordable prices).
- **Implementation:** After PABS is adopted, the agreement will open for signature and ratification by member states. It becomes legally binding once 60 countries ratify it. *The United States is absent. President Trump initiated U.S. withdrawal from WHO.*

About World Health Organization (WHO)	
About	• WHO is the UN's specialized health agency, coordinating global responses to health threats. • WHO's Constitution was adopted at the International Health Conference (New York, 1946); came into force in 1948.
Key Functions	• Coordinates health emergencies, promotes well-being, prevents disease, expands healthcare access, provides technical aid, distributes vaccines/supplies, and sets health guidelines.
Governance	• **World Health Assembly (WHA):** Annual meet in Geneva; sets policies, approves budgets, appoints DG. • **Executive Board:** Implements WHA decisions; nominates DG. • **Secretariat**: HQ in Geneva, 6 regional offices, 150+ country stations.
Membership	• **194 member states** (as of Jan 2025), grouped into 6 regions (Africa, Americas, Eastern Mediterranean, Europe, South-East Asia, Western Pacific). • Open to all UN members; others may join with WHA approval. • **India has been a Member since January 12, 1948.** • As of 2025, the United States and Argentina are in the process of withdrawing from WHO.
Funding	• **Assessed Contributions (AC):** Fixed share of GDP (under 20% of budget) • **Voluntary Contributions (VC):** From member states, UN bodies, foundations, private sector. ○ **Largest donors (2020–23):** US, Gates Foundation, UK, Germany.

UN PEACEKEEPING MINISTERIAL IN BERLIN

Context: The Peacekeeping Ministerial 2025 was held in Berlin, Germany. Previous ministerials were hosted in Accra (2023), Seoul (2021), New York (2019), Vancouver (2017), and London (2016).

- The 2025 edition was significant as it coincided with the 80th anniversary of the UN and the 10th anniversary of the Leaders' Summit on Peacekeeping.

About United Nations Peacekeeping

- The UN peacekeeping is an **international effort developed by the UN Department of Peace Operations to help countries transitioning from conflict to peace.**

- Peacekeeping operations are **authorized by the UN Security Council**, and troops remain under their national command but operate under UN control during missions. Financial support and resources are approved by the UN General Assembly.
- Peacekeeping began in 1948 with the United Nations Truce Supervision Organization (UNTSO) in the Middle East, created to monitor ceasefires.
- Currently, there are 11 active missions, including in Western Sahara, the Golan Heights, and the Democratic Republic of Congo.
- UN Peacekeeping was awarded the Nobel Peace Prize (1988) for its contribution to global peace and security.
- UN Peacekeeping is guided by three basic principles:
  - Consent of the parties;
  - Impartiality;
  - Non-use of force except in self-defence and defence of the mandate.

India and UN Peacekeeping

- **Troop Contribution:** India has deployed over 2.9 lakh peacekeepers across 50+ UN missions since 1948. It currently ranks as the fourth-largest troop-contributing nation (5,375 personnel), after Nepal, Rwanda, and Bangladesh.
- **Operational Role:** Played crucial roles in missions such as the Korean War armistice, Cyprus, and the Congo.
- **Centre for United Nations Peacekeeping (CUNPK)**: Set up by the Indian Army in New Delhi, acts as the hub for training, research, and international cooperation in peacekeeping.
- **Gender Equality:** In 2007, India became the first country to send an all-women Formed Police Unit to Liberia, setting a global example in promoting women's participation in peacekeeping.

NEW DEVELOPMENT BANK

Context: Algeria has become the 9th member of the New Development Bank (NDB).

About New Development Bank (NDB)

- Established in **2015** by the **BRICS nations** (Brazil, Russia, India, China, and South Africa), the NDB is a multilateral development bank that **mobilizes resources for infrastructure and sustainable development projects in emerging markets and developing countries (EMDCs).**
- It is **headquartered in Shanghai, China.**
- The Bank's authorized capital is $100 billion, with the **five founding members contributing equally to an initial $50 billion**. They retain a combined voting power of at least 55%, ensuring a balanced governance structure.

Membership of NDB

- **Membership is open to all UN member states**, both borrowing and non-borrowing, under Article 2 of the NDB Agreement.
- Its membership now includes **Brazil, Russia, India, China, South Africa, Bangladesh, UAE, Egypt, and Algeria**.
- **Uruguay, Uzbekistan, Columbia, and Ethiopia** have been approved as prospective members.

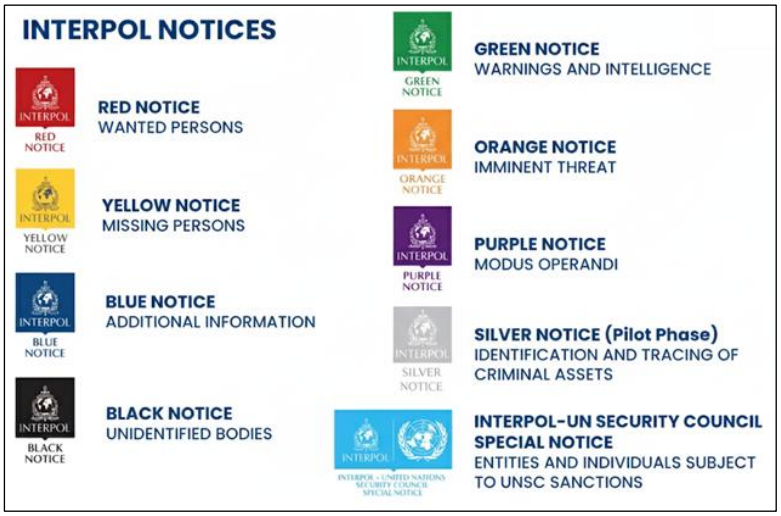
Category	Asian Development Bank (ADB)	Asian Infrastructure Investment Bank (AIIB)	African Development Bank (AfDB)
Headquarters	Manila, Philippines	Beijing, China	Abidjan, Côte d'Ivoire
Genesis	1966	2016	1964
Members	69 members: 50 from Asia-Pacific and 19 from outside (including India).	111 approved members: 105 full and 6 prospective (including India as full member).	81 members: 54 African and 27 non-African (including India).
Voting Structure	Voting based on shareholding; US & Japan largest	Voting based on capital China is the largest, followed by India & Russia.	African members hold majority (~60%)

INDIA'S FIRST INTERPOL SILVER NOTICES

Context: India's first-ever Interpol Silver Notices were issued at India's request in May 2025 to tackle two major financial crimes: a visa fraud case in New Delhi, and a cryptocurrency scam.

About INTERPOL Silver Notice

- Introduced in January 2025 as a pilot programme with 51 participating countries.
- Enables the sharing of alerts and requests to identify and track assets of criminals worldwide.
- Each country can issue up to nine Silver Notices during the pilot phase (till November 2025).



Key Objectives

- **Tracking Illicit Assets:** Monitors properties, vehicles, bank accounts, and businesses obtained illegally.
- **Facilitating Global Cooperation:** Enhances coordination among countries against transnational organized crime.
- **Enabling Asset Recovery:** Aids in locating, seizing, and returning laundered assets across borders.

About INTERPOL	
Headquarters	Lyon, France
Genesis	Founded as International Criminal Police Commission (ICPC) at 2nd International Police Congress, Vienna (1923); renamed INTERPOL in 1956
Members	196 countries (India is a founding member)
Governing Bodies	The General Assembly and the Executive Committee
National Central Bureaus (NCBs)	Set up by member countries as official points of access for INTERPOL affairs
India's NCB	**Central Bureau of Investigation (CBI);** also developed the Bharatpol portal for better coordination

INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA)

Context: IAEA chief notes progress in Iran talks over nuclear site inspections.

About International Atomic Energy Agency (IAEA)

- The IAEA is an intergovernmental body **founded in 1957 to ensure nuclear energy is used only for peaceful purposes.**
- It **works within the UN system**, reports to the **General Assembly** and **Security Council,** and is headquartered in **Vienna, Austria.**
- Created during the Cold War, it was **inspired by the U.S. President Eisenhower's "Atoms for Peace" speech (1953**), which called for global regulation of nuclear resources.
- **Members:** 180 (India is a member). North Korea has withdrawn from the IAEA.
- **Institutional Structure:**
  - **General Conference:** All member states; meets annually to approve budgets and set policy.
  - **Board of Governors:** 35 members; meets ~5 times a year to approve safeguards, exercise statutory powers, and appoint the Director General.
  - **Secretariat:** Led by the Director General; manages daily operations.
- **Functions:**
  - Promote peaceful uses of nuclear energy in medicine, agriculture, and power.
  - Verify through safeguards and inspections that nuclear materials are not used for weapons.
  - Set global standards for nuclear safety and radiation protection.
  - Provide training and technical support, especially to developing nations.
- **NPT Role:** Under the 1968 Nuclear Non-Proliferation Treaty (NPT), non-nuclear states must allow IAEA inspections of their nuclear facilities.

- **Recognition:** In **2005**, the IAEA and Director General Mohamed ElBaradei won the **Nobel Peace** Prize for preventing misuse of nuclear energy and promoting safety.

UN SECURITY COUNCIL'S (UNSC) 1267 SANCTIONS COMMITTEE

Context: Indian officials recently briefed the monitoring team of the UN Security Council's 1267 Sanctions Committee regarding The Resistance Front's (TRF) involvement in the 2025 Pahalgam terrorist attack.

UN Security Council's 1267 Sanctions Committee

- Also called the ISIS and Al-Qaeda Sanctions Committee, the committee was **established in 1999 to tackle terrorism connected to these groups and their networks.**
- Comprising all permanent and non-permanent members of the Security Council, it monitors threats, enforces sanctions such as travel bans, asset freezes, and arms embargoes, and ensures compliance with key resolutions including 1267 (1999), 1989 (2011), and 2253 (2015).
- The 1267 Committee manages a "**Consolidated List**" of designated terrorists and related entities, and all member states are required to freeze their assets, impose travel bans on them, and block the supply of arms or military training.
- The 1267 regime is considered binding on all member states under Chapter VII of the UN Charter.

ASIAN PRODUCTIVITY ORGANIZATION (APO)

Context: India assumed the Chairmanship for 2025–26 at the 67th Governing Body Meeting of APO.

- The APO is a **regional intergovernmental body founded in 1961, headquartered in Tokyo, Japan**, to boost productivity in the Asia-Pacific region through cooperation and capacity building.
- The APO functions through its **Governing Body, National Productivity Organizations (NPOs) in each member country, and a Secretariat led by the Secretary-General**.
- Membership is open to Asia-Pacific states in UN ESCAP. It has **21 members, including India** (a founding member), Japan, Korea, Indonesia, Malaysia, Vietnam, Iran, Turkiye, and others.
- **Key Functions:** Capacity building and knowledge sharing in productivity science; Research, policy advisory, and demonstration projects; Promotes modernization, green productivity, and innovation; Nonpolitical, nonprofit, and inclusive in character.
- The APO contributes to the sustainable socioeconomic development of the region through policy advisory services, acting as a think tank, and undertaking smart initiatives in the industry, agriculture, service, and public sectors.

WORLD BANK LAND CONFERENCE

Context: India served as a Country Champion at the World Bank Land Conference 2025.

World Bank Land Conference

- The World Bank Land Conference is a premier **global forum on land governance and land sector reforms**, held **annually**.
- The 2025 conference took place from May 5 to 8, 2025, in Washington, DC. It brought together over 1,000 participants from governments, development partners, civil society, academia, and the private sector **to showcase research, discuss good practices, and promote policy reforms related to securing land tenure and access.**
- **2025 Conference Theme:** "Securing Land Tenure and Access for Climate Action: Moving from Awareness to Action"
- India participated strongly, highlighting its SVAMITVA Scheme and Gram Manchitra platform as models of inclusive, technology-driven rural governance which improve livelihoods, empower women, and enable access to credit by formalizing land records.

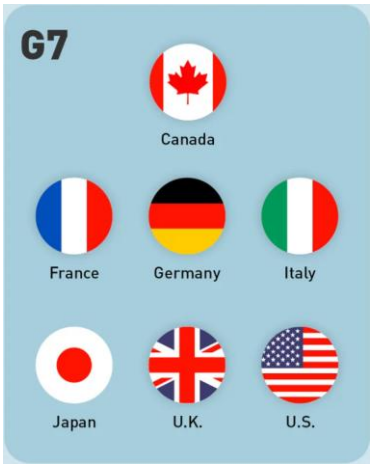
G7 SUMMIT 2025

Context: 2025 G7 Leaders' Summit was held in Kananaskis, Alberta, Canada, marking the 50th anniversary of the first G7 Summit. PM Modi participated in the G7 Outreach Session.

Key Outcomes of 51st G7 Summit 2025

- **Kananaskis Wildfire Charter:** Adopted to strengthen global cooperation on wildfire prevention, preparedness, response, and recovery, emphasizing nature-based solutions.

- **G7 Critical Minerals Action Plan:** Agreed to diversify supply chains for critical minerals, promote responsible mining, and support clean energy innovation.
- **Supply Chain Resilience:** Committed to resilient, inclusive supply chains and supporting the World Bank-led RISE partnership for global trade stability.
- **Condemnation of Transnational Repression (TNR):** Condemned state-led interference targeting dissidents abroad and pledged to counter such actions
- **Migrant Smuggling Initiatives:** Leaders agreed to prevent smuggling through coalitions and actionable plans.
- **No Final Communiqué:** Geopolitical tensions (Israel-Iran) and trade issues prevented a final statement.



The G7 (Group of Seven)

- The G7 is a forum of seven advanced economies- **Canada, France, Germany, Italy, Japan, the UK, and the US-** with the **EU** participating as a non-enumerated member.
- **Formed in 1975** (as G6) to address the oil crisis, it became the G7 in 1976 and briefly the G8 with Russia (1997–2014).
- The G7 has **no treaty or permanent secretariat;** its presidency rotates annually, with decisions taken by consensus.
- It addresses global issues like trade, security, economic stability, climate change, and democracy.
- Collectively, G7 countries account for ~10% of the world's population, ~50% of global wealth, and ~44% of nominal GDP.

About Resilient and Inclusive Supply-Chain Enhancement Partnership (RISE)

- The RISE Partnership is a global initiative that supports the **development of diversified, resilient, and inclusive clean energy supply chains**, especially in Low- and Middle-Income Countries (LMICs).
- It provides knowledge support, technical assistance, and finance facilitation.
- It aims to ensure that developing countries gain value addition, jobs, and economic diversification, rather than remaining only raw material suppliers. At the same time, it supports global decarbonisation by reducing over-dependence on a few supply sources.
- RISE is **managed under the Extractives Global Programmatic Support Trust Fund, administered by the World Bank.**

3RD UN OCEAN CONFERENCE (UNOC3)

Context: The 2025 UN Ocean Conference (UNOC3) in Nice, France, adopted *"Our Ocean, Our Future: United for Urgent Action"*, strengthening global commitments to SDG 14 (Life Below Water).

- France and Costa Rica co-hosted the UNOC3. UNOC4 will be co-hosted by Chile and South Korea in 2028.

Key Outcomes of UNOC3

- **Global Consensus:** Countries adopted the political declaration "Our Ocean, Our Future: United for Urgent Action".
- **Nice Ocean Action Plan:** Includes a political declaration and pledges on youth advocacy, marine literacy, treaty ratifications, and innovative financing.
- **Marine Protected Areas (MPAs):** Only 8% of oceans designated as MPAs, with 2.8% effectively protected**.** French Polynesia announced the world's largest MPA (5 million sq. km). Chile, Colombia, Tanzania pledged new MPAs.
- **High Seas Treaty (BBNJ):** 19 new ratifications, bringing the total to 50 of 60 needed. Treaty aims to protect biodiversity beyond national jurisdictions.
- **Coral Reef Protection:** 11 nations pledged to protect climate-resilient coral reefs. $25 million pledged to the Global Fund for Coral Reefs (GFCR). Current bleaching affects 83.7% of coral reefs. Coral reefs support 25% of marine life and provide services worth up to $9.9 trillion/year.

Three Main Priorities of UNOC3

- Complete multilateral processes related to the ocean.
- Mobilize finance for SDG14 and promote a sustainable blue economy.
- Strengthen and share marine science knowledge to inform policymaking.

Blue NDC Challenge

- The Blue NDC Challenge was launched by **Brazil and France** at the third UN Ocean Conference (UNOC3) in Nice, France.
- The initiative aims to dramatically scale up ocean-focused climate action, recognizing the ocean's critical role in climate regulation, carbon sequestration, and sustaining biodiversity.
- The Blue NDC Challenge is a global call for all Parties to the Paris Agreement to integrate ocean-based climate solutions into their NDCs,
- **Inaugural Participants**: Alongside Brazil and France, six other countries, Australia, Fiji, Kenya, Mexico, Palau, and the Republic of Seychelles, have committed to including ocean-focused actions in their updated NDCs.
- **Support Mechanisms**: The initiative is backed by organizations like the World Resources Institute (WRI), Ocean Conservancy, Ocean & Climate Platform, and WWF-Brazil

UN Decade of Ocean Science for Sustainable Development (2021-2030)

- Also known as the **Ocean Decade**, is a global initiative led by UNESCO's Intergovernmental Oceanographic Commission (IOC).
- It aims to reverse the decline in the health of the ocean and catalyze new solutions for sustainable development.

INDIA AND INTERNATIONAL INSTITUTE OF ADMINISTRATIVE SCIENCES (IIAS)

Context: India has been elected to the Presidency of the IIAS for the 2025–2028 term. India will also host the 2025 IIAS Annual Conference in Kochi, Kerala. This was the first-ever election by ballot in IIAS's 100-year history.

About International Institute of Administrative Sciences (IIAS)

- The **IIAS (founded in Madrid in 1930) is an international non-profit organization with scientific purposes.** IIAS is a federation of member states, national sections and academic research centres jointly elaborating public governance solutions to the policy challenges of the day.
- It comprises 31 Member Countries, 20 National Sections, and 15 Academic Research Centres. The **headquarters is in Brussels, Belgium.**
- IIAS promotes scientific research in public administration and collaborates closely with the United Nations, although it is **not formally affiliated with the UN.**
- Key member countries include India, Japan, China, Germany, Italy, Korea, Saudi Arabia, South Africa, Switzerland, Mexico, Spain, Qatar, Morocco, and Indonesia, among others.
- **India has been a member of IIAS since 1998,** represented by the Department of Administrative Reforms and Public Grievances (DARPG).
- The Indian Presidency will promote the governance model of *"Maximum Governance – Minimum Government."*
- As the current President of the International Institute of Administrative Sciences (IIAS), India has proposed creating a new International Governance Index.

INTERNATIONAL AIR TRANSPORT ASSOCIATION

Context: The PM addressed the International Air Transport Association's (IATA) 81st Annual General Meeting (AGM) and plenary session of World Air Transport Summit (WATS) in New Delhi.

About International Air Transport Association (IATA)

- IATA was founded in 1945 in Havana, Cuba, by 57 airlines from 31 countries, the International Air Transport Association (IATA) succeeded the International Air Traffic Association established in 1919 in The Hague.
- IATA's primary role is to promote cooperation among airlines worldwide, establish industry standards, and advocate for safe, secure, and efficient air transport.
- **Headquarters:** Montreal, Canada, with over 50 offices worldwide.
- **Membership:** Comprises ~350-member airlines from 126 countries, representing over 80% of global scheduled air traffic.

Functions of IATA

- **Industry Standards & Regulations:** Develops global standards for ticketing, cargo handling, and operations.
- **Advocacy:** Represents airline interests in policy discussions with governments and international bodies.

- **Financial Systems:** Manages global payment systems like BSP (Billing and Settlement Plan) and CASS (Cargo Account Settlement System) for streamlined financial settlements.
- **Training & Certification:** Offers programs to improve safety and operational efficiency.
- **Sustainability:** Supports decarbonization efforts and promotes Sustainable Aviation Fuels (SAF).
- **Data & Research:** Provides industry data, forecasts, and safety performance reports.

UN'S DEVELOPMENT CONFERENCE IN SEVILLE

Context: Global leaders convened the **4th International Conference on Financing for Development (FFD4)** in Seville, Spain. India's participation in the FFD4 was led by Union Finance Minister Sitharaman.

FFD4 Conference Highlights

- **FFD4 Focus:** Political, financial, and trade leaders address aid, trade, and debt challenges.
- **Seville Commitment (Compromiso de Sevilla):** Signed by nearly all UN member states, it aims to boost investment in sustainable development, address the debt crisis afflicting many of the world's poorest countries, and give developing countries a stronger voice in the international financing architecture.
- The four co-facilitators of FFD4 were Mexico, Nepal, Norway, and Zambia.
- On the final day of talks, the United States abruptly withdrew from the negotiations.

Past Conferences:

- **Monterrey Consensus (2002):** Set ODA targets and supported debt relief for heavily indebted poor countries.
- **Doha Declaration (2008):** Stressed addressing poverty eradication, sustained economic growth, sustainable development, and equitable global economic systems.
- **Addis Ababa Action Agenda (2015):** Introduced SDGs, emphasized tax reforms and curbing illicit financial flows.

2025 NATO SUMMIT

Context: The 2025 NATO Summit was held in The Hague, the Netherlands. The 2026 NATO Summit will be held in Türkiye.

- During the summit, NATO Allies agreed to a new defence spending benchmark of 5% of GDP to be reached within a decade, up from the previous 2%.
- This forms part of the Hague Defence Investment Plan, aimed at strengthening NATO's deterrence and readiness.

About North Atlantic Treaty Organization (NATO)

- NATO is an **intergovernmental military alliance established in 1949 with the signing of the Washington Treaty**. It has 32 member countries from Europe and North America.
- Its core principle is **collective security** i.e. an attack on one member is considered an attack on all **(Article 5).**
- Formed to counter Soviet power during the Cold War, NATO now undertakes peacekeeping, crisis management, and addresses modern threats like cyberattacks, terrorism, and piracy.
- **Structure**:
  - **Headquartered in Brussels,** NATO is **governed by the North Atlantic Council,** with decisions by consensus.
  - **The Military Committee** oversees two strategic commands: Allied Command Operations and Allied Command Transformation.
- **Recent Members**: Finland (2023) and Sweden (2024).

SHANGHAI COOPERATION ORGANIZATION (SCO)

Context: India has refused to sign a joint declaration at the Shanghai Cooperation Organisation (SCO) Defence Ministers' meeting in Qingdao, China.

About Shanghai Cooperation Organization (SCO)	
Genesis	Evolved from the "Shanghai Five" mechanism in 1996; officially established at the Shanghai Summit (2001) by Russia, China, Kyrgyzstan, Kazakhstan, Tajikistan, and Uzbekistan.
Headquarters	Beijing, China
Key Objectives	• Strengthen mutual trust, friendship, and good neighborliness among member states. • Ensure peace, security, and stability in the region. • Promote a democratic, fair, and rational international political and economic order.

Membership	• 10 Members: China, Russia, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, India, Pakistan, Iran (2023), Belarus (2024). • 17 Partners: 2 observers and 15 dialogue partners
Structure	• Council of Heads of States: Apex decision-making body. • Council of Heads of Governments: Second-highest decision-making body. • Standing Bodies: Secretariat (Beijing, China) and Regional Anti-Terrorist Structure (RATS) (Tashkent, Uzbekistan).
Other Details	The UN General Assembly has granted observer status to SCO.

ECONOMIC COMMUNITY OF WEST AFRICAN STATES (ECOWAS)

Context: Recently, Economic Community of West African States celebrated its 50th anniversary.

About ECOWAS	
Establishment	Founded on 28 May 1975 by 15 West African countries through the Treaty of Lagos. Established a Free Trade Area (1990) and adopted a Common External Tariff (2015).
Headquarters	Abuja, Nigeria
Members	• Comprises 12 West African countries (as of June 2025): Benin, Cabo Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Nigeria, Senegal, Sierra Leone, and Togo. • In 2024, the governments of Niger, Burkina Faso, and Mali jointly announced their withdrawal from the bloc.
Aim	• Promote cooperation and integration for an economic union in West Africa. • Improve living standards and economic stability. • Strengthen member relations and contribute to Africa's development.
India–ECOWAS Relations	• India became an Observer in 2004; ECOWAS supports India's bid for permanent UN Security Council membership. • India provided a USD 250 million line of credit (2006) under the Focus Africa Programme (launched 2002–03) to boost trade and investment.

UN ECONOMIC AND SOCIAL COUNCIL (ECOSOC)

Context: India has recently been elected as a member ECOSOC for the 2026–28 term.

About United Nations Economic and Social Council (ECOSOC)	
Genesis	Established in 1945 as one of the six main organs of the United Nations
Headquarters	New York, USA
Membership	• 54 members, elected by the UN General Assembly for a 3-year term; • 18 members elected each year • Membership is region-based and divided among five geographic groups: Africa, Asia-Pacific, Eastern European, Latin American & Caribbean, and Western European and other States. • The presidency rotates annually among member states.
Key Role	• Promote the three dimensions of sustainable development: economic, social, and environmental • Coordinate the work of UN bodies and specialized agencies • Issue policy recommendations to the UN system and member states
Institutional Linkages	• ECOSOC oversees 14 specialized agencies (like WHO, UNESCO), 10 functional commissions (such as on human rights, population, and the status of women), and 5 regional commissions (for Africa, Asia-Pacific, Latin America and the Caribbean, Western Asia, and Europe).

GAVI, THE VACCINE ALLIANCE

Context: The US, a major Gavi supporter, withdraws funding, accusing it and WHO of suppressing dissent and vaccine safety concerns.

About Gavi, the Vaccine Alliance

- Gavi (Global Alliance for Vaccines and Immunisation) is a **public-private global health partnership created in 2000 to increase access to immunization in the world's poorest countries**.
- It helps vaccinate more than half of the world's children and has immunized over 1.2 billion children, preventing around 20.6 million deaths.
- Gavi works with donor and developing country governments, **WHO, UNICEF, the World Bank, vaccine manufacturers,** civil society, and private philanthropists like the **Bill & Melinda Gates Foundation**.
- It supports vaccine financing, strengthening health systems, and innovative technologies to extend immunization coverage, especially to "zero-dose" children who have never been vaccinated.

INTERNATIONAL ORGANISATION FOR MEDIATION (IOMED)

Context: China has established the International Organization for Mediation (IOMed) as a **global alternative to institutions like the ICJ and Permanent Court of Arbitration.**

About International Organization for Mediation (IOMed)

- IOMed is the world's first intergovernmental legal organization dedicated to resolving international disputes through mediation.
- It has **19 founding members**, including China, Indonesia, Pakistan, and Belarus, mostly from Asia, Africa, and the Caribbean, reflecting its non-Western focus.
- Currently, it has 38 members. (India is not a member).
- Its scope covers state-to-state disputes, conflicts between a state and foreign nationals, and international commercial disagreements.
- It is headquartered in Wan Chai, Hong Kong.

INTERNATIONAL ORGANIZATION FOR MARINE AIDS TO NAVIGATION

Context: India attended the 2nd IALA Council session as Vice President in Nice, France, and will host the 3rd General Assembly (2025) and 21st Conference (2027) in Mumbai.

International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA)	
Establishment	Established in 1957 as an NGO; became an Intergovernmental Organization (IGO) in 2024 to strengthen maritime safety and standard-setting globally.
Headquarters	Saint-Germain-en-Laye, France
Structure	The General Assembly of IALA meets about every four years. The council of 24 members meets twice a year to oversee the ongoing programs.
Purpose	Ensure safe, economic, and efficient movement of vessels by improving and harmonizing aids to navigation worldwide.
Mandate	• Harmonize global maritime navigation systems • Promote maritime safety initiatives • Collaborate with member states, international organizations, and industry stakeholders to address maritime safety and environmental challenges

INTERNATIONAL CONFERENCE ON DISASTER RESILIENT INFRASTRUCTURE

Context: African Union joined India's **Coalition for Disaster Resilient Infrastructure at** 7th International Conference on Disaster Resilient Infrastructure (ICDRI 2025) in **France**.

About ICDRI 2025

- The 2025 edition, themed "*Shaping a Resilient Future for Coastal Regions*," focused on promoting sustainable and disaster-resilient infrastructure capable of withstanding climate and economic shocks in vulnerable coastal areas.
- By **convening in Europe for the first time,** ICDRI 2025 has broadened its global impact.
- It launched a **Call to Action for Coastal Resilience**, presenting global recommendations to protect communities and enhance adaptive capacity, especially in Small Island Developing States (SIDS).
- Three core pillars guided the agenda – improving access to finance, deploying data and technology, and enforcing infrastructure codes and standards to enhance resilience.
- The **IRIS Programme (Infrastructure for Resilient Island States)** announced progress with 24 projects in 25 SIDS, alongside new research grants for 53 projects in 21 countries.

- Recommendations included creating a **SIDS Global Data Hub**, expanding early warning systems, and establishing regional training and fellowship hubs to promote local capacity and research in resilience.

About Coalition for Disaster Resilient Infrastructure	
Origin	The CDRI is an international partnership launched by the Government of India in 2019 at the 2019 UN Climate Action Summit in New York.
Main Objective	• Its goal is to reduce the damage and losses caused by natural disasters by promoting resilient infrastructure planning and construction. • It supports the UN Sustainable Development Goals (SDGs), the Paris Climate Agreement, and the Sendai Framework for Disaster Risk Reduction.
Mission and Activities	• Improving both new and old infrastructure for disaster resilience. • Conducting research and knowledge exchange. • Developing global standards, building codes, and financing tools for resilient projects.
Support to Countries	• It helps developing and developed nations by offering technical advice, training programs, and access to international best practices to strengthen their infrastructure systems.
Governance Structure	• It is governed by a Charter. Its Secretariat is based in New Delhi. • The Governing Council is co-chaired permanently by India and rotationally by other key members.
Global Reach	53 member countries and 11 partner organizations

ILO CONVENTION ON BIOLOGICAL HAZARDS

Context: The International Labour Organization (ILO) adopted its first-ever international convention on biological hazards at work (Convention No. 192) during its 113th session on June 13, 2025.

About ILO Convention No. 192

- It establishes the first-ever global standard aimed at preventing exposure to and protecting workers from biological hazards such as viruses, bacteria, fungi, and other harmful biological agents in workplaces
- The Convention's core objective is to provide a legal framework for the realization of the fundamental right to a safe and healthy working environment concerning biological hazards. It covers all workers and sectors where biological exposure risks exist.

About Biological Hazards (Biohazards)

- Biohazards are biological in origin or transmitted through biological vectors, including viruses, bacteria, fungi, toxins, and other bioactive substances.
- Workers in healthcare, agriculture, and laboratory settings face the highest risk.
- Factors contributing to biohazards include changes in climate and weather, heat-related risks, and overuse of antimicrobials.
- Relevant measures include ILO Conventions 155 and 187, and India's Occupational Safety, Health and Working Conditions Code, 2020.

CHICAGO AND MONTREAL CONVENTION

Context: Following the recent Air India crash, international rules governing accident investigation come under focus.

About Chicago Convention:

- The Convention on International Civil Aviation (Chicago Convention) was signed in 1944 to standardize global civil aviation practices.
- It is **administered by the International Civil Aviation Organisation (ICAO)**, a **UN agency in Montreal**, with 193 member states including **India**, the US, and the UK.
- **Annex 13** of the Convention details international procedures for investigating aircraft accidents and serious incidents.
- Its goal is not to assign blame, but to enhance aviation safety by identifying causes and preventing future crashes.
- **Key Provisions (Chapter 5, Annex 13):**

- The "State of Occurrence" (where the accident happens) leads the investigation.
- Other involved states (the State of Registry, Operator, Design, and Manufacture) have the right to participate in the inquiry.

About Montreal Convention (1999)

- Also known as MC99, it is the Convention for the **Unification of Certain Rules for International Carriage by Air,** finalised under ICAO.
- It creates a uniform legal framework for compensation relating to international air travel - passengers, baggage, and cargo.
- India joined in 2009 as the 91st member.
- **Key Provisions:**
  - Airlines are liable to pay compensation to victims' families. (Air India must pay about ₹1.5 crore per victim, based on the Montreal Convention.)
  - Compensation is calculated in Special Drawing Rights (SDRs)- about 128,821 SDRs per victim (≈ USD 1.33 per SDR, Oct 2024).
  - Airlines can recover costs through insurance for lost aircraft and liabilities.

UNESCO

Context: The United States announced its decision to withdraw from the United Nations Educational, Scientific and Cultural Organization (UNESCO), citing concerns that the agency supports ideological and politically divisive agendas and displays bias against Israel.

About UNESCO	
Full Name	United Nations Educational, Scientific and Cultural Organization
Type	Specialized agency of the United Nations
Purpose	To promote peace, security, and sustainable development by fostering international collaboration in education, science, culture, and communication.
HQ	Paris, France
Membership	194 Member States and 12 Associate Members (India is a member)
Governance	UNESCO is governed by a **General Conference** of member states which meets biennially to set programs and budgets, and an **Executive Board** (58 Member States) responsible for management. • *India has been re-elected to the Executive Board for the 2025-29 term.*
Key Reports & Programmes	• Global Education Monitoring Report • World Trends in Freedom of Expression and Media Development • UNESCO World Heritage Sites Programme • Man and the Biosphere (MAB) Programme

ICJ RULING ON CLIMATE CHANGE

Context: The International Court of Justice (ICJ) has issued a landmark advisory opinion declaring that countries have a legal obligation under international law to reduce greenhouse gas emissions.

Key Highlights

- In its advisory opinion, the ICJ affirmed that **climate action is a binding legal duty, not a matter of voluntary commitment, under international law.**
- The Court cited key climate treaties — UNFCCC, Kyoto Protocol, and Paris Agreement — along with environmental frameworks such as UNCLOS and the Montreal Protocol, to establish that **all countries are legally bound to reduce greenhouse gas emissions.**
- It emphasised that **industrialised nations (Annex I countries) bear a greater responsibility** to lead emission reductions and to support developing countries through technology transfer and financial assistance.
- The ICJ warned that failure to fulfil these obligations constitutes an "*internationally wrongful act*", making countries liable for compensation to those affected by climate-related disasters.
- It further clarified that states may also be held responsible for harmful actions by private entities if they fail to regulate or prevent such behaviour through effective laws and oversight mechanisms.

About International Court of Justice (ICJ)

- The ICJ, also known as the World Court, is the principal judicial organ of the United Nations (UN).
- **Established:** June 1945 (by the UN Charter); **Began work:** April 1946.
- **Headquarters**: **Peace Palace, The Hague**, Netherlands (the only UN organ not based in New York.)
- **Official Languages:** English and French.
- **Functions**
  - **Contentious Cases:** Settles legal disputes between states on issues like borders, maritime boundaries, sovereignty, use of force, and violation of international law.
  - **Advisory Opinions:** Provides legal advice to UN bodies or specialised agencies; these opinions are not binding.
- **Judgments: Final and binding on parties** in contentious cases, with no appeal allowed. Decides cases based on international law, treaties, customs, and recognized legal principles.
- **Enforcement:** ICJ does not have its own enforcement mechanism; enforcement relies on the UN Security Council,
- **Composition**
  - **15 judges from different countries, elected for nine-year terms** by both the UN General Assembly and the Security Council.
  - **One-third of the judges are elected every three years; re-election is allowed.**
  - Judges act independently, not as representatives of their countries.
  - States without a national judge on the bench may appoint a judge ad hoc for a specific case.
  - The Court is **supported by the Registry**, its independent administrative secretariat.

The ICJ is distinct from the International Criminal Court (ICC). The ICJ deals with disputes between countries, while the ICC prosecutes individuals for war crimes, crimes against humanity, and genocide.

GEELONG TREATY UNDER AUKUS

Context: Australia and the UK have recently signed a long-term defence cooperation agreement, known as Geelong Treaty, under AUKUS Pillar I. The agreement is set to last for the next 50 years.

About the Geelong Treaty

- Also called the **Nuclear-Powered Submarine Partnership and Collaboration Treaty**, it aims to strengthen defence cooperation between the two countries.
- The treaty seeks to ensure peace, stability, and security across both the Indo-Pacific and Euro-Atlantic regions.
- **Key Objectives:**
  - Facilitate joint work on the design, construction, operation, maintenance, and disposal of SSN-AUKUS nuclear-powered submarines.
  - Build secure and resilient supply chains among the AUKUS partners.
  - Comply fully with international nuclear non-proliferation commitments and the AUKUS Naval Nuclear Propulsion Agreement (ANNPA).

About AUKUS

- AUKUS is a security alliance formed in 2021 between **Australia, the United Kingdom, and the United States.** It focuses on defence technology sharing and strategic cooperation in response to evolving regional security challenges.
- **AUKUS has Two Pillars:**
  - **Pillar I:** Development of nuclear-powered attack submarines (SSNs) and enhancement of shipbuilding capabilities across the three nations.
  - **Pillar II:** Joint development of advanced military technologies, including artificial intelligence (AI), autonomous systems, electromagnetic warfare, and modelling and simulation tools.
- **Implementation Timeline**
  - The USA will sell a few nuclear-powered submarines to Australia in the 2030s.
  - By the early 2040s, Australia and the UK are expected to jointly build new SSN-AUKUS submarines for their navies.

BRICS SUMMIT 2025

Context: The 17th BRICS Summit in Rio de Janeiro, Brazil, concluded with the 'Rio de Janeiro Declaration', marking a strategic shift towards inclusivity, expansion, and South–South cooperation.

Key Highlights of 17th BRICS Summit	
Expansion of BRICS	• Indonesia joined as a full BRICS member. • 10 new BRICS partner countries welcomed (Belarus, Bolivia, Kazakhstan, Cuba, Nigeria, Malaysia, Thailand, Vietnam, Uganda, and Uzbekistan.)
Global Peace & Security	• Condemned unilateral coercive measures and military strikes on Iran. • Called for peaceful resolution of conflicts in Ukraine, Palestine, Sudan, Syria, and Haiti. • Strong condemnation of terrorism, particularly cross-border terrorism and attacks in Jammu & Kashmir.
Key Declarations & Initiatives	• **BRICS Leaders' Framework Declaration on Climate Finance:** adopted the Climate Leadership Agenda and Climate Finance Framework; rejected unilateral carbon border taxes. • **Global Governance of Artificial Intelligence (AI):** joint statement supporting AI governance and the UN Cybercrime Convention. • **BRICS Partnership for the Elimination of Socially Determined Diseases (SDDs):** enhanced cooperation on vaccines and public health systems.
Economic & Financial Cooperation	• Discussed **BRICS Pay** and national currency settlement frameworks, but ruled out a common BRICS currency. • **New Development Bank (NDB)** launched the **BRICS Multilateral Guarantee (BMG) Mechanism** to mobilize private investment in infrastructure, climate, and sustainability. • Endorsed the **BRICS Cross-Border Payments Initiative (BCBPI).** • Supported expansion of NDB membership and leadership continuity. • Initiated discussions on BRICS Grain Exchange and Carbon Markets Partnership.
2026 Presidency	• India will assume the Chairship of the XVIII BRICS Summit in 2026.

About BRICS

- BRICS is an intergovernmental organization comprising ten major emerging economies.
- **Founding Members:** Brazil, Russia, **India**, China, South Africa,
- **New Members:** Egypt, United Arab Emirates, Ethiopia, Iran (added in 2024), and Indonesia (added in 2025)
- The group's core purpose is **to promote political, economic, and social cooperation** among its members and increase the influence of the Global South in global governance.
- The acronym "BRIC" was first coined in 2001 by economist Jim O'Neill to describe Brazil, Russia, India, and China as dynamic economies likely to shape future global growth. South Africa joined in 2011, changing the name to BRICS.

BRICS Timeline		
2001	**Term "BRIC" coined**	British economist Jim O'Neill of Goldman Sachs introduced the term to highlight the investment potential of Brazil, Russia, India, and China.
2006	**Informal meeting of BRIC**	Informal meeting among Russia, India, and China held during the G8 Outreach Summit in Russia.
2009	**First BRIC Summit**	The first formal summit was hosted in Russia.
2010	**South Africa joined**	South Africa became a member, transforming BRIC into BRICS.
2015	**Launch of New Development Bank (NDB)**	Also known as the BRICS Bank, it was established to support development projects in member countries.
2023	**BRICS expanded**	Six countries (Iran, United Arab Emirates, Saudi Arabia, Argentina, Egypt, and Ethiopia) were invited to join the alliance.

- The bloc has grown rapidly, now including **six new members admitted in 2024-25.**

Key Institutions and Initiatives

1. New Development Bank (NDB)

- Established in 2015, its primary objective is to mobilize resources for infrastructure and sustainable development projects in BRICS and other emerging markets and developing countries.

2. BRICS Contingent Reserve Arrangement (CRA)

- It was established in 2015 with a $100 billion reserve pool to help members facing short-term liquidity or currency pressures. The **CRA operates primarily through a central bank liquidity swap arrangement.**
- **Capital contributions to the CRA are not equal,** and voting rights are allocated in proportion to each member's capital contribution.

QUAD FOREIGN MINISTERS MEET

Context: The second Quad foreign ministers' meeting took place in Washington, DC.

About the Quad

- The Quadrilateral Security Dialogue (Quad) is a strategic group of four democratic countries- India, the United States, Japan, and Australia.
- Its main aim is to ensure a free, open, and rules-based Indo-Pacific region.
- It is not a formal military alliance but rather a diplomatic partnership aimed at promoting shared values and rules-based order in the region.

Evolution of Quad

- **2007**: The Quad was first proposed by Japanese Prime Minister Shinzo Abe during an informal ASEAN leaders' meeting.
- **2012**: The concept of the 'Democratic Security Diamond,' including the US, Japan, India, and Australia, was introduced by Japan.
- **2017**: Facing increasing threats from China, the Quad was revitalized with a focus on establishing a rule-based international order. The first Quad talks were held in Manila before the ASEAN Summit.
- **2020**: The Malabar naval exercises expanded to include Australia, marking the first joint military drills of the Quad nations in over a decade.
- **2021**: Quad leaders held a virtual meeting and released the joint statement, 'The Spirit of the Quad'.

Initiatives of Quad	Focus
Quad Maritime Security Working Group	Maritime security, domain awareness, naval interoperability.
Quad Health Security Partnership	Vaccine production and distribution: India (production), US (financing), Australia & Japan (aid).
Quad Indo-Pacific Oceans Research Alliance	Data exchange on ocean climate impacts, sea level rise, and marine ecosystems.
Indo-Pacific Partnership for Maritime Domain Awareness	Combat illegal fishing, respond to climate change, and enforce laws near shores.
QUAD Fellowship	Scholarships and funding for STEM master's and PhD degrees.
Quad Investors Network (QUIN)	Investments in clean energy, semiconductors, critical minerals, and quantum technologies.
Quad Working Group on Counter-Terrorism	Address new terrorism threats, radicalization, and extremism.
Quad Climate Working Group	Climate change adaptation and capacity building in the Indo-Pacific.
Critical and Emerging Technologies	Collaboration on essential technologies for global digital economies.

GROUP OF FRIENDS (GOF)

Context: At a recent meeting of the Group of Friends (GOF), India reaffirmed its commitment to ensuring justice for crimes committed against United Nations peacekeepers.

About the Group of Friends (GOF)

- The GOF is an **initiative aimed at promoting accountability for all forms of violence and offences committed against UN peacekeeping personnel.**
- It was established in **2022** to strengthen international cooperation in protecting peacekeepers who serve in conflict zones.
- The group functions as an **important platform within the United Nations Alliance of Civilizations (UNAOC) framework**, contributing actively to strategic planning and programme implementation related to peace, security, and inter-cultural understanding.

- Group of Friends currently includes 161 Members of which are 131 UN Member States, 1 non-member state, and 29 international organizations. India is a Member.

PACT FOR FUTURE

Context: India has reaffirmed its commitment to the 'Pact for the Future' during a recent United Nations dialogue.

About the 'Pact for the Future'

- It is a historic international agreement adopted at the United Nations Summit of the Future in September 2024.
- It is **designed as a wide-ranging, action-oriented pact to make the international system more inclusive, effective, and fit to address 21st-century global challenges.**
- The Pact includes comprehensive commitments on peace and security, sustainable development, climate change, digital cooperation, human rights, gender equality, youth empowerment, and the transformation of global governance.

Key aspects of the Pact for the Future include:

- Strengthening multilateralism and international cooperation to tackle global issues.
- Specific pledges to accelerate progress towards the Sustainable Development Goals (SDGs) and climate action under the Paris Agreement.
- A **Global Digital Compact** to enhance digital cooperation and close digital divides, ensuring technology benefits all societies.
- A **Declaration on Future Generations**, committing nations to act responsibly for the welfare of people yet to be born.
- Promises to advance peace, human rights, gender equality, youth participation, and inclusivity.
- Calls for reforms in the UN system, including Security Council reform and strengthening UN bodies to make global governance more effective.
- Focus on sustainable development financing, food security, international peace, climate change, and technological innovation.

INTERNATIONAL CRIMINAL COURT (ICC)

Context: The International Criminal Court (ICC) has officially welcomed Ukraine as the 125th State Party to the Rome Statute.

About International Criminal Court (ICC)

- The ICC is a **permanent intergovernmental tribunal established in 2002 under the Rome Statute.** It is headquartered in The Hague, Netherlands.
- It is the **first international court with jurisdiction to prosecute individuals for serious international crimes:** genocide, crimes against humanity, war crimes, and the crime of aggression.
- The ICC operates as a **court of last resort,** intervening only when national courts are unwilling or unable to prosecute offenders.
- The ICC's jurisdiction **applies to crimes committed after July 1, 2002**, **either on the territory of a member state or by nationals of member states**.
- As of early 2025, **125 states are parties to the Rome Statute.** Notably, major countries such as the United States, China, Russia, and **India** have **not ratified the statute** and do not recognize ICC jurisdiction.
- The **ICC can initiate investigations through** state party referrals, the United Nations Security Council referrals, or by the Prosecutor acting on information from other sources.

E3 COUNTRIES

Context: Recently, Iran faced the possibility of snapback sanctions imposed by the E3 countries amid the ongoing deadlock in U.S.–Iran nuclear negotiations.

About the E3 Countries

- The E3 refers to an informal diplomatic and security coordination group comprising the **United Kingdom, France, and Germany.**
- **Origin:** The E3 first convened in 2003, following the U.S. invasion of Iraq, to develop a joint European strategy on Middle East security issues and to address concerns about Iran's nuclear programme.

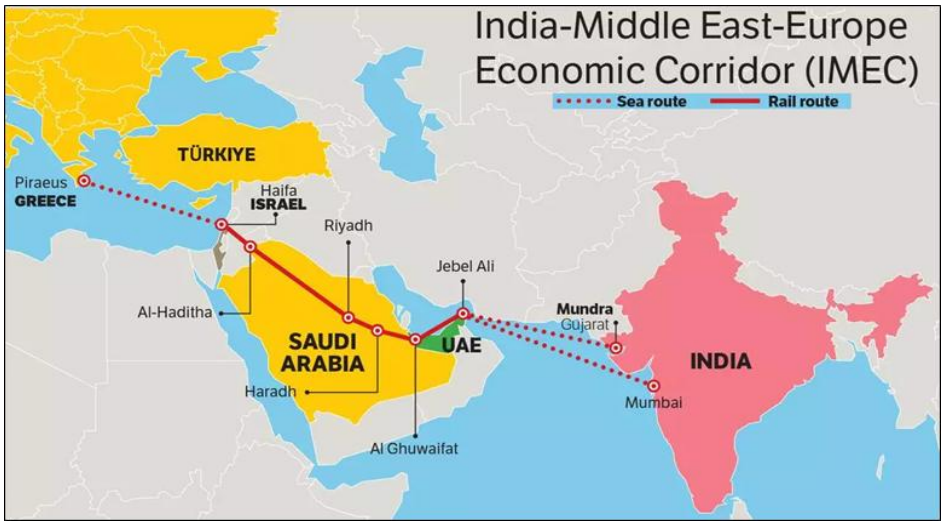
- The group continues to play a key role in European foreign policy coordination and non-proliferation diplomacy, particularly concerning Iran and regional stability.

INDIA–MIDDLE EAST–EUROPE ECONOMIC CORRIDOR (IMEC)

Context: India's National Security Council Secretariat hosted officials from the U.S., UAE, Saudi Arabia, France, Italy, Germany, Israel, Jordan, and the EU to review progress on the IMEC.

About India-Middle East-Europe Economic Corridor (IMEC)

- **Establishment**: Formed through a Memorandum of Understanding (MoU) signed by leaders from India, the European Union, France, Germany, Italy, Saudi Arabia, the United Arab Emirates (UAE), and the United States during the 18th G20 Summit 2023 in New Delhi.
- **Objective**: A multi-modal connectivity initiative designed to develop infrastructure such as ports, railways, roads, sea routes, and pipelines to boost trade across India, the Arabian Peninsula, the Mediterranean region, and Europe.
- **Structure of the Corridor:** (a) Eastern Corridor which connects India with the Gulf region and (b) Northern Corridor which links the Gulf region to Europe.



Key Features

- IMEC is a component of the **Partnership for Global Infrastructure and Investment (PGII).**
- PGII is a collaboration between the G7 countries to fund infrastructure projects in developing nations. PGII was announced during the 2021 G7 Summit in the UK.
- PGII is seen as an alternative to China's Belt and Road Initiative (BRI).

EURASIAN ECONOMIC UNION

Context: India and the Eurasian Economic Union (EAEU) have recently signed the Terms of Reference for a proposed Free Trade Agreement (FTA).

About the Eurasian Economic Union (EAEU)

- The EAEU is a **regional economic union formed by five post-Soviet states** - **Russia, Belarus, Kazakhstan, Armenia, and Kyrgyzstan -** with the aim of promoting deeper economic integration and cooperation among its members.
- The EAEU officially came into existence on January 1, **2015**, following the signing of the Treaty on the Eurasian Economic Union in May 2014.

Key Features

- It ensures the free movement of goods, services, capital, and labor among member states.
- It coordinates policies in sectors such as industry, energy, transport, agriculture, and macroeconomics.
- Unlike the European Union, the EAEU does not have a common currency, but it does have a **common external tariff for goods entering the union.**

Governance

- **Supreme Eurasian Economic Council:** The highest decision-making body, composed of the Heads of State of the member countries.
- **Eurasian Intergovernmental Council:** The second level of governance, consisting of the Heads of Government of the member states.
- **Eurasian Economic Commission:** The executive body responsible for the Union's day-to-day administration, policy implementation, and coordination.

- **Court of the Eurasian Economic Union:** The judicial authority that settles disputes.

UNSC TO END UNIFIL MISSION IN LEBANON

Context: The UN Security Council has voted unanimously to terminate the United Nations Interim Force in Lebanon (UNIFIL) after nearly five decades.

- The peacekeeping mission will conclude on December 31, 2026, giving the force 16 months to withdraw its 10,800 personnel and equipment.

About United Nations Interim Force in Lebanon (UNIFIL)

- UNIFIL was established in **1978 to oversee Israel's withdrawal from southern Lebanon** and was later expanded following the 2006 Israel–Hezbollah war.
- It was created by UN Security Council Resolutions 425 and 426 in 1978.
- Its mandate included **monitoring the Israel–Lebanon border (the 120km Blue Line)** and supporting regional stability.
- With its withdrawal, the Lebanese government will become the sole provider of security north of the Blue Line.

INDIAN OCEAN NAVAL SYMPOSIUM (IONS)

Context: The Indian Ocean Naval Symposium (IONS) Emerging Leaders Panel was held at the Southern Naval Command, Kochi, with participation from representatives of 19 member countries.

About Indian Ocean Naval Symposium (IONS)

- The IONS is a **voluntary initiative launched by the Indian Navy** in **2008** to strengthen maritime cooperation among the navies of countries bordering the Indian Ocean Region (IOR).
- It serves as an open platform for **discussing regional maritime concerns, sharing information, and building a common understanding to develop cooperative solutions.**
- IONS comprises **25 member states** and **9 observer states**. A nation state with permanent territory or border with the Indian Ocean and which maintains a Navy or maritime agency is eligible to become a member.
- The symposium is held **biennially**, with the chairmanship rotating every two years among member states.
- **India hosted the inaugural symposium** in 2008 and is set to chair IONS again from 2025 to 2027.

MILMEDICON-2025

Context: The Union Minister of State for Defence inaugurated MILMEDICON-2025, an international conference on physical and mental trauma in military settings, at the Manekshaw Centre, New Delhi.

- **Organiser**: Directorate General of Medical Services (Army).
- **Focus**: Innovations, challenges, international cooperation, and reforms in military medicine, aligned with the Indian Army's 'Year of Reforms'.
- **Commemoration**: Centenary of the Military Nursing Service, marking a hundred years of women's contributions to combat medical care and celebrating Nari Shakti.

UN-INDIA GLOBAL CAPACITY-BUILDING INITIATIVE

Context: India has launched projects with the United Nations under the Global Capacity Building Initiative for countries in Asia, Africa, and the Caribbean.

About Global Capacity Building Initiative (Launched in 2023)

- The Global Capacity Building Initiative is a **collaborative effort between India and the United Nations aimed at strengthening the capacities of countries** in the Global South to achieve the **Sustainable Development Goals (SDGs).**
- The implementation is carried out through the **UN India SDG Country Fund** and **Indian Technical and Economic Cooperation Programme (ITEC).**

INTERMEDIATE-RANGE NUCLEAR FORCES (INF) TREATY

Context: Russia has formally ended its participation in the 1987 Intermediate-Range Nuclear Forces (INF) Treaty.

About Intermediate-Range Nuclear Forces (INF) Treaty

- The INF Treaty was a landmark **arms control agreement** signed in **December 1987** between the **United States and the Soviet Union (later Russia),** aimed at eliminating an entire category of nuclear weapons and reducing the risk of war in Europe and globally.

- The treaty **banned all nuclear and conventional ground-launched ballistic and cruise missiles with ranges between 500 and 5,500 kilometers**.
- It **did not cover air- or sea-launched missiles,** focusing only on land-based systems.
- Both parties agreed to eliminate all such missiles and their launchers **within three years of the treaty's entry into force,** with extensive on-site inspections and verification mechanisms.
- In 2019, the United States formally withdrew from the treaty, citing Russian non-compliance.

Major Nuclear Arms-Control Treaties	
Nuclear Non-Proliferation Treaty (NPT, 1968 / in force 1970)	• Foundation of global nuclear governance. • Seeks to prevent spread of nuclear weapons, promote disarmament, and support peaceful nuclear technology.
Comprehensive Nuclear-Test-Ban Treaty (CTBT, 1996)	• Prohibits all nuclear test explosions. • Not in force because several Annex-II states (e.g., US, China, India, Pakistan, North Korea, Israel, Iran, Egypt) have not ratified.
New START Treaty (2010 / in force 2011)	• US–Russia treaty limiting deployed strategic warheads (1,550) and delivery systems. • Last major arms-control treaty still in operation but suspended by Russia in 2023.
Strategic Arms Limitation Talks (SALT 1972 & 1979)	• **SALT I (1972):** Interim agreement limiting ICBM and SLBM launchers. • **SALT II (1979):** Set further limits, but never ratified by the US (though both sides largely observed it initially).
Strategic Arms Reduction Treaty (1991 & 1993)	• **START I (1991):** Major cuts in nuclear warheads and delivery vehicles; entered into force 1994. • **START II (1993):** Aimed to eliminate MIRVed ICBMs; never entered into force and was abandoned in 2002.
Treaty on the Prohibition of Nuclear Weapons (2017 / in force 2021)	• Completely bans nuclear weapons: development, testing, production, stockpiling, transfer, and use. • No nuclear-armed state has joined.
Treaty of Tlatelolco (1967)	• Created a nuclear-weapon-free zone in Latin America and the Caribbean.
Pelindaba Treaty (1996)	• Bans nuclear weapons in Africa.
Rarotonga Treaty (1985)	• Prohibits nuclear weapons in the South Pacific.

ASIA-PACIFIC INSTITUTE FOR BROADCASTING DEVELOPMENT (AIBD)

Context: India has recently been elected as the Chairman of the AIBD Executive Board.

About Asia-Pacific Institute for Broadcasting Development (AIBD)

- The AIBD is a regional intergovernmental organization established in **1977** under the auspices of **UNESCO to promote and develop electronic media in the Asia-Pacific region**.
- It is **hosted by the Government of Malaysia, with its secretariat located in Kuala Lumpur.**
- AIBD currently has 92 member organizations from 44 countries, including 26 government members.
- Founding organizations include UNESCO, the International Telecommunication Union (ITU), the United Nations Development Programme (UNDP), and the Asia-Pacific Broadcasting Union (ABU).
- **India is one of the founding members of AIBD**, with Prasar Bharati serving as the representative body

GLOBAL OUTLOOK COUNCIL ON WATER INVESTMENTS

Context: The President of South Africa has announced the launch of the Global Outlook Council on Water Investments (GOCWI).

About GOCWI

- GOCWI has been launched as a **G20 Presidential Legacy Initiative** and is a **key part of the Global Water Partnership's (GWP) Global Transformation Agenda on Water Investments.**
- The Council comprises current and former Heads of State, global leaders, and senior public and private sector representatives. Notable members include PM Modi of India.

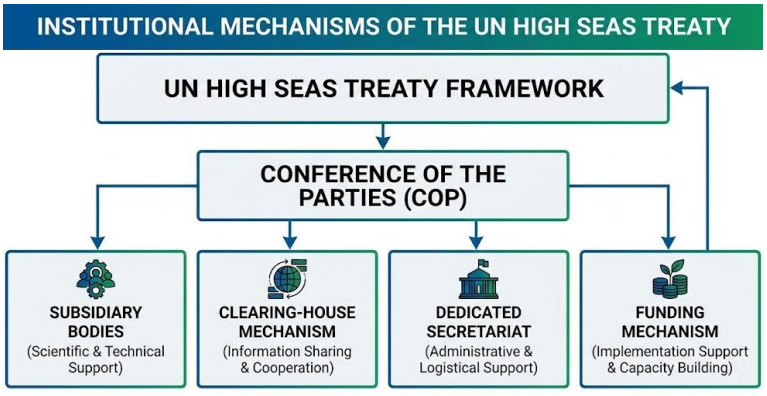
- The Global Outlook Council along with the Global Water Investment Platform, aims to serve as the world's premier high-level political and investment platform on water.
- **Global Water Partnership (GWP):**
  - A worldwide network involving governments, civil society, and experts.
  - Works to ensure that water resources are managed in a fair, sustainable, and efficient way.
  - Through its Transformation Agenda, GWP aims to mobilise USD 15 billion for global water security by 2030.

UN HIGH SEAS TREATY

Context: The BBNJ Agreement, also called the High Seas Treaty, is now set to enter into force.

About BBNJ Agreement/High Seas Treaty

- The BBNJ Agreement, formally known as the **Agreement on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction**, is an **international treaty** under the **United Nations Convention on the Law of the Sea (UNCLOS) aimed at protecting biodiversity in the high seas**—regions lying outside Exclusive Economic Zones (EEZs).
- The BBNJ Agreement is the **first legally binding** instrument specifically targeting biodiversity conservation in the high seas.
- It supports global efforts to achieve Sustainable Development Goal 14 (Life Below Water) and fills critical gaps in ocean governance.
- **Entry into Force:** The Agreement becomes operational 120 days after 60 countries ratify it.
  - **As of 30 September 2025:** 145 countries have signed, 74 have ratified.
  - **India:** Signed but not yet ratified (as of Dec 2025)
  - Countries not party to UNCLOS are still eligible to join the BBNJ Agreement.
- It is the third implementation agreement under UNCLOS, after:
  - **1994 Part XI Implementation Agreement**: governs exploration and extraction of minerals in the international seabed.
  - **1995 UN Fish Stocks Agreement:** regulates conservation of straddling and highly migratory fish stocks.
- **Key Objectives and Provisions:** The BBNJ Agreement addresses four main pillars:
  - **Conservation and fair sharing of marine genetic resources,** including benefits from their use.
  - **Establishment of marine protected areas (MPAs)** and other area-based management tools to safeguard ecosystems.
  - **Mandatory environmental impact assessments (EIAs)** for activities that may harm the high seas.
  - **Capacity-building and transfer of marine technology,** especially to developing countries
- **Exceptions:** The Agreement does not apply to:
  - Warships, military aircraft, and naval auxiliaries
  - Fishing and fishing-related activities already governed by other international laws
  - Military activities of a Party, including the use of government vessels and aircraft in non-commercial service, in relation to obligations on MGRs and digital sequence information
  - *However, non-military activities of Parties are covered by the treaty.*



AWAZA PROGRAMME OF ACTION (2024-2034) (APOA)

Context: 3rd UN Conference on Landlocked Developing Countries (LLDC3) opened in Awaza, Turkmenistan.

- The Awaza Programme of Action (APOA) 2024–2034 is **a comprehensive framework adopted by the United Nations General Assembly** on 24 December 2024 **to support the development of Landlocked Developing Countries (LLDCs) for the next decade.**

- It **replaces the Vienna Programme of Action (2014–2024)** and **aims to accelerate progress** in key areas such as trade facilitation, structural transformation, transport connectivity, technology, climate resilience, and international support.

UN GENERAL ASSEMBLY (UNGA)

Context: India's External Affairs Minister Dr. Jaishankar addressed the 80th session of the UN General Assembly.

About UN General Assembly (UNGA)

- The UNGA is the main deliberative, policymaking and representative body of the United Nations.
- **All 193 UN member states are members, each with one vote.** The Holy See and Palestine participate as permanent observers.

Working Structure

- **Sessions:** Holds an annual Regular Session beginning in September, including the High-Level Week. May convene Special or Emergency Special Sessions when required.
- **President & Bureau:** A President, elected annually, chairs the session and sets procedural priorities. The presidency rotates among regional groups.

Key Powers and Functions

- Approves the UN budget and allocates member-state contributions.
- Elects non-permanent members of the Security Council and members of other UN bodies.
- Elects ICJ judges jointly with the Security Council.
- Recommends the UN Secretary-General for appointment by the Security Council.
- Can create subsidiary organs, and convene global conferences.

Decision-Making

- **Voting: Important questions** (e.g., admission of members, budget, peace and security recommendations) **require a two-thirds majority.** Other matters are decided by a simple majority.
- **Nature of Decisions:** Most resolutions are **non-binding,** but they carry strong political and moral influence. *Binding enforcement powers largely rest with the UN Security Council.*

Key Achievements

- **Universal Declaration of Human Rights (1948):** Foundational human rights document adopted by UNGA.
- **Decolonisation:** Passed the 1960 Declaration on Independence for Colonial Countries; guided major decolonisation waves.
- **Global Development Agendas:** Endorsed the Millennium Development Goals (MDGs) and later the 2030 Agenda and SDGs (2015)

The General Debate

- **Purpose:** Leaders present national positions and respond to global challenges under an annual theme.
- **Speaking Order:** Traditionally Brazil speaks first, followed by the United States, then others based on request and protocol.
- **Theme of the 80th Session:** "Better Together: 80 years and more for peace, development and human rights."
- **President of the 80th Session:** Annalena Baerbock (Germany) presided over the session held in New York.

WORLD FOOD INDIA 2025

Context: World Food India (WFI) 2025, held at Bharat Mandapam in New Delhi, was the largest edition so far. The 2025 event was the 4th edition, following successful editions in 2023 and 2024.

About WFI:

- The Ministry of Food Processing Industries (MoFPI) launched WFI in 2017 as its flagship international event to promote India's food sector and draw global investors.
- It serves as a global platform to showcase India's food value chain, attract investment, strengthen trade partnerships, and promote food-processing-led rural development.

Purpose:

- Position India as a global food hub and boost exports of agricultural and processed-food products.
- Encourage investment, innovation and market linkages across the entire food processing value chain.
- Support higher farmer incomes, rural employment, and reduction of post-harvest losses, in line with the Viksit Bharat 2047 vision.

- Highlight India's achievements in sustainability, food safety, cold-chain development and value addition.

CPA INDIA REGION CONFERENCE

Context: The 11th Conference of the **Commonwealth Parliamentary Association (CPA) - India Region** was held at Vidhana Soudha, Bengaluru, and hosted by the Karnataka Legislative Assembly (CPA Karnataka Branch).

- The **theme** focused on *"Debates & Discussions in the Houses of Legislature: building people's trust, meeting people's aspirations."*

About the Commonwealth Parliamentary Association (CPA) Conference

- The CPA Conference is the **largest annual gathering of Commonwealth Parliamentarians**.
- **Hosted each year by a different Commonwealth Parliament,** it includes a General Assembly, thematic workshops, networking sessions, and platforms for sharing good practices among legislatures.

About Commonwealth Parliamentary Association (CPA)

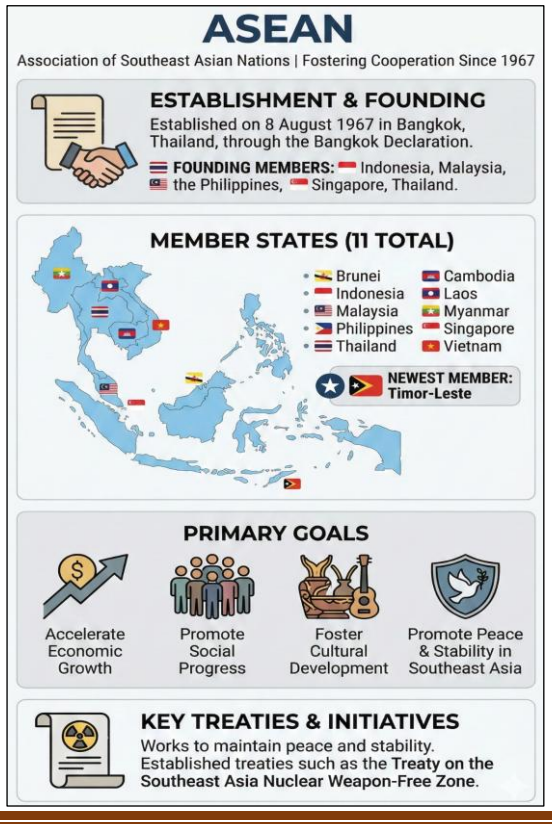
- The **CPA links Parliamentarians and parliamentary staff from over 180 national, state, provincial and territorial Parliaments and Legislatures across the Commonwealth** through its network. **The CPA Headquarters Secretariat is based in London.**
- One of the oldest Commonwealth organisations, **the CPA was founded in 1911**.
- Its mission is **to promote the advancement of parliamentary democracy** by enhancing knowledge and understanding of democratic governance, youth engagement in democracy, gender equality and equal representation.

GENOCIDE CONVENTION

Context: A recent report by the UN-mandated Independent International Commission of Inquiry offered a legal assessment of Israel's actions in Gaza in relation to the Genocide Convention.

About the Genocide Convention

- The Genocide Convention, officially known as the **Convention on the Prevention and Punishment of the Crime of Genocide**, is an international treaty adopted by the UN General Assembly on 9 December 1948 and entered into force on 12 January 1951.
- Every year on 9 December, the **Office on Genocide Prevention and the Responsibility to Protect** marks the adoption of the Convention.
- It was the **first human rights treaty adopted by the UN** and **the first legal instrument to define and criminalize genocide.**
- **Definition of Genocide:** The Article II of the Convention defines genocide as specific acts carried out with the intent to destroy, in whole or in part, a national, ethnic, racial, or religious group. It is recognised as a crime that can occur both during armed conflict and in periods of peace.
- **Membership:** The Convention has 41 signatories and 153 States Parties. India signed the Convention in 1949 and ratified it in 1959.
- **Dispute Settlement:** The International Court of Justice (ICJ) is responsible for resolving disputes concerning the interpretation or application of the Convention.



47TH ASEAN SUMMIT

Context: The 47th ASEAN Summit, chaired by Malaysia's Prime Minister Anwar Ibrahim, concluded in Kuala Lumpur.

Key Highlights

- Leaders from ASEAN member states and dialogue partners such as Japan, Australia, New Zealand, and South Korea participated, along with representatives from Brazil, South Africa, and Canada.

1. ASEAN–India Year of Maritime Cooperation

- In his virtual address, PM Modi declared 2026 as the "ASEAN–India Year of Maritime Cooperation."

2. Philippines to Chair ASEAN in 2026

- Malaysia formally handed over the ASEAN chairmanship to the Philippines for 2026.

3. East Timor Becomes ASEAN's 11th Member

- East Timor (Timor-Leste) was admitted as the 11th member of ASEAN, marking the bloc's first expansion since Cambodia joined in 1999.
- East Timor lies north of Australia, occupying the eastern half of Timor Island (the western side belongs to Indonesia).

4. Thailand–Cambodia Peace Agreement

- A peace agreement between Thailand and Cambodia was signed on the sidelines of the summit, settling their longstanding border dispute.

UNIVERSAL POSTAL UNION (UPU)

Context: The Union Minister for Communications has launched the UPI–UPU Integration project, which seeks to modernise and streamline cross-border remittances by linking India's Unified Payments Interface (UPI) with the global postal network under the Universal Postal Union (UPU).

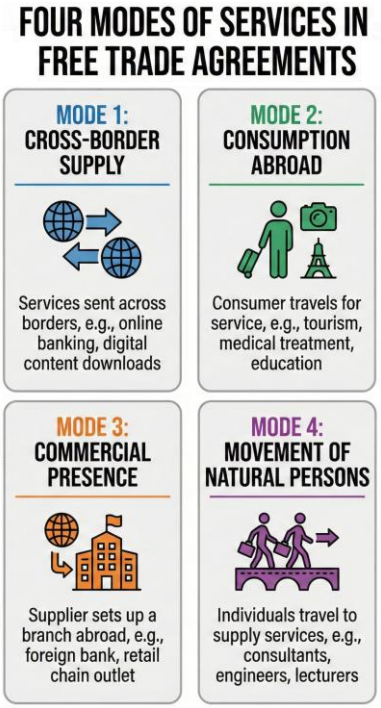
About the Universal Postal Union (UPU)	
About	• The UPU is the second-oldest international organisation, preceded only by the International Telecommunication Union (ITU), created in 1865. • UPU coordinates postal policies among its 192 member countries and facilitates a uniform worldwide postal system.
Establishment	Founded in 1874 by the Treaty of Bern, and later designated as a specialised agency of the United Nations in 1948.
Headquarters	Located in Berne, Switzerland
Membership	It comprises 192 member countries, including India.
Role	Serves as the main platform for cooperation among global postal services, ensuring a universal, modern, and efficient postal network with harmonised products and services.

INDIA-EFTA TRADE AND ECONOMIC PARTNERSHIP AGREEMENT (TEPA)

Context: The India–European Free Trade Association (EFTA) Trade and Economic Partnership Agreement (TEPA), signed on 10 March 2024, entered into force on 1 October 2025.

About European Free Trade Association (EFTA)

- EFTA is a regional trade organization established in 1960 **to promote free trade and economic integration among its member countries**: Iceland, Liechtenstein, Norway, and Switzerland.
- Unlike the European Union (EU), EFTA is **not a customs union,** meaning each member state maintains its own commercial policies toward non-EFTA countries.
- **Relationship with the EU:**
  - Iceland, Liechtenstein, and Norway are part of the European Economic Area (EEA), which gives them access to the EU single market without EU membership.
  - Switzerland is not in the EEA but maintains market access through a network of bilateral agreements, including a free trade agreement with the EU.
  - All EFTA members are part of the Schengen Area, enabling passport-free movement across 26 European countries (including EU).
- **Trade with India:** India is EFTA's fifth-largest trading partner after the EU, US, UK, and China.



About India-EFTA Trade and Economic Partnership Agreement (TEPA)

- It is a comprehensive trade pact signed between India and the four EFTA countries- Switzerland, Norway, Iceland, and Liechtenstein.

Key Features of the TEPA

- The agreement targets the creation of one million direct jobs, a first for any FTA signed by India.
- It is India's first FTA to include Mutual Recognition Agreements (MRAs) for regulated professions (e.g., nursing, chartered accountancy, architecture).
- It aims to provide better access through Mode 1 (digital services), Mode 3 (commercial presence), and Mode 4 (temporary movement of key personnel).

GAZA PEACE SUMMIT IN EGYPT

Context: An international peace conference was held in Sharm el-Sheikh, Egypt in October 2025, to work toward a final agreement to end the ongoing conflict in Gaza.

About Gaza Peace Summit

- The summit was **co-chaired by the U.S. President Trump and Egyptian President Abdel Fattah el-Sisi,** and brought together representatives from over 20 countries.
- The U.S. President along with leaders of Egypt, Qatar and Turkiye signed the declaration as guarantors to the Gaza deal meant to cement a ceasefire in Gaza.
- India was represented by Kirti Vardhan Singh, Minister of State for External Affairs, who attended as the Prime Minister's special envoy.
- The meeting sought to promote peace and stability in West Asia and to begin the second phase of Trump's regional peace initiative.
- It followed a ceasefire between Israel and Hamas, achieved after three days of negotiations mediated by Egypt, Qatar, Turkey, and the United States.
- Israel, Hamas, and the Palestinian Authority were not present at the summit.

19TH NAM MID-TERM MINISTERIAL MEETING

Context: Kirti Vardhan Singh, Minister of State for External Affairs, represented India at the 19th mid-term ministerial meeting of the **Non-Aligned Movement (NAM)** held in Kampala, Uganda.

- The meeting was organised under the theme "*Deepening Cooperation for Shared Global Affluence*."
- **Uganda** holds the **NAM chairmanship** for 2024–26.

About the Non-Aligned Movement (NAM)

- NAM is a **grouping of developing countries that choose not to align with any major global power bloc.**
- Formally founded in **1961**, its roots trace back to the **1955 Bandung Conference** in Indonesia.
- The movement **today comprises 121 developing countries as member states** — including 54 from Africa, 39 from Asia, 26 from Latin America and the Caribbean, and 2 from Europe — along with Palestine, 18 observer states, and 10 observer organisations.
- **India is a founding member,** and NAM remains the **second-largest international grouping after the United Nations.**
- The movement has **no permanent secretariat**, charter, or binding treaty; instead, it functions through shared political understanding and cooperative principles.

UN CONFERENCE ON TRADE AND DEVELOPMENT

Context: The 16th session of UNCTAD took place at the Palais des Nations in Geneva, co-hosted by Switzerland and UNCTAD.

- **Theme**: "*Shaping the future: Driving economic transformation for equitable, inclusive and sustainable development.*"

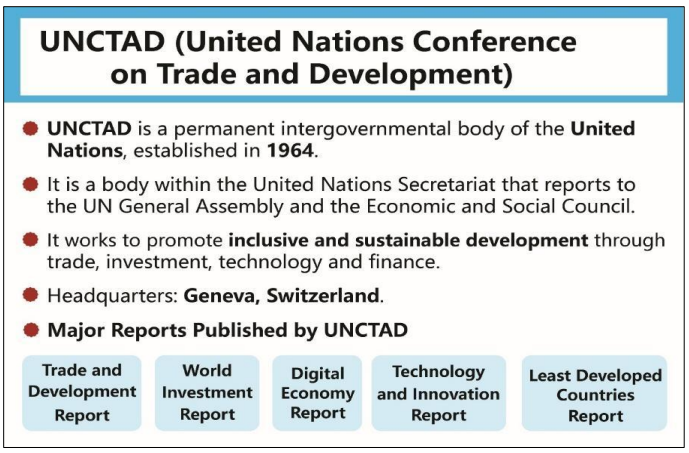
Key Outcomes

1. Adoption of the Geneva Consensus

- The conference concluded with the adoption of "**The Geneva Consensus for a Just and Sustainable Economic Order."**
- The agreement emphasises development as a global priority rooted in equity, inclusiveness, and sustainability.

2. Major Announcements

- Saudi Arabia will host the **2nd UN Global Supply Chain Forum** in November 2026 to enhance supply chain resilience and financing for small firms.
- Switzerland committed 4 million Swiss francs to support UNCTAD's work on e-commerce and digital development.



UN HUMAN RIGHTS COUNCIL

Context: India has been elected unopposed to the United Nations Human Rights Council (UNHRC) for the seventh time. The new term will run for three years (2026–2028), beginning next year.

About UN Human Rights Council

- UNHRC is the principal intergovernmental body within the UN system **responsible for promoting and protecting human rights worldwide, addressing violations, and encouraging international cooperation.**
- **Establishment:** Created in 2006 by the UN General Assembly, replacing the former Commission on Human Rights.
- **Headquarters:** Geneva, Switzerland,
- **Membership:** Comprises 47 member states, elected by the UN General Assembly. Members serve three-year terms and may hold no more than two consecutive terms.
- **Equitable Distribution:** Seats are distributed geographically (Africa, Asia-Pacific, Eastern Europe, Latin America/Caribbean, Western Europe/Others).
- **Bureau:** Oversees the Council's procedural and organizational operations. It comprises five officers: one President and four Vice-Presidents, each representing one of the five UN regional groups. They serve for a year, in accordance with the Council's annual cycle.
- **Secretariat:**
  - The Council benefits from substantive, technical, and secretariat support from the **Office of the High Commissioner for Human Rights (OHCHR),** headed by the UN High Commissioner for Human Rights.
- **Functions:**
  - **Investigation of Human Rights Violations:** Examines allegations of rights abuses in UN member states, including issues related to freedom of expression, assembly, religion, and the protection of women, minorities, and LGBT persons.
  - **Universal Periodic Review (UPR):** Conducts a peer-review mechanism that assesses the human rights record of every UN member state and offers recommendations for improvement.
  - **Adoption of Resolutions:** Passes resolutions on human rights concerns, often urging states to uphold international standards or take corrective measures.
  - **Special Procedures:** Appoints independent experts, known as Special Rapporteurs and Working Groups, to monitor, investigate, and report on thematic or country-specific human rights situations.

UNITED NATIONS CONVENTION AGAINST CYBERCRIME

Context: Recently, 72 out of 193 UN member states signed the United Nations Convention Against Cybercrime in Hanoi, Vietnam,

About United Nations Convention on Cybercrime (UNCC)

- The UNCC, officially titled "*Convention on Cybercrime: Strengthening International Cooperation to Combat Crimes Committed Through Information and Communication Technology (ICT) Systems*", is the **first international criminal justice treaty negotiated in over two decades.**
- The Convention was adopted by the UN General Assembly on 24 December 2024. It will enter into force 90 days after the 40th country deposits its instrument of ratification.
- The treaty remains open for signature until 31 December 2026. ***India has not yet signed the Convention*** *(as of Dec 2025).*
- The **UN Office on Drugs and Crime (UNODC)** acted as the secretariat for the negotiations.

Significance of the Convention

- It is the first **universally applicable, legally binding** UN instrument governing the **collection, exchange, and use of electronic evidence for investigating serious crimes.**
- The Convention responds to long-standing demands for a **global alternative to the Budapest Convention on Cybercrime (2001),** which was drafted by the Council of Europe.
- Several countries, including Russia and China, opposed the Budapest Convention and supported the creation of a new UN-led cybercrime treaty. India also did not join the Budapest Convention on Cybercrime (2001).

2025 G20 SUMMIT

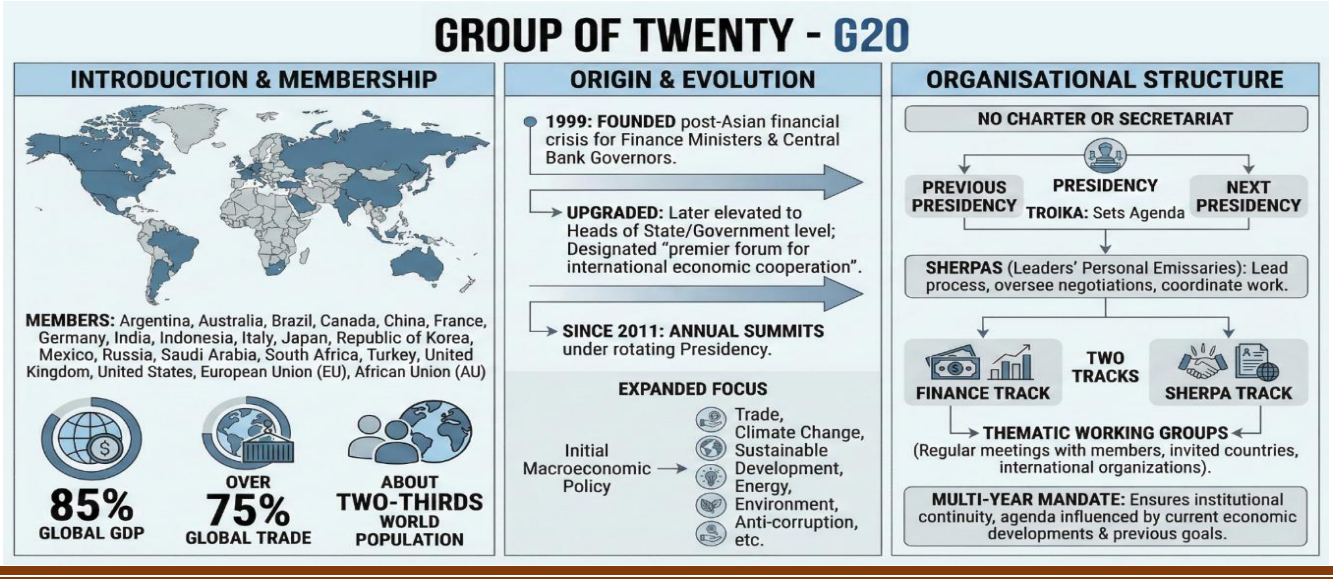
Context: The 2025 G20 Leaders' Summit was held in Johannesburg, South Africa, marking the first-ever G20 summit hosted on the African continent.

- **South Africa's presidency followed those of Indonesia, India, and Brazil,** making it the fourth consecutive G20 presidency led by a Global South nation.

Theme of the 2025 G20 Summit: *Solidarity, Equality, Sustainability*

Key Outcomes of 2025 G20 Summit

- **Strengthening Disaster Resilience:** Member countries endorsed greater investment in disaster risk reduction, preparedness, early-warning systems, and inclusive recovery, with special focus on Small Island Developing States (SIDS) and Least Developed Countries (LDCs). The summit adopted High-Level Disaster Risk Reduction (DRR) Principles.
- **Debt Sustainability for Developing Economies:** Acknowledging rising debt distress, leaders supported enhanced debt transparency, reforms in the IMF and World Bank, and assistance to liquidity-constrained developing countries through the G20 Common Framework.
- **Just and Inclusive Energy Transitions:** Key decisions included strong emphasis on a just energy transition, reaffirming commitments to tripling renewable energy capacity and doubling global energy efficiency improvements by 2050. It also includes promoting affordable climate finance, and supporting **Mission 300, which aims to electrify 300 million people in Africa by 2030.**
- **Critical Minerals for Sustainable Growth:** The G20 adopted a ***voluntary*** **Critical Minerals Framework** to expand exploration, promote local value addition, and ensure that producer countries receive fair economic benefits.
- **Food Security and the Ubuntu Approach:** Drawing on the African philosophy of **Ubuntu ("I am because we are")**, leaders committed to strengthening resilient food systems, reducing food price volatility, and supporting agricultural capacity building in Africa to combat hunger.
- **Harnessing Artificial Intelligence for Development:** The summit launched the **AI for Africa Initiative**, focusing on skill development, improved access to computing resources, and ethical governance of AI. This initiative is supported by the ***UNESCO-backed*** **Technology Policy Assistance Facility (TPAF)**, created in collaboration with UNESCO and announced during the 2025 G20 Summit.



- **Africa Energy Efficiency Facility (AfEEF):** The G20 South Africa Presidency launched AfEEF in partnership with the African Union (AU) Commission in October 2025. This legacy initiative provides a continental platform to enhance Africa's energy productivity by 12% by 2030, 50% by 2050, and 70% by 2063.
- **G20 Extraordinary Committee of Independent Experts on Global Inequality:** The Committee chaired by Nobel laureate Prof. Joseph Stiglitz, recommends establishing an Intergovernmental Panel on Inequality (IPI) modelled on the IPCC, to provide timely data and analysis for evidence-based policymaking.

COP 30

Context: The 30th meeting of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) held in Belém, Brazil, concluded with a political agreement known as the **Global Mutirão Agreement,** drawing from the **tradition of community-driven collective action.**

Key Takeaways

- **Roadmap Focused on Ending Deforestation:** The central outcome of the conference was a strong political push to address global deforestation. The COP30 President announced a dedicated deforestation roadmap, which countries will develop over the coming year.
- **Belém Health Action Plan:** Seeks to strengthen climate-resilient health systems, with a clear emphasis on equity and public participation.
- **Tropical Forests Forever Facility (TFFF):** Aims to create a USD 125 billion fund for forest conservation, using satellite-based verification mechanisms. Brazil committed the first USD 1 billion to the Facility. India joined the TFFF as an observer.
- **Open Planetary Intelligence Network (OPIN):** A new global collaboration aimed at improving climate data integration and strengthening digital cooperation.
- **Global Ethical Stocktake (GES):** Introduces ethics, justice, and the role of civil society into global climate accountability processes.
- **Belém 4X Pledge on Sustainable Fuels:** Sets a goal to achieve a fourfold increase in sustainable fuels—such as biofuels, hydrogen, and biogas—by 2035.
- **Belém Declaration on Hunger, Poverty, and People-Centered Climate Action:** Signed by 43 countries and the European Union, the declaration focuses on social protection measures and resilience-building for vulnerable populations.
- **National Adaptation Plan (NAP) Implementation Alliance:** Seeks to accelerate adaptation finance and strengthen national-level climate resilience planning.
- **Global Mutirão Strategy:** Promotes a community-driven approach to closing gaps between climate pledges and delivery, particularly in the areas of energy, finance, and trade.
- **Belém Gender Action Plan (GAP):** Aims to strengthen gender equality and enhance women's empowerment in climate action.
- **Just Transition Mechanism (JTM) – Belém Action Mechanism (BAM):** A new mechanism adopted at COP30 that focuses on ensuring a fair, inclusive, and just transition. It does not introduce new or assured sources of finance.
- **Global Mutirão Platform:** It is a digital initiative launched by Brazil to strengthen collective global climate action and bridge the persistent gap between climate pledges and their actual implementation.
- **Utilities for Net Zero Alliance (UNEZA):** At COP30, Public utility companies pledged $66 billion annually for renewable energy and $82 billion for transmission and storage. UNEZA is a coalition of leading global utilities and power-sector companies created at COP28 to accelerate decarbonisation and grid-ready renewables.

INDIA RE-ELECTED TO CODEX EXECUTIVE COMMITTEE

Context: India has been re-elected to the Executive Committee of Codex Alimentarius Commission (CCEXEC) for the Asia region at the 48th session of Codex Alimentarius Commission (CAC48).

About Codex Alimentarius Commission (CAC)

- The CAC was established in **1963** by the **Food and Agriculture Organization (FAO) and the World Health Organization (WHO)** to implement the **Joint FAO/WHO Food Standards Programme.**
- It is an intergovernmental body with **189 Codex Members,** comprising 188 member countries and the European Union. **India became a member in 1964.**

- India participates through the **National Codex Contact Point (NCCP)**, constituted by the Food Safety and Standards Authority of India (FSSAI), to coordinate national input into Codex activities.

- The Codex Executive Committee (CCEXEC) plays a crucial role in reviewing proposals for new work and monitoring the progress of food standards development. The **CCEXEC Secretariat is hosted by the FAO**.

Codex Standards

- The **collection of food standards and related texts adopted by the CAC** is known as the Codex Alimentarius. The term is derived from Latin and means **"food code."**
- Codex standards are **international food texts,** including **standards**, **codes of practice, guidelines, and other recommendations.**
- They cover areas such as food hygiene, food additives, residues of pesticides and veterinary drugs, contaminants, labelling and presentation, methods of analysis and sampling, and import and export inspection and certification.
- **Codex standards are voluntary and do not replace national laws.** Countries are required to comply with their own domestic food regulations.
- Codex standards are recognized by the World Trade Organization (WTO) as reference standards for international trade and dispute settlement under the SPS Agreement.

INTERNATIONAL MARITIME ORGANISATION

Context: India has been re-elected to the Council of the International Maritime Organization (IMO) for the term 2026–27.

About International Maritime Organization (IMO)

- The IMO is a specialised agency of the United Nations mandated to promote safe, secure, and environmentally sound shipping.
- It was established in 1948 as the Inter-Governmental Maritime Consultative Organization (IMCO), became a UN specialised agency in 1959, and was renamed the International Maritime Organization in 1982.
- **Headquartered in London**, the IMO has **176 Member States** and three Associate Members. **India has been a member since 1959.**
- The IMO's primary role is to develop a fair, effective, and universally accepted regulatory framework for the global shipping industry.
- It is also involved in legal matters, including issues related to liability and compensation, as well as the facilitation of international maritime traffic.
- The IMO Assembly, comprising all Member States, is the highest governing body of the organization.
- The IMO Council functions as the executive organ, responsible for supervising the work of the organization under the authority of the Assembly.

TROPICAL FOREST FOREVER FACILITY (TFFF)

Context: The COP30 climate summit held in Belém, Brazil, unveiled the Tropical Forest Forever Facility (TFFF), a new $125 billion global fund designed to reward developing countries for conserving tropical forests.

About Tropical Forest Forever Facility (TFFF)

- The TFFF is a **self-sustaining investment fund, spearheaded by Brazil, aimed at rewarding up to 74 developing countries for preserving old-growth tropical forests.**
- The fund seeks to mobilise $125 billion, comprising $25 billion from governments and philanthropies and $100 billion from private investments.
- The collected funds will be invested in public and corporate bonds, and the annual returns will be distributed to forest nations based on satellite-monitored forest canopy data.
- The TFFF complements existing forest finance mechanisms like REDD+ but does not generate carbon or biodiversity credits.
- Initial commitments include $1 billion each from Brazil and Indonesia, $250 million from Colombia, $3 billion over a decade from Norway, $5 million from the Netherlands, and €1 million from Portugal.
- **India has joined the TFFF as an observer.**

BHUTAN'S GLOBAL PEACE PRAYER FESTIVAL (GPPF)

Context: Bhutan hosted its first Global Peace Prayer Festival (GPPF) in Thimphu from November 4-19, 2025.

About the Global Peace Prayer Festival

- The festival aimed to promote peace, healing, and global harmony, bringing together Buddhist leaders from Mahayana, Theravada, and Vajrayana traditions.
- Representatives from China, Taiwan, Singapore, Sri Lanka, Cambodia, Myanmar, Thailand, India, Bhutan, and the Tibetan region participated in the event. Organisers highlighted that interfaith collaboration is essential for achieving lasting peace.
- A key event of the festival was **Jabzhi**, a **significant Vajrayana Buddhist ritual** believed to cleanse negative karma and dispel destructive forces.
- **India extended financial and logistical support to the festival**, including the transportation of Buddha relics from New Delhi for public veneration.
- In a historic and deeply symbolic gesture, the **sacred Piprahwa relics of Lord Buddha**, housed at the National Museum in New Delhi, **were brought to Thimphu** as a goodwill gift from India to Bhutan during the GPPF and were returned to India after the conclusion of the festival.

IBSA SUMMIT 2025

Context: The IBSA Summit 2025 was held in Johannesburg, South Africa, on November 23, 2025, on the sidelines of the G20 Summit.

About IBSA (India-Brazil-South Africa)

- IBSA is a trilateral dialogue forum established in 2003 to promote cooperation among three major emerging democracies from different continents.
- The grouping was formally launched when the Foreign Ministers of India, Brazil, and South Africa met in Brasília on 6 June 2003 and adopted the Brasília Declaration.
- South Africa is the current Chair of IBSA.
- **Cooperation within IBSA operates on three fronts:**
    - As a **forum for consultation and coordination** on global and regional political issues;
    - Through **trilateral collaboration in identified sectors** via working groups and People-to-People Forums;
    - By **assisting other developing countries** through development projects supported under the **IBSA Fund.**

IBSA Trust Fund

- The IBSA Facility for Poverty and Hunger Alleviation (IBSA Fund) was jointly established by India, Brazil, and South Africa in 2004 and became operational in 2006.
- Since its inception, the IBSA Fund has allocated over US$53.27 million, supporting 46 development projects under South–South cooperation.
- These projects have been implemented in 34 partner countries, with the majority located in Least Developed Countries (LDCs).

About IBSAMAR

- The 8th edition of IBSAMAR, a joint multinational maritime exercise involving the navies of India, Brazil, and South Africa, was conducted in October 2024 off the coast of South Africa.

APEC SUMMIT 2025

Context: Leaders of 21 Asia-Pacific economies concluded the APEC Summit 2025 in Gyeongju, South Korea, reaffirming their commitment to economic cooperation amid global uncertainty.

About Asia-Pacific Economic Cooperation (APEC)

- APEC is an intergovernmental forum comprising **21 member economies in the Pacific Rim** that promotes free trade, economic growth, and regional cooperation in the Asia-Pacific region.
- **Established in 1989,** APEC aims to facilitate trade and investment, reduce barriers, and support sustainable development across its member economies.
- APEC operates on consensus and voluntary commitments, with no binding treaty obligations for members.
- Three Pillars of APEC cooperation
    - Trade and Investment Liberalization

- Business Facilitation
- Economic and Technical Cooperation (ECOTECH)

- Member economies include Australia, China, Japan, the United States, and others. (India is not a member.)
- In APEC, each member must be an independent economic entity, rather than a sovereign state. For example: People's Republic of China is a member while, Hong Kong is also listed separately as a member economy
- **The APEC Secretariat, based in Singapore,** coordinates activities, manages projects, and provides technical support to member economies.

2ND WORLD SUMMIT FOR SOCIAL DEVELOPMENT (WSSD)

Context: The 2nd World Summit for Social Development (WSSD) was held in **Doha, Qatar**, with India represented by the Union Minister of Labour and Employment, Dr. Mansukh Mandaviya.

About the World Summit for Social Development (WSSD)

- The WSSD is a United Nations–convened series of summits aimed at advancing global social development, poverty eradication, and social justice.
- **The first WSSD, held in Copenhagen in 1995**, marked a global consensus on people-centred development.
- It resulted in the adoption of the **Copenhagen Declaration on Social Development and its Programme of Action.**
- The second summit, held in Doha in November 2025, focused on accelerating progress towards the Sustainable Development Goals (SDGs) by addressing persistent challenges such as inequality and limited social protection.

7TH NSA-LEVEL MEETING OF COLOMBO SECURITY CONCLAVE

Context: The 7th National Security Adviser (NSA)-level meeting of the Colombo Security Conclave (CSC) was held in New Delhi, hosted by India's NSA Ajit Doval.

About Colombo Security Conclave (CSC)

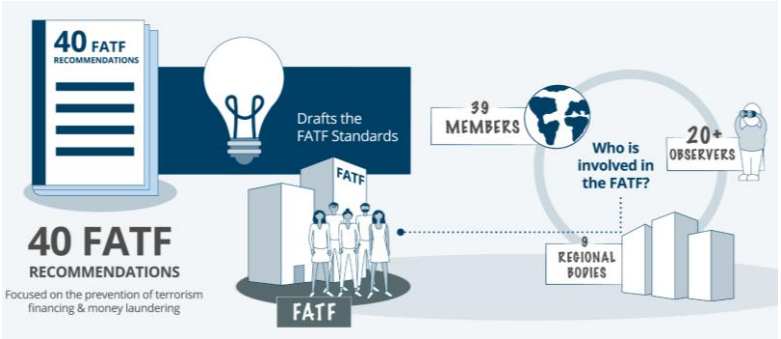
- The CSC is a regional **security grouping in the Indian Ocean Region**, established in 2011 in Colombo.
- Its broad objective is to promote a safe, secure, and stable Indian Ocean Region by enhancing regional security cooperation, especially on maritime and transnational threats.
- The CSC brings together National Security Advisers (NSAs) and Deputy NSAs for collaboration on transnational threats.
- **Members:** The founding members of the CSC are **India, Sri Lanka, and the Maldives**. **Mauritius** joined in 2022, **Bangladesh** became a member in 2024, and **Seychelles** (initially participated as an observer, became a full member in 2025). Malaysia has also participated as a guest.
- The **permanent secretariat of the CSC** is located in **Colombo, Sri Lanka**. It coordinates all activities and implements decisions made at the National Security Adviser (NSA) level.

FATF RELEASES GLOBAL ASSET RECOVERY GUIDANCE

Context: The Financial Action Task Force (FATF) has released its updated 'Asset Recovery Guidance and Best Practices', introducing a strengthened global framework to combat financial crimes. India played an active role in drafting the revised FATF standards and guidance.

About Financial Action Task Force (FATF) (HQ: Paris)

- FATF is an **intergovernmental organization established in 1989 by the G7 nations** to set international standards and promote effective implementation of measures to combat money laundering, terrorist financing, and other threats to the integrity of the global financial system.
- FATF formulates the "40 Recommendations," which serve as the global benchmark for anti-money laundering (AML), countering terrorist financing (CFT), and countering proliferation financing (CPF).



- The Recommendations are non-binding guidelines that target specific areas in which money launderers, terrorists and other criminals conduct illicit financial behavior.
- The FATF's decision-making body, known as the **FATF Plenary, meets three times a year**. It monitors compliance and holds countries accountable if they fail to meet agreed standards.
- Countries that repeatedly fall short may be designated as **Jurisdictions under Increased Monitoring (grey list)** or **High-Risk Jurisdictions with Strategic Deficiencies (black list)**.
- **Members:** 39 members, including 2 regional organizations (the Gulf Cooperation Council and the European Commission).
    - India joined as an observer in 2006 and became the full member on June 25, 2010
- **Associate Members:** 9 Regional Bodies (e.g., MONEYVAL, APG), tasked with enforcing its mandate on a regional basis.

UN80 INITIATIVE ACTION PLAN

Context: The United Nations (UN) has recently introduced the UN80 Initiative Action Plan, which serves as a coordinated roadmap to implement reforms across the entire UN system.

About the UN80 Initiative

- The UN80 initiative is the United Nations' ambitious, system-wide reform effort, launched by Secretary-General António Guterres in March 2025 as the UN marks its 80th anniversary
- **Objective**: To make the UN more agile, integrated, efficient, and effective, particularly in a context of shrinking resources.
- The initiative consists of three major work streams:
    - Identifying ways to improve efficiency and strengthen the functioning of the UN system.
    - Reviewing the implementation of mandates assigned by Member States.
    - Examining potential structural reforms and programme realignments within the UN system.
- **Timeline**: November 2025 to December 2026

EAST ASIA SUMMIT (EAS)

Context: The 20th East Asia Summit adopted the **Kuala Lumpur Declaration on Peace and Stability.**

- The declaration focuses on implementing joint projects and activities under the EAS Plan of Action (2024–2028), in alignment with the ASEAN 2045: Our Shared Future vision.

About the East Asia Summit (EAS)

- The East Asia Summit refers to the **Meeting of Heads of States/Governments of the EAS participating countries which is convened annually.**
- It was established in **2005**, and the first **Summit was held in Kuala Lumpur, Malaysia.**
- **Members**:
    - **At Inception: 10 ASEAN states** (Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Viet Nam) and Australia, China, **India**, Japan, New Zealand, South Korea,
    - **Joined at the 6th EAS 2011:** Russia and the United States.
- EAS promotes **dialogue and cooperation** on strategic, political, and economic issues to support peace, stability, and prosperity in the East Asian region.

AUSTRALIA- CANADA- INDIA TECHNOLOGY AND INNOVATION (ACITI)

Context: India, Australia, and Canada have announced a new trilateral framework called ACITI, launched on the sidelines of the G20 Summit in Johannesburg.

About Australia–Canada–India Technology and Innovation (ACITI) Partnership

- ACITI Partnership is a **trilateral initiative launched by India, Australia, and Canada** to **deepen cooperation in critical and emerging technologies**, with a strong focus on green energy innovation, resilient supply chains, and the mass adoption of artificial intelligence
- It emphasises collaboration in **clean energy** and the development of diversified and resilient supply chains, especially in critical minerals.
- ACITI aims to advance shared goals on the path to net-zero emissions, support diversification of global supply chains, and promote a secure, sustainable, and resilient technological ecosystem.

WORLD ARTIFICIAL INTELLIGENCE COOPERATION ORGANIZATION

Context: At the recent APEC meeting in Busan, South Korea, China proposed the creation of a global body called WAICO.

About WAICO

- WAICO is a **proposed global body aimed at governing artificial intelligence,** advancing shared rules, and boosting international cooperation in the AI field. It is proposed to be headquartered in Shanghai.
- **Aim**: To contribute to the development of global standards that promote international cooperation in the field of AI.
- The framework draws upon **principles from China's 2023 Global AI Governance Initiative,** which highlights human-centred design, respect for data sovereignty, and greater algorithmic transparency.
- WAICO was **announced during the 2025 World Artificial Intelligence Conference held in Shanghai.**

WATER CONVENTION

Context: Bangladesh has become the first country in South Asia to join the UN Water Convention.

About United Nations Water Convention

- Officially known as the "Convention on the Protection and Use of Transboundary Watercourses and International Lakes", is a legally binding international treaty adopted in Helsinki in 1992 and entered into force in 1996.
- Its main goal is to promote the sustainable management of shared water resources, prevent conflicts, and foster regional cooperation for peace and integration.
- It requires participating countries to prevent, control, and reduce transboundary impacts arising from activities affecting shared water bodies.
- It also mandates cooperation among riparian states through agreements and the establishment of joint institutional bodies.
- It is composed of United Nations entities (Members) and international organizations (Partners) working on water and sanitation issues.
- Originally a regional treaty for Europe, since March 2016 it has been open to accession by all UN Member States, making it a global instrument. ***India has not ratified or acceded to it.***

INTERNATIONAL IDEA

Context: India's Chief Election Commissioner is assumed the Chairship of International Institute for Democracy and Electoral Assistance (International IDEA) on behalf of India.

About International IDEA

- International IDEA is an intergovernmental organization (IGO) with a mandate **to support sustainable democracy worldwide.**
- International IDEA works worldwide. **Based in Stockholm, Sweden**, it has offices in Africa, Asia and Latin America
- **Established in 1995**, International IDEA also holds an **observer status in the UN General Assembly since 2003.**
- International IDEA's working modalities include a virtuous cycle of four elements: **knowledge production, capacity development, advocacy and convening of dialogues.**
- International IDEA is governed by its Council of Member States and by its Statutes, the latest of which entered into force in November 2008.
- **Membership: 35 countries** and the United States and Japan as Observers. **India is a founding member** of International IDEA.
- **Chairship:** Each year, the Council elects a Chair and two Vice Chairs among its Member States. The Chairship term runs from the end of the annual Council meeting (usually in December) to the next annual Council meeting.

UNITED NATIONS ENVIRONMENT ASSEMBLY

Context: India's resolution on "Strengthening the Global Management of Wildfires" was adopted at the 7th session of the United Nations Environment Assembly (UNEA-7) in Nairobi.

Theme of UNEA-7: *"Advancing sustainable solutions for a resilient plane"*

About United Nations Environment Assembly (UNEA)

- UNEA is the **world's highest decision-making body on environmental issues.** It serves as a global forum where countries work together to address major environmental challenges and strengthen international environmental governance.
- At the 2012 United Nations Conference on Sustainable Development, world leaders adopted the outcome document "**The Future We Want**", which called for **universal membership of the Governing Council of the United Nations Environment Programme (UNEP).**
- As a result, the **54-member Governing Council** was transformed into the **UNEA, with all 193 UN Member States as members.**
- **Meetings:** UNEA meets every two years in Nairobi, Kenya, and is attended mainly by environment ministers from around the world.



PAX SILICA INITIATIVE

Context: The First Pax Silica Summit was held with the signing of the Pax Silica Declaration in the US.

About Pax Silica Initiative

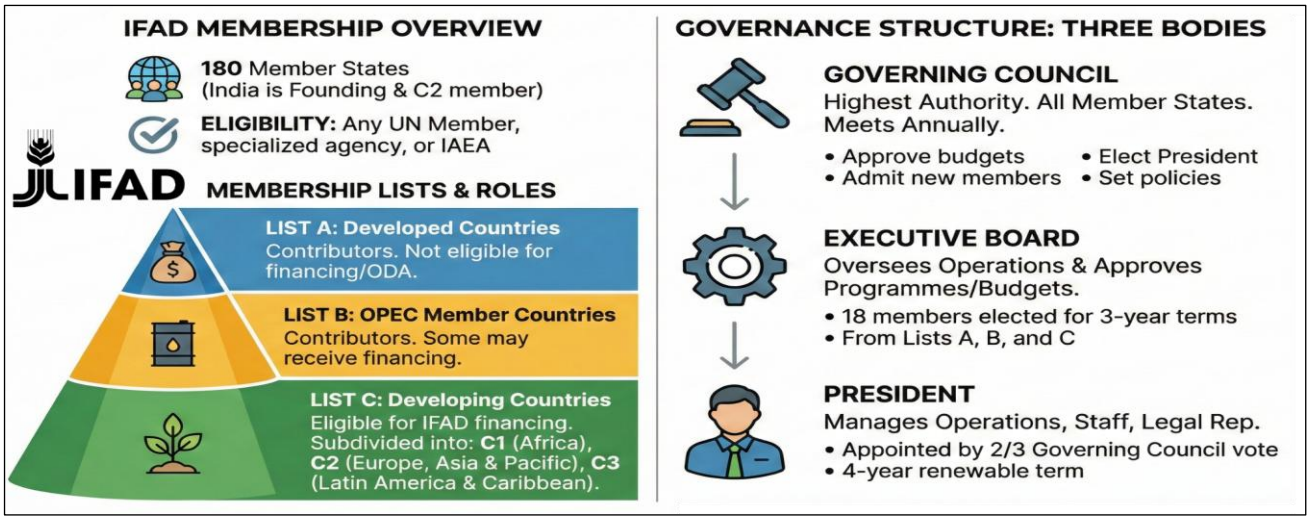
- Pax Silica is a **U.S.-led strategic initiative** that seeks **to develop a secure, resilient, and innovation-driven silicon and semiconductor supply chain.** It covers the entire value chain, from critical minerals and energy inputs to advanced manufacturing, semiconductors, AI infrastructure, and logistics.
- The inaugural Pax Silica Summit brought together participants from: Japan, Republic of Korea, Singapore, the Netherlands, United Kingdom, Israel, United Arab Emirates, and Australia. (*India is not part of the Pax Silica.)*
- Guest contributions also came from: Taiwan, the European Union, Canada, and the OECD.

IFAD–INDIA DAY

Context: The **International Fund for Agricultural Development (IFAD) hosted** the IFAD–India Day in **Rome** to highlight India's long-standing partnership with IFAD in promoting rural development, reducing poverty, and building resilient agricultural systems.

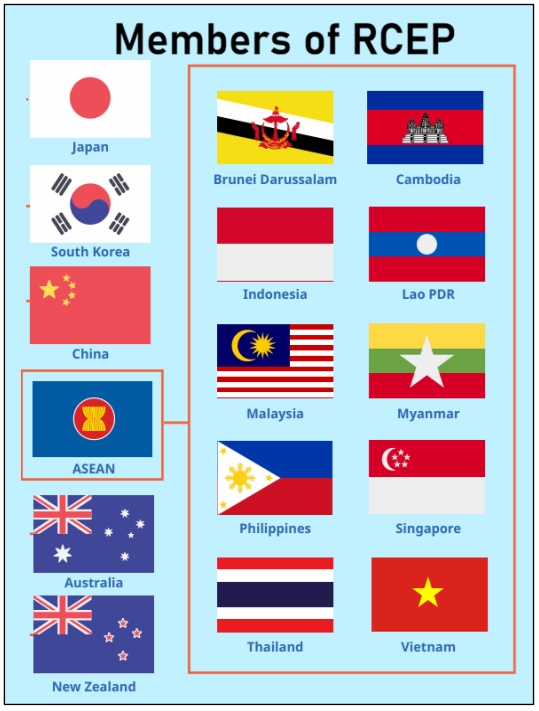
About International Fund for Agricultural Development (IFAD)

- **Established in 1977 in response to a global food crisis,** IFAD is a **specialized agency** of **the United Nations** dedicated **to eradicating hunger and poverty in developing countries.**
- **Headquartered in Rome (Italy)**, IFAD invests in rural communities to strengthen food security, enhance incomes, and improve resilience.
  - *Rome also hosts the Food and Agriculture Organization (FAO) & World Food Programme (WFP).*
- It finances projects that provide rural populations with access to financial services, markets, technology, land, and skills.
- IFAD also supports climate adaptation, disaster preparedness, and sustainable management of natural resources, particularly in fragile and vulnerable regions.



REGIONAL COMPREHENSIVE ECONOMIC PARTNERSHIP (RCEP)

Context: With the conclusion of the India–New Zealand Free Trade Agreement (2025), India now has free trade agreements with all RCEP members except China.



About Regional Comprehensive Economic Partnership (RCEP)

- RCEP is the world's largest free trade agreement, encompassing 15 Asia-Pacific nations.
- RCEP unites the **10 ASEAN countries** with **China, Japan, South Korea, Australia, and New Zealand**, representing about 30% of global GDP and population.
- RCEP negotiations were formally launched at the 2012 ASEAN Summit in Cambodia and the Agreement was signed in November 2020. It entered into force on 1 January 2022 for ten participating countries.
- **India participated in negotiations but withdrew from the agreement in 2019.**

Key Provisions

- **Trade in Goods:** Around 92% tariff elimination on goods traded among RCEP members. Preferential market access for select products in markets such as China, Japan, and Korea.
- **Non-Tariff Measures (NTMs):** Provisions to reduce trade transaction costs for businesses.
- **Rules of Origin:** Simplified and flexible rules to access preferences. Regional cumulation enables use of regional supply chains.
- **Customs Procedures & Trade Facilitation:** Simplified clearance, including release of express and perishable goods within 6 hours.
- **Trade in Services:** Deeper commitments beyond ASEAN+1 FTAs in professional, business, R&D, IT, and logistics services.

Asia Pacific Trade Agreement (APTA)

- India and China are currently signatories to the Asia Pacific Trade Agreement (APTA). The APTA (earlier known as Bangkok Agreement) is an initiative under the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) for trade expansion through exchange of tariff concessions among developing country members of the Asia Pacific Region
- Originally signed in 1975, APTA expanded from its original five members- Bangladesh, **India**, Republic of Korea (South Korea), Laos PDR, and Sri Lanka, with **China** joining in 2000 and Mongolia acceding fully in 2020.
- APTA focuses on duty reductions (margin of preference (MOP)), simplified rules of origin, and non-tariff measure cooperation.

INDIA TO CHAIR THE KIMBERLEY PROCESS FROM 2026

Context: India has been selected by consensus to serve as Chair of the Kimberley Process (KP) from January 1, 2026, for the third time.



About the Kimberley Process (KP)

- The Kimberley Process is a **tripartite initiative** involving **governments,** the **international diamond industry,** and **civil society organisations.**
- It **aims to curb the trade in "conflict diamonds" or blood diamonds,** defined as **rough diamonds used by rebel groups to finance armed conflicts**, as recognised by UNSC resolutions.
- The **Gem & Jewellery Export Promotion Council (GJEPC)** serves as **India's nodal agency** for the Kimberley Process.
- The **Kimberley Process Certification Scheme (KPCS)** is the **mechanism the KP uses to prevent the trade of conflict diamonds**.

- Launched in **2003**, it is enforced individually by KP Participant countries to ensure that rough diamonds in the legitimate supply chain are KP-compliant.
- Kimberley Process Secretariat is located in **Gaborone, Botswana.**
- The **KP has 60 participants, representing 86 countries,** with the European Union counted as a single participant. **India** is a participant.
- It **regulates 99.8% of the global rough diamond trade,** making it the most comprehensive international mechanism governing this sector.

2ND WHO GLOBAL SUMMIT ON TRADITIONAL MEDICINE

Context: The 2nd WHO Global Summit on Traditional Medicine took place in December 2025, at Bharat Mandapam in New Delhi, India.

- It was jointly organised by the World Health Organisation (WHO) and the Ministry of Ayush.
- **Theme**: *"Restoring balance: The science and practice of health and well-being"*

Key Developments at the Summit

- **Adoption of the Delhi Declaration:** The Participants committed to
  - Strengthening the evidence base for traditional medicine
  - Supporting equitable access to safe and effective traditional medicine through appropriate regulatory mechanisms
  - Integrating safe and effective traditional medicine into health systems
  - Optimizing cross-sector value through data, collaboration and empowered communities
- **Launch of the Traditional Medicine Global Library**
- **Launch of My AYUSH Integrated Services Portal (MAISP)**
- **Launch of Ayush Quality Mark**
- Inauguration of the WHO South-East Asia Regional Office (SEARO) building in New Delhi.

- Traditional medicine (TM) includes **codified and non-codified systems that predate biomedicine** and have continued to evolve for contemporary use.
- TM remains the main source of health care—locally accessible, affordable and bio-culturally aligned—and for many more, it is a preferred, personalized and more natural health option.
- Nearly 90% of WHO Member States (170 out of 194) report that 40–90% of their populations use TM.



BIOLOGICAL WEAPONS CONVENTION

Context: Biological Weapons Convention (BWC) recently marked 50 years of completion.

About Biological Weapons Convention (BWC)

- The BWC is a major **international treaty that prohibits the development, production, stockpiling, and use of biological and toxin weapons,** thereby **banning an entire category of Weapons of Mass Destruction (WMDs).**
- Formally known as "The Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction"

- The Convention is **supported by the United Nations Office for Disarmament Affairs (UNODA)** through its Implementation Support Unit (ISU) based in Geneva.
- The BWC was **adopted in 1972 and entered into force in 1975.** It requires States Parties to destroy existing biological weapons and related production facilities.
- The BWC does not possess an inspection mechanism, unlike the Chemical Weapons Convention. The convention is without a formal verification regime.
- **Membership:** The BWC has near-universal membership, with 189 States Parties (including India) as of 2025. Four countries (Egypt, Haiti, Somalia, and Syria) remain signatories but have not ratified the Convention.

Key Features

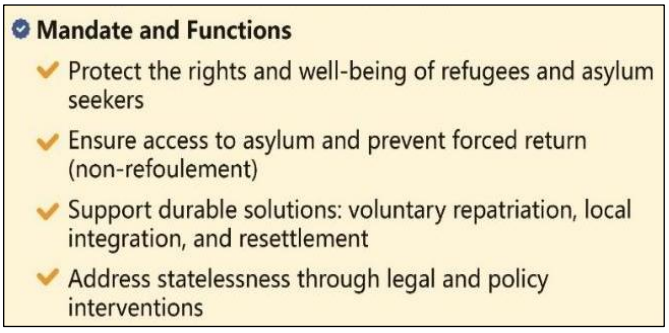
- Covers biological agents and toxins "of types and in quantities that have no justification for prophylactic, protective, or peaceful purposes."
- Encourages international cooperation in peaceful biological research and public health.
- Emphasises national implementation through appropriate domestic laws and regulations.

UNITED NATIONS HIGH COMMISSIONER FOR REFUGEES (UNHCR)

Context: The United Nations General Assembly has approved former Iraqi President Barham Salih as the next head of the United Nations High Commissioner for Refugees (UNHCR).

About the United Nations Refugee Agency (UNHCR)

- Established in **1950**, UNHCR is a **United Nations agency** mandated **to protect and assist refugees, forcibly displaced persons, and stateless individuals worldwide.**
- **Headquartered in Geneva**, it operates in 136 countries, providing life-saving support such as shelter, food, healthcare, and education.
- UNHCR's activities are guided mainly by the **1951 Refugee Convention** and its **1967 Protocol**, which define who qualifies as a refugee and specify the obligations of states.
    - *India is not a signatory to the 1951 Convention/1967 Protocol but cooperates with UNHCR operationally.*
- UNHCR's mandate stems from **UN General Assembly Resolution 428 (V) in 1950, initially focusing on post-World War II refugees** but later expanding through resolutions to cover broader displacement crises worldwide, excluding Palestinian refugees handled by UNRWA.
- UNHCR's operations depend almost entirely on voluntary contributions from governments, interstate actors, and the UN emergency fund.



- UNHCR has been awarded the **Nobel Peace Prize twice (in 1954 and 1981)** in recognition of its humanitarian work.

IMPORTANT EVENTS IN NEWS

MOST FAVOURED NATION STATUS

Context: The US President signed an executive order to reduce prescription drug prices by linking them to the lowest prices paid for the same medicines in selected developed countries under the Most Favoured Nation model.

Most-Favoured-Nation (MFN) Principle

- MFN is a status or level of treatment given by one country to another country in international trade agreements.
- Under MFN, **any trade advantage or concession given to one country must be automatically extended to all other countries in the system.**

- This ensures that every country benefits from deals negotiated by major trading partners without extra negotiations, promoting fairness and equal opportunity in international trade.
- Under Article 1 of the General Agreement on Tariffs and Trade (GATT), 1994, every member country of the WTO must give MFN status to all other member countries.
- It is also included in GATS (services trade) and TRIPS (intellectual property), covering all main areas of WTO trade.

Exceptions to the MFN Principle

- **Regional Trade Agreements (RTAs):** Countries in a free trade group (e.g., EU, NAFTA, ASEAN) can give each other better trade terms without extending them to all MFN partners.
- **Generalized System of Preferences (GSP):** Developed countries can offer lower tariffs to developing nations to support their growth, without giving the same benefits to all countries.
- **National Security Exceptions:** Countries can impose trade restrictions for national security reasons, even if it goes against MFN rules.

COLOMBIA JOINS BRI

Context: Colombia has formally joined China's Belt and Road Initiative (BRI), marking a significant shift in its foreign policy. The agreement was signed during a regional summit in Beijing.

About Belt and Road Initiative (BRI)

- BRI is a **global infrastructure development strategy launched by China in 2013** under President Xi Jinping. It aims to enhance regional connectivity and economic cooperation among more than 150 countries across Asia, Africa, Europe, and beyond by investing in infrastructure such as roads, railways, ports, energy, and digital networks.
- The BRI consists of two main components: the **Silk Road Economic Belt, which is land-based**, and the **21st Century Maritime Silk Road, which focuses on maritime routes.**
- As of 2025, over 146 countries have joined the BRI, representing about 75% of the world's population and over half of global GDP.
- The BRI encompasses **six major overland economic corridors** and extensive maritime links, notably including the **China-Pakistan Economic Corridor (CPEC).**

POLITICAL CRISIS IN NEW CALEDONIA

Context: A French-brokered political deal for New Caledonia collapsed in May 2025, increasing uncertainty about the territory's future.



About New Caledonia

- New Caledonia is a **French overseas territory located in the southwestern Pacific Ocean**, about 1,500 km east of Australia, with around 271,400 residents.
- Under the **1998 Nouméa Accord, it enjoys semi-autonomous status**, with its own Congress and limited local citizenship.
- The indigenous Kanak population has long sought independence, citing colonial trauma and historical injustices.
- The 1984–88 conflict and subsequent accords granted limited autonomy but stopped short of full sovereignty.

UK TRANSFERS CHAGOS ISLANDS SOVEREIGNTY TO MAURITIUS

Context: UK Prime Minister Keir Starmer signed a landmark deal transferring sovereignty of the Chagos Islands, including Diego Garcia, to Mauritius. The UK will now lease Diego Garcia from Mauritius for 99 years. Mauritius will receive £3.4 billion ($4.35 billion) over the lease period (averaging £101 million per year).



About the Chagos Archipelago

- The Chagos Archipelago is a group of seven atolls located about 500 km south of the Maldives in the Indian Ocean.

- The Archipelago was uninhabited until the 18th century, later colonized by the French, who ceded it to Britain in 1814.
- British Indian Ocean Territory (BIOT) was created by the UK in 1965, with Chagos as its central part. Some islands of BIOT were transferred to Seychelles in 1976.
- In the late 1960s, Britain invited the US to build a military base on Diego Garcia, the largest of the Chagos Islands, removing thousands of people from their homes.
- The archipelago was detached from Mauritius in 1965, three years before Mauritius gained independence.

IMF'S EXTENDED FUND FACILITY

Context: India abstained from voting on the IMF's decision to release $1 billion under the $7 billion Extended Fund Facility (EFF) and $1.3 billion under the Resilience and Sustainability Facility (RSF).

About Extended Fund Facility (EFF)

- EFF **provides financial assistance to countries facing serious medium-term balance of payments problems arising from structural impediments or slow growth.** It supports countries in implementing medium-term structural reforms.
- **All IMF member countries** facing actual or potential external financing needs are **eligible**.
- The EFF is a **repayable loan**, not a grant or financial aid. It is offered for an extended period, usually more than three years, with longer repayment timelines than standard IMF loans.
- **Disbursement takes place in tranches, linked to periodic performance reviews.**
- While the facility is typically used by advanced and emerging economies, low-income countries may access the EFF alongside the Extended Credit Facility (ECF).

About Resilience and Sustainability Facility (RSF)

- RSF provides **affordable, longer-term financing to low-income and vulnerable middle-income countries**.
- It is designed to strengthen macroeconomic resilience and sustainability by supporting reforms **related to climate change, pandemic preparedness**, and other long-term structural challenges that threaten balance of payments stability.
- The RSF offers **highly concessional terms, with a maturity period of 20 years** and a grace period of 10.5 years.
- **Eligible countries include** those **low-income states** that qualify for concessional financing from the IMF's Poverty Reduction and Growth Trust (PRGT), as well as certain **vulnerable middle-income countries.**

Instrument	Financing / Duration	Purpose / Use
SBA (Stand-By Arrangement)	Up to 3 years (usually 12–18 months)	Short-term or potential BoP needs
SCF (Standby Credit Facility)	1–3 years	Short/medium-term BoP needs (low-income)
ECF (Extended Credit Facility)	3-5 years, with an overall maximum duration of 5 years.	Long-term BoP needs in low-income countries
RFI (Rapid Financing Instrument)	One-time disbursement, Repayment Within 3¼ to 5 years	Urgent/emergency BoP needs
RCF (Rapid Credit Facility)	One-time disbursement	Urgent BoP needs in low-income countries
FCL (Flexible Credit Line)	1–2 years	Precautionary; short-term BoP pressures
SLL (Short-term Liquidity Line)	12 months (renewable)	Short-term BoP pressures
PLL (Precautionary & Liquidity Line)	6 months (liquidity) or 1–2 years	Prospective BoP needs; precautionary

CHINA PAKISTAN ECONOMIC CORRIDOR (CPEC)

Context: The foreign ministers of China, Pakistan, and Afghanistan have agreed to extend the China-Pakistan Economic Corridor (CPEC) to Afghanistan.

About China-Pakistan Economic Corridor (CPEC)

- CPEC was launched in 2015 as the flagship project of China's Belt and Road Initiative (BRI). It **connects the Silk Road Economic Belt with the Maritime Silk Road.**
- Focused mainly on energy and infrastructure, it includes around 3,000 km of roads, railways, and pipelines designed to transport oil and gas from **Pakistan's Gwadar Port to Kashgar in China's Xinjiang region.**
- **CPEC passes through Pakistan-occupied Jammu and Kashmir (PoJK)**, which is India's integral territory. India consistently opposes CPEC, viewing it as a violation of its territorial integrity and sovereignty.



About Belt and Road Initiative (BRI)

- The BRI was proposed in 2013 aiming to boost transcontinental connectivity.
- It has two components: the **overland Silk Road Economic Belt** linking China with Central and South Asia and Europe, and the **Maritime Silk Road** connecting China with Southeast Asia, the Gulf, Africa, and Europe.

LIABILITY AND ACCOUNTABILITY IN SHIP SINKING INCIDENTS

Context: Two recent maritime incidents off Kerala's coast have raised environmental and safety concerns.

Regulatory Framework for Maritime Sector

1. International Maritime Organization (IMO):

- The IMO is a specialised agency of the United Nations that sets global rules to ensure international shipping is safe, secure, and environmentally responsible.
- In 1948, an international conference held in Geneva adopted a convention to establish the organisation. It was originally named the Inter-Governmental Maritime Consultative Organization (IMCO) and was renamed IMO in 1982.
- The **IMO Convention entered into force in 1958,** and the organisation became operational in 1959. The IMO is **headquartered in London, United Kingdom.**
- The organisation develops international regulatory frameworks to govern shipping, including:
  - **SOLAS (Safety of Life at Sea):** Ensures ships are designed and equipped to keep lives safe at sea.
  - **MARPOL (Marine Pollution):** Prevents and controls pollution from ships, including oil spills, garbage, and sewage.
  - **STCW (Standards of Training, Certification, and Watchkeeping):** Sets uniform standards for training and qualifications of seafarers.
  - **LL (Load Lines Convention):** Ensures ships are stable and seaworthy by marking safe load levels.

2. India's Maritime Regulatory Framework

- **Directorate General of Shipping (DG Shipping):** The apex maritime authority under the Ministry of Ports, Shipping, and Waterways, responsible for implementing IMO conventions and maritime legislation in India. **Its functions include:**
  - Administering safety regulations for Indian ships and seafarers.
  - Enforcing environmental protection standards in line with international conventions.
  - Overseeing certification, licensing, ship registration, and port state control inspections.
  - Representing India at the IMO and other international maritime forums.
- **The Merchant Shipping Act, 1958:** The Act and its amendments provide the statutory basis for implementing IMO conventions in the Indian context.

Conventions Not Yet Ratified by India

- **Ballast Water Management Convention (2004):** Seeks to prevent the spread of invasive aquatic species through ship ballast water. India has not ratified it yet, though domestic guidelines on ballast water exchange exist.

- **HNS Convention (2010 – Hazardous and Noxious Substances):** Establishes a liability and compensation framework for damage caused by the maritime transport of hazardous and noxious substances.

IRAN MOVES TO BLOCK STRAIT OF HORMUZ

Context: Iran's Parliament has approved a proposal to close the Strait of Hormuz, pending final approval by the Supreme National Security Council, following US strikes on Iranian military sites.



About Strait of Hormuz

- A **narrow waterway connecting the Persian Gulf with the Gulf of Oma**n, ultimately leading to the Arabian Sea.
- It is a critical maritime passage for oil-exporting countries like Iran, Saudi Arabia, and the UAE, handling a significant share of the world's oil trade.
- Located in the territorial waters of Iran and Oman, the strait is geopolitically sensitive.
- At its narrowest point, the strait is just 33 km wide, with a 3 km wide shipping lane in each direction.

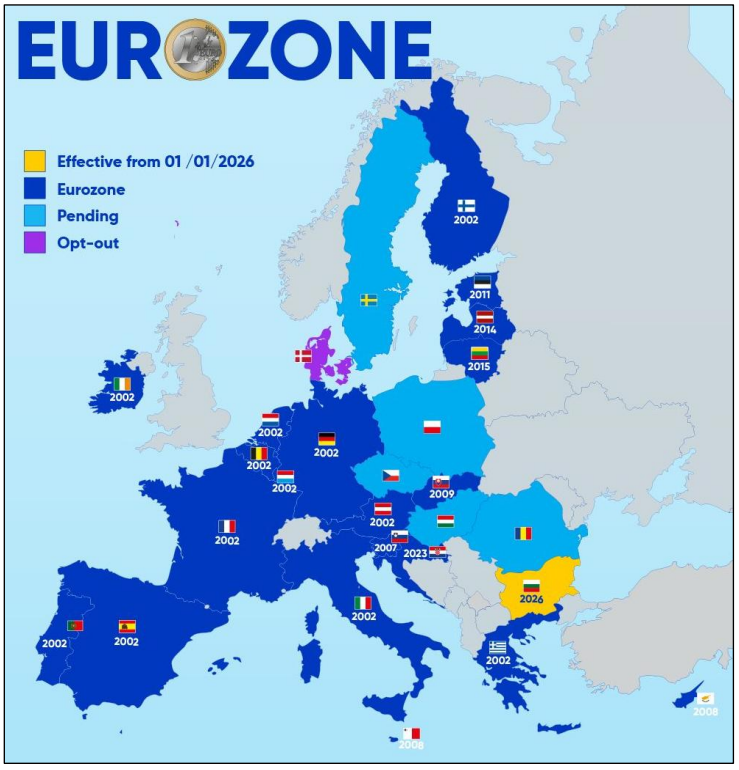
Significance of the Strait

- It is the world's most important oil and LNG transit route.
- In 2024–25, over 25% of global seaborne oil trade and 20% of global oil and petroleum product consumption passed through it.
- Around 20% of global LNG trade, mainly from Qatar, also transited the strait.

BULGARIA CLEARED TO ADOPT THE EURO IN 2026

Context: The European Commission has approved Bulgaria's readiness to adopt the euro, setting January 1, 2026 as the official adoption date. Bulgaria will become the 21st member of the Eurozone.

- **Next Steps:** EU member states and the European Parliament still need to ratify the decision, though approval is widely expected.
- **Current Bulgarian Currency:** Bulgarian Lev (BGN)



About the Euro (€)

- The euro is the official currency of the Eurozone, used by 20 of the 27 EU member countries.
- Introduced in 1999 for non-cash transactions and in 2002 for notes and coins, the euro is managed by the European Central Bank (ECB).

Conditions for Euro Adoption (Convergence/Maastricht Criteria): To adopt the euro, an EU country must meet these criteria:

1. **Price Stability:** Inflation no more than 1.5 percentage points above the average of the three best-performing EU countries.
2. **Sound Public Finances:** The planned or actual **government deficit should not exceed 3% of GDP** and the **government debt** ratio **should not be higher than 60% of GDP.**
3. **Exchange Rate Stability:** Currency must remain stable within the Exchange Rate Mechanism (ERM II) for at least two years.

4. **Long-term Interest Rates:** No more than 2 percentage points above the average of the three best-performing EU countries in terms of inflation.

BORDER DISPUTE BETWEEN THAILAND & CAMBODIA

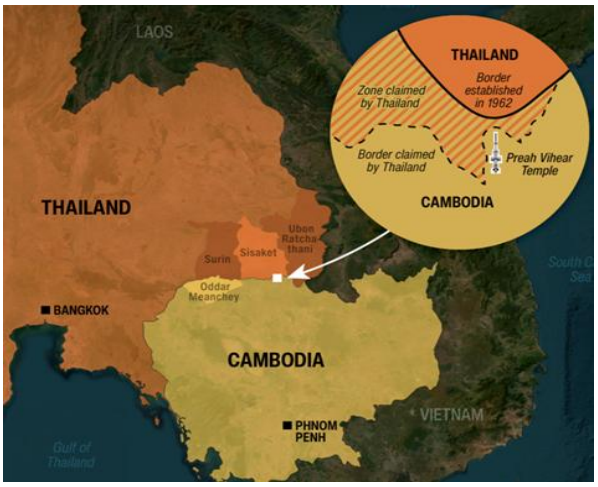
Context: Thailand's Prime Minister Paetongtarn Shinawatra was suspended by the Constitutional Court after a leaked phone call about discussions on an ongoing border dispute.

Thai–Cambodian Border Tensions

- The core issue lies around the **Preah Vihear Temple** (Phra Wihan in Thai), located on a disputed section of the 800-km border between Thailand and Cambodia.
- Although the temple holds deep historical and cultural value for both nations, its formal location within Cambodian territory remains a source of nationalist tension and recurring disputes.

From Cordiality to Conflict

- Historically, Siam (Thailand) and Khmer (Cambodia) civilizations enjoyed friendly ties marked by trade, intermarriage, and cultural exchange.
- By the 15th century, power shifted as the **Ayutthaya Kingdom of Siam** took advantage of the declining Khmer Empire, capturing its capital, Angkor.
- The Khmers retaliated, triggering a cycle of conflicts that extended into the 16th century.
- Cambodia became part of French Indochina, and the 1904 border map drawn under French supervision placed the Preah Vihear Temple within Cambodian territory. In 1907, under French pressure, Siam signed a treaty ceding Battambang, Sisophon, and Siem Reap to Cambodia.



Post-Independence Dispute

- After gaining independence from France in 1953, Cambodia discovered Thai troops occupying the Preah Vihear Temple. Cambodia broke diplomatic ties twice, in 1958 and 1961, and subsequently approached the International Court of Justice (ICJ).
- In 1962, the ICJ ruled (9–3 majority) that the Preah Vihear Temple belongs to Cambodia, a decision that continues to shape Thai–Cambodian relations today.

About Preah Vihear Temple

- It is an early medieval Hindu temple complex of the Khmer Empire, located atop a 525-metre cliff in the Dângrêk Mountains of northern Cambodia near the Thai border.
- It is historically important as an outstanding example of **Khmer Architecture**. It is a UNESCO World Heritage Site dedicated originally to Shiva. With the regional decline of Hinduism, the complex, gradually shifted to Buddhist use and today houses small Buddhist shrines.



CONTINUATION OF DALAI LAMA INSTITUTION & ROLE OF GADEN PHODRANG TRUST

- Just before his 90th birthday, the 14th Dalai Lama announced that the institution of the Dalai Lama will continue.
- He reaffirmed that only the Gaden Phodrang Trust has the exclusive authority to recognize his future reincarnation, rejecting any external interference.
- This reiterates his 2011 declaration, which had formally assigned this responsibility to the Trust.

About Gaden Phodrang Trust

- **Origin:** "Gaden Phodrang" was originally the name of the Dalai Lama's residence at Drepung Monastery in Lhasa, Tibet.
- **Historical Context:** The Dalai Lamas later resided at the Potala Palace and Norbulingka until the 14th Dalai Lama fled to India in 1959.
- **Establishment:** Formally registered in Dharamshala in 2011, the Trust functions from the Dalai Lama's office.Leadership Headed by Prof. Samdhong Rinpoche, a senior monk and close advisor to the Dalai Lama.

- **Mandate:** To recognize the reincarnation of the Dalai Lama and preserve the spiritual and cultural traditions of Tibetan Buddhism.

GIRMITIYA COMMUNITY

Context: During his visit to Trinidad and Tobago, PM Modi announced that India is developing a global Girmitiya community database and plans to regularly host World Girmitiya Conferences to celebrate shared heritage and strengthen diaspora connections.

Who Were the Girmitiyas?

- The term "Girmitiyas" refers to **Indian indentured labourers who migrated during the mid to late 19th century to work in British colonies** after the **Slavery Abolition Act of 1833** created a shortage of workers.
- The word "**Girmit**" originated as a **local pronunciation of "Agreement,"** referring to the work contracts they signed before leaving India.
- They primarily worked on sugarcane plantations, tea estates, and construction projects, and many eventually made these colonies their permanent homes.

Geographical Spread of Girmitiyas

- **Indian Ocean Region:** Mauritius, Réunion, Seychelles
- **Caribbean:** Trinidad and Tobago, Guyana, Suriname, Jamaica
- **Pacific:** Fiji
- **Africa:** South Africa, Kenya
- **Southeast Asia:** Ceylon (Sri Lanka), Burma (Myanmar), Malaysia

Origins and Migration Patterns

- Most Girmitiyas came from eastern Uttar Pradesh and Bihar, areas then known for high poverty, unemployment, and agricultural distress.
- Economic hardships and the promise of better wages and living conditions abroad drove many to accept indenture contracts.
- However, in the colonies, they faced harsh living conditions, low pay, and limited access to food, healthcare, and education.
- A separate migration stream included Tamil labourers from Madras, Negapatam, and Thondi, who moved to Ceylon, Burma, and Malaysia.

CHINA'S MEDOG HYDROPOWER PROJECT

Context: China has begun construction of the Medog (Motuo) Mega Dam Project on the Yarlung Zangbo River (known as the Brahmaputra in India) in the Tibet Autonomous Region.

About the Medog Hydropower Project

- Once completed, the Medog project is expected to exceed the Three Gorges Dam in size and capacity, potentially generating three times more electricity.
- **Location**: The dam is being constructed at the Great Bend of the Yarlung Tsangpo River in Tibet, close to the Arunachal Pradesh border.
- **Design**: Marketed as a run-of-the-river project, it will include five cascade hydropower stations and reservoir-like structures, capable of diverting up to half of the river's natural flow.



H-1B VISA CHANGES

Context: H-1B visa in the United States will now include a new one-time processing fee of $100,000 for certain new applicants, effective for petitions filed on or after September 21, 2025.

About H- 1B Visa

- The H-1B is a **temporary, non-immigrant visa** that allows employers in the United States to hire foreign professionals for specialised roles, such as in technology, engineering, finance, and research.

- The visa is employer-sponsored, meaning a U.S. employer must file a petition on behalf of the worker. The visa is meant for **jobs that require at least a bachelor's degree or its equivalent.**
- **Introduced in 1990,** it supports employers who need workers with skills that may be scarce in the domestic labour market.
- An H-1B visa is typically **issued for an initial period of three years** and can be extended up to a maximum of six years. After this period, workers must either leave the United States for at least one year or transition to permanent residency (a Green Card).
- Tech giants like Amazon, Meta, Microsoft, and Google have been among the major users of H-1B visas.
- The **annual limit for new H-1B visas is 65,000**, with an additional 20,000 slots reserved for applicants who hold a master's degree or higher from a US institution.
- Several categories are exempt from this cap. These include petitions for continued employment, and positions in universities, nonprofit institutions of higher education, and nonprofit or government research organisations.

RED SEA

Context: Cargo ships in the Red Sea have recently come under attack, with Houthi rebels from Yemen claiming responsibility for sinking a vessel.

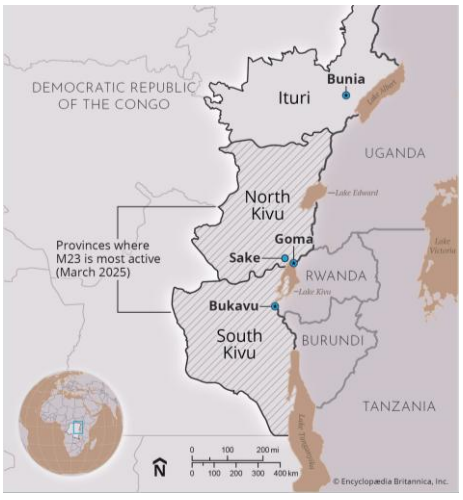


About the Red Sea

- The Red Sea is a marginal sea located in the northwestern part of the Indian Ocean.
- **Connectivity:** It is linked to the Gulf of Aden through the Strait of Bab-el-Mandeb in the south. It connects to the Mediterranean Sea through the Suez Canal in the north.
- **Bordering Nations: West**: Egypt, Sudan, and Eritrea | **East**: Saudi Arabia and Yemen | **Northeast (via Gulf of Aqaba):** Israel and Jordan
- **In the North, Red Sea divides into two arms:** Gulf of Suez (northwest), Gulf of Aqaba (northeast)
- It has one of the **highest salinity levels among the world's seas.** The region receives very little rainfall, and no major rivers flow into it, making evaporation the dominant process.

M23 REBELS

Context: The Democratic Republic of Congo (DRC) and M23 rebels, reportedly backed by Rwanda, have agreed to implement a permanent ceasefire in the conflict-hit eastern region of Congo.



About the M23 Rebels

- The M23 or **March 23 Movement** is a **Tutsi-led armed group** operating in eastern DRC, a region known for its rich deposits of minerals such as gold, coltan, and cobalt.
- **Origin of the Name:** The group derives its name from March 23, 2009, the date when a peace accord was signed between the Congolese government and the National Congress for the Defence of the People (CNDP), a Tutsi rebel faction.
- **Formation:** The M23 movement was formed in 2012 by former CNDP members who accused the government of failing to implement the 2009 peace agreement.
- **The group claims to fight for:** Protection of minority Tutsis, and Equitable distribution of national resources.

UN CONFIRMS FAMINE IN GAZA

Context: The UN-backed Integrated Food Security Phase Classification (IPC) has declared a famine (IPC Phase 5) in the Gaza Governorate, including Gaza City—the first officially confirmed famine in West Asia.

About Integrated Food Security Phase Classification (IPC)

- The IPC, created in 2004 during Somalia's food crisis, is the leading **global framework used to assess famine and severe hunger**. It is **coordinated by the UN FAO,** with contributions from UN agencies, national governments, and humanitarian organisations.
- While the IPC provides the classification system, **famine is formally declared by the UN, governments, or senior international representatives.**

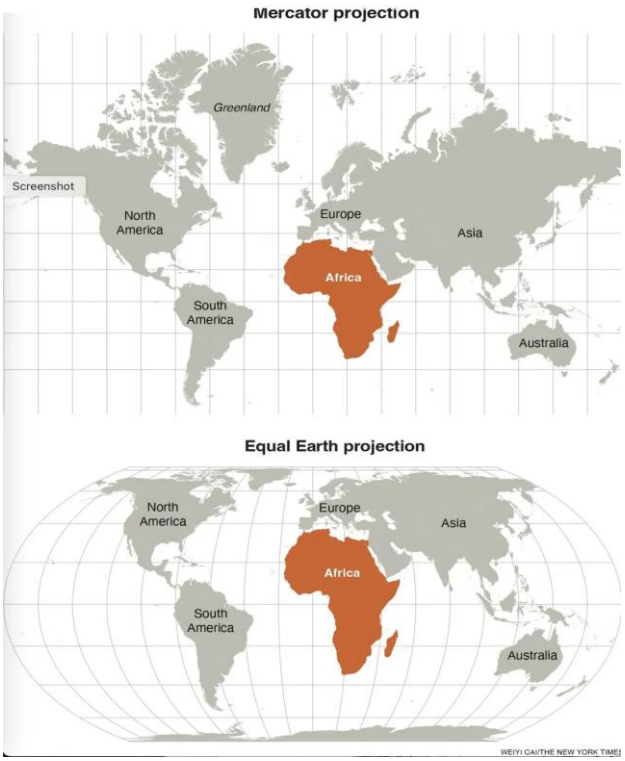
IPC Famine Criteria (All three must be met)

- **Food Access:** At least 20% of households face an extreme lack of food.
- **Malnutrition**: At least 30% of children under five are acutely malnourished.
- **Mortality**: Crude death rate ≥ 2 per 10,000 people per day, or under-five death rate ≥ 4 per 10,000 per day.
- Famine is considered human-made, driven by conflict and access restrictions, not by global food shortages.

PROBLEM WITH AFRICA'S REPRESENTATION ON MAPS

Context: The African Union (AU) has endorsed the **Correct the Map campaign**, calling for the **replacement of the Mercator projection with alternatives such as the Equal Earth map.**

- The AU argues that this distortion has contributed to symbolic marginalisation for centuries, and that adopting a fairer projection will restore geographical accuracy and dignity.
- For example, Africa (about 30 million sq. km) is often shown nearly the same size as Greenland, which is actually fourteen times smaller.



What is Mercator Projection?

- The Mercator projection, created in 1569 to aid navigation, **allowed sailors to follow straight rhumb lines across the seas**, transforming European exploration and later colonial expansion.
- A rhumb line (or loxodrome) is a path on Earth that crosses all meridians at the same angle.
- It **represents a constant compass direction** (e.g., always heading northwest at 45°).
- On a globe, this path curves and spirals toward the poles.
- On the Mercator projection, rhumb lines appear as straight lines, which made the map extremely useful for navigators during the Age of Exploration.

What is Equal Earth Projection?

- The Equal Earth projection, **introduced in 2018** by cartographers Bojan Šavrič, Tom Patterson, and Bernhard Jenny, presents continents and countries in their correct proportions.
- It preserves the relative sizes of landmasses, especially regions near the equator like Africa.
- It does, however, introduce some shape distortion as continents may appear slightly curved or stretched, but overall provides a fairer visual representation of the world.

INDIA SECURES 2ND DEEP-SEA MINERAL EXPLORATION CONTRACT IN INDIAN OCEAN

Context: India has signed a new contract with the International Seabed Authority (ISA) for exclusive exploration of Polymetallic Sulphides (PMS) in the **Carlsberg Ridge** of the Indian Ocean.

India's Expanded Exploration Rights:

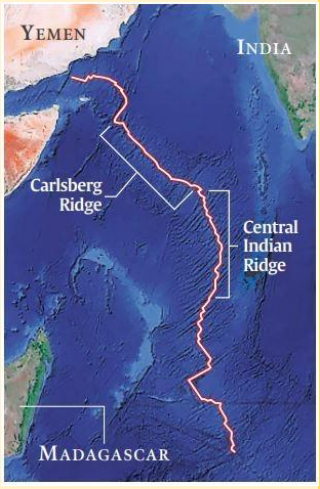
- With this contract, **India becomes the first country to hold two ISA exploration contracts for PMS**, giving it the **largest internationally allocated seabed area for PMS exploration.**
- India **earlier secured a PMS exploration contract in 2016** for the Central and Southwest Indian Ridges. It now commands the largest area allocated in the international seabed for PMS exploration.
- The National Centre for Polar and Ocean Research (NCPOR), Goa, will begin exploration in 2026 through detailed geophysical and hydrographic surveys.
- It will be supported by India's deep-sea initiatives, including the Samudrayaan Mission and advanced ocean technology development.
- Since 2016, NCPOR has conducted extensive surveys across the Central and Southwest Indian Ocean ridges, developing strong technical capability.

About Carlsberg Ridge

- A major **mid-ocean ridge system in the Indian Ocean** formed by seafloor spreading.
- **Location:** Extends from the triple junction of the African, Indian, and Australian plates (near 2°N, 66°E) towards the Gulf of Aden. Forms a boundary separating the Arabian Sea (NE) from the Somali Basin (SW).

Features:

- Formed around 40 million years ago with a spreading rate of 2.4–3.3 cm per year.
- Depth ranges from 1,800–3,600 m below sea level.
- Shows rugged terrain, a median valley, and structural features typical of slow-spreading ridges.
- Hosts active hydrothermal vent systems, making it rich in PMS deposits.
- Much closer to India (~2°N) than earlier PMS exploration sites (~26°S).
- Situated in a seismically active zone linked to the East African Rift System.



About Polymetallic Sulphides

Mineral-rich deposits that form on the ocean floor near hydrothermal vents.

- Created when cold seawater meets underlying magma and re-emerges as hot, mineral-loaded fluids that solidify on the seabed.
- Commonly found along mid-ocean ridges at depths of 2,000–5,000 m.
- **Composition**: High concentrations of copper, zinc, lead, silver, gold, and trace rare metals.

Applications:

- Used in electronics and high-technology industries (copper, rare metals).
- Essential for renewable energy systems, including solar technologies and batteries (zinc, silver).
- Important for aerospace, defence, and modern clean-tech manufacturing.

About International Seabed Authority (ISA)

- The International Seabed Authority (ISA) is an autonomous international organization established under UNCLOS (1982) and the 1994 Implementation Agreement.
- **Headquartered in Kingston, Jamaica,** it came into existence in 1994 and became fully operational in 1996.
- The ISA regulates all mineral-related activities in the international seabed area, which is the seabed and ocean floor beyond national jurisdiction, often referred to as "The Area".
- **Membership:** Under Article 156(2) of UNCLOS, all States Parties to UNCLOS are automatically members of ISA. **As of 1 November 2025, it has 171 members (170 countries and the European Union). India is a Member.**
- **Structure:**
  - **Assembly:** It is the **supreme authority** of the ISA, comprising all member states, which sets general policies and budgets.
  - **Council:** The **36-member** Council**,** elected by the Assembly, acts as the executive authority, approving contracts for exploration and mining and establishing rules and procedures. ***India is a member of ISA Council.***

- **Secretary-General:** They are nominated by the Council and elected by the Assembly for a four-year term.

About National Centre for Polar and Ocean Research (NCPOR)

- The NCPOR is an **autonomous body under the Ministry of Earth Sciences, for scientific research in the polar regions and the Southern Ocean.**
- Established on **May 25, 1998** as the **National Centre for Antarctic and Ocean Research (NCAOR)**, it was later renamed NCPOR. NCPOR is headquartered in Vasco da Gama, Goa.
- **Mandate of NCPOR**
  - Providing leadership in polar and ocean sciences
  - Conducting geoscientific surveys of India's EEZ and extended continental shelf
  - Undertaking deep-sea drilling and exploration of ocean resources such as gas hydrates and multi-metal sulphides
  - Facilitating and supporting national research programmes in Antarctica, the Arctic, and the Southern Ocean
  - Managing India's annual scientific expeditions and **research stations** (Maitri, Bharati, and Himadri), and operating research vessels including **ORV Sagar Kanya.**

ARMENIA–AZERBAIJAN PEACE AGREEMENT

Context: A peace agreement between Armenia and Azerbaijan was initiated and a joint declaration signed, with the mediation of the United States.

About Armenia–Azerbaijan Peace Agreement



- The agreement, initiated in August 2025, marks a significant step toward ending nearly four decades of conflict, particularly over the **Nagorno-Karabakh region.**
- The deal was **brokered by the United States**, with Armenian Prime Minister Nikol Pashinyan and Azerbaijani President Ilham Aliyev signing a joint declaration in the US.
- It committed both nations to mutual respect for territorial integrity, the relinquishment of territorial claims, and a ban on the use of force.
- The agreement also focuses on **reopening the Zangezur Corridor,** a route through southern Armenia that **connects Azerbaijan with its exclave Nakhchivan.** This corridor has remained closed since the first Armenia–Azerbaijan war in the early 1990s.
- Under the accord, the **United States received the right to manage and develop the Zangezur Corridor**, referred to as the "Trump Route for International Peace and Prosperity", **for a period of 99 years.**
- The agreement dissolved the OSCE Minsk Group, which had been the main mediator for decades.

CHINA'S NEW K VISA

Context: China is launching a new K visa to draw foreign STEM professionals at a time when the United States is tightening access through restrictions on the H-1B visa.

About the K Visa

- A new visa category (effective 1 October) **designed for young foreign graduates and researchers in STEM fields** from leading global universities and institutions.
- It offers **greater entry flexibility, longer validity, and allows a wider range of activities,** including study, research, and entrepreneurship, **without requiring sponsorship from a local employer.**
- The K visa is viewed as a **complement to China's existing R-visa, which targets senior experts and high-level talent.**

FRANCE RECOGNISES PALESTINE

Context: At the UN General Assembly, France joined the UK, Canada, Australia, and several European nations in recognising the State of Palestine.

Question of Palestinian Statehood	
Criteria for Statehood	• The 1933 **Montevideo Convention** outlines four requirements for statehood: a defined territory, a permanent population, a government, and the capacity to engage in international relations. • For Palestine, each of these elements remains contested under Israeli occupation.
Territory	• The West **Bank, East Jerusalem**, and Gaza- territories claimed by Palestine are effectively under Israeli control. • Expansion of Israeli settlements and annexation efforts continue to undermine the possibility of clear territorial sovereignty.
Permanent Population	• The Gaza war has caused severe devastation, with over 65,000 estimated deaths and widespread famine.
Government	• The Palestinian Authority (PA) administers limited areas of the West Bank, while Hamas controls Gaza under blockade. • International calls for PA reform and the disarmament of Hamas reflect governance challenges.
International Recognition	Growing diplomatic recognition strengthens Palestine's ability to engage globally, even though control over land, population, and governance remains fragmented.

India's Stand on Palestine

- India has consistently supported the Palestinian cause as part of its foreign policy.
- In 1974, India became the first non-Arab country to recognise the Palestine Liberation Organization (PLO).
- In 1988, India was among the earliest states to recognise the State of Palestine.
- In 1996, India opened its Representative Office in Gaza, which was later shifted to Ramallah in 2003.
- India supported Palestine's status as a UN non-member observer state, and in 2011, voted in favour of Palestine's full membership in UNESCO.
- India advocates a negotiated Two-State Solution, aiming for a sovereign, independent, and viable Palestinian state coexisting peacefully with Israel.
- The Two-State framework envisions a Palestinian state in the West Bank and Gaza, with East Jerusalem as its capital, based on pre-1967 borders.

UN General Assembly: New York Declaration

- The UN General Assembly endorsed the New York Declaration—outcome of a July conference hosted by France and Saudi Arabia—with 142 votes in favour, 10 against, and 12 abstentions.
- Countries voting against: Israel, United States, Argentina, Hungary, Micronesia, Nauru, Palau, Papua New Guinea, Paraguay, Tonga.
- The Declaration outlines a roadmap to revive the Israel–Palestine two-state solution.

UN SNAPBACK SANCTIONS ON IRAN

Context: UN sanctions on Iran were reimposed through the **JCPOA "snapback" mechanism** after France, Germany, and the UK declared in August 2025 that Iran was not complying with the 2015 nuclear agreement.

What is Snapback Sanction?

- A snapback sanction is a **provision that allows previously lifted UN sanctions to automatically come back into force** if a country is found violating an international agreement. This process does not require a new vote or approval from the UN Security Council.
- In the **2015 JCPOA Iran nuclear deal,** this clause was built in to ensure strict compliance. If any participating country declares that Iran is not meeting its commitments, a 30-day timer begins. At the end of this period, all UN sanctions are automatically restored, and no country can block the process with a veto.

About Joint Comprehensive Plan of Action (JCPOA)

- The JCPOA, commonly known as the Iran nuclear deal, is an international agreement reached in July 2015 between **Iran and the P5+*1* countries** (the United States, the United Kingdom, France, Russia, China, and *Germany*), along with the European Union.
- The **main goal of the JCPOA was to restrict Iran's nuclear program** in exchange for the lifting of international sanctions. The deal included extensive monitoring and verification by the International Atomic Energy Agency (IAEA) to ensure compliance.
- The United States withdrew from the JCPOA in 2018 under President Trump, reimposing sanctions on Iran.

ETHIOPIA INAUGURATES AFRICA'S LARGEST HYDROPOWER DAM

Context: Ethiopia inaugurated the Grand Ethiopian Renaissance Dam (GERD).

About Grand Ethiopian Renaissance Dam (GERD)

- It is 170 metres tall and nearly 2 km wide, the dam on the **Blue Nile River.**
- It can **store 74 billion cubic metres of water** and generate 5,150 megawatts of electricity, effectively doubling Ethiopia's power capacity.
- Ethiopia maintains that the dam's hydroelectric design will not reduce downstream water flow. But Sudan and Egypt, who rely heavily on the Nile for water supplies, have expressed fears that the dam will threaten their water security and even breach international law.

About Nile

- The Nile River is formed by two major tributaries: White Nile and Blue Nile. The two rivers meet at **Khartoum, Sudan**, forming the main Nile River, which then flows northward to Egypt and the Mediterranean Sea.

White Nile

- Originating from **Lake Victoria** in **East Africa**, it is the longer of the two and flows through Uganda and South Sudan before joining the Blue Nile at Khartoum, Sudan.
- The White Nile is crucial for maintaining a stable water supply to Egypt, especially during the dry season.
- It is named for the whitish clay sediment it carries, giving its water a pale color.

Blue Nile

- It originates from **Lake Tana in the Ethiopian Highlands** and flows through Ethiopia and Sudan. It is shorter than the White Nile but **contributes about 80% of the Nile's water** and most of its sediment, particularly during the flood season.
- Its water is darker due to the black sediment picked up from the Ethiopian highlands.



SAUDI ARABIA-PAKISTAN DEFENCE PACT

Context: Pakistan and Saudi Arabia have signed a landmark mutual defence pact, formalising a security partnership that has existed informally since the 1960s.

About Saudi Arabia-Pakistan Defence Pact

- The agreement states that "***any aggression against either country shall be considered aggression against both***." It is intended to deepen defence cooperation and enhance joint deterrence in the region.
- Concluded in the aftermath of Israel's recent strike in Qatar and amid declining confidence in U.S. security guarantees, the pact represents the **first major defence agreement between an Arab state and a nuclear-armed country.**

INDIA ON THE U.S. BLACKLIST ON FENTANYL

Context: In the latest **Major's List** submitted to the U.S. President Donald Trump identified 23 countries, including **India**, Pakistan, China, and Afghanistan, as major sources or transit hubs for illicit drugs, particularly fentanyl, posing risks to the United States and its citizens.

- The "Majors List" of Illicit Drug Producing and Drug-Transit Countries, **compiled annually,** identifies countries whose geography, trade patterns, or industrial capacities enable significant flows of narcotics or precursor chemicals into global markets.

About Fentanyl

- Fentanyl is a **synthetic opioid** developed in the 1960s for **treating severe medical pain**. Today, illicit **fentanyl has become the leading cause of overdose deaths** in the USA.
- Fentanyl has several legitimate medical uses, primarily in anesthesia and analgesia during surgery.
- Illegal fentanyl can be up to 50 times stronger than heroin, and as little as 2 mg can be fatal because it suppresses the brainstem centres that control breathing.
- **Overdoses can be reversed with naloxone**, but survival depends on rapid administration, as delayed treatment can lead to irreversible brain damage or death.

Why Regulating Fentanyl Is Difficult

- Unlike plant-based drugs such as heroin or cocaine, fentanyl is entirely synthetic, made in laboratories using chemical precursors like N-phenethyl-4-piperidone (NPP) and 4-anilino-N-phenethylpiperidine (4-ANPP).
- These precursor chemicals have legitimate industrial and pharmaceutical applications, which makes strict regulation challenging. Governments cannot simply ban them without disrupting lawful industries.

FAST TRACK IMMIGRATION - TRUSTED TRAVELLER PROGRAMME (FTI-TTP)

Context: The Home Minister has launched FTI–TTP to provide quick, technology-enabled immigration clearance.

About FTI–TTP

- FTI–TTP is a technology-driven and scalable system designed to speed up immigration processing for low-risk, pre-vetted travellers.
- It seeks to expedite immigration clearance for **pre-verified Indian nationals** and **Overseas Citizen of India (OCI) cardholders** at major Indian international airports.
- It aims to reduce queues, minimise manual checks, and strengthen national security while improving passenger convenience.
- The scheme enables immigration clearance in around 30 seconds through automated e-gates, significantly cutting waiting time.
- **Earlier, it was introduced at IGI Airport Delhi,** followed by Mumbai, Chennai, Kolkata, Bengaluru, Hyderabad, Cochin, and Ahmedabad.
- The programme has been extended to **five additional airports:** Lucknow, Thiruvananthapuram, Tiruchirappalli, Kozhikode, and Amritsar. A planned expansion will cover 21 major airports, including upcoming airports such as Navi Mumbai and Jewar.

How Does It Work?

- **Pre-verification:** Eligible passengers are verified in advance.
- **Dedicated Fast Track Lanes**: Proceed to the FTI-TTP immigration counters.
- **Quick & Hassle-Free Clearance:** Experience faster processing and move through immigration with ease.

CHINA TO FORGO SPECIAL & DIFFERENTIAL TREATMENT AT THE WTO

Context: China has announced that it will no longer seek Special and Differential Treatment (S&DT) in current or future World Trade Organization (WTO) negotiations.

- Although Beijing will formally retain its developing-country status, it will stop claiming S&DT benefits in new WTO agreements.

About Special and Differential Treatment (S&DT)

- The WTO agreements contain special provisions that **grant developing countries certain benefits** and **allow other member countries to treat them more favourably.** These are known as Special and Differential Treatment (S&D or SDT) provisions.
- These provisions include:
  - **Longer time periods for implementing agreements** and fulfilling commitments.
  - **Measures to expand trading opportunitie**s for developing countries.
  - **Obligations on all WTO members** to safeguard the trade interests of developing countries.
  - **Support for capacity building,** including assistance to develop the infrastructure needed to participate in WTO activities, handle disputes, and implement technical standards.

- **Specific provisions for Least-Developed Countries (LDCs)** to provide them with additional flexibility and support.

- **Other examples of countries foregoing S&DT Status:** South Korea, Brazil, Singapore.

SEVILLA FORUM ON DEBT

Context: The Sevilla Forum on Debt was launched during the 16th United Nations Conference on Trade and Development (UNCTAD16) in Geneva.



About Sevilla Forum on Debt

- It is one of the **key outcomes of the 4th International Conference on Financing for Development (FfD4),** which earlier set a global roadmap for strengthening development finance and addressing the growing problem of unsustainable debt in developing economies.
  - FfD4 was held in Seville, Spain in July 2025.
- The Forum is a **Spanish-led initiative supported by UNCTAD** and the **UN Department of Economic and Social Affairs (UN DESA).**
- The Sevilla Forum **aims to create an open and inclusive platform for dialogue on global debt challenges.**
- It **brings together developed and developing countries,** international financial institutions, borrowers, lenders, civil society, academia, and experts **to exchange ideas and develop innovative debt solutions.**
- The Forum will also **track the implementation of existing debt-related initiatives** and help convert political commitments into institutional mechanisms that promote fairer, more predictable, and equitable debt governance.

IRAN JOINS UN CONVENTION AGAINST TERROR FINANCING

Context: Iran has approved legislation to join the UN International Convention for the Suppression of the Financing of Terrorism (CFT).

About UN International Convention for the Suppression of the Financing of Terrorism

- The Convention for the Suppression of the Financing of Terrorism is a multilateral treaty adopted in **1999** at the fourth session of the **General Assembly of the United Nations.** It entered into force 10 April 2002.
- It is aimed at **criminalizing the act of providing or collecting funds with the intent or knowledge that they will be used to commit terrorist acts.**
- The Convention requires States Parties to criminalize the intentional provision or collection of funds, directly or indirectly, knowing that they will be used, in full or in part, to commit terrorist acts that cause harm or death to civilians or non-combatants.
- The treaty has been ratified by 191 states and signed by 132 states. India has signed and ratified the treaty.

UNESCO LAUNCHES VIRTUAL MUSEUM OF STOLEN CULTURAL OBJECTS

Context: UNESCO has launched a digital museum to document cultural objects stolen through theft, trafficking, or colonial-era looting.

- The platform aims to raise awareness, strengthen public engagement, and support global efforts for the recovery and repatriation of displaced heritage.
- Unveiled during the MONDIACULT conference, the initiative underscores that stolen cultural objects represent a profound loss of identity for affected communities.

About MONDIACULT

- Mondiacult is UNESCO's World Conference on Cultural Policies and Sustainable Development, recognized as the largest global gathering focused on cultural policy.

- It is the largest global ministerial forum dedicated to cultural policy, bringing together representatives of UNESCO's 194 Member States to shape the international cultural agenda.
- The 2025 MONDIACULT conference was held in Barcelona, Spain.

Features of the Virtual Museum

- The museum currently showcases around 240 missing artifacts from 46 countries. It uses AI-generated 3D reconstructions when photographs are unavailable, enabling immersive, rotatable views of artifacts.
- The initiative is **backed financially by Saudi Arabia and developed in partnership with INTERPOL**, enhancing cross-border cooperation against illicit trafficking.
- Designed by Francis Kéré, a Pritzker Prize–winning architect.

India's Featured Artifacts

Two 9th-century sandstone deities from the Mahadev Temple in Pali (Chhattisgarh) are included in the virtual collection:

- **Nataraja (Shiva):** Represents the cosmic dance symbolising the triumph of knowledge over ignorance.

Brahma: Depicted in lalitasana, holding a rosary and Vedas, accompanied by the hamsa (goose) symbolising wisdom.

SIR CREEK DISPUTE

Context: During Vijaya Dashami celebrations at Defence Minister Rajnath Singh warned Pakistan that any provocation in the Sir Creek sector would be met with a strong and decisive response.

About Sir Creek

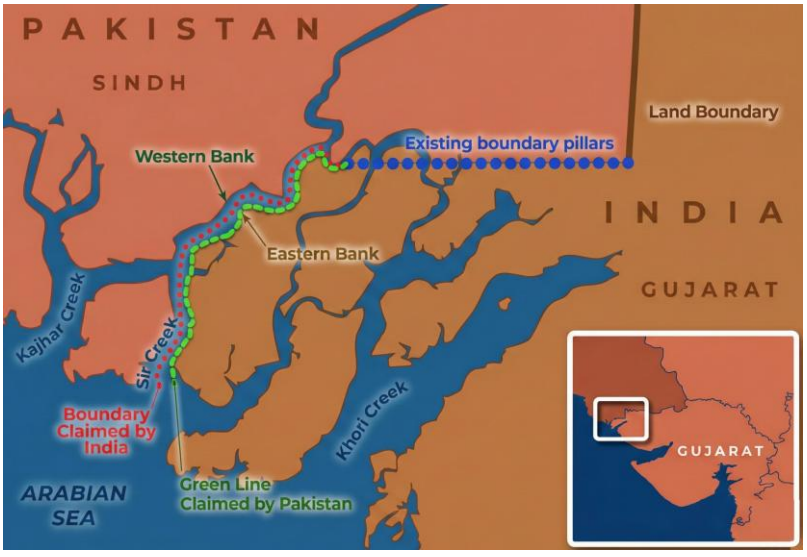
- Sir Creek is a **narrow tidal estuary,** less than 100 km long, **situated between the Rann of Kutch in Gujarat and Sindh in Pakistan.**
- Originally known as Ban Ganga, Sir Creek was renamed during British colonial times after a British official. The creek is part of the Indus River Delta and is characterized by shifting channels, marshy terrain, and saline mudflats, making it a challenging area for border patrolling.
- It forms the westernmost portion of the India–Pakistan boundary, yet the exact demarcation remains unresolved because both sides interpret the maritime boundary differently.

India's Position

- India argues that the **boundary should follow the mid-channel of Sir Creek,** dividing the creek and the adjoining marshlands between both countries.
- This stance is supported by a 1925 map and the **Thalweg principle, which sets boundaries along the deepest navigable channel of a waterway.**

Pakistan's Position

- Pakistan relies on a **1914 agreement between the Rao of Kutch and the Sindh government,** claiming that the eastern bank of Sir Creek represents the true boundary.
- This interpretation would provide **Pakistan extended access toward Gujarat's coastline.**
- Pakistan also challenges the application of the Thalweg principle by arguing that Sir Creek is non-navigable, and therefore the principle does not apply.



The Thalweg Principle is an international law concept for setting boundaries in shared waterways, defining the border along the **thalweg**, which is the line of the deepest or most navigable point in the river's main channel. It ensures fair access and resource division

YOGA TO GAIN COMPETITIVE SPORT STATUS IN THE UAE

Context: The UAE is moving to recognise yoga as a competitive sport, making it **the first Gulf country to grant yoga full sporting status.**

- This historic decision is part of the UAE's broader strategy to diversify its sports portfolio and strengthen cultural ties with India, especially given the large Indian expatriate community in the UAE.
- The **UAE Yoga Committe**e, under the **Ministry of Sports** and the **UAE Sports for All Federatio**n, is developing a national framework for competitive yoga

INDIA PULLS OUT OF AYNI AIRBASE

Context: India has withdrawn from the Ayni Airbase in Tajikistan, which was its only full-fledged overseas military base and had been developed and maintained for nearly two decades.

About Ayni Airbase, Tajikistan



- Ayni Airbase, also known as Hisar or Gissar Air Base, is a strategically significant airfield located about 10 km west of Dushanbe, the capital of Tajikistan.
- Originally a Soviet-era facility, Ayni was renovated by India at an estimated cost of around US$80 million under a 2002 bilateral agreement, with the work executed by the Border Roads Organisation (BRO).
- The airbase was initially used during India's support to the Northern Alliance against the Taliban and later played a role in the evacuation of Indian nationals from Kabul in 2021.
- India upgraded the base with a 3,200-metre runway, hangars, fuel storage facilities, and air traffic control systems, significantly enhancing its operational capability.
- Located around 300 kms from Afghanistan's Wakhan Corridor which borders with China's Xinjiang region and Pakistan-occupied Kashmir
- The base offered India important security and intelligence advantages in a geopolitically sensitive area.
- India's lease for Ayni Airbase expired in 2022, and Tajikistan did not renew the agreement.

INTERNATIONAL CRIMES TRIBUNAL VERDICT AGAINST SHEIKH HASINA

Context: Bangladesh's former Prime Minister, Sheikh Hasina, has been sentenced to death by the International Crimes Tribunal (ICT) for crimes against humanity committed during the student-led protests of 2024.

About International Crimes Tribunal (ICT) of Bangladesh

- The International Crimes Tribunal (ICT) of Bangladesh is a **domestic special court set up in 2009 to prosecute international crimes** such as genocide, crimes against humanity, war crimes and related offences committed in Bangladesh, primarily during the 1971 Liberation War.
- The ICT is founded on the International Crimes (Tribunals) Act, 1973, a Bangladeshi statute enacted to prosecute atrocities committed in 1971.
- The tribunal primarily **focused on alleged collaborators with Pakistan,** including senior leaders of Jamaat-e-Islami.

MOROCCO'S PLAN FOR WESTERN SAHARA

Context: The United Nations Security Council has adopted a resolution stating that genuine autonomy under Moroccan sovereignty could represent the most realistic solution to the long-standing conflict in Western Sahara.

- The resolution, drafted by the United States, calls upon Morocco and the Polisario Front to engage in meaningful negotiations, based on Morocco's 2007 autonomy plan.

About Western Sahara

- **Western Sahara has remained a disputed territory in northwestern Africa, since Spain's withdrawal in 1975** and Morocco's subsequent annexation.



- It is recognized by the UN as non-self-governing and often called Africa's last colony.
- **Morocco** claims sovereignty over Western Sahara.
- The **Polisario Front,** a Sahrawi nationalist organization, seeks full independence for the region as the **Sahrawi Arab Democratic Republic.**
- **Algeria** supports the Polisario Front and hosts Sahrawi refugee camps in Tindouf.

MAGNITUDE 6.3 EARTHQUAKE STRIKES AFGHANISTAN

Context: A 6.3-magnitude earthquake recently struck near Mazar-e-Sharif in northern Afghanistan.

Geographical Location of Mazar-e-Sharif

- Mazar-e-Sharif, the **capital of Balkh province,** is located in **northern Afghanistan**, close to the borders with Uzbekistan and Tajikistan.
- The city lies in a **broad alluvial plain of the Amu Darya basin,** which has made it an important urban and economic centre in the region.
- **Mazar-e-Sharif is situated near the boundary zone between the Eurasian and Indian tectonic plates**, a region marked by intense crustal compression due to the northward movement of the Indian Plate.
- This plate collision has created active fault systems across northern and northeastern Afghanistan, where seismic stress regularly builds up and is released through earthquakes.
- The recent earthquake near Mazar-e-Sharif is associated with shallow crustal faults within this convergence zone, where compressional forces produce strike-slip and thrust faulting, mechanisms commonly responsible for strong tremors in the region.

ABRAHAM ACCORDS

Context: The President of the United States recently confirmed that Kazakhstan would become a participant in the Abraham Accords.

About Abraham Accords

- The Abraham Accords were first signed in 2020 between **Israel** and three countries i.e. the **United Arab Emirates (UAE), Bahrain, and Morocco.**
  - The **Sudan** government signed the declaration in 2021, but ongoing instability within Sudan has delayed its ability to formalize a bilateral agreement with Israel.
  - **Kazakhstan** announced in November 2025 that it would accede to the agreement.
- The Accords **aim to reduce tensions in the Middle East** by normalising relations between Israel and several moderate Arab states. The **objective is to establish formal diplomatic, trade, and security ties between these states and Israel.**
- The name "Abraham" refers to the biblical figure Abraham, who is **regarded by both Jews and Arabs as a common ancestor** and a symbol of shared heritage and brotherhood.

AUSTRALIA SOCIAL MEDIA BAN

Context: Australia has introduced a **first-of-its-kind** ban preventing children **under 16** from using major social media platforms such as TikTok, Instagram, Facebook, Snapchat, YouTube, etc.

How will it be enforced?

- New accounts cannot be created and existing profiles are being deactivated.
- Children and parents will not be penalized. Social media companies must block under-16 users or face fines up to A$49.5 million. (US$32m)
- Platforms must use **age-verification systems such as ID checks,** selfies, or behavioural age-inference tools.
- Self-certification by users or parents is not allowed.
- **Platforms like YouTube Kids, Google Classroom, and WhatsApp are not covered**, as they do not meet the criteria for social networking. Children can still view most content on platforms that do not require accounts.

ECONOMY AND INFRASTRUCTURE

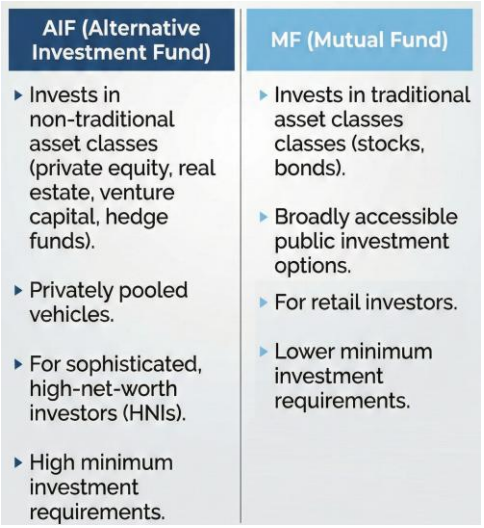
MONEY AND BANKING

ALTERNATIVE INVESTMENT FUNDS (AIFS)

Context: The Reserve Bank of India (RBI) revised the rules for investment by regulated entities (REs) such as banks, NBFCs, and other financial institutions in Alternative Investment Funds (AIFs)

What are Alternative Investment Funds (AIFs)?

- An AIF is a **privately pooled investment vehicle incorporated in India** that collects funds from **sophisticated investor**s (Indian or foreign) to invest according to a defined investment policy for the benefit of its investors.
- AIFs can be structured as trusts, companies, limited liability partnerships, or corporate bodies.
- AIFs are **regulated by the SEBI** under the SEBI (Alternative Investment Funds) Regulations, 2012.



Types of AIFs in India

- **Category I:** Invest in socially or economically desirable sectors. Examples: Venture Capital Funds, Angel Funds, SME Funds, Infrastructure Funds.
- **Category II:** Does not employ leverage or debt, except for day-to-day operational expenses. Examples: Private Equity Funds, Debt Funds, Real Estate Funds.
- **Category III: High-risk, high-return funds** using complex strategies, Can use **leverage**, including through investments in listed or unlisted derivatives. Examples: hedge funds and PIPE funds

PRIORITY SECTOR LENDING (PSL) NORMS FOR SFB

Context: The Reserve Bank of India (RBI) issued new rules under Section 22(1) of the Banking Regulation Act, 1949, revising PSL requirements for SFBs.

- Total PSL requirement reduced from 75% to 60%, with a portion now flexible for sectoral choice or non-PSL lending.

Priority Sector Lending (PSL)

- PSL was introduced in 1972 to ensure that creditworthy but underserved sectors can access financial support from formal institutions.
- **Objective:** To provide vulnerable sections of society and underdeveloped regions with access to credit.
- **PSL Targets:** Banks are required to allocate a certain percentage of their Adjusted Net Bank Credit (ANBC) or Credit Equivalent of Off-Balance Sheet Exposure (CEOBE)—whichever is higher—towards PSL.
- **Priority Sector Lending Certificates (PSLCs)** are tradable certificates issued against loans extended under the PSL framework, allowing banks to meet targets flexibly.
- Banks **missing targets must contribute to the Rural Infrastructure Development Fund (RIDF)** and other designated funds at fixed interest rates.

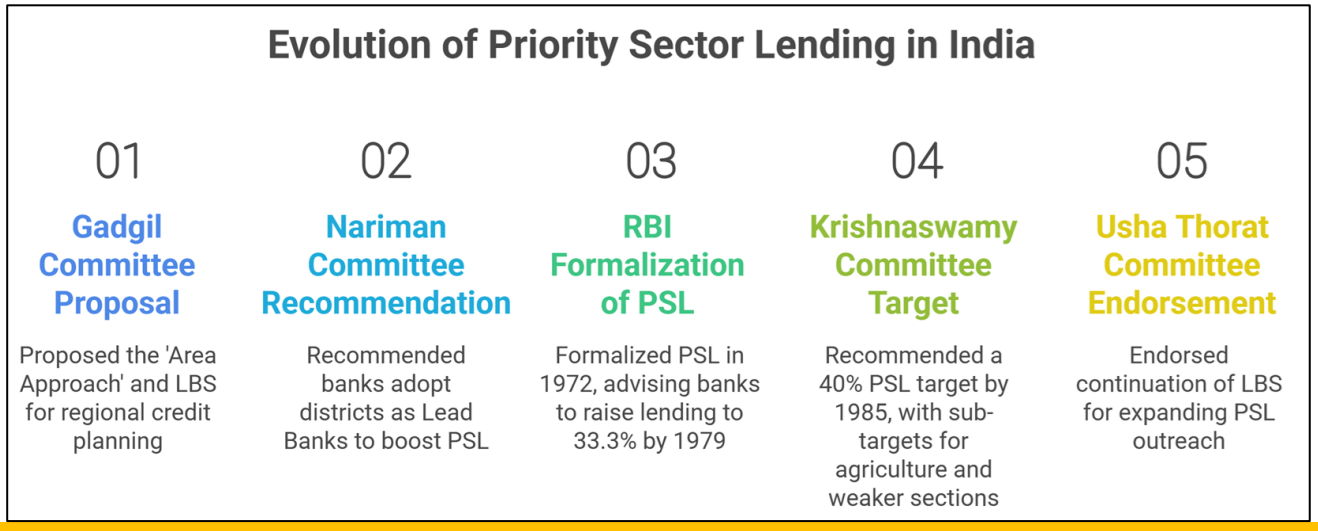
Categories under PSL

- Agriculture
- Micro, Small, and Medium Enterprises (MSMEs)
- Export Credit
- Education
- Housing
- Social Infrastructure
- Renewable Energy

PSL Targets for Banks:

- **Scheduled Commercial Banks (SCBs) & Foreign Banks (20+ branches in India):** 40% of Adjusted Net Bank Credit (ANBC) or CEOBE, whichever is higher
- **Foreign Banks (less than 20 branches):** 40% of ANBC or CEOBE (Export Credit: min 32%; Non-export: 8%)
- **Urban Cooperative Banks**: 65% in FY 2024-25, increasing to 75% in FY 2025-26.
- **Regional Rural Banks (RRBs):** 75% of ANBC or CEOBE, whichever is higher

- **Small Finance Banks (SFBs):** 60% of ANBC



Parameter	Earlier Rule	New Rule (Effective FY 2025-26)
Target for SFBs	75% of ANBC	60% of ANBC
Mandatory PSL Allocation	Entire 75% to PSL sectors	40% mandatory for standard PSL sectors (e.g., agriculture, microenterprises)
Flexible PSL Allocation	Not applicable	35% can be allocated to PSL sectors of competitive advantage
Non-PSL Lending		20% can now be used for non-PSL secured loans

About Small Finance Banks (SFBs)

- A SFB is a type of bank in India that is designed to provide basic banking services to sections of the population that are typically underserved or unserved by larger commercial banks.
- The main goal of a small finance bank is to promote financial inclusion, which means bringing more people and businesses into the formal financial system.
- **Established**: Announced in Union Budget 2014-15.
- Registered as a public limited company under the Companies Act, 2013.
- **Regulated by:** RBI (Licensed under Section 22 of the Banking Regulation Act, 1949)
- **Features of SFBs:**
  - SFBs offer basic banking services like accepting deposits and providing loans, mainly to small business owners, small and marginal farmers, micro-enterprises, and unorganized sector.
  - They are required to open at least 25% of their branches in unbanked rural areas.
  - They are expected to allocate at least 60% of their lending to the priority sector.
- **Capital & Reserve Requirements:**
  - **CRR & SLR**: Subject to the same Cash Reserve Ratio (CRR) and Statutory Liquidity Ratio (SLR) norms as Scheduled Commercial Banks (SCBs).
  - **Minimum Capital:** ₹200 crores in paid-up voting equity capital (except for SFBs converted from Urban Cooperative Banks).

PAYMENTS REGULATORY BOARD

Context: The Reserve Bank of India (RBI) has notified the Payments Regulatory Board Regulations, 2025 under the Payment and Settlement Systems Act, 2007.

About Payments Regulatory Board	
Establishment	**2025** by the Reserve Bank of India (RBI) under Payment and Settlement Systems Act, 2007.
Objective	Ensure transparency, accountability, and uniformity in payment system policies, supporting the growth of India's digital payments ecosystem
Replaces	Board for Regulation and Supervision of Payment and Settlement Systems (BPSS)
Structure	**Chairperson**: RBI Governor

	Members: Deputy Governor in charge of Payment and Settlement Systems, 1 RBI-nominated officer, 3 members nominated by the Central Government, (may invite experts in payments, IT, and law)
Functions	• Rule-making for payment systems • Issuing instructions to operators • Ensuring smooth, safe, and efficient payment and settlement operations
Supported by	RBI's Department of Payment and Settlement Systems (DPSS)
Meetings	At least twice a year
Decision-making	By majority vote; In the event of a tie, the chairperson (or in his absence, the deputy governor who is a member of the board) will have a second or casting vote.

BANK.IN DOMAIN FOR BANKS

Context: The Reserve Bank of India (RBI) has directed banks to migrate their existing domains to 'bank.in' by October 31, 2025.

About the 'bank.in' Domain

- The 'bank.in' domain is a **secure and exclusive internet domain introduced by the Reserve Bank of India (RBI) specifically for Indian banks**.
- The **Institute for Development and Research in Banking Technology (IDRBT),** authorized by the National Internet Exchange of India (NIXI) under the Ministry of Electronics and Information Technology (MeitY), acts as the exclusive registrar managing registration and migration for this domain.
    - NIXI is a not-for-profit organisation set up to enable Internet Service Providers (ISPs) to route domestic internet traffic within India, improving service quality and reducing international bandwidth costs.
- The purpose of this domain is to curb digital payment fraud, enhance cybersecurity in the banking sector, and help customers easily identify genuine banking websites.
- Besides Indian banks, a similar domain **'.fin.in'** has been introduced for non-banking financial companies (NBFCs).

RBI'S FINANCIAL CONDITIONS INDEX (FCI)

Context: The Reserve Bank of India (RBI) has proposed a daily-frequency Financial Conditions Index (FCI) to monitor the health of India's financial markets in real-time, providing a tool for policymakers and analysts.

- **Objective:** The FCI will act as a composite indicator, measuring whether financial conditions are tight or easy relative to historical averages since 2012.
- **Components:** It tracks 20 financial market indicators across money markets, government securities (G-Secs), corporate bonds, equities, and forex markets.
- **Interpretation:** Positive standardized FCI values indicate tighter financial conditions, while negative values signal easier conditions.

RBI'S SURPLUS

Context: The RBI's Central Board announced a record surplus transfer of ₹2.69 lakh crore to the Central government for 2024-25, marking a 27% increase over the previous year's ₹2.11 lakh crore.

What is a Surplus?

- A surplus arises **when income is greater than expenditure**. In the case of the Reserve Bank of India (RBI), its expenditure amounts to nearly one-seventh of its total net interest income, which leaves a significant surplus.

Sources of RBI's Revenue

- **Seigniorage:** The RBI earns seigniorage, which is the difference between the face value of currency and the cost of printing it. Commercial banks purchase currency notes at face value, enabling the RBI to capture this margin as income.
- **Lending Operations:** The RBI lends money to the Central and State governments, as well as to commercial banks. The interest earned on these loans contributes significantly to its income.

- **Foreign Investments:** The RBI invests in foreign government bonds and securities. It earns interest from these investments and, at times, benefits from fluctuations in currency exchange rates.

Legal Provisions related to Surplus Transfers to the Government:

- **Section 48, RBI Act, 1934:** Exempts RBI from paying income or super tax. Surplus is transferred to the Centre after provisions are set aside.
- **Section 47, RBI Act, 1934:** Mandates that RBI's remaining profits be transferred to the Government of India.

Components of RBI's Expenditure

- **Operational Expenses:**
  - Printing of currency notes.
  - Agency charges (including commissions to banks and primary dealers).
  - Employee costs.
- **Risk Provisions:**
  - **Contingency Fund (CF):** Maintained for unforeseen risks such as the fall in the value of securities or policy-related risks.
  - **Asset Development Fund (ADF):** Allocated for investment in subsidiaries, associated institutions, and internal capital expenditure.

Understanding the Economic Capital Framework (ECF)

- The ECF is a **policy that guides how the Reserve Bank of India (RBI) manages its financial reserves**, **provisions for risk, and the transfer of surplus earnings to the central government.**
- A key component of the framework is the **Contingency Risk Buffer (CRB),** which serves as a financial safeguard against unforeseen economic shocks.
- The **Bimal Jalan Committee (2018)** recommended that this buffer should be maintained within a range of **5.5% to 6.5% of the RBI's balance sheet.**
- This provision ensures that the RBI retains adequate resources to maintain stability and effectively discharges its role as the Lender of Last Resort (LoLR) during financial crises.
- Since 2019, the RBI has implemented these recommendations. Following the latest review in 2024-25, the **RBI's Central Board widened the CRB range to 4.5–7.5%.**
- The buffer was gradually increased from 5.5% (2018–22) to 6% (2022–23), then 6.5% (2023–24), and now stands at 7.5%, the new upper limit.

DIGITAL PAYMENT INTELLIGENCE PLATFORM

Context: The Reserve Bank of India (RBI) has partnered with major public and private banks to develop the Digital Payment Intelligence Platform (DPIP) as a Digital Public Infrastructure (DPI).

About Digital Payment Intelligence Platform (DPIP)

- The platform aims to strengthen fraud risk management through real-time intelligence gathering and sharing. It will act as a national intelligence layer for digital payments.
- In June last year, RBI formed a committee, chaired by A.P. Hota, to examine its implementation.
- The RBI Innovation Hub (RBIH) is developing a prototype in consultation with banks.
- DPIP **uses artificial intelligence (AI)** to assign a **real-time risk score to every digital transaction.** Instead of sharing sensitive transaction data, it shares only a risk signal (for example: low risk or high risk). Banks then decide whether to allow, stop, or closely monitor a transaction.

Mule Hunter: an AI-based tool developed by RBIH

- A mule account is a bank account used to receive and transfer stolen or illegal money, often without the account holder fully understanding the crime.

About Mule Hunter

- Mule Hunter is an AI model designed to detect such accounts early.
- It analyses transaction behaviour to identify accounts that act as money pass-through channels.
- The model has shown around 90% accuracy and has already been adopted by several banks.

About Reserve Bank Innovation Hub (RBIH)

- RBIH is a wholly-owned subsidiary of the Reserve Bank of India (RBI), established to foster and accelerate innovation across India's financial sector.

- It was inaugurated in March 2022 with an initial capital of ₹100 crore and operates as a **Section 8 non-profit organization (NPO) company under the Companies Act, 2013.**
- RBIH works closely with banks, fintech firms, and regulators to create digital public infrastructure for the financial sector.

MOODY'S DOWNGRADES US CREDIT RATINGS

Context: Moody's Ratings has downgraded the United States government's credit rating from the perfect AAA status to AA1.

- In August 2025, S&P Global raised India's long-term sovereign credit rating to **BBB** from BBB-. This marks India's first rating upgrade by S&P in 18 years, the previous one being in 2007.

What is Sovereign Credit Rating (SCR)?

- A SCR is an independent **evaluation of a country's creditworthiness i.e. its ability to repay debt and meet financial commitments.**
- It helps investors assess the level of risk involved in investing in a country's bonds or other debt instruments, including potential political and economic risks.
- **Key factors influencing SCR** include the debt service ratio, growth of domestic money supply, import ratio, and stability of export revenues.
- A strong credit rating is especially important for developing countries seeking access to international bond markets for raising funds.
- Besides external borrowing, countries pursue SCRs to attract foreign direct investment (FDI) by signalling economic stability and financial discipline.
- Most nations obtain ratings from leading global credit rating agencies such as Moody's, Standard & Poor's (S&P), and Fitch Ratings to boost investor confidence.
- A **better rating enables a country or company to raise funds at a lower cost,** as investors perceive reduced risk.
- Conversely, **lower ratings can make borrowing more expensive**, as lenders demand higher interest rates to offset perceived risk.
- Ratings are divided into two rough classes: **investment and speculative grades.** Entities, including countries, in the former class are worth investing in, while repayment of loans taken by those in the latter is more difficult to predict.

S&P	Moody's	Fitch	Meaning and Color
AAA	Aaa	AAA	Prime
AA+	Aa1	AA+	High Grade
AA	Aa2	AA	
AA-	Aa3	AA	
A+	A1	A+	Upper Medium Grade
A	A2	A	
A-	A3	A-	
BBB+	Baa1	BBB+	Lower Medium Grade
BBB	Baa2	BBB	
BBB-	Baa3	BBB-	
BB+	Ba1	BB+	Non Investment Grade Speculative
BB	Ba2	BB	
BB-	Ba3	BB-	
B+	B1	B+	Highly Speculative
B	B2	B	
B-	B3	B-	
CCC+	Caa1	CCC+	Substantial Risks
CCC	Caa2	CCC	Extremely Speculative

GDP BASE YEAR CHANGE

Context: The MoSPI has announced that it is revising the base year for calculating the Gross Domestic Product (GDP), Index of Industrial Production (IIP), and Consumer Price Index (CPI).

What is a Base Year?

- A base year is a fixed reference year used to measure the economic growth of a country while removing the effects of inflation.
- **Example:** If 2011–12 is the base year, then GDP in later years (e.g., 2024–25) is calculated using 2011–12 prices. This helps to compare real growth without the effect of price rise (inflation).
- Ideally, a base year should be a "normal" or "average" year, free from major economic disturbances or structural changes. However, for practical reasons and to improve international comparability, base years are often revised periodically (e.g., every five years), especially for national accounts like GDP,

Why is there a need to change the Base Year?

- **Adjust for Inflation:** Prevents GDP from appearing inflated due to old prices.
- **Improve Data Accuracy:** Incorporates updated data from new technologies and digital platforms.

- **Reflect Economic Changes:** Captures new industries, consumption patterns, and structural shifts.
- **Global Comparison:** Aligns India's data with international standards.
- **Policy Support:** Enables informed decisions on spending, taxation, and welfare.

UPDATES IN MONETARY POLICY

Context: The RBI's Monetary Policy Committee has reduced the policy repo rate by 50 basis points to 5.5% (1 bps = 0.01%).

Aspect	Repo Rate (Repurchase Option Rate)	Reverse Repo Rate
Definition	Interest rate at which the RBI lends money to commercial banks.	Interest rate at which the RBI borrows money from commercial banks.
Lender	RBI	Commercial Banks
Borrower	Commercial Banks	RBI
Purpose	Banks borrow to meet short-term fund requirements, maintain CRR, or cover temporary fund shortages.	RBI absorbs excess liquidity from banks to control inflation.
Mechanism	Banks sell government securities to RBI with an agreement to repurchase at a predetermined price/date. Interest charged = Repo Rate.	Banks park surplus funds with RBI, receiving government securities as collateral and interest at Reverse Repo Rate.
Controlling Inflation	RBI increases repo rate → borrowing cost rises → banks raise lending rates → borrowing/spending decreases → money supply reduces → inflation curbed.	RBI increases reverse repo rate → banks park more funds with RBI → lending decreases → liquidity reduces → inflation controlled.
Boosting Growth / Injecting Liquidity	RBI decreases repo rate → borrowing cheaper → banks lower lending rates → borrowing/investment/spending increases → stimulates economic activity.	RBI decreases reverse repo rate → banks less incentivized to park funds → lend more to public/businesses → money supply increases → liquidity injected.

INDIA POST PAYMENTS BANK (IPPB)

Context: India Post Payments Bank (IPPB) has won the **Digital Payments Award 2024-25 of the Department of Financial Services (DFS), Ministry of Finance** in recognition of its outstanding contribution to expanding digital payments and promoting financial inclusion across the country.

- The recognition follows IPPB achieving 1st position among all payments banks on the Department of Financial Services (DFS) performance index for FY 2024-25.

About India Post Payments Bank (IPPB)

- Established in 2018 under the Department of Posts, Ministry of Communications, with 100% equity owned by the Union Government.
- **Vision:** To create the most accessible, affordable, and trusted bank for every citizen in India.
- **Mandate**: To remove barriers for the unbanked and under-banked, reaching the last mile through a network of 165,000 post offices (including 614,000 in rural areas) and 200,000 postal employees.
- **Operating Model:** Built on the key pillars of **India Stack**, enabling paperless, cashless, and presence-less banking. Services are delivered securely at the customer's doorstep through a **Core Banking Solution (CBS)-integrated smartphone and biometric device.**
- **Reach & Services:** IPPB offers banking solutions in 13 languages, serving 11 crore customers across 5.57 lakh villages and towns in India.

STABLECOINS

Context: India's Chief Economic Adviser V. Anantha Nageswaran noted that the rising popularity of U.S. dollar stablecoins could pose global monetary policy challenges next year.

What are Stablecoins?

- Stablecoins are **cryptocurrencies designed to keep their value stable by linking to assets like the US dollar, gold, or other cryptocurrencies.** They aim to reduce volatility, making them useful for transactions and cross-border payments.

Types of Stablecoins:

- **Fiat-backed:** Supported by reserves of traditional currencies; examples include Tether (USDT), USD Coin (USDC), and Binance USD (BUSD).
- **Crypto-backed:** Backed by other cryptocurrencies through smart contracts; examples include DAI and Wrapped Bitcoin (WBTC).
- **Algorithmic:** Maintain stability using algorithms and supply-demand mechanisms, though they are more prone to instability.

Regulation of Cryptocurrency or Crypto Assets in India

- At present, crypto assets are **not formally regulated in India.**
- **The Finance Act, 2022 introduced a taxation framework for transactions** involving **Virtual Digital Assets (VDAs).** A 30% tax is levied on capital gains from the transfer of VDAs.
- The Income Tax Act, 1961 defines a VDA as any digital representation of value (such as information, code, number, or token) created through cryptographic or other means and capable of being transferred, stored, or traded electronically. *Examples* include cryptocurrencies and Non-Fungible Tokens (NFTs).
- In 2023, **VDAs were also brought under the ambit of the Prevention of Money Laundering Act (PMLA)**, 2002, to ensure oversight of financial transactions and curb potential misuse.

FINANCIAL INCLUSION INDEX (FI-INDEX) 2025

Context: The RBI's Financial Inclusion Index (FI-Index), which measures the extent of access and usage of financial services across the country, has risen to 67 in FY25, up from 64.2 in FY24.

About the Financial Inclusion Index (FI-Index):

- First published in 2021, the FI-Index is released annually in July.
- It has been conceptualised by the RBI in consultation with the Government of India and sectoral regulators across banking, investments, insurance, postal, and pension sectors.
- The index provides a composite measure of financial inclusion on a scale of 0 to 100, where 0 indicates complete exclusion and 100 represents full inclusion.
- **Parameters and Weightage:** Access (35% weight), Usage (45%), Quality (20%)
  - These parameters are derived from 97 indicators covering multiple aspects of financial inclusion.
- The Quality parameter captures dimensions such as financial literacy, consumer protection, and service deficiencies, making it a distinctive feature of the index.
- The index has **no base year**, allowing it to reflect the cumulative progress made over time.

INOPERATIVE PMJDY ACCOUNTS

Context: The Ministry of Finance has reported that about 23% of all Pradhan Mantri Jan Dhan Yojana (PMJDY) accounts are inoperative.

- According to RBI guidelines, a savings account is considered inoperative or dormant if it has no customer-initiated transactions for more than two years.

About Pradhan Mantri Jan Dhan Yojana (PMJDY)

- PMJDY was launched in 2014 as a national financial inclusion mission **by the Department of Financial Services, Ministry of Finance.**
- Its main goal is to help unbanked individuals open a Basic Savings Bank Deposit Account.
- There is no minimum balance requirement for PMJDY accounts, and they earn interest like regular savings accounts.
- PMJDY account holders receive RuPay debit cards.
- An accident insurance cover of ₹1 lakh is provided with RuPay cards issued under PMJDY. For accounts opened after 2018, this cover is enhanced to ₹2 lakh.
- Eligible PMJDY account holders can access an overdraft facility of up to ₹10,000.

- PMJDY accounts are also eligible for: **Direct Benefit Transfers (DBT)**; Pradhan Mantri Jeevan Jyoti Bima Yojana (**PMJJBY**); Pradhan Mantri Suraksha Bima Yojana (**PMSBY**); Atal Pension Yojana (**APY**); **MUDRA scheme** under the Micro Units Development and Refinance Agency Bank

RBI'S 7 SUTRAS

Context: A committee set up by the RBI to develop a **Framework for Responsible and Ethical Enablement of Artificial Intelligence (FREE-AI)** in the financial sector has developed **7 sutras to serve as the foundational principles for AI adoption.**

RBI's 7 Sutras

- The RBI has introduced the "7 Sutras" as guiding principles for responsible and ethical enablement of Artificial Intelligence (AI) in the financial sector under its FREE-AI framework.
- These sutras are:
  - **Trust is the Foundation:** AI systems must be reliable, transparent, and inspire public confidence.
  - **People First:** AI should augment human decision-making, prioritizing human welfare, dignity, and inclusion.
  - **Innovation over Restraint:** Encourage AI-driven innovation tailored to India's needs without excessive restrictions.
  - **Fairness and Equity:** AI models must be free from bias and ensure equitable outcomes for all.
  - **Accountability**: Clear responsibility and answerability for AI decisions must lie with humans and institutions.
  - **Understandable by Design:** AI systems should be explainable and interpretable to users, regulators, and auditors.
  - **Safety, Resilience, and Sustainability:** AI applications must be secure, robust, and sustainable in the long term.
- Guided by the 7 sutras, the committee has recommended a forward-looking approach, containing 26 actionable recommendations under six strategic pillars- infrastructure, policy, capacity, governance, protection and assurance.

SPECIAL RUPEE VOSTRO ACCOUNTS

Context: The Reserve Bank of India (RBI) has simplified the process for opening Special Rupee Vostro Accounts to promote international trade using the Indian Rupee.

- Authorised Dealer (AD) banks no longer require prior RBI approval to open these accounts for their overseas correspondent banks.
- The SRVA framework, introduced in 2022, allows exporters and importers to invoice and settle transactions in Indian Rupees.

What is a Special Rupee Vostro Account (SRVA)?

- A Special Rupee Vostro Account (SRVA) is a bank account that **allows a foreign bank to hold Indian Rupees in an Indian bank.**
- It is used so that two countries can settle trade directly in rupees instead of using other foreign currencies like the US dollar.

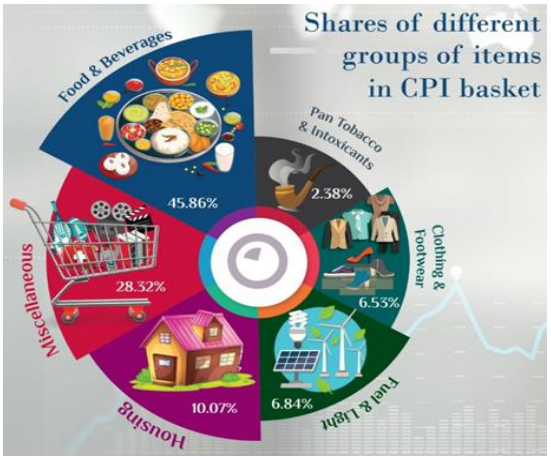
Vostro Account	Nostro Account
• A foreign bank's account held in a domestic bank in the local currency. • Example: If Chase Bank (US) holds an account in PNB (India) in INR, it is a Vostro account for PNB. • Allows foreign banks to operate in another country and facilitate transactions.	• A domestic bank's account held in a foreign bank in the currency of that foreign country. • Example: If PNB (India) holds an account in Chase Bank (US) in USD, it is a Nostro account for PNB. • Helps domestic bank conduct transactions in foreign currencies easily.

INDIA'S RETAIL (CPI) INFLATION

Context: India's retail inflation eased to an 8-year low of 1.55% in July 2025. Measured through the All India CPI, this is the lowest year-on-year inflation rate recorded since June 2017.

About the Consumer Price Index (CPI)

- The CPI measures how the average prices of a fixed basket of goods and services (typically purchased by households) change over time. It reflects inflation by showing how the cost of living rises or falls.
- CPI–Rural, CPI–Urban, and CPI Combined are the newer indices that represent both rural and urban consumption patterns.
- CPI Combined is the primary index used for tracking inflation at the national level.
- **CPI = (Cost of Fixed Basket in Current Year / Cost of Fixed Basket in Base Year) × 100**



Type of CPI	Purpose	Compiled By	Base Year
CPI (Combined)	• Used for macroeconomic analysis and policy-making. • Official inflation target index for RBI's monetary policy.	National Statistical Office (NSO)	2012
CPI (Rural)	• Measures inflation affecting rural households	NSO	2012
CPI (Urban)	• Measures inflation affecting urban households	NSO	2012
CPI for Industrial Workers (CPI–IW)	• Used mainly to revise Dearness Allowance (DA) for government and industrial sector employees	Labour Bureau, Ministry of Labour & Employment	2016
CPI for Urban Non-Manual Employees (CPI–UNME)	• Earlier tracked price changes for urban salaried employees; used for DA calculations for some companies *(Discontinued since January 2011; replaced by CPI–Urban))*	National Statistical Office (NSO)	1984–85
CPI for Agricultural Labourers (CPI–AL)	• Used to revise minimum wages for agricultural labourers across states	Labour Bureau	1986–87
CPI for Rural Labourers (CPI–RL)	• Proposed for use in setting minimum wages under MGNREGA (though CPI–AL is presently used)	Labour Bureau	1986–87

CPI vs. Wholesale Price Index (WPI)

- WPI measures inflation at the wholesale or bulk-transaction level, while CPI measures inflation faced by consumers.
- The weight of food items is higher in CPI, whereas the weight of fuel is higher in WPI, leading to differences in how the two indices behave.

Headline, Core and Super Core Inflation

- **Headline inflation measures the overall change** in prices for a broad basket of goods and services, typically via the Consumer Price Index (CPI), including volatile items like food and energy.
- **Core inflation excludes the volatile food and energy components** to reveal underlying price trends.
- Super core inflation is computed by **excluding food, energy, and housing.**

UPI IN QATAR

Context: NPCI International Payments Ltd, in partnership with Qatar National Bank (QNB), has enabled the acceptance of QR code-based Unified Payments Interface (UPI) across Qatar via point-of-sale terminals for merchants acquired by QNB.

About Unified Payments Interface (UPI)

- UPI is a **digital payment system** developed by the **National Payments Corporation of India (NPCI) and regulated by the Reserve Bank of India (RBI).**
- Launched on April 11, 2016, it enables **peer-to-peer inter-bank transfers through a simple two-factor authentication process.**
- It allows users to transfer money using a recipient's UPI ID, removing the need to enter bank account numbers or other sensitive details. A single UPI PIN works across apps, making transactions easy and fully interoperable.
- UPI functions as a **digital public infrastructure**, enabling seamless and low-cost transactions for both customers and merchants.
- It uses systems such as the **Immediate Payment Service (IMPS)** and the **Aadhaar-Enabled Payment System (AEPS)** to ensure secure, real-time movement of funds.
- UPI **supports push and pull transactions**, and also enables recurring payments such as utility bills, insurance premiums, and school fees.
- **UPI in Foreign Markets:** UPI's international expansion now allows payments in Sri Lanka, Mauritius, France, the UAE, Singapore, Maldives, Bhutan, Nepal and Qatar.

NPCI LAUNCHES SUBSIDIARY

Context: The National Payments Corporation of India (NPCI) has created a new subsidiary, NPCI Tech Solutions Limited (NTSL), to accelerate innovation in India's fintech ecosystem.

About NPCI Tech Solutions Limited (NTSL)

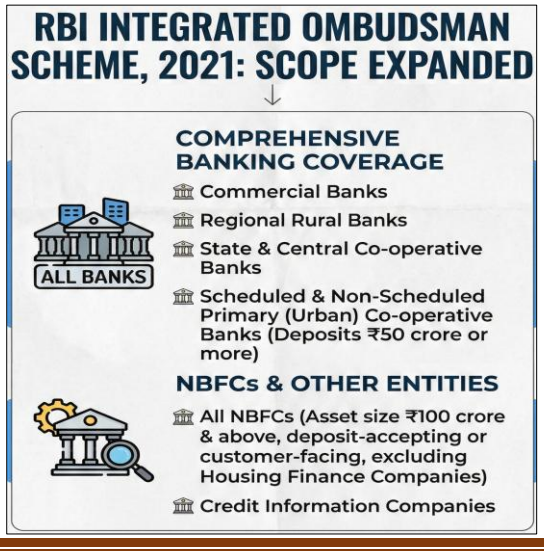
- NTSL will function as an innovation hub, enabling experimentation, development, and scaling of next-generation digital payment technologies.
- It aims to convert emerging ideas into deployable, real-world solutions for India's fast-growing digital economy.
- With NTSL, NPCI now has four subsidiaries:
  1. **NPCI Bharat BillPay Limited (NBBL):** Operates Bharat Bill Payment System.
  2. **NPCI International Payments Limited (NIPL):** Promotes UPI and RuPay globally.
  3. **NPCI BHIM Services Limited (NBSL)**: Manages the BHIM UPI platform.
  4. **NTSL**: New innovation and technology development arm.

About National Payments Corporation of India (NPCI) (Established: 2008)

- A Umbrella organisation for operating retail payment and settlement systems in India, providing **infrastructure for physical and digital payments ecosystem.**
- **Promoters:** Reserve Bank of India (RBI) and Indian Banks' Association (IBA).
- **Legal Basis: I**ncorporated under the Payment and Settlement Systems Act, 2007 as a Not-for-profit company
- **Key Systems Operated:** UPI, RuPay, AEPS, NACH, FASTag, BBPS, etc.

EXPANSION OF INTEGRATED OMBUDSMAN SCHEME

Context: The RBI has expanded the Reserve Bank Integrated Ombudsman Scheme, 2021, to **include State Co-operative Banks and Central Co-operative Banks within its purview.**



About Integrated Ombudsman Scheme, 2021

- The scheme **provides customers with a cost-free and speedy grievance redressal mechanism** for complaints against regulated entities such as banks, NBFCs, and digital payment systems.
- It **consolidates three earlier ombudsman schemes into a single, unified framework**, making the complaint process simpler and more accessible.
- Based on a "**one nation, one ombudsman" model,** the scheme is **jurisdiction-neutral,** meaning **customers no longer need to identify the correct ombudsman office** for filing complaints.

- The scheme defines "**deficiency in service"** as the **primary basis for lodging a complaint,** instead of a narrow list of permissible grounds. This prevents rejection of complaints on technicalities.
- **Regulated entities must submit required documents to the ombudsman within 15 days**. Failure to comply results in the entity losing the right to appeal if an award is issued against them.
- Customers who remain dissatisfied with the ombudsman's ruling can **appeal** within 30 days to the Appellate Authority, headed by the Executive Director in charge at the RBI.

FIDC APPOINTED SRO FOR NBFC

Context: The RBI has granted self-regulatory organisation (SRO) status to the Finance Industry Development Council (FIDC) for the Non-Banking Financial Company (NBFC) segment.

What Is a Self-Regulatory Organisation (SRO)?

- A SRO is a **non-governmental body responsible for creating and enforcing rules and standards for the conduct of its member entities within an industry.**
- Its primary objective is to protect consumers while promoting ethical behaviour, fairness, and professional standards.
- RBI has issued a framework for recognising SROs across different financial sectors, including NBFCs, fintech firms, and payment service providers.
- Under this framework, SROs are expected to support the RBI by promoting regulatory compliance, ensuring data accuracy, and fostering responsible innovation within their respective industries.
- The microfinance sector already has two SROs: Sa-Dhan and the Microfinance Network (MFIN), while FACE (Fintech Association for Consumer Empowerment) serves as the SRO for fintechs.

About Finance Industry Development Council (FIDC)

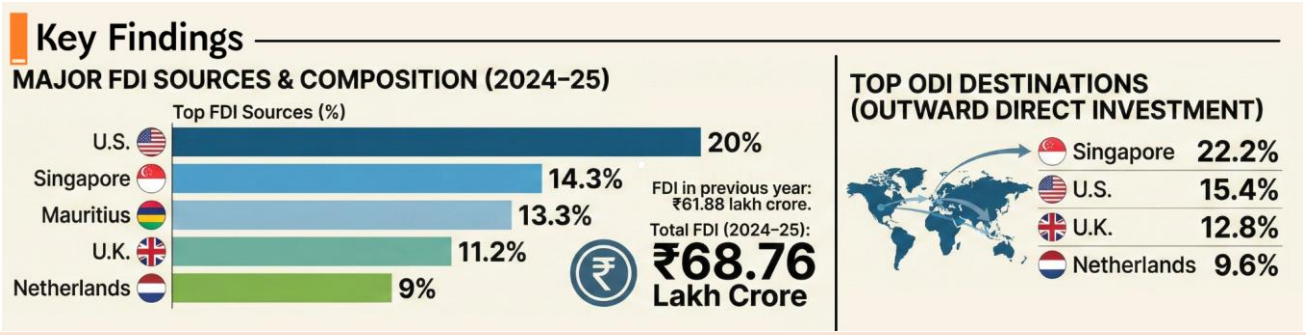
- FIDC is an industry body representing asset financing and loan financing NBFCs registered with the RBI established in 2004.
- It works closely with the RBI and other regulators to promote the interests of the NBFC sector and support responsible lending standards.
- The organisation is also involved in policy advocacy, financial literacy initiatives, and capacity building for NBFCs.

FOREIGN LIABILITIES AND ASSETS CENSUS

Context: The Reserve Bank of India (RBI) has released the provisional results of the 2024–25 Census on Foreign Liabilities and Assets (FLA).

About Foreign Liabilities and Assets (FLA) Census

- The FLA Census is an **annual survey conducted by the Reserve Bank of India (RBI) to collect comprehensive data on the cross-border liabilities and assets of Indian entities**, such as companies, limited liability partnerships (LLPs), alternative investment funds (AIFs), and partnership firms.
- The main objective of the FLA Census is to **collate information on foreign direct investment (FDI) received by Indian entities** (foreign liabilities) and **overseas direct investment (ODI) made by Indian entities** (foreign assets).



OPEN MARKET OPERATION (OMO) AND DOLLAR-RUPEE SWAP

Context: The Reserve Bank of India (RBI) has announced that it will conduct Open Market Operation (OMO) purchases of government securities worth ₹1 trillion and undertake a three-year dollar–rupee buy/sell swap of $5 billion to inject additional liquidity into the financial system.

About Open Market Operations (OMO)

- OMOs are a key **monetary policy instrument** through which the **RBI buys or sells government securities to regulate liquidity in the banking system.**
- **OMO purchases inject liquidity**, as the RBI pays banks for the securities it buys.
- **OMO sales absorb liquidity**, as banks pay the RBI to purchase government securities.
- When there is excess liquidity, the RBI sells securities to reduce liquidity, and when liquidity is tight, it buys securities to increase it.
- OMOs also **help in managing bond yields.** Reduced liquidity can push yields up, as more securities in the market require higher returns to attract buyers.

About Dollar–Rupee Swap

- It is a **foreign exchange transaction** in which **banks sell US dollars to the RBI in exchange for rupees.** The RBI then enters into a separate agreement **to sell the same US dollars back to the banks at a pre-determined rate and date.**
- The rate for the future transaction is usually at a premium to the rate at which the dollars were initially sold to the RBI.
- This swap **injects rupee liquidity into the banking system** and helps ease tightness in bank funds.
- By increasing its dollar reserves, the RBI also strengthens its buffer against external shocks.

NATIONAL STRATEGY FOR FINANCIAL INCLUSION 2025-30

Context: The Reserve Bank of India (RBI) has released the NFSI 2025–30, formulated under the aegis of the **Technical Group on Financial Inclusion and Financial Literacy (TGFIFL).**

- It builds on the gains of NFSI 2019–24 and shifts the focus from mere access to quality-based inclusion.
- The framework was approved by the Sub-Committee of the **Financial Stability and Development Council.**
- It is guided by **five strategic pillars (Panch-Jyoti)** and supported by 47 action points for implementation during 2025–30.
  - **Expanding access to equitable, affordable, and responsible financial services**
  - **Promoting women-led inclusion** and tailored strategies
  - **Linking livelihoods and skill development ecosystems**
  - Using **financial education** to foster **disciplined financial behaviour**.
  - **Strengthening consumer protection and grievance redressal mechanisms.**

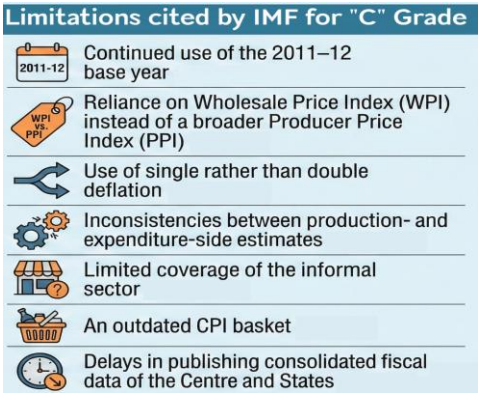
IMF GRADING OF INDIA'S NATIONAL ACCOUNTS

Context: The International Monetary Fund (IMF) has assigned a C grade to India's national accounts statistics, which include key indicators such as Gross Domestic Product (GDP) and Gross Value Added (GVA).

- India received an overall grade of B, as other statistical areas such as prices, government finance statistics, external sector statistics, monetary and financial statistics, and inter-sectoral consistency, were all graded B.

About IMF Grading Assesment

- This assessment forms part of the **IMF's annual bilateral consultations** with its member countries, conducted under **Article IV of the IMF's Articles of Agreement.**
- During these consultations, an IMF staff team visits the country, gathers economic and financial data, and holds discussions with government officials on economic developments and policy measures. A detailed report is prepared after the consultations.



IMF Rating Scale

- The IMF uses a four-point rating scale (A to D) to assess data quality:
  - **A**: Data are adequate for IMF surveillance.
  - **B**: Data have some shortcomings but are broadly adequate.
  - **C**: Data have some shortcomings that partly hamper surveillance.
  - **D**: Data have serious shortcomings that significantly hamper surveillance.

BLUE PORTS

Context: The Department of Fisheries (DoF), under the Ministry of Fisheries, Animal Husbandry and Dairying, has signed a **Technical Cooperation Programme (TCP) agreement** with the **Food and Agriculture Organization (FAO)** to strengthen **Blue Port infrastructure in India.**

What is Blue Port?

- A Blue Port is a **modern, sustainable, and technologically advanced fishing harbor** designed to support the long-term growth of fisheries, enhance food security, and promote environmental stewardship and social inclusion in coastal communities.

Blue Ports Framework

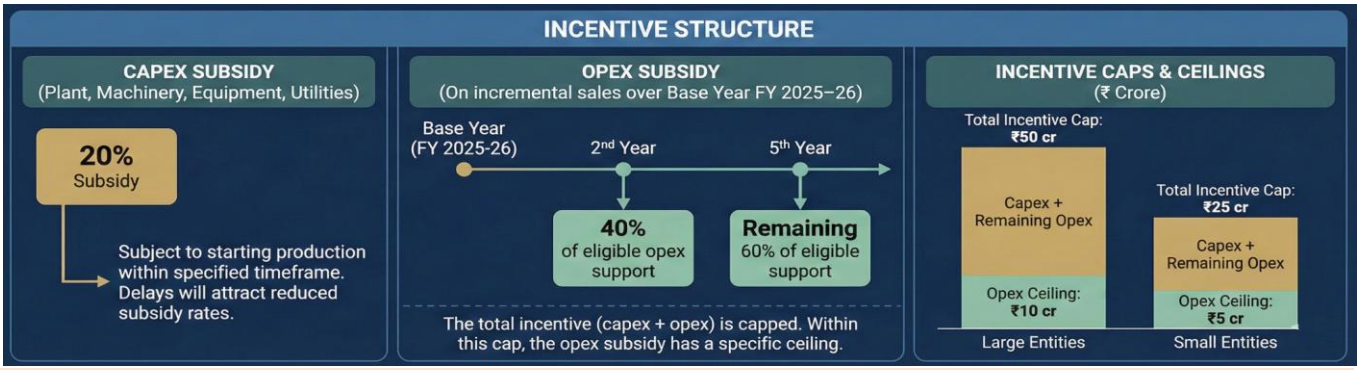
- The DoF is developing **Smart and Integrated Fishing Harbour**s that combine modern technology with environmentally responsible practices.
- Three pilot harbours - **Vanakbara (Diu), Karaikal (Puducherry), and Jakhau (Gujarat)**—have been approved with a total investment of ₹369.8 crore.
- These harbours aim to modernize post-harvest fisheries infrastructure by ensuring safer, cleaner, and more efficient operations for fishing communities.
- Sustainability measures include **rainwater harvesting, energy-efficient lighting, electric-powered equipment, and improved waste management systems.**
- **Supported under the Pradhan Mantri Matsya Sampada Yojana (PMMSY),** the initiative integrates smart technologies such as IoT devices, sensor networks, satellite communication, and data analytics to streamline harbour operations and enable real-time decision-making.

SCHEME TO PROMOTE CRITICAL MINERAL RECYCLING

Context: The Union Cabinet has approved a ₹1,500-crore **incentive scheme** to strengthen India's capacity **to recycle critical minerals from secondary sources.**

About Scheme to Promote Critical Mineral Recycling

- It is an **incentive scheme to promote recycling of e-waste and battery waste for the extraction** of critical minerals. It forms part of the **National Critical Mineral Mission (NCMM)**.
  - NCCM seeks to build domestic capabilities and strengthen supply chain resilience for critical minerals.
- **Eligible feedstock** includes **e-waste, lithium-ion battery (LIB) scrap,** and other recyclable materials such as catalytic converters from end-of-life vehicles.
- The scheme **targets both large, established recyclers and small or new recyclers**, including start-ups. One-third of the total outlay is reserved for smaller players.
- Incentives will apply to investments in new recycling units as well as the expansion, modernisation, or diversification of existing units.
- The scheme will run from FY26 to FY31 as a near-term solution until domestic mining and exploration of critical minerals yield results.



REGULATORY ASSETS

Context: SC directed the State Electricity Regulatory Commissions (SERCs) and electricity distribution companies (DISCOMs) to clear regulatory assets within four years and liquidate any new assets within three years.

What are Regulatory Assets?



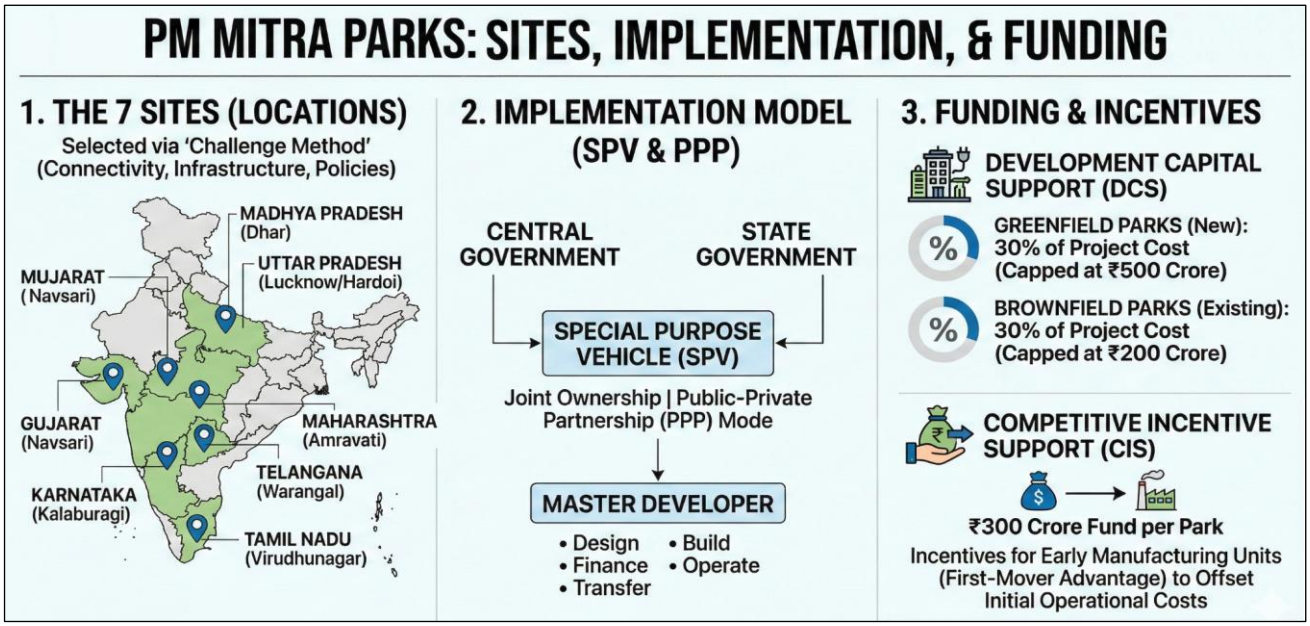
- A regulatory asset refers to a cost incurred by a public utility (such as an electricity, water, or gas company) that the regulator allows the company to record as an asset on its balance sheet instead of treating it as an immediate expense.
- In the Power Sector, regulatory assets are basically **unpaid losses of electricity distribution companies** (DISCOMs). These losses are kept aside to be recovered from consumers in the future.
- They **arise when the cost of supplying electricity is higher than the money DISCOMs receive through consumer tariffs and government subsidies** (Annual Revenue Requirement, or ARR). Instead of increasing electricity prices immediately, **the regulator allows DISCOMs to record this gap as a regulatory asset.**

PM MITRA SCHEME

Context: The Prime Minister recently laid the foundation stone for a PM MITRA Park in the Dhar district of Madhya Pradesh.

About PM MITRA (Pradhan Mantri Mega Integrated Textile Region and Apparel) Scheme

- The PM MITRA Scheme is a flagship initiative by the **Ministry of Textiles** to position India as a global hub for textile manufacturing and exports. In 2023, seven sites were approved across India.
- **Launched in October 2021** (for the period 2021-22 to 2027-28), the scheme **aims to create world-class industrial infrastructure that attracts large-scale investment, including Foreign Direct Investment (FDI).**
- Its vision is based on the **"5F" concept—Farm → Fibre → Factory → Fashion → Foreign,** to strengthen and scale up India's textile ecosystem.
- The PM MITRA scheme aims to attract Rs. 70,000 crore in investments and create nearly 20 lakh direct and indirect jobs.
- Each park is projected to generate around 10 lakh employment opportunities. Each park will house the entire textile value chain at a single location, from spinning and weaving to processing, dyeing, printing, and garment manufacturing.



ENGINEERING EXPORT PROMOTION COUNCIL INDIA

Context: The Engineering Export Promotion Council (EEPC) India has celebrated its platinum jubilee, marking 70 years of its establishment.

- Founded in 1955, EEPC India serves as **the trade and investment promotion body for the engineering sector**. It is sponsored by the **Ministry of Commerce and Industry.**

- It is headquartered in Kolkata.
- It **advises the Government of India on engineering trade policy** and acts as a key link between the engineering industry and the government.
- It conducts buyer–seller meets in India and abroad, organizes overseas trade fairs and exhibitions, and sets up India pavilions at international events.
- It supports global sourcing from India and helps MSMEs adopt international best practices. It also assists MSMEs in integrating with global value chains.

INDUSTRIAL PARK RATING SYSTEM 3.0

Context: The Ministry of Commerce & Industry has launched the Industrial Park Rating System (IPRS) 3.0.

About Industrial Park Rating System (IPRS) 3.0

- It has been **developed by the Department for Promotion of Industry and Internal Trade (DPIIT)** with support from the Asian Development Bank (ADB).
- The initiative aims **to strengthen India's industrial ecosystem and enhance the competitiveness of industrial infrastructure.**
- The government is developing 20 plug-and-play industrial parks and smart cities under the **National Industrial Corridor Development Corporation (NICDC).** Four parks are already completed, and four more are under active construction.
- It will provide stakeholders with reliable data, promote best practices, and support the creation of world-class infrastructure, thereby contributing to the Make in India programme and improving India's global competitiveness.
- Building on the pilot phase (2018) and IPRS 2.0 (2021), the **third edition expands its framework to include new parameters such as sustainability, green infrastructure,** logistics connectivity, digitalization, skill linkages, and enhanced tenant feedback.
- Under **IPRS 3.0, industrial parks will be categorized as Leaders, Challengers, and Aspirers** based on their performance across key indicators.

GLOBAL INNOVATION INDEX 2025

Context: Global Innovation Index (GII) 2025, **released by the World Intellectual Property Organization (WIPO)**, reports a global slowdown in innovation investments.

About Global Innovation Index

- Launched in 2007, the GII was created to develop reliable methods for measuring innovation in society. WIPO became formally associated with it in 2011.
- The index ranks 139 economies using over 80 indicators that measure both the inputs and outputs of innovation.

Global Rankings 2025

- **Top 5:** Switzerland (1st), Sweden (2nd), United States (3rd), Republic of Korea (4th), Singapore (5th).
- India has improved consistently, rising from 48th in 2020 to **38th in 2025**. It also ranks 1st among lower-middle-income economies and in the Central and Southern Asia region.

About World Intellectual Property Organization (WIPO)

- WIPO is **one of the 15 specialized agencies of the UN** and serves as the **global forum for intellectual property (IP) services, policy, information and cooperation.**
- Established in **1967**, its mission is to promote a balanced and effective international IP system that supports innovation and creativity.
- WIPO has **193 member states** (India is a member) and is **headquartered in Geneva, Switzerland.**
- Its predecessor was the United International Bureaux for the Protection of Intellectual Property, founded in 1893.

LARGE SHIPS GRANTED INFRASTRUCTURE STATUS

Context: The Indian government has granted infrastructure status to large ships. This change has been implemented by updating the **Harmonized Master List (HML)** and adding large ships as a new sub-sector under Transport & Logistics.

Eligibility as a Large Ship

- A large ship is defined as a commercial vessel with a gross tonnage (GT) of 10,000 or more, under Indian ownership and Indian flag.
- Commercial vessels built in India, Indian-owned, and Indian-flagged, with a gross tonnage of 1,500 or more, also qualify for infrastructure status.

Significance of Inclusion in the HML

- Grants access to infrastructure lending on easier terms, including enhanced borrowing limits.
- Access to larger amounts of funding through external commercial borrowings (ECBs).
- Allows eligibility for viability gap funding to support financially challenging projects.
- Tax-related incentives available to infrastructure sectors, improving overall project viability.

About Harmonized Master List (HML)

- The HML is an **official list maintained by the Ministry of Finance**, Government of India, which **identifies and categorizes infrastructure sub-sectors** for the purpose of coordinated **policy support, priority sector lending, and financial incentives.**
- It serves as a reference for all agencies involved in infrastructure development, ensuring a uniform definition and approach across various sectors.
- A dedicated committee chaired by the **Secretary, Department of Economic Affairs**, oversees the periodic review and update of the HML.
- The HML is periodically updated to reflect evolving economic needs and technological advancements. The latest updates: **Data Centres, Energy Storage Systems, etc.**

Categories and Sub-sectors

- Transport and Logistics (including roads, ports, large ships, and logistics parks)
- Energy (including electricity, oil & gas, and ESS)
- Water and Sanitation.
- Communication (including optic fibre networks and data centres)
- Social and Commercial Infrastructure

OJU (SUBANSIRI) HYDROELECTRIC PROJECT

Context: The Union Environment Ministry's Expert Appraisal Committee (EAC) has recommended environmental clearance for the Oju hydroelectric project on the Subansiri River.

About Oju (Subansiri) Hydroelectric Project

- The project has a total installed capacity of 2,220 MW, which includes a 2,100 MW main power plant and a 120 MW dam-toe power plant.
- Its design places it as the uppermost project in the planned cascade of hydropower projects on the **Subansiri River at Taksing in Upper Subansiri district, close to the India–China border.**
- It will be developed by Oju Subansiri Hydro Power Corporation Pvt Ltd.
- The project will require diversion of 750 hectares of forest land, and around 43 hectares will be submerged. Oju would be the largest project by capacity in the basin.
- Other planned projects in the Subansiri basin include Niare, Naba, Nalo, Dengser, Upper Subansiri, and Lower Subansiri.

SAWALKOTE (CHENAB) HYDEL PROJECT

Context: The stalled Sawalkote hydropower project on the Chenab River in Jammu and Kashmir has re-emerged as a central component of India's plan to utilise the river's hydropower potential.

About Sawalkote (Chenab) Hydel Project

- Sawalkote is a large western-river hydropower scheme, commonly described as a 1,856 MW run-of-river project.
- The project is planned in two stages: Stage-I (1,406 MW) and Stage-II (450 MW).
- The Sawalkote project involves the construction of a 192.5-metre-high concrete gravity dam, with a reservoir capacity of 530 million cubic metres, spread across 1,159 hectares.
- The project, to be built by NHPC Ltd. in Jammu and Kashmir's Ramban district, is set to become one of the largest hydropower projects on the west-flowing Chenab River.

- The Chenab basin already hosts three operational hydropower projects: Dulhasti (390 MW) in Kishtwar, Baglihar (890 MW) in Ramban, Salal (690 MW) in Reasi.
- It was stalled for nearly 4 decades. The Centre expedited the project, first initiated in 1984, after putting the Indus Waters Treaty (IWT) in abeyance following the Pahalgam terror attack

EXPANSION OF CREDIT GUARANTEE SCHEME FOR STARTUPS

Context: The Department for Promotion of Industry and Internal Trade (DPIIT) has expanded the Credit Guarantee Scheme for Startups (CGSS) to improve access to finance for emerging businesses.

About Credit Guarantee Scheme for Startups (CGSS)

- Launched in 2022, CGSS is an initiative **designed to provide collateral-free credit guarantees for loans and investments extended to eligible startups in India**.
- It provides **guarantee coverage for collateral-free loans** offered by Scheduled Commercial Banks, All India Financial Institutions (AIFIs), NBFCs, and SEBI-registered AIFs.
- Operated by the **National Credit Guarantee Trustee Company Limited (NCGTC),** the scheme supports working capital, term loans, and venture debt, enabling startups to access finance more easily.

Key changes under the expanded Scheme

- The guarantee ceiling per borrower has been increased from Rs 10 crore to Rs 20 crore.
- Guarantee coverage has been revised to 85% for loans up to Rs 10 crore and 75% for amounts above Rs 10 crore.
- Annual Guarantee Fee (AGF) for startups in 27 identified Champion Sectors has been halved from 2% to 1%, encouraging innovation in sectors critical to Make in India and technological advancement.

Definition of a Startup according to Government

A company can be recognized as a "Startup" by the DPIIT and become eligible for government benefits if it meets the following criteria:

- **Age of the Company:** The company should be incorporated or registered within the last **10 years.**
- **Original Entity:** An entity should not have been formed by splitting up or reconstructing an already existing business.
- **Type of Company:** It must be registered in India as one of the following:
  - Private Limited Company (as per the Companies Act, 2013)
  - Partnership Firm (under Section 59 of the Partnership Act, 1932)
  - Limited Liability Partnership (LLP) (under the LLP Act, 2008)
- **Annual Turnover:** The turnover of the company should not exceed Rs. 100 crores in any financial year since its incorporation/registration.
- **Innovation & Scalability:** The company should be engaged in innovation, developing or improving products, processes, or services, or have a scalable business model with high potential for employment generation or wealth creation.

NATIONAL BANK FOR FINANCING INFRASTRUCTURE & DEVELOPMENT

Context: NaBFID plans to enter the overseas credit market for the first time in FY2025–26. It aims to raise $2 billion through a mix of loans and bonds. This step will help deepen India's offshore debt market, which is still relatively small compared to Asian peers like South Korea.

About National Bank for Financing Infrastructure and Development (NaBFID)

- The NaBFID is a **specialized Development Finance Institution (DFI)** established to strengthen India's infrastructure sector. It seeks to improve credit flow through innovative financial instruments and channelized investments.
- Created in 2021 under the NaBFID Act, 2021, its core objectives are:
  - Providing long-term, non-recourse finance for infrastructure projects.
  - Supporting the growth of India's bond and derivatives markets.
  - Contributing to sustainable economic growth by bridging financing gaps in infrastructure development.
- In 2022, Reserve Bank of India (RBI) announced that NaBFID will be regulated and supervised by it as an **All India Financial Institution (AIFI)** under the RBI Act, 1934.

About All India Financial Institution (AIFI)

- AIFIs are specialized financial institutions in India regulated by RBI. They provide sector-specific long-term financing and investment.
- **Some AIFIs in the country are:** Export - Import Bank of India (Exim Bank), National Bank for Agriculture and Rural Development (NABARD), Small Industries Development Bank of India (SIDBI), National Housing Bank (NHB), NaBFID.

Development Finance Institution (DFI)

- DFIs are organisations usually owned by the government or public institutions to provide funds for **infrastructure** and large scale projects, where it often becomes unviable for large banks to lend.
- They provide two types of funds- Medium (1-5 years) and Large (< 5 years).
- DFIs do not accept deposits from people but they raise funds by borrowing from governments, insurance companies, pension funds and sovereign funds.
- It also provides a guarantee to banks on behalf of companies and subscriptions to shares, debentures etc.
- DFIs in India:
  - 1st DFI in India was the Industrial Financial Corporation of India (IFC) that was launched in 1948. IDBI, UTI, NABARD, EXIM Bank, SIDBI, NHB, IIFCL are the other major DFIs.
  - Later, several of them were converted into banks like ICICI Bank, IDBI Bank etc.
- DFIs in India are classified as per their functions:
  - National Development Banks e.g IDBI, SIDBI, ICICI, IDFC
  - Sector specific **AIFIs** e.g. NaBFID, EXIM Bank, NABARD, NHB
  - Investment institutions e.g LIC, GIC, UTI
  - State level institutions e.g. state Finance corporations.

FOREIGN DIRECT INVESTMENT (FDI)

Context: According to the Reserve Bank of India (RBI), net foreign direct investment (FDI) declined sharply by 96.5%, falling to $353 million in FY 2024-25, compared to $10.1 billion in FY 2023-24.

What is Foreign Direct Investment (FDI)?

- FDI refers to the investment made by a foreign entity or company in the businesses or assets of another country, usually to establish a lasting interest or control.
- FDI is an investment made by a person residing outside India in:
  - The capital instruments of an unlisted Indian company, or
  - 10% or more of the post-issue paid-up equity capital of a listed Indian company, calculated on a fully diluted basis.
  - If an existing foreign investment in a listed Indian company falls below 10%, it will still continue to be treated as FDI.
- FDI is different from portfolio investment, which only involves buying stocks or bonds without any controlling stake.
- FDI is a major source of capital inflow, technology transfer, and employment generation in the host country.
- The Department of Industrial Policy and Promotion is the nodal agency for foreign investment policy. However, RBI is the nodal agency for regulating inflow and outflow of Foreign Direct Investment as well as Foreign Portfolio Investment – the latter along with SEBI.

Net FDI = Gross FDI Inflows – [Repatriation by Foreign Companies+Outward FDI (OFDI)]

FDI Routes

- Foreign investment is allowed in most sectors in India. Foreign Direct Investment (FDI) can occur through two routes:
  - **Automatic Route:** No prior approval from the Reserve Bank of India (RBI) or Government of India is required.
  - **Government Route:** Requires prior approval from the Government of India. Proposals are reviewed by the relevant Administrative Ministry or Department.
    - After the abolition of the Foreign Investment Promotion Board (FIPB) in 2017, the responsibility for processing FDI proposals shifted to the respective Administrative Ministries or Departments overseeing each sector.

Sectors Where FDI is Prohibited

- **Lottery Business:** Including government, private, and online lotteries.
- **Gambling and Betting:** Including casinos.
- **Chit Funds and Nidhi Companies.**
- **Trading in Transferable Development Rights (TDRs).**

FDI Trends in India

India received **$50 billion in FDI equity inflows.**

- **Top investors:** Singapore ($14.9 bn), Mauritius ($8.3 bn), U.S. ($5.5 bn), Netherlands ($4.6 bn), UAE ($4.3 bn).
- **Leading sectors:** Services ($9.3 bn), Software & Hardware ($7.8 bn), Trading ($4.2 bn), Renewable Energy ($4 bn), Infrastructure ($2.2 bn).
- **Top states:** Maharashtra ($19.6 bn), Karnataka ($6.6 bn), Delhi ($6.1 bn), Gujarat ($5.7 bn), Tamil Nadu ($3.7 bn).

- **Real Estate Business or Farmhouse Construction:** Excludes township development, residential/commercial projects, roads, bridges, and REITs regulated under SEBI (REITs) Regulations, 2014.
- **Tobacco Manufacturing:** Cigars, cheroots, cigarillos, cigarettes, or substitutes.
- **Restricted Activities:** Sectors not open to private investment like Atomic Energy and Railway Operations.
- **Foreign Technology Collaboration:** Licensing for franchise, trademark, brand name, or management contracts is prohibited in Lottery, Gambling, and Betting sectors.

The **Sabka Bima Sabki Raksha (Amendment of Insurance Laws) Act, 2025** allows up to **100% FDI in insurance companies**, up from 74%.

NATIONAL SCHEME FOR ITI UPGRADATION

Context: The Cabinet has approved a National Scheme for Upgradation of Industrial Training Institutes (ITIs) and setting up of five National Centres of Excellence (NCoEs) for skilling to enhance the overall quality and relevance of vocational training in the country.

National Scheme for Industrial Training Institute (ITI) Upgradation

- The National Scheme for Industrial Training Institute (ITI) Upgradation is a major Centrally Sponsored Scheme approved by the Union Cabinet in May 2025.
- **Financial Outlay:** ₹60,000 crore (Central Share: ₹30,000 crore, State Share: ₹20,000 crore, Industry Share: ₹10,000 crore)
- **External Funding:** 50% of the central share will be co-financed by the Asian Development Bank (ADB) and the World Bank.

Components

- **Upgradation:** Upgradation of 1,000 government ITIs through a hub-and-spoke arrangement with industry-aligned, revamped courses.
- **NSTI Expansion:** Capacity augmentation of five National Skill Training Institutes (NSTIs) and establishment of five National Centres of Excellence for Skilling.

SAGAR MEIN SAMMAN

Context: The Ministry of Ports, Shipping and Waterways launched 'Sagar Mein Samman' (SMS), **a policy initiative to build a future-ready, gender-equitable maritime workforce.**

- It was unveiled during the inaugural **International Day for Women in Maritime (May 18)** in Mumbai, aimed at increasing women's participation across all levels of maritime operations, from docks to decision-making boards.
- The event, organized by the Directorate General of Shipping, was held under the theme "Women in Maritime: Leading Transformation and Sustainability."

KONKAN RAILWAY MERGES WITH INDIAN RAILWAYS

Context: The Maharashtra government has agreed to merge the Konkan Railway Corporation Limited (KRCL) with Indian Railways. With Goa, Karnataka and Kerala having already approved the merger, Maharashtra's decision clears the way for the complete integration.

About Konkan Railway

- Konkan Railway is a vital link between Mumbai and Mangalore traversing through a distance of 741 Kms along the Western Ghats covering Four States viz. Maharashtra, Goa, Karnataka & Kerala (indirectly).
- It covers a length of about **741 kilometers**, running from **Roha** near Mumbai to **Thokur** near **Mangalore** (Karnataka).
- Established under **Konkan Railway Corporation Limited (KRCL)**, the project was inaugurated on January 26, 1998.
- The Konkan Railway Corporation Limited, headquartered in Navi Mumbai, functions as an autonomous company under the Ministry of Railways.
- The KRCL was formed as a joint venture in which the Union Government held a 51% stake, Maharashtra 22%, Karnataka 15%,and Goa and Kerala 6% each. Moreover, KRCL always existed as a distinct entity from the Indian Railways.

SHILLONG SILCHAR HIGHWAY

Context: The Cabinet Committee on Economic Affairs has approved the development, maintenance, and management of a 4-lane Greenfield access-controlled highway National Highway 06 stretching 166.80 km from Mawlyngkhung (near Shillong, Meghalaya) to Panchgram (near Silchar, Assam).

- The project will be implemented under Hybrid Annuity Mode.
- It is being implemented by National Highways and Infrastructure Development Corporation Limited (NHIDCL) for the Ministry of Road Transport and Highways (MoRTH), and is expected to be completed by 2030.
- This highway, along with the Kaladan Multi-Modal Transit Transport Project, will provide an alternative maritime route through Myanmar, thereby reducing India's dependence on Bangladesh for seaborne cargo access.

About Kaladan Multimodal Transit Transport Project (KMTTP)

- The KMTTP is an infrastructure **initiative jointly developed by India and Myanmar** to create a multi-modal transport corridor **connecting the eastern Indian seaport of Kolkata with the northeastern states of India via Myanmar.** The project combines sea, river, and road routes:
  - It **links Kolkata to the Sittwe seaport** in Myanmar by **sea**, covering about 539 km.
  - From Sittwe, goods are transported **inland via** the **Kaladan River to Paletwa** in Myanmar.
  - From **Paletwa**, a **road** connects to the India-Myanmar border at **Zorinpui in Mizoram**, linking further with the road network in India.
- The project aims to provide an alternative route for the northeastern states of India, bypassing the vulnerable Siliguri Corridor and reducing dependency on routes passing through Bangladesh.
- Once completed, the project will **reduce travel distance between Kolkata and Aizawl by about 700 km.**
- The waterways and port components, including Sittwe Port, have been operationalized as of 2023, while some road components are still under construction with delays due to security concerns in Myanmar. The entire project was expected to be fully operational by around 2023–2027 timelines.



REVAMPED PERIODIC LABOUR FORCE SURVEY (PLFS)

Context: National Statistics Office (NSO) has revamped PLFS from January 2025.

About Periodic Labour Force Survey (PLFS)

- The PLFS was launched in 2017 by the **National Statistics Office (NSO), Ministry of Statistics & Programme Implementation (MOSPI).**
- **Aim**: To generate reliable and timely estimates of key labour market indicators.

Indicators in PLFS

- **Labour Force Participation Rate (LFPR):** Percentage of the working-age population (15+) that is either employed or actively seeking work.
- **Worker Population Ratio (WPR):** Percentage of the population that is actually employed.
- **Unemployment Rate (UR):** Percentage of people in the labour force who are not employed but actively seeking work.
- **Usual Status (US):** Measures employment/unemployment over a longer period (typically past 365 days); captures the usual economic activity of a person.
- **Current Weekly Status (CWS):** Measures employment/unemployment during the past 7 days before the survey; captures short-term or recent activity.

Feature	Before 2025	After 2025 (Revamped Design)
Indicators	LFPR, WPR, UR (quarterly for urban, annual for rural + urban).	LFPR, WPR, UR with monthly, quarterly, and annual estimates.

Quarterly Estimates	Urban areas only, Current Weekly Status (CWS).	Extended to rural areas → quarterly data for the whole country.
Reporting Cycle	July–June reporting.	Calendar year (Jan–Dec) reporting.
Sample Size	~1,02,400 households (12,800 FSUs).	~2,72,300 households (22,692 FSUs) → 2.65× increase.
Households per FSU	8 households.	12 households.
Geographical Representation	NSS regions as sampling units.	District as basic unit (better rural-urban representation).

VIZHINJAM INTERNATIONAL SEAPORT

Context: PM Modi inaugurated the Vizhinjam International Seaport (VIS) in Kerala

About Vizhinjam International Seaport (VIS)

- India's **first deep-water transshipment port,** VIS handles container and multi-purpose cargo. Transshipment is the process of transferring cargo from one ship to another at an intermediate port before it reaches its final destination.
- It is developed under a Public-Private Partnership (Design, Build, Finance, Operate, and Transfer (DBFOT) basis).
- Strategically located **10 nautical miles from major international shipping routes**, the port accommodates large vessels with depths of 18–20 meters.
- As **India's first semi-automated port**, it features an AI-driven control room and the country's first Indigenous Vessel Traffic Management System (VTMS), reducing turnaround times and optimizing traffic flow.
- VIS aims to cut India's reliance on foreign ports, where 75% of transshipment cargo is currently handled, saving an estimated USD 200–220 million annually.
- Future expansions in phases two and three will increase capacity from 1 million to 3 million TEUs by 2028.

NATIONAL ROAD SAFETY BOARD (NRSB)

Context: The SC has questioned the Central Government for not implementing **Section 215B of the Motor Vehicles Act, 1988**, which mandates the constitution of the **National Road Safety Board.**

About National Road Safety Board (NRSB)

- The NRSB is a **statutory body** constituted under Section 215B of the Motor Vehicles (Amendment) Act, 2019, **to improve road safety, traffic management**, and evolve effective strategies for reducing road accidents across India.
- **Composition:** A Chairman and 3–7 members, all appointed by the Central Government.
- **Head Office:** To be located in the National Capital Region
- **Functions:** The NRSB is tasked with promoting road safety, encouraging innovation, adopting new technology, and regulating traffic and motor vehicles. Its responsibilities include:
  - Providing technical advice and assistance to the Central Government, State Governments, and local authorities on road safety and traffic management.
  - Facilitation of safe and sustainable utilisation of road transport ecosystem;
  - Promotion of new vehicle technology; safety of vulnerable road users; programmes for educating and sensitising drivers and other road users

DISTRICT MINERAL FOUNDATION (DMF)

Context: The Standing Committee on Coal Mines and Steel presented a report in Parliament reviewing the implementation of the District Mineral Foundation (DMF) Fund.

About District Mineral Foundation (DMF)

- The DMF is a **statutory, non-profit trust established in every district affected by mining activities**, with the main purpose of working for the interest and benefit of the persons and areas affected by mining operations.
- DMF was created via an **2015 amendment to the Mines and Minerals (Development and Regulation) (MMDR) Act, 1957.**
- As of 2025, DMFs have been set up in 646 districts across 23 mining states in India.

- **Objective:** To ensure that a share of the wealth generated from mining reaches local communities, typically the most affected and vulnerable sections
- **Funding:** Funding comes from contributions by mining lease holders, calculated as a percentage of royalty: 10% of royalty for leases granted on or after 2015; 30% of royalty for leases granted before 2015.
    - The funds are meant to be used for welfare projects, addressing health, education, environment, livelihoods, infrastructure, and other needs in mining-affected areas.
- **Administration and Guidelines**
    - DMFs function through a two-tier setup: a Governing Council for policy-making, and a Managing Committee for execution.
    - The functioning and fund utilization are guided by central PMKKKY (Pradhan Mantri Khanij Kshetra Kalyan Yojana) guidelines and relevant state regulations.

About PMKKKY (Pradhan Mantri Khanij Kshetra Kalyan Yojana)	
About	A development and welfare scheme implemented by DMFs aimed at the socio-economic development of areas and people affected by mining activities.
Launch	2015 under Section 20A of the MMDR Act, 1957
Objective	Promote sustainable development in mining-affected areas; fund healthcare, education, infrastructure, water, livelihoods
Fund Allocation (2024 Guidelines)	70% to high-priority sectors: drinking water, healthcare, education, skill development, welfare of vulnerable sections, sanitation, housing, agriculture and animal husbandry 30% cap on other sectors: infrastructure, irrigation, energy, watershed development, etc.
Directly Affected Areas	70% of funds must be spent in directly mining-affected areas
Endowment Fund	10% of annual DMF receipts set aside for sustaining livelihoods in post-mining areas

PREDATORY PRICING

Context: The Competition Commission of India (CCI) has recently notified the Cost Regulations, 2025, introducing new definitions aimed at curbing predatory pricing.

About Predatory Pricing

- **Definition:** Selling goods or providing services below cost with the intention of reducing competition or eliminating competitors.
- Section 4(2) of the Competition Act, 2002 considers predatory pricing by a dominant enterprise as an abusive practice.

Impact of Predatory Pricing

- **On Customers:** Initially benefits customers through lower prices, but in the long term, reduced competition leads to fewer choices and higher prices.
- **On Companies:** Harms competitors in the short term; once rivals are eliminated, the dominant firm may raise prices to recover losses and earn monopoly profits.

URBAN CHALLENGE FUND

Context: The Urban Challenge Fund (UCF), a Rs 1 lakh crore initiative announced in the Union Budget 2025-26, aims to drive sustainable urbanization and redevelopment in Indian cities.

- The fund finances up to 25% of project costs, with the remaining ≥50% from bonds, bank loans, or PPPs.
- An initial Rs 10,000 crore allocation is proposed for 2025-26, along with a Rs 300 crore pilot for smaller cities (~1 lakh population).
- UCF targets investment-ready cities, encouraging innovation, reforms, and performance-driven urban infrastructure development.

Key Focus Areas include

- Transforming cities into growth hubs
- Creative redevelopment and urban regeneration
- Improving water supply and sanitation

INDEX OF INDUSTRIAL PRODUCTION DROPS

Context: According to the IIP for April 2025, growth in industrial activity was last slower in August 2024, when it had contracted 0.1%.

About Index of Industrial Production (IIP)

- It indicates the **relative change of physical production in the field of industries during a specified year as compared to the previous year.**
- It is a composite indicator that tracks the growth rate of industry groups classified into **Broad sectors:** Manufacturing (77.6%), Mining (14.4%) and Electricity (8%).
    - The eight core industries (refinery products, electricity, steel, coal, crude oil, natural gas, cement, fertilizers) constitute about 40.27% of the total weight in the IIP.
- It is computed and published by the **National Statistical Organisation (NSO)** on a **monthly basis.**
- **Base Year:** For the IIP series in India, the **base year is 2011-12**. The base year is assigned a value of 100. If the current IIP is 110, it indicates a 10% growth compared to the base year.

MINIRATNA STATUS

Context: The Ministry of Defence has approved the **Miniratna status Category I** for Munitions India Limited (MIL), Armoured Vehicles Nigam Limited (AVNL) & India Optel Limited (IOL).

What is a Miniratna Status?

- It was introduced by the Government of India, is designed to grant greater autonomy and delegated powers to certain well-performing Central Public Sector Enterprises (CPSEs).
- This status is intended to encourage their efficiency, profitability, and competitiveness.
- 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.
- Miniratna CPSEs are classified into two categories: **Category-I and Category-II.**

Category	Eligibility Criteria	Benefits
Miniratna Category–I	• Must have earned profit for the last **three consecutive years**. • Must have earned a **pre-tax profit of ₹30 crore or more** in at least one of those three years. • Must have a **positive net worth**.	• Can undertake **capital expenditure** on new projects, modernization, etc., up to **₹500 crore** or **equal to their net worth** (whichever is lower) **without prior approval** of the Central Government.
Miniratna Category–II	• Must have earned profit for the last **three consecutive years**. • Must have a **positive net worth**.	• Can undertake **capital expenditure** on new projects, modernization, etc., up to **₹300 crore** or **50% of their net worth** (whichever is lower) **without prior approval** of the Central Government.

ETALIN HYDROPOWER PROJECT

Context: The Environment Ministry's Forest Advisory Committee (FAC) has granted in-principle forest clearance for the 3,097 MW Etalin Hydropower Project in **Arunachal Pradesh.**

About Etalin Hydropower Project

- It is a proposed hydroelectric power station in the Dibang Valley district of Arunachal Pradesh. It is **planned to be one of the largest hydropower projects in the country, with an installed capacity of 3,097 MW.**
- The Project is planned as a **run-of-the-river hydropowe**r project, which generates electricity by using the natural flow of a river, with little or no storage of water in large reservoirs.
- The project will be built on the **Dri River and Talo River.** Both rivers are tributaries of the **Dibang River**, which later joins the **Brahmaputra River system.**
- The required forest land is largely community-owned and has met resistance from the Idu Mishmi tribe, who share deep spiritual and cultural ties with the region's forests and rivers.

CHENAB AND ANJI BRIDGES INAUGURATED

Context: The Prime Minister inaugurated the Chenab Bridge and Anji Bridge on the USBRL Project in Jammu & Kashmir, aiming to boost connectivity, tourism, and employment in the region.

About Udhampur–Srinagar–Baramulla Rail Link (USBRL) Project

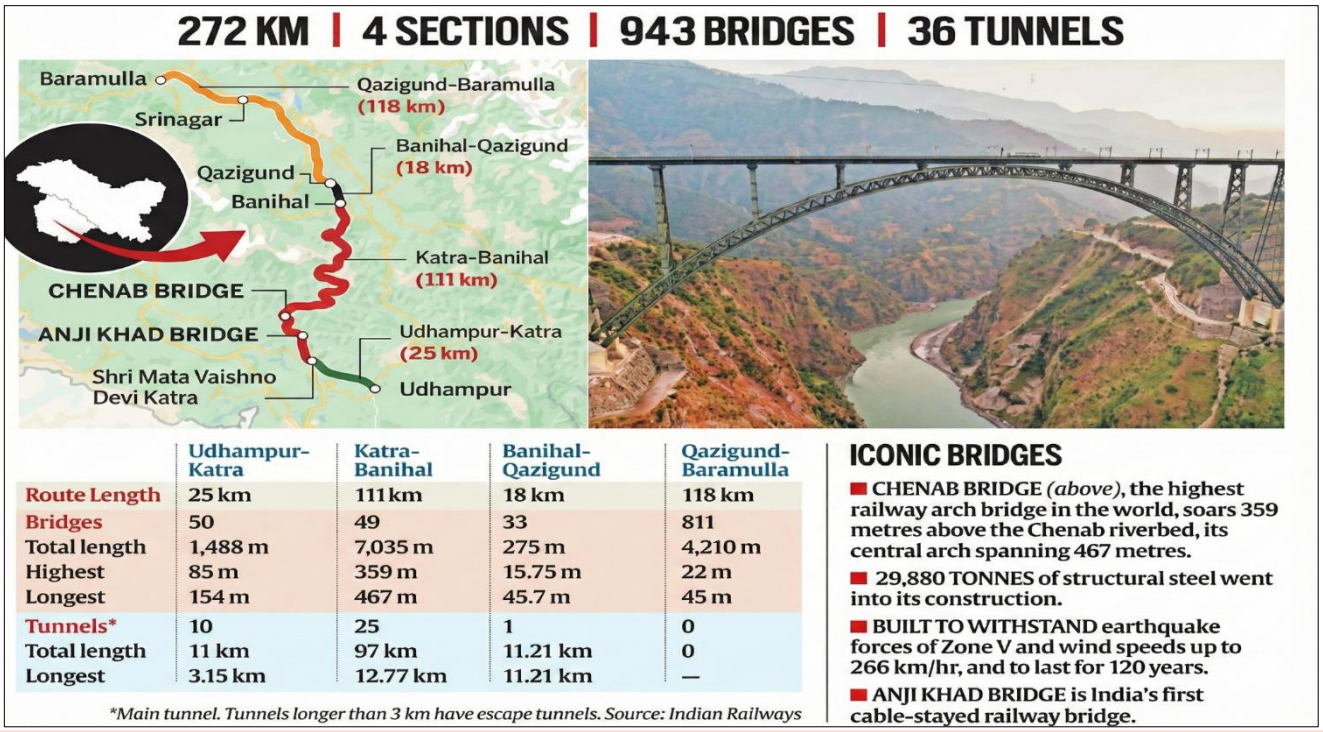
- Conceived in 1994 to link Udhampur, Srinagar, and Baramulla, officially approved in 1995 at ₹2,500 crore, and declared a national project in 2002.
- The rail link, stretching 272 km through the Himalayas, connects Katra (Reasi district) to Srinagar with a travel time of just 3 hours, marking a transformative step for regional integration and accessibility.
- Built at a cost of ₹43,780 crore, it includes: 36 tunnels covering 119 km, and 943 bridges across valleys and mountains.

Chenab Bridge

- The Chenab Rail Bridge is the **world's highest railway arch bridge**, standing **359 metres above the riverbed.** It is 35 metres taller than the Eiffel Tower, highlighting its exceptional height. The bridge **is 1,315 metres long and forms a crucial part of the USBRL.**
- Built with strong steel, it can withstand winds up to 260 km/h and extreme temperatures ranging from –10°C to 40°C. The bridge is designed for a lifespan of 120 years.
- Advanced Tekla software was used to ensure precise design and safe construction in difficult terrain.

Anji Khad Bridge

- **India's first cable-stayed railway bridge**, built over the Anji River, a tributary of the Chenab.
- The bridge rises 331 metres above the riverbed and has a total length of 725 metres.
- It is supported by 96 high-strength cables and an inverted Y-shaped pylon that stands 193 metres high.
- It forms a key component of the USBRL project, ensuring seamless travel between Katra and Reasi throughout the year.



	Udhampur-Katra	Katra-Banihal	Banihal-Qazigund	Qazigund-Baramulla
Route Length	25 km	111 km	18 km	118 km
Bridges	50	49	33	811
Total length	1,488 m	7,035 m	275 m	4,210 m
Highest	85 m	359 m	15.75 m	22 m
Longest	154 m	467 m	45.7 m	45 m
Tunnels*	10	25	1	0
Total length	11 km	97 km	11.21 km	0
Longest	3.15 km	12.77 km	11.21 km	—

*Main tunnel. Tunnels longer than 3 km have escape tunnels. Source: Indian Railways

ICONIC BRIDGES

- CHENAB BRIDGE *(above)*, the highest railway arch bridge in the world, soars 359 metres above the Chenab riverbed, its central arch spanning 467 metres.
- 29,880 TONNES of structural steel went into its construction.
- BUILT TO WITHSTAND earthquake forces of Zone V and wind speeds up to 266 km/hr, and to last for 120 years.
- ANJI KHAD BRIDGE is India's first cable-stayed railway bridge.

SCHEME TO PROMOTE MANUFACTURING OF ELECTRIC PASSENGER CARS IN INDIA

Context: The **Ministry of Heavy Industries (MHI)** has notified guidelines for the Scheme to Promote Manufacturing of Electric Passenger Cars in India (SPMEPCI).

About Scheme to Promote Manufacturing of Electric Passenger Cars in India (SPMEPCI)

- The scheme aims to make India a global hub for electric vehicle (EV) production, attract major investments, and accelerate the transition towards sustainable mobility.
- **Its key goals include:**

- Attracting global EV manufacturers and promoting technology transfer and innovation.
- Building domestic manufacturing capacity through Domestic Value Addition (DVA) norms.
- Supporting economic growth, job creation, and reducing oil imports while tackling air pollution.

Key Features

- **Minimum Investment Requirement:** Applicants (domestic or global) must invest at least ₹4,150 crore (≈ US$480 million) to set up manufacturing facilities in India.
- **Reduced Import Duties:** Approved companies can import up to 8,000 completely built electric four-wheelers (CBU e-4Ws) annually at a 15% customs duty for five years, with each unit priced at a minimum CIF value of US$35,000.
- **Domestic Value Addition (DVA):** The manufacturing facilities shall be made operational within a period of 3 years from the date of issuance of approval letter by MHI and Firms must achieve 25% DVA by the third year and 50% by the fifth year to receive full benefits.
- **Quota and Duty Cap:** Unused import quotas can be carried forward. Total duty foregone is capped at ₹6,484 crore or the company's actual investment, whichever is lower.

Complementary Schemes

- **PM E-DRIVE Scheme (2024):** Promotes consumer EV adoption, supports domestic manufacturing, battery value-chain resilience, and charging infrastructure development.
- **PLI Scheme for Automobiles and Auto Components:** Encourages manufacturing of advanced automotive technologies like electric and hydrogen vehicles, with 50% DVA requirements.
- **PLI Scheme for Advanced Chemistry Cells (ACC):** Boosts domestic battery cell production, essential for India's EV ecosystem.

NATIONAL INVESTMENT AND INFRASTRUCTURE FUND (NIIF)

Context: The Union Minister for Finance and Corporate Affairs chaired the 6th meeting of the Governing Council (GC) of the NIIF in New Delhi.

About National Investment and Infrastructure Fund (NIIF)

- Established in **2015**, NIIF is a **government-backed Category II Alternative Investment Fund (AIF)** providing long-term capital for infrastructure development.
- Its objective is to maximise economic impact through investments in commercially viable greenfield (new) and brownfield (existing or upgraded) projects.
- The Government of India holds 49% equity, while the remaining stake is held by domestic and international investors, including the Abu Dhabi Investment Authority, Temasek, and HDFC Group.
- Often described as India's quasi-sovereign wealth fund, NIIF invests across ports and logistics, real estate, and renewable energy sectors.
- Headquartered in Mumbai, the Fund is managed by National Investment and Infrastructure Fund Limited (NIIFL).



SEZ REFORMS

Context: The Ministry of Commerce and Industry has notified several modifications to the Special Economic Zones (SEZ) Rules, 2006, to address the specialized needs of semiconductor and electronics component manufacturing sectors.

What are Special Economic Zones (SEZs)?

- A SEZ is a **geographically delineated area within a country that has economic laws and regulations different from the rest of the country**, designed to attract foreign and domestic investment, boost exports, and promote economic growth.

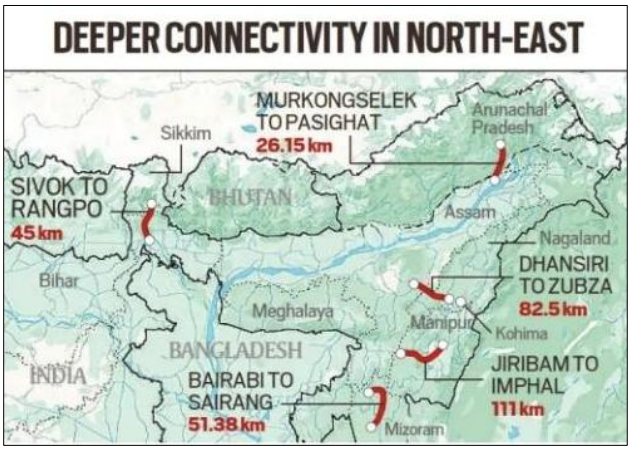
- India was among the first in Asia to adopt the Export Processing Zone (EPZ) model, establishing Asia's first EPZ in Kandla in 1965.
- However, EPZs suffered due to: Multiple layers of control and clearances, Poor infrastructure, Unpredictable fiscal environment.
- To overcome these shortcomings and boost export-led growth, India introduced the Special Economic Zones (SEZs) Policy in April 2000.
- The SEZs are governed by the **SEZ Act, 2005** and **SEZ Rules, 2006.** About 276 SEZs are currently operational in India.

Objectives of the SEZ Policy
- Promote exports of goods and services.
- Attract foreign and domestic investment.
- Generate employment opportunities.
- Enhance infrastructure development.
- Accelerate economic growth.

2025 Modifications to SEZ Rules, 2006
- **Reduced Land Requirement:** Minimum land for SEZs in semiconductor or electronic component manufacturing cut from 50 ha to 10 ha, easing high-tech setup.
- **Land Encumbrance Relaxation:** SEZ land can now be mortgaged or leased to government agencies without needing to be fully encumbrance-free.
- **Free-of-Cost Goods:** Rule 53 now includes free-of-cost imports/exports in Net Foreign Exchange (NFE) calculations as per customs rules.
- **Domestic Sales:** SEZ units, especially in semiconductors and electronics, may sell in the Domestic Tariff Area (DTA) on payment of duties.
- **Textile SEZs:** In Gujarat, minimum area for textile SEZs reduced to 4 hectares, boosting sector growth.

AIZAWL JOINS RAIL NETWORK

Context: Mizoram's capital, Aizawl, is now connected to the national railway network via the Bairabi–Sairang line, making it the fourth North-East state capital with rail connectivity after Guwahati, Agartala, and Itanagar.



About Bairabi–Sairang line
- The 51.38-km Bairabi–Sairang line has a sanctioned cost of ₹5,021.45 crore and is divided into four sections.
- This project is part of the Ministry of Railways' broader initiative to connect all North-East state capitals by rail.

Other Key New Line Projects in the North-East
- **Dimapur–Kohima Line (Dhansiri–Zubza):** 82.5 km from Dhansiri (Assam) to Zubza (15 km from Kohima). Targeted completion: December 2029.
- **Murkongselek–Pasighat Line:** 26.15 km broad-gauge line enhancing Assam-Arunachal Pradesh connectivity. Cost: ₹414.84 crore. Completion: February 2026.
- **Sivok (West Bengal)–Rangpo (Sikkim) Line:** 45 km **connecting Sikkim to the national network for the first time**. Cost: ₹7,876.92 crore. Completion: December 2027.
- **Jiribam–Imphal Line:** 111 km line to integrate Manipur's capital.

ASSET MONETIZATION

Context: The National Highways Authority of India (NHAI) has announced a plan to monetize its assets to unlock value and boost public–private participation in road infrastructure development.

What is Asset monetization?
- Asset monetization refers to the **process of unlocking the economic value of underutilised or unutilised public assets to generate new or alternative sources of revenue**, primarily for the government or public sector entities.
- This is **accomplished by converting assets,** such as roads, airports, pipelines, and other infrastructure, **into forms that can deliver financial returns,** typically through structured partnerships **without outright selling them.**

Models of Asset Monetization in India

- **Project-based Financing:** Enables sectors to raise long-term funds by securitizing user fee receipts (e.g., toll plazas).
- **Toll, Operate & Transfer (TOT):** Private players manage completed assets for toll collection rights by paying an upfront lump sum and handling maintenance.
- **Design-Build-Finance-Operate-Transfer (DBFOT):** Concessionaire designs, builds, finances, and operates the project, transferring it to the government after the contract period.
- **Infrastructure Investment Trusts (InvITs):** SEBI-regulated pooled funds that invest in infrastructure assets, offering investors steady returns and diversification benefits.
- **Real Estate Investment Trusts (REITs)**: Similar to InvITs but focused on income-generating real estate projects.

Institutions Related to Asset Monetization	
NITI Aayog	Nodal agency for National Monetization Pipeline (NMP); develops framework, identifies assets, and coordinates with ministries.
National Land Monetization Corporation (NLMC)	GOI-owned company under Finance Ministry; monetizes surplus land/buildings of CPSEs, manages PSU assets under closure/disinvestment.
Department of Public Enterprises	Oversees asset monetization policy for CPSEs; supports NLMC and supervises transfer of non-core assets from DIPAM.
Core Group of Secretaries on Asset Monetization (CGAM)	High-level body chaired by Cabinet Secretary; monitors implementation and resolves inter-ministerial issues.
Department of Investment and Public Asset Management	Focuses on strategic disinvestment and equity sales; coordinates with DPE and NLMC on asset monetization projects.

Initiatives for Asset Monetization in India

- **National Monetisation Pipeline (NMP):** A structured program targeting around ₹6 lakh crore through leasing of public infrastructure assets between 2022 and 2025.
  - Sectors Covered: Roads, railways, power, oil and gas pipelines, telecom, civil aviation, shipping ports and waterways, mining, stadiums, warehouses, and sports complexes.
- **National Land Monetization Corporation (NLMC):** A fully government-owned entity under the Department of Public Enterprises, responsible for **monetizing surplus and non-core assets** of Central Public-Sector Enterprises (CPSEs).

ATAL MISSION FOR REJUVENATION AND URBAN TRANSFORMATION

Context: The AMRUT scheme has completed a decade since its launch.

About Atal Mission for Rejuvenation and Urban Transformation (AMRUT)	
Ministry	Ministry of Housing and Urban Affairs
Type	Centrally Sponsored Scheme
AMRUT 1.0 (2015)	• **Implemented in 500 cities and towns**, focusing on development of basic urban infrastructure: Water supply, Sewerage and septage management, Storm water drainage, Green spaces and parks, and Non-motorized urban transport. • AMRUT was subsumed into AMRUT 2.0 (Oct 2021), with the urban transport component excluded.
About AMRUT 2.0	
Aim	• Focuses on water supply and sewerage only. • Aims to provide tap water to all households in statutory towns (around 4,700 Urban Local Bodies) and improve sewerage management in 500 AMRUT cities.
Major Components	• **Pey Jal Survekshan**: Challenge-based assessment of cities on service level benchmarks for water supply, reuse, sewerage, and conservation. • **Behaviour Change Communication**: Promotes water conservation and efficient water use. • **Technology Sub-Mission**: Supports start-ups and private enterprises through pilot projects screened by experts.

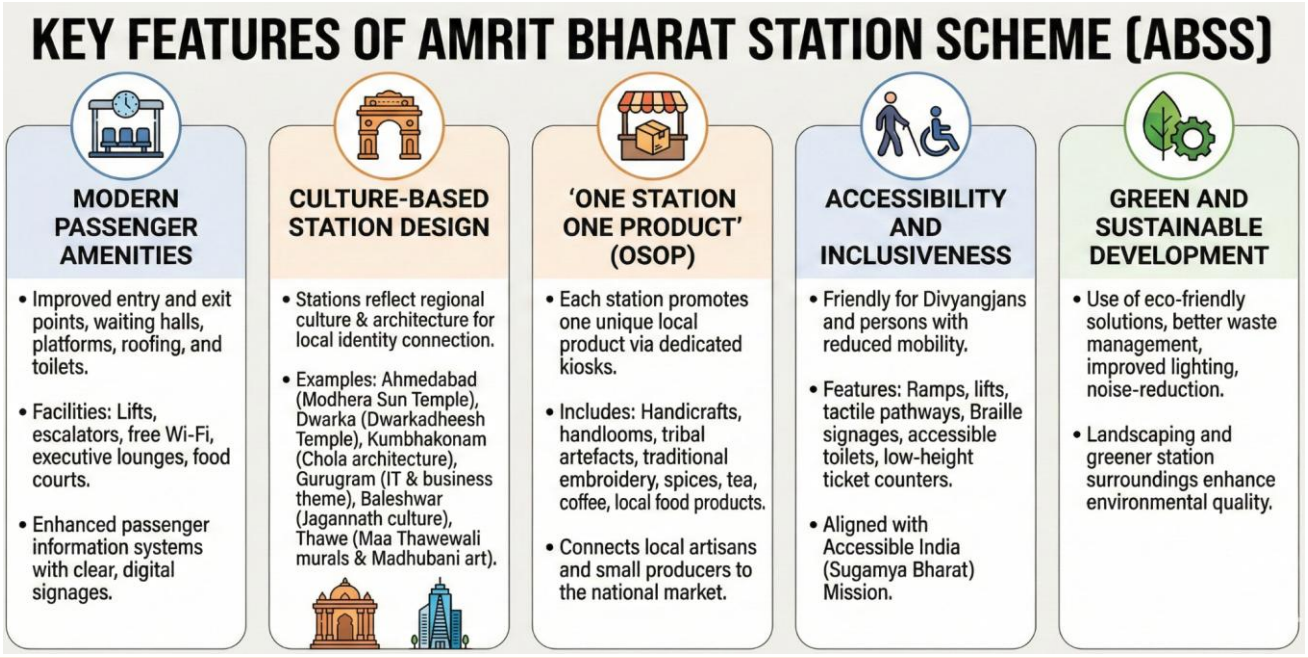
Other Features	• **Public Private Partnership (PPP)**: Mandatory for cities with population >1 million. • **Outcome-Based Funding:** Linked to target achievement roadmaps. • **Community Participation**: Emphasizes women's self-help groups. • **Circular Economy of Water**: Focus on recycling/reusing treated sewage and rejuvenating water bodies.
Monitoring Mechanism	• **National Level**: Apex Committee chaired by Secretary, MoHUA. • **State Level**: State High Powered Steering Committee (SHPSC) chaired by Chief Secretary.

AMRIT BHARAT STATION SCHEME

Context: The Prime Minister inaugurated 103 redeveloped railway stations, spread across 18 states and Union Territories, under the Amrit Bharat Station Scheme (ABSS).

About Amrit Bharat Station Scheme (ABSS)

- To improve passenger comfort, accessibility, and urban integration, **Indian Railways** launched the ABSS as a **long-term programme for comprehensive station redevelopment.**
- It was launched in December 2022 by the Ministry of Railways aimed at redeveloping and modernizing ~1,300 railway stations across India into modern, integrated transport hubs.
- **Objectives**
  - To make railway stations cleaner, safer, and easier to use.
  - To improve the overall travel experience for passengers.
  - To integrate stations with the urban transport system such as buses and metro rail.
  - To promote local culture, heritage, and economy through station design and commerce.
- **Funding:** The scheme is funded primarily through budgetary allocations with some stations developed under Public-Private Partnership (PPP) models, such as Rani Kamalapati Railway Station in Madhya Pradesh.



EMPLOYMENT LINKED INCENTIVE SCHEME

Context: The Union Cabinet approved an Employment-Linked Incentive (ELI) scheme with an allocation of Rs. 99,446 crore to support employment generation.

About the Employment-Linked Incentive (ELI) Scheme

- Announced in the Union Budget 2024–25, the ELI Scheme is part of a ₹2 lakh crore employment and skilling package, aimed at supporting 4.1 crore youth through a mix of direct incentives, skilling initiatives, and expansion of social security.
- Under the Scheme, while the first-time employees will get one month's wage (up to Rs 15,000/-), the employers will be given incentives for a period of two years for generating additional employment.

- It aims to incentivize the creation of more than 3.5 Crore jobs in the country, over a period of 2 years. Out of these, 1.92 Crore beneficiaries will be first timers, entering the workforce.
- The Scheme consists of two parts with Part A focused on first timers and Part B focused on employers:

Component	Part A: Incentives for First-Time Employees	Part B: Incentives for Employers
Target Group	First-time employees registering with EPFO	Employers generating new jobs, , which are registered with EPFO
Goal	Integrate youth into formal workforce Promote savings culture	Promote large-scale, formal job creation, especially in manufacturing
Eligibility	Monthly salary up to ₹1 lakh	Must hire: Minimum 2 new employees (if staff < 50) Minimum 5 new employees (if staff ≥ 50)
Incentive Details	One month's EPF wage (max ₹15,000) in two instalments: After 6 months of service After 12 months + financial literacy course	Monthly incentive per employee: ₹1,000 (salary ≤ ₹10,000) ₹2,000 (₹10,001–₹20,000) ₹3,000 (₹20,001–₹1 lakh)
Additional Features	Part of the incentive will go into a savings/deposit account to promote financial planning	Higher incentive duration for manufacturing: 2 years (all sectors) 4 years (manufacturing)
Expected Impact	Benefits 1.92 crore first-time workers Supports formalisation and social security inclusion	Expected to create around 2.6 crore new jobs
Payment Mechanism	Through Aadhaar Bridge Payment System (ABPS)	Directly into PAN-linked employer accounts

ADEETIE SCHEME

Context: The Ministry of Power has launched the **Assistance in Deploying Energy Efficient Technologies in Industries and Establishments (ADEETIE)** scheme.

About ADEETIE Scheme

- The scheme **aims to support India's transition to a low-carbon economy by helping Micro, Small, and Medium Enterprises (MSMEs)** adopt energy-efficient technologies through financial and technical assistance.
- It will be implemented by the **Bureau of Energy Efficiency (BEE)** over a three-year period (FY 2025–26 to FY 2027–28), with a budgetary outlay of ₹1,000 crore.
- **Phased Implementation:** Phase I: 60 industrial clusters; Phase II: Additional 100 clusters.
- **Sectoral Coverage:** 14 energy-intensive sectors- Brass, Bricks, Ceramics, Chemicals, Fishery, Food Processing, Forging, Foundry, Glass, Leather, Paper, Pharmaceuticals, Steel Re-rolling, and Textiles.
- **Financial Support:** Interest subvention on loans for adopting energy-efficient technologies: 5% for Micro and Small Enterprises, 3% for Medium Enterprises.
- **Comprehensive Support:** End-to-end assistance including Investment Grade Energy Audits (IGEA), Detailed Project Reports (DPRs), and Monitoring & Verification (M&V) after implementation.

About Bureau of Energy Efficiency (BEE)

- A statutory body established in 2002 under the Energy Conservation Act, 2001 under MoPower.
- Its mission is to formulate policies and strategies that promote energy conservation and efficiency by encouraging self-regulation and market-based mechanisms, thereby reducing the energy intensity of the Indian economy.
- It has a two-tier system with the BEE as the central nodal agency and State Designated Agencies (SDAs) as the state-level nodal agencies.

SPREE 2025

Context: The Employees' State Insurance Corporation (ESIC) has approved the re-launch of SPREE 2025 to expand Employees' State Insurance (ESI) coverage across India.

About SPREE: Scheme for Promotion of Registration of Employers and Employees

- SPREE is a special initiative by the Employees State Insurance Corporation (ESIC), offering **a one-time window** from 1st July to 31st December 2025 **for employers to register their factory/establishments and all eligible employees without any demand of dues for the past period.**
- The scheme **promotes universal social security coverage**, **extends protection to temporary, casual, and contract workers** across establishments, and supports the goal of ease of doing business.
- Originally launched in 2016, the scheme facilitated the registration of over 88,000 employers and 1.02 crore employees under the ESI scheme.
- Employers can register themselves and their workers through the ESIC portal, Shram Suvidha Portal, and MCA portal.
- No inspection or demand for past records will be made for the pre-registration period.

About Employees' State Insurance (ESI) Scheme

- The ESI scheme is a **comprehensive social security program** that provides medical and cash benefits to employees and their families in the event of sickness, maternity, disability, or death due to employment injury.
- The scheme is managed by the Employees' State Insurance Corporation (ESIC) under the Ministry of Labour & Employment.
- **Coverage:**
  - Mandatory for factories and specified establishments employing 10 or more persons, including shops, hotels, restaurants, cinemas, educational and medical institutions, road transport, and newspaper establishments.
  - Employees earning up to ₹21,000 per month (or ₹25,000 for persons with disabilities) are eligible,
  - Coverage extends to both the employee and their dependents.
- **Contribution:** The contribution rates are 0.75% of wages by employees and 3.25% by employers**.**
- **Benefits:** Insured persons receive medical care for themselves and their families, along with cash benefits in cases of sickness, maternity, employment-related injury, or death.

About the Employees' State Insurance Corporation (ESIC)

- **Established**: In 1952 under the Employees' State Insurance Act, 1948.
- **Status**: A statutory organisation under the Ministry of Labour and Employment.
- **Healthcare Facilities:** ESIC can establish hospitals and dispensaries either independently or in collaboration with State Governments.

YAKTEN - DIGITAL NOMAD VILLAGE

Context: Yakten, a village in Sikkim's Pakyong district, has been officially declared India's first Digital Nomad Village.

- A digital nomad is a person who uses technology to work remotely, earning a living online while moving between different locations of their choice.
- The initiative is a collaboration between the district administration and the NGO Sarvahitey under the Nomad Sikkim project.

About the Initiative

- The project aims to transform strategic locations in Sikkim into year-round hubs for digital professionals from India and abroad.
- It seeks to ensure sustainable income opportunities for local homestay owners, promoting community-based tourism and inclusive development.
- Designed for professionals seeking a balance between work and peaceful living, the village provides a serene and eco-friendly environment ideal for remote work.

- **Infrastructure Highlights:** Equipped with high-speed Wi-Fi networks for reliable connectivity. Encourages eco-friendly practices and promotes a sustainable work-living model in the Himalayan region.

Sikkim's Achievements

- India's first fully organic state (2016).
- First state to introduce organic aquaculture.
- First state to achieve 100% Open Defecation Free (ODF) status (2016).

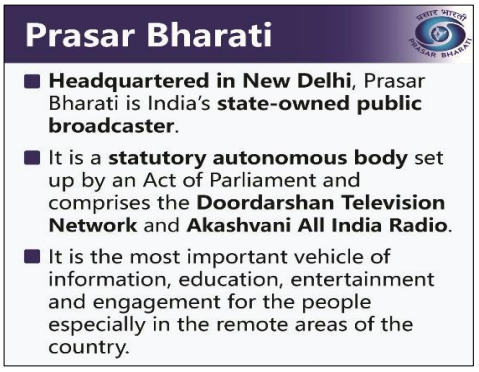
BIND SCHEME

Context: The Government of India has announced the establishment of a new Akashvani Kendra in Ujjain, supported under the Broadcasting Infrastructure and Network Development (BIND) scheme.

- The new Kendra aims to strengthen regional broadcasting, preserve cultural heritage, and provide timely information to the people of Madhya Pradesh.

About the BIND Scheme

- **Nodal Ministry:** Ministry of Information and Broadcasting.
- **Objective:** To support the infrastructure development of Prasar Bharati, including All India Radio (AIR) and Doordarshan (DD).
- The scheme provides financial assistance to Prasar Bharati for:
  - Expansion and upgradation of broadcasting infrastructure.
  - Content development for diverse audiences.
  - Civil works related to broadcasting facilities.
- **Key Features**
  - **Expansion of AIR FM coverage** from 59% to 66% of India's geographical area and from 68% to 80% of the population.
  - Focus on developing high-quality content for both domestic and international audiences.
  - Upgradation of the DTH platform to accommodate more channels and improve reach.
  - Free distribution of over 8 lakh DD Free Dish Set-Top Boxes (STBs) to households in remote, tribal, Left-Wing Extremist, and border areas to ensure access to public broadcasting services.



INDIAN RAILWAYS TEST FIRST HYDROGEN POWERED COACH

Context: The Indian Railways (IR) has successfully tested its first hydrogen-powered coach at the Integral Coach Factory (ICF) in Chennai.

About Hydrogen for Heritage Initiative

- The hydrogen coach forms part of the Hydrogen for Heritage Initiative, under which Indian Railways plans to deploy 35 hydrogen-powered trains.
- These trains will primarily operate on heritage and hill routes, promoting sustainable tourism and reducing environmental impact.
- The project aligns with India's broader mission to cut greenhouse gas emissions and increase renewable energy use in the transport sector.
- The adoption of hydrogen as a clean fuel will significantly reduce dependence on fossil fuels.

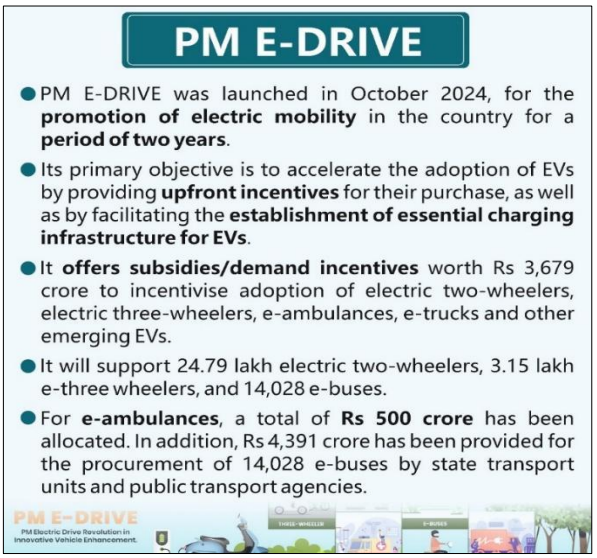
Pilot Project Details

- Indian Railways has initiated a pilot project to retrofit an existing Diesel Electric Multiple Unit (DEMU) with a hydrogen fuel cell.
- The project is being implemented at a cost of ₹111.83 crore and is planned to run on the **Jind–Sonipat section of Northern Railway.**
- **Major Components:**
  1. **Conversion of Diesel Coaches:** Two conventional 1600 HP diesel power cars are being converted into hydrogen fuel cell-powered traction systems.
  2. **Hydrogen Infrastructure:** A hydrogen storage and fuelling facility is being established at Jind, Haryana.

INCENTIVE SCHEME FOR E-TRUCK

Context: The Ministry of Heavy Industries (MHI) has launched a new Incentive Scheme for Electric Trucks under the PM E-DRIVE to promote clean and sustainable freight transportation in India.

About Incentive Scheme for e-Truck



- The scheme aims to provide direct financial support for electric trucks, marking a major step toward decarbonising the freight sector and promoting efficient, low-emission mobility.
- **Budgetary Allocation:** ₹500 crore has been earmarked within the overall ₹10,900 crore outlay of the PM E-DRIVE Scheme.
- **Incentive Support:** A maximum incentive of ₹9.6 lakh per vehicle will be provided. The scheme aims to support the deployment of around 5,600 e-trucks nationwide.
- **Special Focus:** A dedicated provision for 1,100 e-trucks in Delhi, at a cost of ₹100 crore, to combat the capital's severe air pollution.
- **Beneficiary Sectors:** Cement, steel, ports, and logistics sectors are expected to benefit the most.

Eligibility and Implementation

- **Vehicle Categories Covered:**
  - N2 category: Trucks with a gross vehicle weight (GVW) between 3.5–12 tonnes.
  - N3 category: Trucks weighing 12–55 tonnes.
- **Nature of Incentive:** Offered as an upfront reduction in the purchase price, later reimbursed to Original Equipment Manufacturers (OEMs).
- **Warranty Requirements:**
  - Battery: Minimum warranty of 5 years or 5 lakh kilometres.
  - Vehicle and Motor: Minimum warranty of 5 years or 2.5 lakh kilometres.
- **Scrappage Condition:** Mandatory scrapping of old, polluting diesel trucks to avail the incentive

SANCHAR MITRA SCHEME

Context: The Department of Telecommunications (DoT) has expanded the Sanchar Mitra Scheme nationwide, transforming it into a full-fledged program aimed at empowering youth as digital ambassadors.

About the Sanchar Mitra Scheme:

- Initially piloted in select institutions, the programme now **engages student volunteers, known as Sanchar Mitras**, **to promote awareness on digital safety, cyber fraud prevention, EMF (Electromagnetic Field) radiation, and responsible mobile usage.**
- Students pursuing courses in telecom, electronics, computer science, and cyber security will be nominated through local DoT offices.

Training and Exposure:

- Volunteers will undergo structured training through the **National Communications Academy–Technology (NCA-T) and DoT's Media Wing.**
- The training will include exposure to emerging technologies such as 5G, 6G, Artificial Intelligence (AI), and cyber security practices.

Objectives:

- To engage student volunteers as digital ambassadors to bridge the communication gap between citizens and the telecom ecosystem.
- T**o develop a digitally aware, skilled, and research-oriented youth workforce.**
- Sanchar Mitras will conduct community-level awareness campaigns, collaborate with NGOs, and act as **catalysts for informed digital behaviour.**

TRADE CONNECT EPLATFORM

Context: To enhance MSME participation in global trade, the Directorate General of Foreign Trade (DGFT) showcased its Trade Connect ePlatform at two major B2B trade exhibitions (the India International Garment Fair (IIGF) and the Toy Biz International B2B Expo 2025.)

About the Trade Connect ePlatform

- The Trade Connect e-Platform is a one-stop digital solution that provides exporters with near real-time access to critical trade information.
- It functions as a digital gateway for international trade, bringing together Indian Missions, Export Promotion Councils, Commodity Boards, and officials from DGFT and the Department of Commerce to provide integrated and coordinated support to Indian exporters.
- The platform is an initiative of the DGFT under the Ministry of Commerce and Industry.

Key Features:

- Provides updated information on tariffs, certifications, trade events, e-commerce opportunities, and international buyers in a simplified format tailored for MSMEs.
- Offers interactive multilingual courses introducing MSMEs to export processes and documentation.
- Functions as a single digital platform for the issuance and verification of preferential and non-preferential Certificates of Origin, ensuring a secure, electronic, and paperless process.

DIGITAL INDIA COMPLETES 10 YEARS

Context: Govt of India is celebrating the 10th year of the Digital India Mission launched in 2015.

About Digital India Mission	
Nodal Ministry	Ministry of Electronics and Information Technology (MeitY)
Nature	Umbrella programme integrating multiple e-Governance initiatives across Ministries and Departments.
Purpose	To transform India into a digitally empowered society and knowledge economy.
Implementation Model	Encourages Public-Private Partnerships (PPP) wherever feasible for e-Governance projects.
Objectives	• Promote digital access, inclusion, and empowerment. • Bridge the digital divide across regions and communities. • Ensure government services are available electronically. • Enable participation in a knowledge-based economy.
Vision Areas	• **Digital Infrastructure as a Utility to Every Citizen:** Universal digital identity, mobile connectivity, and secure cloud services. • **Governance & Services on Demand:** Seamless integration of services across departments. • **Digital Empowerment of Citizens:** Access to digital literacy and content in Indian languages.
Nine Pillars of Digital India	1. Broadband Highways 2. Universal Access to Mobile Connectivity 3. Public Internet Access Programme 4. e-Governance – Reforming Government through Technology 5. e-Kranti – Electronic Delivery of Services 6. Information for All 7. Electronics Manufacturing 8. IT for Jobs 9. Early Harvest Programmes

INDIA ENERGY STACK

Context: The power ministry is working with discoms, regulators, and technology companies to roll out the India Energy Stack blueprint, which will ultimately be implemented nationwide.

About India Energy Stack (IES)

- The IES is a **comprehensive digital public infrastructure initiative** of the Ministry of Power, **aimed at modernising India's power sector through a standardised, modular, and open-source digital platform.**

- Inspired by Aadhaar and UPI, it seeks to create a **seamless and interoperable framework connecting all stakeholders in the power ecosystem,** including producers, grid operators, distributors, consumers, regulators, and market participants.
- Envisioned as a **secure digital backbone for the entire energy value chain**, the project is being **implemented with REC Limited as the nodal agency** and FSR Global as the knowledge partner. **It is scheduled for completion by July 2026.**

Key Features & Objectives

- **Digital IDs:** Assigns unique digital identities to all energy assets (e.g., solar panels, EV chargers, batteries) and consumers for accurate tracking and carbon trading.
- **Open Data Framework**: Uses open APIs and data-sharing protocols for transparency, efficiency, and innovation across legacy systems.
- **Utility Intelligence Platform (UIP):** Provides real-time analytics, grid management, simulation tools for DISCOMs, consumer services like green tariffs and grievance redressal.
- **Innovation Support**: Encourages startups, energy fintechs, and virtual power plants through open data access and regulatory sandboxes.
- **Scalable Design:** Features a plug-and-play architecture for renewable integration, cross-utility collaboration, and data-driven decisions.
- **Implementation Plan:** Begins with a 12-month pilot in select utilities (Mumbai, Delhi), followed by national rollout and capacity-building initiatives.

RESEARCH DEVELOPMENT AND INNOVATION (RDI) SCHEME

Context: The Department of Science and Technology (DST) has launched the Research, Development, and Innovation (RDI) Scheme, following approval by the Cabinet on July 1, 2025.

About Research, Development, and Innovation (RDI) Scheme

- RDI initiative seeks to **boost private sector investment in high-impact research and development,** strengthen India's technological capabilities, and promote self-reliance in line with the Atmanirbhar Bharat vision.

Key Objectives

- **Promote Private Sector R&D:** Encourage industries and startups to invest in advanced research and form partnerships with academia and government.
- **Focus on Strategic Technologies:** Prioritize areas like energy transition, climate action, deep tech (AI, quantum, robotics, space), biotechnology, and the digital economy.
- **Strengthen Self-Reliance:** Support indigenous technology development in critical sectors to advance Atmanirbhar Bharat.
- **Ensure Flexibility:** Allow funding for emerging or essential sectors serving the national and public interest.

Funding

- The scheme provides long-term financing or refinancing with low or zero interest rates to incentivize private sector R&D.
- Financing modes include long-term loans, equity infusion (especially for startups), and contributions to the Deep-Tech Fund of Funds.
- *Grant financing and short-term loans are not included under this scheme.*
- Up to 50% of assessed project costs for transformative RDI projects can be financed.

Implementation

- The scheme is operated through a **two-tier fund structure**:
  - **A Special Purpose Fund under the Anusandhan National Research Foundation (ANRF)** as the primary custodian
  - **Second-level fund managers (SLFM)** such as Alternate Investment Funds (AIFs), Development Finance Institutions (DFIs), and focused research organizations implementing the financing.

About Anusandhan National Research Foundation (ANRF)

- ANRF is a **statutory apex body** established under the ANRF Act, 2023, **replacing the earlier Science and Engineering Research Board (SERB)**.
- ANRF is administered by the **Department of Science and Technology (DST).**

- It is tasked with providing high-level strategic oversight, funding, and direction for research, development, and innovation across India's universities, colleges, research institutions, and R&D laboratories.

INTELLECTUAL PROPERTY RIGHTS IN INDIA

Context: India's Intellectual Property (IP) filings have increased by 44% over the past five years, driven by a 380% surge in Geographical Indication (GI) registrations.

About Intellectual Property Rights (IPR)

- Intellectual Property Rights are special legal rights granted to individuals or organisations for their original creations of the mind, such as inventions, artistic works, or brand symbols.
- These rights allow creators to control how their creations are used, usually for a fixed period of time.

Administrative Structure:

- **Controller General of Patents, Designs, and Trademarks (CGPDTM)** oversees most IP categories under the Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry.
- **Ministry of Electronics and Information Technology (MeitY)** manages laws related to **semiconductor layout designs.**
- **Ministry of Agriculture and Farmers' Welfare** administers laws concerning **plant varieties.**

IPR Category	Legal Framework	Key Coverage	Duration of Protection
Industrial Designs	Designs Act, 2000 & Designs (Amendment) Rules, 2021	New or original designs with visual appeal	10 years + 5-year extension
Geographical Indications (GI)	Geographical Indications of Goods (Registration and Protection) Act, 1999 & Rules 2002 (amended 2020)	Agricultural, natural, or manufactured goods with distinct geographical origin	10 years; renewable for another 10 years
Copyrights	Copyright Act, 1957 & Rules, 2013 (amended 2021)	Literary, musical, artistic, and audiovisual works	Lifetime of author + 60 years (others vary: performers – 50 years)
Patents	Patents Act, 1970 & Patent Rules, 2003 (amended till 2021)	Novel inventions with industrial use	20 years
Plant Varieties	Protection of Plant Varieties and Farmers' Rights Act (PPVFRA), 2001	New and traditional plant varieties	6+9 years for field crops (up to 18 years for trees and vines)
Trademarks	Trade Marks Act, 1999 & Rules, 2017	Brand names, logos, symbols	10 years; renewable indefinitely on fee payment
Trade Secrets	Common Law (Contract Act, IP laws)	Confidential business information	Valid till secrecy maintained
Semiconductor Layout Designs	Semiconductor Integrated Circuits Layout-Design Act, 2000 & Rules, 2001	Layouts of transistors and circuit connections	10 years

Key International Efforts

- **World Intellectual Property Organization (WIPO):** UN agency (est. 1967) that promotes global IP protection, manages 26 treaties on patents, copyrights, and trademarks, and harmonizes IP laws worldwide.
- **World Trade Organization (WTO):** Oversees international trade and enforces IP standards through the TRIPS Agreement, which sets minimum global rules for IP protection and enforcement.
- **TRIPS Agreement:** It is the first comprehensive inclusion of intellectual property law in global trade governance. It **establishes baseline rules for areas such as patents, copyrights, trademarks, geographical indications, and trade secrets**, ensuring that enforcement and dispute settlement fall under the WTO's authority.

GLOBAL CAPABILITY CENTRE (GCC)

Context: India's Finance Minister has urged closer collaboration between industry and government to expand the network of Global Capability Centres (GCCs).

About Global Capability Centres (GCCs)

- Also known as Global In-House Centres (GICs) or Captive Units, GCCs are **offshore facilities set up by multinational companies to deliver a range of services to their parent organizations.**
- These services typically include **IT operations, research and development (R&D),** customer support, and other business process functions.
- GCCs function as an **integral part of the global corporate structure**, enabling companies to optimize efficiency, innovation, and cost management.
- Currently, **India hosts about 1,700, ~50% of all GCCs globally,** contributing around $68 billion in gross value added (GVA) and employing 2.16 million professionals.

FIRST AUCTION OF GREEN AMMONIA

Context: Under the National Green Hydrogen Mission (NGHM), the Solar Energy Corporation of India (SECI) has conducted its first-ever auction to procure green ammonia under SIGHT Scheme.

What is Green Ammonia?

- It is ammonia (NH_3) **produced using renewable energy instead of fossil fuels.**
- **Traditionally, ammonia is produced through the Haber–Bosch process**, which relies on natural gas or coal and releases significant amounts of carbon dioxide (CO_2).
- Green ammonia, by contrast, is made by combining: **Green hydrogen** (produced by electrolysis of water using solar or wind energy) and **Nitrogen** extracted from the air
- This process **avoids CO_2 emissions** and makes the product environmentally sustainable.

Applications of Green Ammonia

- **Fertilizers:** A cleaner alternative to conventional ammonia-based fertilizers.
- **Energy carrier:** Acts as a stable liquid carrier for green hydrogen, making transportation easier than gaseous hydrogen.
- **Power generation:** Can be used directly in gas turbines or in fuel cells to produce electricity.
- **Sustainable fuel:** Holds promise as a carbon-neutral fuel, especially for the shipping industry and other hard-to-abate sectors.

About the National Green Hydrogen Mission (NGHM)

- Launched in 2023 with an outlay of ₹19,744 crore, the NGHM aims to position India as a global hub for the production, usage, and export of green hydrogen and its derivatives.
- The mission will be implemented in two phases: Phase I (2022-23 to 2025-26) and Phase II (2026-27 to 2029-30).

Key components include:

- **Facilitating demand creation** through exports and domestic use.
- **Strategic Interventions for Green Hydrogen Transition (SIGHT) program**, which includes incentives for **manufacturing electrolysers** and **producing green hydrogen.**
- **Development of Green Hydrogen Hubs**, including three ports: Deendayal (**Kandla**, Gujarat), **Paradip** (Odisha), and **V.O. Chidambaranar** (Tuticorin, Tamil Nadu).

Implementation of NGHM

- An **Empowered Group (EG) chaired by the Cabinet Secretary** and comprising Secretaries of Government of India and experts from the industry **will guide the Mission.**
- An **Advisory Group chaired by the Principal Scientific Adviser (PSA)** and comprising experts will advise the EG on scientific and technology matters
- A **Mission Secretariat headquartered in the Ministry of New And Renewable Energy (MNRE)** will undertake the programme implementation.

First Green Hydrogen Plant of India at Kandla

- The Deendayal Port Authority has commissioned the country's first 1 MW green hydrogen plant at Kandla. The facility is fully indigenous and marks the first phase of a larger 10 MW project planned for the port.

About Kandla (Deendayal) Port

- Commonly known as Deendayal Port, it is located in the Kutch district of Gujarat. It is one of India's 12 major ports and lies along Kandla Creek, near the Gulf of Kutch.
- Built in the 1950s, it served as the principal seaport for western India.
- In 2017, it was renamed Deendayal Port under the Indian Ports Act, 1908.
- The port's facilities are spread across three locations along the Gulf of Kutch: Kandla Creek, Tuna Tekra, Vadinar

PROJECT AAROHAN

Context: The National Highways Authority of India (NHAI) has launched Project Aarohan to provide scholarships and mentorship to the children of toll plaza employees.

- The initiative aims to remove financial barriers, reduce socio-economic inequalities, and ensure equal access to quality education for students from economically weaker sections, including those belonging to SC, ST, OBC, and minority communities.
- It plans to support 500 students from Class 11 to the final year of graduation, each receiving an annual scholarship of ₹12,000 during FY 2025–26.
- Additionally, 50 meritorious students aspiring for postgraduate or higher studies will receive scholarships of ₹50,000 each.

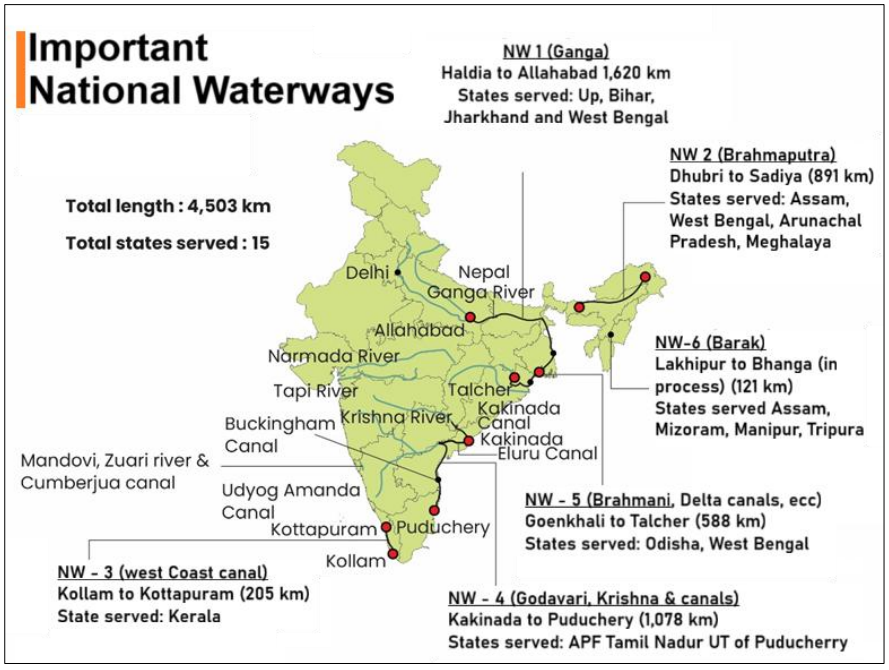
NATIONAL WATERWAY 57 OPERATIONALISED

Context: In a major step towards reviving Assam's river-based trade and promoting sustainable logistics, **National Waterway 57 (River Kopili)** has been operationalised.

- The Inland Waterways Authority of India (IWAI) has been actively working to unlock the navigational potential of rivers across the Northeast.

About Inland Waterways Authority of India

- It is a statutory body established in 1986 under the Inland Waterways Authority of India Act (IWAI), 1985.
- **Purpose**: The Authority primarily undertakes projects for development and maintenance of IWT infrastructure on national waterways through grants received from the Ministry of Ports, Shipping and Waterways.
- **Headquarters:** Noida, Uttar Pradesh
- **Nodal Ministry**: Ministry of Ports, Shipping and Waterways.
- The **Inland Waterways Development Council (IWDC**) is the apex body for policy deliberation on the inland waterways network in the country, **chaired by the Union Shipping Minister.**



- India has about 14,500 km of navigable waterways which consist of rivers, canals, backwaters, creeks, etc.

INDIA'S 1ST SUSTAINABLE AVIATION FUEL PLANT

Context: Indian Oil Corporation (IOC), the country's largest oil refiner and fuel retailer, is set to begin commercial-scale production of Sustainable Aviation Fuel (SAF). IOC recently became the first company in India to receive the **ISCC CORSIA certification** for producing SAF at its Panipat refinery.

What is Sustainable Aviation Fuel (SAF)?

- SAF, also called aviation biofuel, is made from sustainable feedstocks and has a chemical makeup similar to traditional aviation turbine fuel (ATF) derived from crude oil.
- It is a "drop-in fuel", meaning it can be blended with ATF and used in existing aircraft engines without any modifications.

Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)

- CORSIA is a **global market-based program** developed by the **International Civil Aviation Organization (ICAO) to address and reduce carbon dioxide (CO2) emissions from international aviation**.
- Its primary goal is to stabilize net CO2 emissions from **international flights** at 2019 levels, essentially achieving carbon-neutral growth from 2021 onwards.
- The scheme applies to flights between participating ICAO member states, with a phased implementation that becomes mandatory for most international flights by 2027.

Why is it needed?

- When aircraft fly, they release water vapour, soot, sulfur aerosols, and nitrogen oxides (NO_x). These substances help form **contrails** i.e. thin clouds that appear behind airplanes when water vapour condenses and freezes around tiny particles in the exhaust.
- These emissions and contrails add extra warming effects to the atmosphere, contributing to climate change.

Sources of SAF

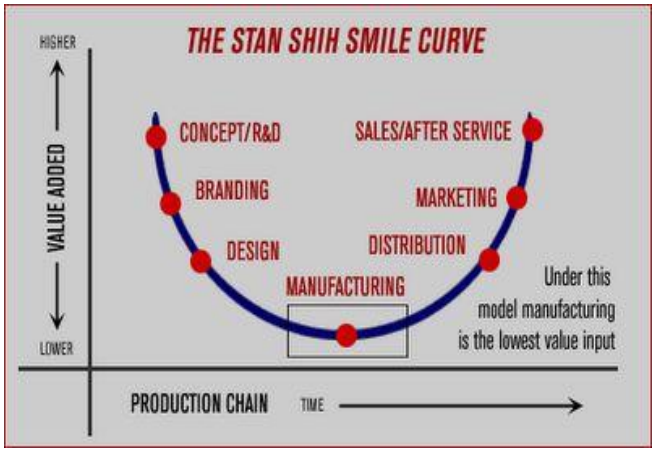
- SAF can be produced from a wide range of materials, such as:
  - **Oils and fats:** used cooking oil (UCO), oil-rich plant seeds, algae oils, animal fats
  - **Municipal Solid Waste (MSW):** everyday waste collected in cities
  - **Agricultural and forestry residues:** wood waste, sugarcane bagasse, corn stover, husks, straw, sugars, and starches

PRODUCT NATION

Context: A recent report by the Standing Committee on Finance has outlined measures to help India deal with rising global trade uncertainties and increasing protectionism.

What Is a Product Nation?

- A product nation is a **country that manufactures and exports a significant volume of high-value good**s, positioning itself as a net producer instead of a net importer.
- **Purpose:** The goal is to shift from being mainly a consumer or assembler to becoming a creator of globally competitive products.
- **Smile Curve:** Popularised by Stan Shih, the Smile Curve illustrates that the highest value in a product's lifecycle lies in: Research and development (R&D), Design, Branding, Distribution, rather than pure manufacturing.



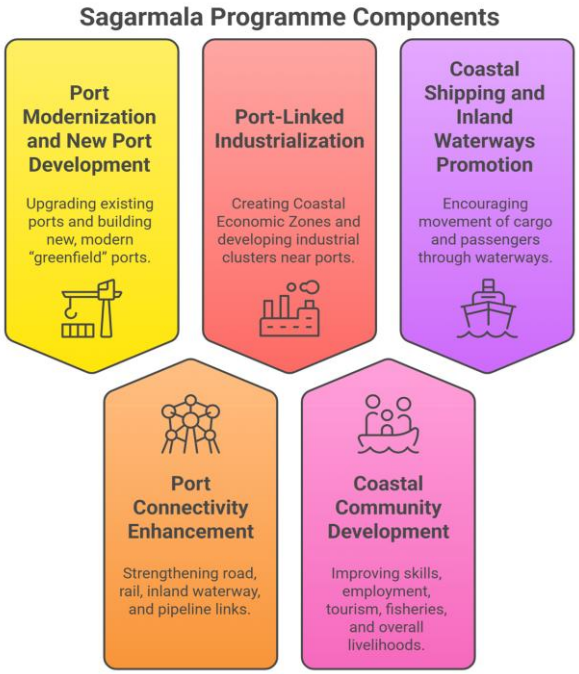
- **Example:** Apple (valued at around USD 3 trillion) captures far more value than Foxconn (around USD 85 billion), which mainly assembles Apple products.
- This highlights the importance of investing in the entire lifecycle of a product—beyond just assembly.

SAGARMALA PROGRAMME

Context: The Sagarmala Programme has helped India achieve major progress in coastal shipping, with a 118% increase in coastal cargo movement in the past decade.

About Sagarmala

- Sagarmala is a **flagship port-led development programme** of the **Ministry of Ports, Shipping and Waterways,** launched in **2015** to reduce logistics costs and harness India's long coastline and waterways for economic growth.
- It aims to modernize ports, improve connectivity, promote coastal industrialization and community development, and thereby boost trade competitiveness and job creation.



Key Objectives

- Lower logistics costs for both Exports-Imports (EXIM) and domestic trade
- Expand the use of inland and coastal waterways as part of multimodal transport
- Promote job creation and skill development in maritime and port-related sectors

Institutional and Funding Framework

- Apex policy body is **National Sagarmala Apex Committee (NSAC)** chaired by the **Union Minister of Ports, Shipping and Waterways**, with State-level committees for coordination.
- **Implementation is decentralized** across central ministries, major ports, state governments, IWAI, Indian Railways, NHAI and others, with **Sagarmala Development Company Limited (SDCL)** formed in 2016 to take equity in project SPVs.
- **Funding** mix includes **public–private partnership (PPP)**, internal and extra-budgetary resources of MoPSW, grants-in-aid for socially important but less remunerative projects, and equity support via SDCL.

A "Sagarmala 2.0" phase announced in 2025 **emphasizes shipbuilding and repair,** further port modernization, green and digital ports, and expanded coastal community and cruise tourism initiatives, aligned with the Viksit Bharat and Atmanirbhar Bharat 2047 vision.

COMPETITION COMMISSION OF INDIA

Context: Recently, the Standing Committee on Finance presented a report titled Evolving Role of Competition Commission of India in the Economy, particularly the Digital Landscape in Parliament.

About Competition Commission of India (CCI) (HQ: New Delhi)

- CCI is the **principal national competition regulator in India**, established **under the Competition Act, 2002**.
- It functions as a **statutory body** under the **Ministry of Corporate Affairs** and is **responsible for enforcing competition law** to promote fair and healthy competition, protect consumer interests, and ensure freedom of trade in Indian markets.
- **Composition: Chairperson** and two to **six Members** to be appointed by the Central Government.

Functions and Role

- To eliminate practices having adverse effects on competition
- To promote and sustain competition
- To protect the interests of consumers
- To ensure freedom of trade in the markets of India
- Giving expert opinions on competition-related issues when requested by statutory authorities.

SAGARMALA FINANCE CORPORATION LIMITED

Context: The Ministry of Ports, Shipping & Waterways (MoPSW) inaugurated SMFCL, India's first NBFC dedicated to the maritime sector.

About Sagarmala Finance Corporation Limited

- Previously Sagarmala Development Company Limited (SDCL), SMFCL aims to bridge financing gaps and drive economic growth in maritime infrastructure.
- SFCL is a Mini Ratna Category-I Central Public Sector Enterprise under the Ministry of Ports, Shipping and Waterways (MoPSW).
- It will provide short, medium, and long-term funding to port authorities, shipping companies, MSMEs, startups, and maritime educational institutions.
- Strategic sectors supported include shipbuilding, renewable energy, cruise tourism, and maritime education, advancing India's goal to become a global maritime hub.
- SMFCL is poised to enable projects fostering sustainable development, innovation, and efficient national logistics.

RUDRASTRA - INDIA'S LONGEST FREIGHT TRAIN

Context: On August 7, Indian Railways successfully operated "Rudrastra," a long freight train created by combining six empty BOXN rakes, from Ganjkhwaja station under the Pandit Deen Dayal Upadhyay (DDU) Division.

- The train measures approximately 4.5 km in length with 345 wagons, making it the longest freight train ever operated by Indian Railways. In all, seven engines were used.
- This initiative by the DDU Division of the East Central Railway (ECR) aims to enhance freight-handling capacity and improve efficiency in goods transportation.

SHRAM SHAKTI NITI 2025

Context: The Ministry of Labour and Employment has released the draft **National Labour & Employment Policy — Shram Shakti Niti 2025**, aligned with India's Viksit Bharat @2047 vision.



INDIA MARITIME WEEK 2025

Context: Prime Minister Narendra Modi addressed the Maritime Leaders Conclave and chaired the Global Maritime CEO Forum during India Maritime Week 2025, held in Mumbai.

India Maritime Week 2025 — A Global Maritime Showcase

- India Maritime Week (IMW) 2025 is the **country's flagship international maritime event,** organised under the theme "*Uniting Oceans, One Maritime Vision."*
- The 2025 edition represents the fourth iteration of the summit and stands as India's premier platform for global maritime engagement.
- IMW 2025 **aims to present India's long-term maritime strategy,** positioning the country as a future global maritime hub and a leader in the **Blue Economy.**
- It is hosted by the Ministry of Ports, Shipping and Waterways and organized by the Indian Ports Association (IPA).
- The event showcases India's progress in modernising maritime infrastructure, enhancing port capacity, strengthening shipping networks, and supporting shipbuilding and maritime services.

LEAPS 2025

Context: The Ministry of Commerce and Industry has launched the LEAPS 2025 to benchmark and reward excellence in India's logistics sector.

About Logistics Excellence, Advancement, and Performance Shield (LEAPS)

- LEAPS is a flagship initiative of the Department for Promotion of Industry and Internal Trade (DPIIT).
- It builds on the vision of PM GatiShakti and the National Logistics Policy (2022) to promote efficiency, competitiveness, and sustainability in logistics.

Key Features

- Covers a wide spectrum of logistics stakeholders: air, road, sea, and rail freight operators; warehousing; multimodal transporters; MSMEs; startups; and academic institutions.
- Emphasises ESG (Environmental, Social, Governance) standards and green logistics practices.
- Aims to drive innovation and create a future-ready logistics ecosystem supporting Make in India, Atmanirbhar Bharat, and Viksit Bharat @2047.

STATE MINING READINESS INDEX

Context: The Ministry of Mines released the State Mining Readiness Index and State rankings to promote reforms in the mining sector.

About State Mining Readiness Index

- The index assesses how well States are prepared to facilitate mining activities, **especially for non-coal minerals** such as lithium, rare earth elements, bauxite, and iron ore *(coal and lignite are outside its scope).*
- Its objective is to benchmark State performance, foster competitive federalism, and push mining sector reforms and sustainable resource management for non-coal minerals.
- **Parameters Used:** Performance in mineral block auctions; Speed of early mine operationalisation; Focus on exploration activities; Adoption of sustainable and scientific mining practices.
- **State Categories:** States are grouped into three categories based on their mineral endowment:
  - **Category A – Mineral-Rich States:** Madhya Pradesh, Rajasthan, Gujarat
  - **Category B – Moderately Endowed States:** Goa, Uttar Pradesh, Assam
  - **Category C – Low-Endowment States:** Punjab, Uttarakhand, Tripura

VLGC SHIVALIK

Context: The Ministry of Ports, Shipping and Waterways has inducted India's third **Very Large Gas Carrier (VLGC)**, Shivalik, under the Indian flag at Visakhapatnam Port.

About VLGC Shivalik

- VLGC Shivalik is a 82,000 CBM (Cubic Meter) capacity vessel, named after the Shivalik mountain range, joins Sahyadri and Anandamayi as the Shipping Corporation of India's (SCI) third VLGC.
- **Built in South Korea,** the 225-metre-long vessel features segregated tanks, advanced temperature-control systems, and full compliance with international safety and efficiency standards.

- It will expand Indian-flag tonnage, reduce reliance on foreign vessels for essential energy cargo, and improve overall cost efficiency.

FOREIGN CURRENCY SETTLEMENT SYSTEM AT GIFT CITY

Context: The Foreign Currency Settlement System (FCSS) has been launched at the International Financial Services Centre (IFSC) in Gujarat International Finance Tec-City (GIFT City).

- With this, GIFT City joins a select group of global financial centres such as Hong Kong, Tokyo, and Manila that possess local mechanisms for foreign currency settlement.



About the Foreign Currency Settlement System (FCSS)

- **Purpose:** Enables Indian banks operating in GIFT City to clear and settle international trades within India, instead of routing them through foreign financial centres.
- **Impact:** Reduces settlement time and costs; Enhances liquidity within India's financial system; Strengthens India's position as a global financial hub.
- **How FCSS Works**
  - A local settlement bank, selected through competitive bidding, functions as the settlement hub.
  - All IFSC Banking Units (IBUs) maintain accounts with this bank.
  - Inter-bank foreign currency transactions are settled directly through these accounts, bypassing the multi-layered Nostro account chain.
  - Initially, FCSS will support USD settlements, with more foreign currencies added gradually.
- **Regulatory Framework**
  - Operates under the **Payment and Settlement Systems (PSS) Act, 2007.**
  - Authorised by the International Financial Services Centres Authority (IFSCA).
  - CCIL IFSC Ltd. (a subsidiary of the Clearing Corporation of India) is the official Payment System Operator (PSO).
  - The software is developed by Indian Financial Technology & Allied Services (IFTAS), a wholly-owned subsidiary of the RBI.

GOOGLE'S INVESTMENT IN AI DATA CENTRE

Context: Google has announced a five-year plan (2026–2030) to invest $15 billion (₹87,520 crore) in setting up a major AI data centre in Visakhapatnam, Andhra Pradesh. This will be the company's largest investment outside the United States.

- For this project, Google is **collaborating with the Adani Group and Bharti Airtel** to develop the necessary digital and physical infrastructure.
- The planned facility will **join Google's global network of AI centres**, which currently operate across 12 countries.
- The **Visakhapatnam site will host India's first gigawatt-scale data centre** and also house **Google's first dedicated AI hub in the country.**
- The project involves building a **new international subsea gateway,** including multiple undersea cables that will land in Visakhapatnam to strengthen global connectivity.
- The hub will be powered by renewable energy to ensure environmental sustainability.

META'S PROJECT WATERWORTH

Context: India is set to gain a major boost in its digital infrastructure with **Meta's Project Waterworth**, the company's most extensive subsea cable initiative so far.

About Project Waterworth

- The project involves laying a **50,000-kilometre undersea cable system that will link India with the United States, Brazil, South Africa, and several other regions across five continents.**
- As a multi-year, multi-billion-dollar investment, it **aims to enhance the scale and dependability of the world's data networks** at a time when the demand for AI, cloud services, and high-speed communication is rapidly expanding.
- The planned cable will extend over 50,000 km, making it the **longest and highest-capacity subsea cable system globally.**
- It will carry 24 fibre pairs, offering far higher data-handling capability than most existing international cables.
- **In India, the cable will land in Mumbai and Visakhapatnam**, reinforcing the country's position as an essential hub for global communications.

DIGITAL PLATFORMS FOR COAL SECTOR

Context: The Ministry of Coal has introduced two major digital platforms- Koyla Shakti and CLAMP, to simplify business processes and promote a more transparent, efficient, and responsible coal mining ecosystem.

About Koyla Shakti Dashboard

- This platform **integrates the entire coal value chain,** bringing together mining companies, railways, ports, and end users on a single digital interface.
- The platform facilitates real-time coordination among coal companies, railways, ports, and end users, thereby enhancing operational efficiency and ensuring seamless coal logistics.
- Designed as a **comprehensive decision-support system,** it helps improve data-driven planning, streamline logistics, and strengthen supply chain management from mine to market.

About Coal Land Acquisition, Management, and Payment (CLAMP) Portal

- The CLAMP portal is a **unified digital system created to modernize and digitise procedures related to land acquisition, compensation, and rehabilitation & resettlement (R&R) in the coal industry.**
- Acting as a **central repository of land records, i**t enables real-time data integration and monitoring across various coal Public Sector Undertakings (PSUs).
- By digitising every step (from uploading land details to processing compensation payments) the portal reduces delays, enhances accountability, improves inter-agency coordination, and prevents duplication of data.

SEVEN PROJECTS APPROVED UNDER ECMS

Context: The Ministry of Electronics and Information Technology (MeitY) has cleared the first set of seven applications under the Electronic Components Manufacturing Scheme (ECMS).

- Of these, five manufacturing units will be set up in Tamil Nadu, while Andhra Pradesh and Madhya Pradesh will each host one plant.
- The approved proposals amount to ₹5,532 crore in investments, with an expected production output of ₹44,406 crore.

About Electronic Components Manufacturing Scheme (ECMS)

- ECMS is an initiative to **promote the domestic manufacturing of electronic components and sub-assemblies.**
- Launched by MeitY in April 2025, it has a tenure of six years, with an optional one-year gestation period.
- The scheme offers differentiated incentives (including **turnover-linked, capital expenditure-linked, and hybrid incentives**) to address manufacturing challenges and improve cost competitiveness.

Objectives of ECMS

- To develop a robust component electronics manufacturing ecosystem.
- Attracting investments across the entire electronics value chain.
- Integrating its domestic electronic industry with the Global Value Chains (GVCs).

ANNUAL SURVEY OF INDUSTRIES

Context: The Ministry of Statistics and Programme Implementation (**MoSPI**) has released the findings of the Annual Survey of Industries (ASI) for FY 2023–24.

About Annual Survey of Industries (ASI)

- ASI serves as a key tool for understanding how India's manufacturing sector is evolving by examining output, value added, employment, capital formation, and several other indicators.
- The survey provides essential inputs for compiling National Accounts Statistics at both national and state levels.
- **Results are prepared at state and by major industrial categories.**
- ASI is conducted **annually** under the statutory provisions of the **Collection of Statistics Act, 2008,** and its main objective is to assess changes in the growth, composition, and structure of the organized manufacturing sector.
- It is conducted by the National Statistical Office (NSO) under MoSPI.

ASI collects comprehensive data on:

- Number of factories, employment, wages, invested capital, capital formation
- Input, output, depreciation, and value added
- Labour statistics such as working days, man-days worked, absenteeism, and labour turnover

Coverage of ASI

- Factories registered under the Factories Act, 1948.
- Units producing bidi and cigars, registered under the Bidi & Cigar Workers (Conditions of Employment) Act, 1966.
- Electricity undertakings involved in generation, transmission, and distribution that are not registered with the Central Electricity Authority (CEA).
- Establishments with 100 or more employees listed in the Business Register of Establishments (BRE) maintained by state governments.
- ***It excludes** establishments under the Defense Ministry, oil storage and distribution units, restaurants, and technical training institutions not producing for sale.*

FARE SE FURSAT INITIATIVE

Context: The Ministry of Civil Aviation has introduced the 'Fare se Fursat' initiative.

About Fare se Fursat Initiative

- The programme brings in a **fixed fare system on select regional routes connecting tier-2 and tier-3 cities**, aimed at providing freedom to passengers from the stress of fluctuating airfares.
- The scheme has been started by the government-owned regional carrier, **Alliance Air**.
- Under the scheme, Alliance Air will offer a single, fixed fare that remains constant regardless of the booking date, even on the day of departure. This marks a **shift away from the usual dynamic pricing model,** where fares change based on demand and booking time.
- The initiative **supports the broader goals of the UDAN (Ude Desh Ka Aam Nagrik) scheme**, which aims to make regional air travel affordable and widely accessible.
- It will operate as a **pilot programme until December 2025**.

About UDAN (Ude Desh ka Aam Nagrik)

- UDAN is a flagship **regional connectivity scheme** launched by the Government of India in **October 2016 to make air travel affordable and accessible for common citizens**, especially those in tier-2 and tier-3 cities, remote, and underserved regions.
- It is **implemented by the Ministry of Civil Aviation,** with the **Airports Authority of India (AAI)** as the nodal agency.
- Airlines bid for routes, and the government provides Viability Gap Funding (VGF) to cover the difference between operational costs and expected revenue.

SCHEME TO PROMOTE REPM MANUFACTURING

Context: The Union Cabinet has approved the Scheme to Promote Manufacturing of Sintered Rare Earth Permanent Magnets (REPMs).

About Rare Earth Permanent Magnets (REPMs)

- REPMs are high-strength permanent magnets made from alloys of rare-earth elements. Magnets such as neodymium magnets and samarium–cobalt magnets are among the strongest permanent magnets in the world.
- REPMs are critical components in sectors such as electric vehicles (EVs), renewable energy, electronics, aerospace, and defence.
- At present, REPM manufacturing is concentrated in a few countries, mainly China, Japan, and Vietnam. Most of India's REPM requirement is currently met through imports.

Sintered REPMs

- Sintered rare earth permanent magnets are **manufactured by pressing finely powdered rare-earth alloys into a desired shape and then heating them to very high temperatures**. This heating step fuses the particles together, creating a compact and mechanically strong magnet.
- Magnets produced through this method (**particularly neodymium-iron-boron (NdFeB) and samarium-cobalt (SmCo) magnets**) offer the **highest magnetic strength** among commercially used permanent magnets.
- They are widely used in high-efficiency electric motors and in advanced technological systems such as electronics, aerospace equipment, and renewable energy devices.

About Scheme to Promote Manufacturing of Sintered Rare Earth Permanent Magnets (REPMs)

- The scheme aims to **establish 6,000 Metric Tonnes Per Annum (MTPA) of integrated REPM manufacturing capacity in India.**
- The total financial outlay is ₹7,280 crore, which includes: ₹6,450 crore as **sales-linked incentives** on REPM sales for a period of five years; and ₹750 crore as **capital subsidy for setting up REPM manufacturing facilities.**
- The scheme will have a total duration of seven years from the date of award, comprising a two-year gestation period for setting up facilities and five years of incentive disbursement based on REPM sales.
- The focus is specifically on **sintered REPMs**, primarily neodymium–iron–boron (NdFeB) magnets, which are the strongest and most commercially demanded REPMs.
- The scheme supports integrated manufacturing facilities capable of undertaking the final three stages of production: 1. Conversion of rare-earth oxide to metal, 2. metal to alloy, and
  3. alloy to REPM.

BHARAT NCAP 2.0

Context: The Ministry of Road Transport and Highways has released a revised draft of the Bharat New Car Assessment Programme (Bharat NCAP 2.0).

About Bharat New Car Assessment Programme (Bharat NCAP)

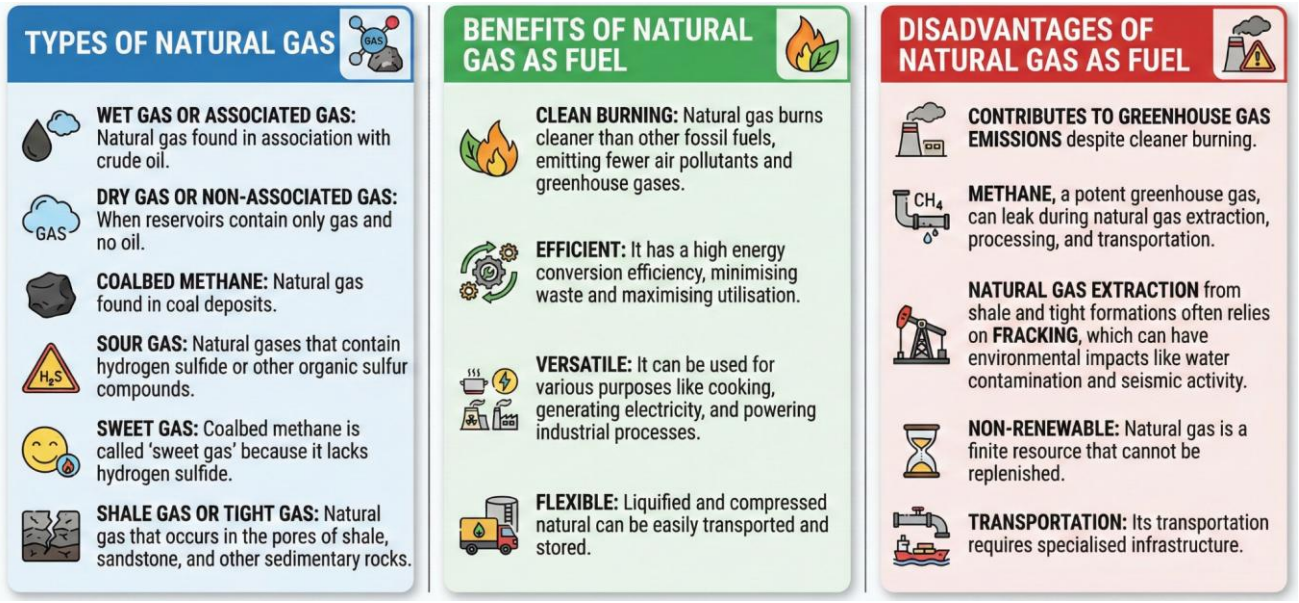
- It is a ***voluntary*** **vehicle safety rating system** that **evaluates cars based on their crashworthiness,** going beyond basic roadworthiness standards.
- Vehicles are tested using **India-specific crash protocols,** and the best-performing models are awarded a **five-star safety rating.**
- The programme is designed to provide Indian consumers with clear and reliable safety information. While it **aligns with global NCAP models**, it is adapted to Indian road conditions and technologies.
- **Central Institute of Road Transport (CIRT), Pune**, is the **authorised agency** responsible for issuing Bharat NCAP ratings.

DISCOVERY OF NATURAL GAS IN ANDAMAN BASIN

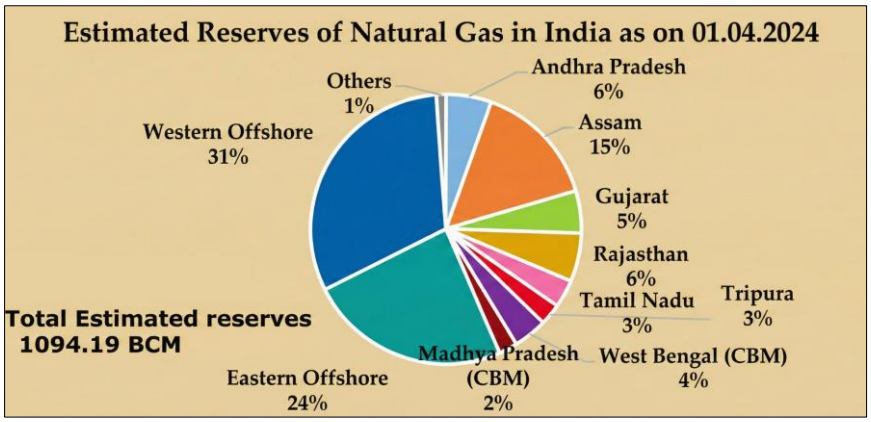
Context: The Ministry of Petroleum and Natural Gas has reported the discovery of natural gas in the Sri Vijayapuram–2 well, located about 17 km off the east coast of the Andaman Islands.

About Natural Gas

- Natural gas is a **fossil fuel primarily composed of methane (CH4),** formed from the decomposition of organic matter under high pressure and heat over millions of years.
- Natural gas is used for power generation, industrial processes, transportation (CNG), and household cooking (PNG).
- It is widely called a 'transition fuel' because it burns cleaner than coal and oil, producing significantly less CO_2



Natural Gas in India



- The estimated reserves of natural gas as of 2024 were 1,094.19 billion cubic meters.
- The **largest reserves of natural gas in India are located in the Western Offshore region,** which holds approximately 31% of the total natural gas reserves.
- This is followed by the **Eastern Offshore**, which accounts for 24% of the reserves.
- At present, domestic production meets about 50% of demand; the remainder is met through LNG imports, mainly from Qatar, the United States, and the UAE.

EMPLOYEES ENROLMENT SCHEME 2025

Context: The Ministry of Labour and Employment has launched the Employees Enrolment Scheme (EES), 2025.

About Employees Enrolment Scheme (EES)

- The scheme aims to bring a large number of workers under the ambit of organised social security through the Employees' Provident Fund Organisation (EPFO).
- The EES, 2025 provides a **voluntary, one-time opportunity for employers to declare and enrol employees who were eligible under the Employees' Provident Funds (EPF)** framework but were not enrolled earlier.
- The scheme will remain operational from 1 November 2025 to 30 April 2026.
- The employee's share of provident fund contribution for the period from July 2017 to October 2025 will be waived, provided that this amount was not deducted from the employee's wages. Employers are required to pay only their own share of the contribution for this period.
- **All establishments are eligible to participate in the scheme**, irrespective of whether they are facing any inquiries or proceedings.
- This scheme is a continued effort of the Ministry, after a successful similar enrolment scheme conducted in the year 2017 for the enrolment of left-out eligible employees from 2009 to 2016.
- Employers availing this scheme shall be liable to pay a nominal Penal Damage of Rs. 100 only as a lump sum, a significant reduction from the standard penalties for non-compliance.

TEX-RAMPS SCHEME

Context: The Union Government has approved the Tex-RAMPS Scheme.

About Tex-RAMPS Scheme

- The Tex-RAMPS (Textiles Focused Research, Assessment, Monitoring, Planning and Start-up) Scheme is a **Central Sector Scheme** to strengthen research, innovation, and competitiveness in the textiles and apparel sector.
- It has a total outlay of ₹305 crore for the period FY 2025-26 to FY 2030-31 and is fully funded by the **Ministry of Textiles.**
- Tex-RAMPS is structured around **five core components,** including promotion of advanced research in smart textiles, sustainability, and process efficiency, development of robust data and analytics systems for evidence-based policymaking, and establishment of an Integrated Textiles Statistical System for real-time monitoring and strategic decision-making.

NATIONAL DATABASE FOR EMERGENCY MANAGEMENT

Context: Recently, the Ministry of Road Transport and Highways has made it mandatory for all Detailed Project Reports (DPRs) of highway projects to include analysis using the National Database for Emergency Management (NDEM).

About the National Database for Emergency Management (NDEM)

- The NDEM is a **unique geo-portal that disseminates space-based inputs** along with services from forecasting agencies **to address natural disasters across India, operational since 2013**
- It **functions as a national repository of multi-scale geospatial data**, integrated with decision-support system tools.
- **Developed by:** Indian Space Research Organisation (ISRO) under the guidance of the National Disaster Management Authority (NDMA).
- **Maintained by**: National Remote Sensing Centre (NRSC).

Key Features of NDEM

- Provides multi-temporal satellite data and thematic layers to identify areas vulnerable to floods, landslides, earthquakes, and other natural hazards.
- Offers decision-support tools for monitoring, preparedness, and hazard management.
- Serves as a uniform national database for States/UTs, NDRF, and SDRF, supporting risk zonation, damage assessment, and emergency response.

EXPORT PROMOTION MISSION

Context: The Union Cabinet has approved the Export Promotion Mission (EPM), which was first announced in the Union Budget 2025–26.

About the Export Promotion Mission (EPM)

- EPM is **aimed at strengthening India's export ecosystem** and **boosting export competitiveness, especially for MSMEs, first-time exporters, and labour-intensive sectors.**
- The mission merges multiple fragmented export-support initiatives into a single, outcome-based and digitally enabled framework
- The Mission will be implemented by the **Directorate General of Foreign Trade (DGFT)**, an agency under the Ministry of Commerce & Industry.
- It has a total outlay of ₹25,060 crore for the period FY 2025–26 to FY 2030–31.
- EPM is anchored in a collaborative framework involving the Department of Commerce, Ministry of MSME, Ministry of Finance, Financial Institutions, Export Promotion Councils, Commodity Boards, industry associations, and state governments.
- A key design feature of EPM is its dedicated digital platform, through which DGFT will manage all processes, from application to approval to disbursal, in an integrated, paperless manner.
- The mission operates through two integrated sub-schemes:
    - **Niryat Protsahan (Financial Enablers):** This sub-scheme focuses on improving access to affordable trade finance for MSMEs via interest subvention, export factoring, collateral guarantees, and credit cards for e-commerce exporters.
    - **Niryat Disha (Non-Financial Enablers):** This sub-scheme provides non-financial support such as compliance and certification assistance, branding, and market access initiatives.

- Special support will be provided to sectors affected by recent increases in global tariffs, including textiles, leather, gems and jewellery, engineering goods, and marine products.

NATIONAL INDUSTRIAL CLASSIFICATION (NIC) – 2025

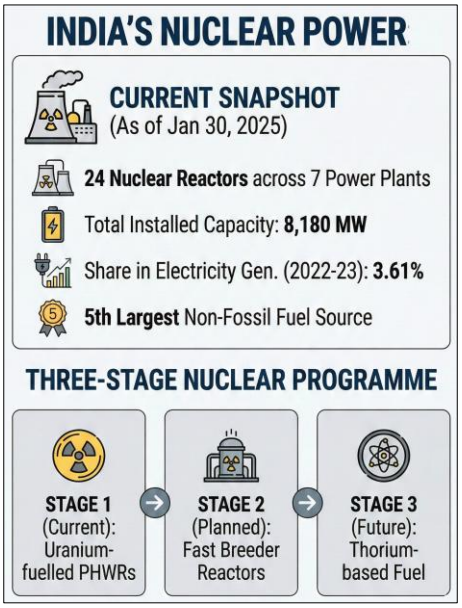
Context: The National Industrial Classification (NIC) was released by the Ministry of Statistics and Programme Implementation (MoSPI).

About National Industrial Classification (NIC)

- It serves as an essential framework for statistical surveys, censuses, economic analysis, and policy formulation.
- NIC 2025 is an **updated version of NIC 2008** (the classification system was first introduced in 1962).
- It has been **developed by MoSPI in alignment with the International Standard Industrial Classification of All Economic Activities** (ISIC), Revision 5, prepared by the **United Nations Statistics Division (UNSD).**
- It introduces a **new 6-digit coding structure** (revised from the earlier 5-digit system in NIC 2008) to provide greater granularity and flexibility in representing emerging sectors.
- New categories have been introduced to reflect the increasing role of intermediaries in sectors like power, retail, logistics, healthcare, and education.

MAHI BANSWARA RAJASTHAN ATOMIC POWER PROJECT

Context: PM Modi has laid the foundation stone of the Mahi Banswara Rajasthan Atomic Power Project (MBRAPP).



About Mahi Banswara Atomic Power Project

- The project is located in **Banswara district of Rajasthan,** near the Mahi Dam on the **Mahi River.**
- The project is set to have an installed capacity of **2,800 MW, with four indigenous 700 MW Pressurized Heavy Water Reactors (PHWRs).**
- The project will be **developed by Anushakti Vidhyut Nigam (ASHVINI),** a joint venture between the Nuclear Power Corporation of India Limited (**NPCIL**) and the National Thermal Power Corporation Limited (**NTPC**).
- MBRAPP is part of **India's fleet mode approach**, under which **ten identical 700 MW nuclear reactors are being constructed across the countr**y using standardised designs and procurement systems.

INDIGENOUS 4G (5G-READY) NETWORK

Context: India's first fully indigenous 4G (5G-ready) network was officially launched by PM Modi.

About Indigenous 4G (5G-ready) Network

- The Indigenous 4G Network, **built on the Bharat Telecom Stack**, is powered entirely by **homegrown technology**.
- It has been **deployed by Bharat Sanchar Nigam Limited (BSNL)** in collaboration with **Tata Consultancy Services (TCS)**, the **Centre for Development of Telematics** (C-DOT), and **Tejas Networks.**
- The stack is software-driven, cloud-native, and modular, designed for seamless **upgrades to 5G without replacing hardware infrastructure.**
- This achievement strengthens India's ability to rapidly adopt 5G technologies and also prepares the groundwork for future 6G development.

DULHASTI HYDROELECTRIC PROJECT (HEP)

Context: Union Environment Ministry's sectoral expert appraisal committee (EAC) on hydel projects recommended an environmental nod for the 260 MW Dulhasti Stage-II project on the Chenab River.

About Dulhasti Hydroelectric Project (HEP)

- Dulhasti HEP is a run-of-the-river power plant on the Chenab River in Kishtwar district, Jammu and Kashmir.
- Stage-I of Dulhasti HEP, operational since 2007, has an installed capacity of 390 MW (3 x 130 MW) diverting water from the Chenab.

- **Dulhasti Stage-II** will draw water from the **Marusudar River (tributary of Chenab), through the Pakul Dul Dam project.**
- The Chenab River basin has three operational projects on it—the 390-MW Dulhasti-I project at Kishtwar, the 890-MW Baglihar at Ramban, and the 690-MW Salal project at Reasi.
- Apart from these, other projects under construction on Chenab include the **Ratle** (850MW), **Kiru** (624 MW), and **Kwar** (540 MW) projects.

NUMALIGARH REFINERY GETS NAVRATNA STATUS

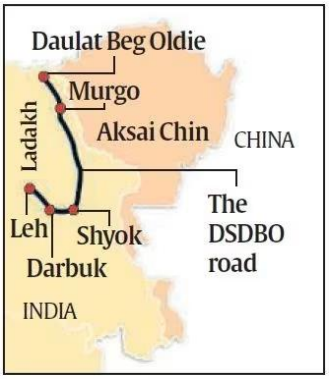
Context: Numaligarh Refinery Limited (NRL) has been accorded Navratna status, becoming the 27th Central Public Sector Enterprise (CPSE) to receive this recognition.

- NRL operates a 3 million metric tonnes per annum (MMTPA) petroleum refinery located at Numaligarh in the Golaghat district of Assam.
- The refinery is promoted by state-owned Oil India Limited, which holds a 69.63% equity stake, along with the Government of Assam (26%) and Engineers India Limited (4.37%).

Eligibility Criteria for Navratna Status	Benefits of Navratna Status
• Must have Schedule 'A' status and Miniratna Category I recognition. • Must have secured at least three "Excellent" or "Very Good" MoU ratings in the last five years. • Must score 60 or more out of 100 on a composite index based on six key performance indicators	• Can invest up to 15% of their net worth in a single project, or 30% of their net worth in a financial year • Such investments can be made without prior approval of the Central Government, subject to an overall cap of ₹1,000 crore.

SHYOK TUNNEL

Context: Recently, 125 infrastructure projects of the Border Roads Organisation (BRO), including the Shyok Tunnel, were inaugurated.



Shyok Tunnel

- The 920-metre cut-and-cover tunnel on the 255 km long **Durbuk–Shyok–Daulat Beg Oldie (DS-DBO)Road,** which **runs along the Line of Actual Control (LAC) in eastern Ladakh.**
- DBO hosts one of the world's highest operational airfields.
- It holds strategic importance, as it provides all-weather connectivity to areas close to the LAC, where India and China were engaged in a military standoff between 2020 and 2024.

NATIONAL TEST HOUSE

Context: The National Test House (NTH) has signed a Memorandum of Understanding (MoU) with the National Highways Authority of India (NHAI) to strengthen quality control and third-party testing in national highway and infrastructure projects.

About National Test House

- Established in **1912**, NTH **functions under the Department of Consumer Affairs**, Ministry of Consumer Affairs, Food and Public Distribution, and is a leading **scientific testing and quality-assurance organisation.**
- NTH is **India's largest multidisciplinary testing laboratory**, undertaking testing, calibration, and quality evaluation across industry, commerce, and trade in line with national and international standards.
- **Located at:** Kolkata (HQ) with **Regional Branches** at Kolkata, Mumbai, Chennai, Ghaziabad, Jaipur, Guwahati, and Varanasi (Satellite Centre).

AGRICULTURE AND ALLIED SECTORS

KALESHWARAM LIFT IRRIGATION PROJECT

Context: The National Dam Safety Authority (NDSA) has identified irreparable structural damage in three barrages that are part of the Kaleshwaram Lift Irrigation Project (KLIP).

About Kaleshwaram Lift Irrigation Project (KLIP)

- KLIP is a multi-purpose irrigation project located on the **Godavari River in Kaleshwaram, Telangana.**
- The project begins at the **confluence of the Pranhita and Godavari rivers** and is set to become the **world's largest multi-stage lift irrigation project.**
- The project spans approximately 500 km across 13 districts, with a canal network of 1,800 km, covering several rainfall-deficit districts.
- The project aims to produce a total of 240 TMC (thousand million cubic feet) of water, allocated for irrigation (169 TMC), municipal drinking water supply to Hyderabad (30 TMC), industrial use (16 TMC), and drinking water for nearby villages (10 TMC).

What is Lift Irrigation?

- In lift irrigation projects, water does not flow naturally through canals using gravity from higher to lower ground.
- Instead, water is lifted using external energy, such as fuel-based or electric pumps, to a main delivery chamber at the highest point of the project, from where it is distributed to the beneficiary fields.
- The water source may include groundwater, river streams, ponds, and lakes.

About National Dam Safety Authority (NDSA)

- NDSA is a **statutory body** established by the Central Government under Section 8(1) of the National Dam Safety Act, 2021. The Nodal Ministry for NDSA is the **Ministry of Jal Shakti.**
- **Headquartered in New Delhi**, it is **led by a Chairman and supported by five members**, each heading one of its five wings: Policy & Research, Technical, Regulation, Disaster & Resilience, and Administration & Finance.

Functions of NDSA

- **Regulation and Oversight:** NDSA monitors, inspects, and regulates dams across the country.
- **Policy Formulation:** It develops policies and guidelines for the construction, maintenance, and operation of dams.
- **Dispute Resolution:** The authority resolves conflicts between State Dam Safety Organisations or between a state organisation and any specified dam owner.
- **Awareness Programs:** NDSA conducts nationwide campaigns to educate citizens on dam safety.
- **Emergency Preparedness:** It ensures comprehensive response plans are in place to handle natural disasters or unforeseen events affecting dams.

DIGITAL INITIATIVES TO REFORM PDS

Context: The **Ministry of Consumer Affairs, Food and Public Distribution** has launched three major digital initiatives Depot Darpan Portal, Anna Mitra, and Anna Sahayata, aimed at transforming India's Public Distribution System (PDS).

Depot Darpan Portal	• The Depot Darpan Portal is designed for real-time monitoring of about 2,278 food storage depots managed by the Food Corporation of India (FCI), Central Warehousing Corporation (CWC), and state agencies. • Features include warehouse star rating, IoT-enabled sensors (monitoring CO_2, fire hazards, humidity), CCTV surveillance, AI-based technologies for inventory and vehicle recognition, and automated actionable insights for depot improvements.
Anna Mitra Platform	• A dedicated mobile application for frontline PDS stakeholders - District Food Supply Officers, Inspectors, and Fair Price Shop (FPS) dealers. • Currently operational in pilot states: Assam, Uttarakhand, Tripura, and Punjab, in Hindi and English; phased national rollout is planned.
Anna Sahayata Platform	• An advanced grievance redressal system for PDS beneficiaries, using WhatsApp, IVRS, and Automatic Speech Recognition (ASR) for easy complaint lodging. • Piloted in Gujarat, Jharkhand, Telangana, Tripura, and Uttar Pradesh, covering roughly 80 crore NFSA beneficiaries; available in 5 regional languages, planned for nationwide expansion.

SPICED SCHEME

Context: The Spices Board has announced the launch of the SPICED scheme for the FY2025–26.

About SPICED Scheme

- The Sustainability in Spice Sector through Progressive, Innovative and Collaborative Interventions for Export Development (SPICED) Scheme aims **to enhance the export of spices and value-added spice products, improve the productivity of cardamom**, and upgrade the post-harvest quality of spices across India.
- It focuses on compliance with global food safety and phytosanitary standards and on capacity building of stakeholders across the spice value chain.
- **Beneficiaries** include farmers' groups, FPOs (Farmer Producer Organizations), farmer clusters under ODOP (One District One Product) and DEH (District Export Hub), SC/ST communities, exporters from the North-East region, and SMEs (Small and Medium Enterprises).
- Special emphasis is placed on first-time exporters and small businesses.

About Spices Board India

- The Spices Board, under the **Ministry of Commerce**, is a **statutory body** established in 1987 under the Spices Board Act, 1986.
- Headquartered in **Kochi, Kerala**, it is responsible for the overall development of the cardamom industry and the export promotion of 52 spices.

FRP AND MSP

Context: Amid a decline in sugar production for the 2024-25 season (Oct 2024 to Sept 2025), the Centre has raised the Fair and Remunerative Price (FRP) of sugarcane to Rs 355 per quintal for 2025-26. Additionally, the Cabinet Committee on Economic Affairs (CCEA) has approved higher Minimum Support Prices (MSP) for 14 Kharif crops for the 2025-26 marketing season.

What is Fair and Remunerative Price (FRP)?

- FRP is the minimum price mandated by the government that sugar mills must pay to farmers for their sugarcane produce. It ensures that farmers receive a fair return for their crop.

How FRP is Determined:

- The Cabinet Committee on Economic Affairs (CCEA), chaired by the Prime Minister, decides the FRP each year.
- Recommendations are made by the Commission for Agricultural Costs and Prices (CACP), a body under the Ministry of Agriculture and Farmers' Welfare.
- **Unlike MSP, FRP is legally binding**, and sugar mills must pay it. Some states may also offer additional State Advised Prices (SAP) above the FRP based on regional considerations.
- FRP payments are governed by the **Sugarcane Control Order, 1966** (under the Essential Commodities Act, 1955), which requires mills to pay farmers within 14 days of delivery.
- If a mill fails to pay, the cane commissioner can take action, including attaching mill properties.

Calculation Based on Sugar Recovery:

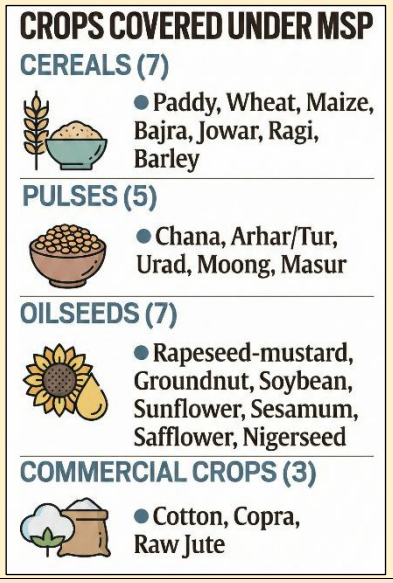
- The FRP is fixed at a basic sugar recovery rate (typically 10.25%) which means that the price fixed per quintal of sugarcane assumes this recovery percentage of sugar from the cane.
- Higher sugar recovery leads to a higher FRP, incentivizing mills and farmers to improve efficiency and productivity.

What is Minimum Support Prices (MSP)?

- MSP is the price at which the government is supposed to buy a particular crop from farmers if the market price falls below it. MSP provides a **floor for market prices**, ensuring that farmers recover their cultivation costs and earn some profit.
- **MSP was introduced in 1966-67** to boost domestic food production during a period of food shortage. It incentivised farmers to plant high-yielding, input-intensive wheat or paddy varieties.
- The Indian **government announces MSP twice a year,** before the Kharif (monsoon) and Rabi (winter) sowing seasons.
- The **Commission for Agricultural Costs and Prices (CACP) recommends the MSP**, which is then CCEA.

How are Minimum Support Prices (MSPs) determined?

- The CACP recommends MSPs by considering multiple factors such as: Cost of growing crops, Crop productivity, Market prices.
- In 2006, the National Commission on Farmers, chaired by Prof. M. S. Swaminathan suggested that MSPs should be at least 50% higher than the cost of production.
- **Calculating cost of production:** CACP estimates costs at three levels:
  - **A2:** Costs of inputs like seeds, fertilizers, and hired labour.
  - **A2+FL:** Includes A2 plus the value of family labour.
  - **C2:** Includes A2+FL plus imputed rent on land and interest on capital assets.
- **How does CACP use these costs?**
  - MSP recommendations **mainly consider A2+FL** for ensuring farmers get a fair return.
  - C2 costs are used as a benchmark or reference to check whether the MSPs cover major opportunity costs in key producing States.



SOUTH ASIA UNIT OF INTERNATIONAL POTATO CENTRE

Context: The Union government has approved the establishment of the South Asia Regional Centre of the Peru-based International Potato Center (CIP) in India.

- CIP, headquartered in Lima, Peru, was founded in 1971 as a research-for-development organization focusing on potato, sweet potato, and Andean roots and tubers. The CIP is engaged in South America, Africa and Asia.

About CIP-South Asia Regional Centre (C-SARC)

- The CSARC will be located at Singna, Agra (UP), with a total project cost of Rs 171 crore—India contributing Rs 111 crore and CIP funding the remainder 60 crore.
- The centre aims to enhance food and nutrition security, increase farmers' income, and generate employment by improving potato and sweet potato productivity, post-harvest management, and value addition.
- CSARC will be the second major international agricultural research institution in India, following the International Rice Research Institute (IRRI) regional centre established in Varanasi in 2017.

Potato Production in India

- India is the world's second-largest producer and consumer of potatoes, producing 51.30 million tonnes in 2020.
- China leads globally with 78.24 million tonnes, together accounting for over one-third of global production (359.07 MT).
- Leading Indian states in potato production (2020–21) include Uttar Pradesh and West Bengal (15 MT each), followed by Bihar (9 MT), with Gujarat, Madhya Pradesh, and Punjab also contributing significantly.

WORLD BEE DAY

Context: The Khadi and Village Industries Commission (KVIC) celebrated World Bee Day 2025 on **20th May** under the banner 'Sweet Revolution Utsav'. The day marks the **birthday of Anton Janša** (1734–1773), a pioneer of modern beekeeping.

Sweet Revolution Utsav

- The 2025 edition of this event was held under the theme "**Bee inspired by nature to nourish us all**," aligning with Prime Minister Modi's vision of **transforming the White Revolution into a Sweet Revolution.**

Significance of Bees

- Bees and other pollinators support over 75% of the world's crops, including fruits, vegetables, nuts, and seeds, boosting both yields and quality.
- Without bees, nearly 30% of food crops and 90% of wild plant species would face serious threats.
- Pollinators are increasingly at risk due to habitat loss, unsustainable farming, climate change, and pollution.

- Bees and other pollinators act as indicators of environmental health. Protecting them boosts biodiversity and essential ecosystem services such as soil fertility, pest control, and water and air regulation.
- Nature-friendly farming practices - such as agroecology, intercropping, agroforestry, and integrated pest management - help sustain pollinator populations

Honey Mission



- Launched in 2017, the **Honey Mission** is a flagship initiative of **KVIC,** under the Ministry of Micro, Small and Medium Enterprises (MSME).
- Till date, KVIC has distributed over 2,29,409 bee boxes and bee colonies across the country, resulting in the production of approximately 20,000 metric tonnes of honey, generating an income of Rs. 325 crore for beekeepers.
- In FY 2024-25, beekeepers associated with KVIC exported honey worth Rs. 25 crore.
- It aims to promote **beekeeping** as a source of livelihood and as a catalyst for increasing rural income, improving crop productivity through pollination, and supporting ecological balance.

Central Bee Research & Training Institute

- The programme also highlighted the historic contribution of the Central Bee Research & Training Institute (CBRTI), Pune, established in 1962.
- The institute has trained over 50,000 beekeepers in modern apiculture techniques. CBRTI's role extends beyond honey production to enhancing agricultural and horticultural productivity through pollination, fostering bee-related research, and nurturing rural entrepreneurship.

MODIFIED INTEREST SUBVENTION SCHEME EXTENDED

Context: The Union Cabinet has approved the continuation of the Interest Subvention (IS) component under the Modified Interest Subvention Scheme (MISS) for the financial year 2025-26.

About Modified Interest Subvention Scheme (MISS)

- The MISS is a Central Sector Scheme aimed at providing affordable short-term credit to farmers through the Kisan Credit Card (KCC) platform.
- **Loan Facility:** Farmers can avail short-term loans up to ₹3 lakh at a subsidized 7% interest rate.
- **Subvention & Incentive:** Eligible banks receive 1.5% interest subvention, while farmers repaying promptly get a 3% Prompt Repayment Incentive (PRI)—reducing the effective interest rate to 4%.
- **Animal Husbandry & Fisheries:** Interest benefits apply for loans up to ₹2 lakh in these sectors.
- **Additional Features:** Collateral-free loans up to ₹2 lakh; Interest relief during natural calamities; Revolving credit facility for up to five years under KCC.
- **Implementation:** Jointly monitored by the Reserve Bank of India (RBI) and NABARD, through Public Sector Banks, RRBs, Cooperative, and Private Banks in rural and semi-urban areas.

About Kisan Credit Card (KCC)

- The KCC scheme, launched in **1998**, provides farmers with easy and timely bank credit to meet farming and related needs. It was **expanded in 2004** to cover allied and non-farm activities and **revised in December 2020** to make access simpler and faster.
- **Who is eligible**: Owner farmers, tenant farmers, sharecroppers, oral lessees, and farmer groups (SHGs and JLGs), including small and marginal farmers.
- **Key features:**
  - Credit limits fixed for five years, based on landholding, crops, and scale of finance
  - Flexible limits (₹10,000–₹50,000) for marginal farmers (Flexi KCC)
  - Works like a revolving credit facility for short-term needs
  - Issued as RuPay-enabled debit/smart cards, usable via ATMs, PoS, BCs, and mobile banking
  - Eligible crop loans get interest subvention and repayment incentives
  - Implementation: Operated by commercial banks, RRBs, small finance banks, and cooperatives.

ICRISAT CENTRE OF EXCELLENCE FOR SOUTH-SOUTH COOPERATION IN AGRICULTURE

Context: The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), in collaboration with the Research and Information System for Developing Countries (RIS) has launched the ICRISAT Centre of Excellence for South-South Cooperation in Agriculture (ISSCA).

- The launch included the signing of a strategic Memorandum of Understanding between ICRISAT and DAKSHIN.

About ICRISAT Centre of Excellence for South-South Cooperation in Agriculture (ISSCA)

- The ISSCA was launched to accelerate agricultural innovation and promote collaborative partnerships across the global south.

- ISSCA provides a dedicated platform to share best practices, scale up innovations, and foster partnerships among nations facing similar agricultural, climatic, and socio-economic challenges.
- It will act as a catalyst for converting proven agricultural solutions into scalable and impactful actions.
- A digital portal under ISSCA serves as a knowledge hub, storing validated innovations and supporting peer-to-peer learning, partnership development, and deployment of low-cost, high-impact technologies suitable for dryland and developing regions.

About the Collaborating Institutions	
ICRISAT (International Crops Research Institute for the Semi-Arid Tropics)	• Headquartered in Hyderabad, India, ICRISAT is an international non-profit organization conducting agricultural research for rural development in Asia and Sub-Saharan Africa. • Established in 1972 by a consortium of organizations convened by the Ford and Rockefeller Foundations. • Works to improve livelihoods in dryland regions through climate-resilient crops and sustainable practices. • India grants ICRISAT special UN status, allowing it immunities and tax privileges as a recognized international organization.
RIS (Research and Information System for Developing Countries)	• An autonomous policy research institute based in New Delhi, established in 1983. • Operates under the Ministry of External Affairs (MEA), Government of India. • Specializes in international economic affairs and development cooperation • Promotes South-South Cooperation and assists developing countries in shaping equitable global economic policies.
DAKSHIN (Development and Knowledge Sharing Initiative)	• Launched during the 1st Voice of Global South Summit (2023) by the Government of India. • Aims to mobilize the Global South towards human-centric and sustainable development. • Functions as an accelerator for achieving Agenda 2030 and the UN Sustainable Development Goals (SDGs).

ORGANIC FARMING

Context: Indian Overseas Bank (IOB) has partnered with AMUL and Richplus to promote organic farming, targeting 1 lakh farmers in Tamil Nadu.

What is Organic Farming?

- Organic Farming is a **sustainable agricultural system avoiding synthetic chemicals (fertilisers, pesticides, hormones)** and **relying on natural methods**- crop rotation, compost, animal manure, mineral additives, and biological pest control.

Principles of Organic Farming

- **Health:** Protect soil, plants, animals, humans.
- **Ecology:** Align with natural ecosystems; conserve biodiversity, water, climate.
- **Fairness:** Ensure equity in production, trade, and environmental justice.
- **Care:** Precautionary approach for present & future generations.

Methods:

- **Soil:** Crop rotation, minimum tillage, composting.
- **Crops:** Polyculture, agroforestry, integrated pest management.
- **Water:** Drip irrigation, mulching.
- **Pests:** Organic pesticides (neem, pyrethrin), biological control (lady beetles).

Government Initiatives for Organic Farming

- **Paramparagat Krishi Vikas Yojana (PKVY):**
  - PKVY (a component of Pradhan Mantri- Rashtriya Krishi Vikas Yojana (PM-RKVY)) **promotes cluster-based organic farming,** providing ₹31,500 per hectare for three years to farmers.
  - It supports training, input supply, certification (PGS/NPOP), branding, and market linkages. Using Direct Benefit Transfer (DBT), it streamlines aid to small and marginal farmers.
- **Mission Organic Value Chain Development for North Eastern Region (MOVCDNER):**
  - MOVCDNER is a Centrally Sponsored Scheme (with 100% Govt of India share).
  - It promotes organic farming in North Eastern States by supporting Farmer Producer Organizations (FPOs), inputs, certification, processing, and marketing. Farmers receive ₹46,500 per hectare over three years.

- **National Mission on Natural Farming (NMNF):**
  - Launched in 2024, NMNF encourages climate-resilient natural and organic farming.
  - It targets 7.5 lakh hectares in clusters, sets up bio-input resource centers, and raises farmer awareness.
- **National Programme for Organic Production (NPOP):**
  - Establishes the standards and certification system for organic products.
  - It is managed by the Agricultural and Processed Food Products Export Development Authority (APEDA) under the Ministry of Commerce.

Factors	Traditional Farming	Organic Farming	Zero Budget Natural Farming (ZBNF)
Definition	Uses chemical fertilisers and pesticides.	Uses organic manure and compost.	Relies on zero external inputs; uses homemade bio-inputs like Jeevamrut, Beejamrut.
Soil Health	Degrades soil over time.	Improves soil fertility with organic matter.	Enhances fertility using natural microbes and mulching.
Water Requirement	High due to intensive cultivation.	Moderate, aided by mulching.	Very low, leveraging natural irrigation and mulching.
Productivity	Initially high but declines over time.	Sustainable, slightly lower than traditional.	Sustainable yield at minimal cost.
Market Dependence & Cost	High reliance on external inputs; costly.	Moderate; inputs can be purchased.	Almost zero; inputs are self-produced.
Ecological Impact	Causes environmental degradation.	Environmentally friendly, needs some external inputs.	Fully sustainable; enhances biodiversity and soil health.

IFFCO NANO FERTILIZER PLANT IN BRAZIL

Context: IFFCO (Indian Farmers Fertiliser Cooperative) will establish its first overseas nano fertilizer plant in Brazil. The facility will produce 4.5 million litres annually.

- The project will be implemented under a 70:30 joint venture between IFFCO Nanoventions (a subsidiary of IFFCO) and the Brazilian firm NANOFERT.
- In 2021, IFFCO launched Nano urea in liquid form as an eco-friendly alternative to conventional urea in India.
- Subsequently, in 2023, it introduced Nano-DAP (di-ammonium phosphate) to reduce India's import dependency on conventional fertilizers.

About Nano Fertilizers

- Nano fertilizers are **nutrient formulations coated with nanomaterials** that enable controlled and gradual release of nutrients into the soil.
- These particles typically measure between 1 and 100 nanometres in size.
- They play a crucial role in precision agriculture and sustainable farming, ensuring efficient use of resources.
- These particles are small enough to penetrate plant cells, allowing for better absorption and more targeted delivery of essential nutrients like nitrogen, phosphorus, and potassium.
- Due to their small size and large surface area, nano fertilizers **enhance nutrient uptake, minimize losses from leaching,** evaporation, and runoff, and **help lower input costs** while **reducing environmental pollution.**

NATIONAL TURMERIC BOARD

Context: Headquarters of National Turmeric Board was inaugurated in Nizamabad, Telangana.

About the National Turmeric Board (NTB)

- The Board aims to enhance awareness, boost international markets, encourage research and innovation, and support farmers in value addition and skill development.
- **Ministry Oversight:** The Ministry of Commerce & Industry has expanded its product-specific boards to six, adding turmeric alongside tea, coffee, rubber, spices, and tobacco.
- **Composition**: The Chairperson will be appointed by the Central Government, with members from: Ministry of AYUSH, Department of Pharmaceuticals, Department of Agriculture & Farmers Welfare and Department of

Commerce. Representatives from the top two turmeric growing states of Maharashtra and Telangana and from the state of Meghalaya. (States will be represented on the Board by rotation.)

- **Mandate**:
  - Enhancing turmeric yield, logistics, and supply chains.
  - Research & Development (R&D), value addition, and awareness of medicinal properties.
  - Expanding international markets, ensuring quality & safety standards.
  - Coordination with the Spices Board and government agencies for sector growth.

About Turmeric (the Golden Spice)

- **Scientific Name**: Curcuma longa (part of the Ginger family Zingiberaceae).
- **Active Compound**: Curcumin, known for anti-inflammatory, antioxidant, & antimicrobial benefits.
- **Major Growing States**: Maharashtra, Telangana, Karnataka, Tamil Nadu, Andhra Pradesh, Madhya Pradesh, Meghalaya.

India's Global Standing:

- Largest producer, consumer, and exporter of turmeric. India produces over 70% of the world's turmeric across 30 varieties.
- In 2022-23, India produced 75% of global turmeric and held 62% of the global export market.
- **Top export markets**: Bangladesh, UAE, USA, Malaysia.
- **GI (Geographical Indication) Tagged Turmeric Varieties**: Lakadong (Meghalaya), Kandhamal (Odisha), Erode (Tamil Nadu), Sangli, Waigaon, and Vasmat (Maharashtra)

CROPIC

Context: The Ministry of Agriculture and Farmers Welfare plans to launch **CROPIC (Collection of Real Time Observations & Photo of Crops)**

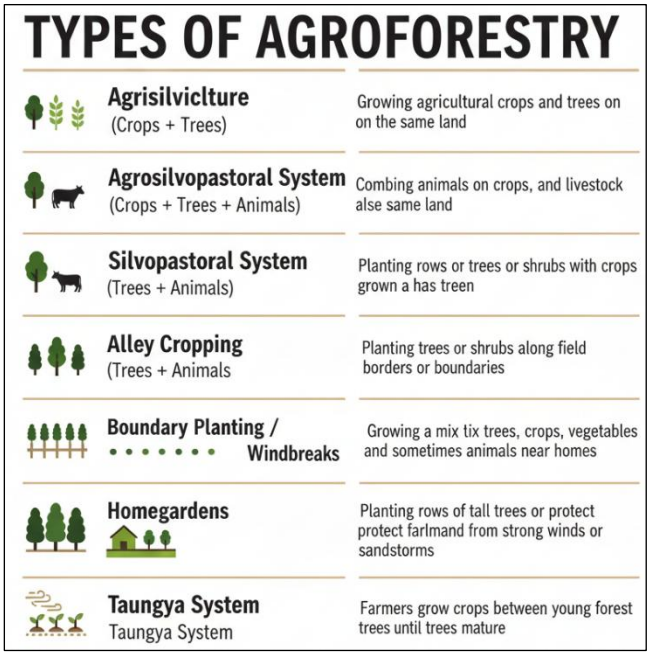
About CROPIC

- CROPIC is one of the **technology initiatives under Pradhan Mantri Fasal Bima Yojana (PMFBY).**
- The **CROPIC mobile app**, developed by the Ministry, uses an **AI-based cloud platform for photo analysis and a web-based dashboard for data visualisation.**
- CROPIC app aims at **collection of geotagged crowdsourced photographs from farmers and field coordinators through smartphones.**
- Crops will be photographed 4–5 times during their cycle to assess health and estimate mid-season losses.

AGROFORESTRY

Context: The government has introduced model rules to regulate the felling of trees on agricultural land with the aim of promoting agroforestry.

- The State-Level Committee, already formed under the Wood-Based Industries Guidelines, 2016, will now function under these model rules.
- Farmers or applicants must register their plantation lands on the National Timber Management System (NTMS) portal.



About Agroforestry

- Agroforestry is a land-use system where trees or shrubs are grown together with crops and/or livestock on the same piece of land.
- It is different from traditional farming because it combines agriculture (growing crops) and forestry (growing trees) in a planned and sustainable way.
- As of early 2024, the total area under agroforestry in India is approximately 28.42 million hectares, which is about 8.65% of the country's total geographical area.

PM DHAN-DHAANYA KRISHI YOJANA

Context: The Union Cabinet has approved the Prime Minister Dhan-Dhaanya Krishi Yojana (PMDDKY) to benefit 1.7 crore farmers across India.

About Prime Minister Dhan-Dhaanya Krishi Yojana (PMDDKY)

- PMDDKY is an initiative to **transform agriculture in 100 underperforming districts,** with a special focus on improving agricultural productivity, sustainability, and farmer incomes.
- **Annual outlay**: ₹24,000 crore for six years (2025-26 to 2030-31), totaling ₹1.44 lakh crore.
- The scheme **consolidates 36 existing central agricultural schemes from 11 ministries**, including PM-KISAN, PMFBY, PMKSY, and RKVY, into **a unified, streamlined program to eliminate duplication and maximize impact.**
- It is designed on the lines of the Aspirational Districts Programme (ADP) launched in 2018 to transform underdeveloped districts.
- **Nodal Agency: NITI Aayog** will guide implementation, provide capacity-building support, and oversee monitoring.

Implementation Framework

- **Coverage:** 100 districts selected based on three parameters: Low productivity, Low crop intensity, and Below-average credit flow. At least one district from every state will be included to ensure balanced regional representation.
- **District Planning:**
  - Each district will prepare a District Agriculture and Allied Activities Plan (DAAAP), formulated by the District Dhan-Dhaanya Samiti, headed by the District Collector and including progressive farmers.
  - Plans will align with national goals such as crop diversification, soil and water conservation, self-sufficiency, and the promotion of natural and organic farming.
  - NABARD and the Department of Financial Services will share district-wise farm credit data.
- **Governance Structure**
  - **District Level:** District committees for local planning, execution, and monitoring.
  - **State Level:** State steering groups to ensure convergence of schemes and coordination among districts.
  - **National Level:** Two oversight bodies — one led by Union Ministers, another by Secretaries and senior officers. Central Nodal Officers (CNOs) will conduct field visits and reviews.
- **Monitoring & Evaluation:** Districts will be ranked based on performance. Progress will be tracked monthly on 117 indicators. Agriculture universities (central and state) will serve as technical knowledge partners.

PRADHAN MANTRI FASAL BIMA YOJANA (PMFBY)

Context: State defaults under the PMFBY have crossed Rs 6,450 crore over five years. This has impacted the timely settlement of farmer claims and eroded trust in the scheme.

About Pradhan Mantri Fasal Bima Yojana (PMFBY)	
Launch	In 2016 as a Central Sector Scheme
Implemented By	Department of Agriculture, Cooperation and Farmers' Welfare, Ministry of Agriculture
Objective	Provide financial protection to farmers against crop loss due to natural calamities, pests, and diseases at affordable premiums.
Key Goals	• Support farmers facing crop damage or loss. • Stabilize farm income and promote continuous cultivation. • Encourage modern farming practices and crop diversification. • Enhance credit access and reduce production risks.
Eligibility	• All farmers (including sharecroppers and tenants) growing notified crops in notified areas. • Must have valid land ownership/tenancy proof. • No duplicate compensation claims allowed. • Priority to SC/ST and women farmers.
Premium Rates	• 2% for Kharif crops | 1.5% for Rabi crops | 5% for commercial/ horticultural crops.

	• Balance subsidized by the Government. • Full premium paid by Government in NE States, J&K, and Himachal Pradesh.
Coverage	• Natural disasters like droughts, floods, and hailstorms. • Pests and crop diseases. • Post-harvest losses (hailstorms, landslides). • Wild animal attacks and Paddy Inundation *(added in 2025)* • Excludes war, nuclear risks, and deliberate damage.
Compensation	• Claims to be processed within **two months** of harvest for timely relief.
Technology Use	• Integration of **satellite imagery, drones, and mobile apps** for accurate crop loss estimation. • **Platforms**: **National Crop Insurance Portal (NCIP)**, **YES-TECH**, and **CROPIC** for digital monitoring and faster claim settlement.

WOOLAH TEA

- Assam's first bagless tea brand, Woolah Tea, has been granted a 20-year patent.
- The patent has been granted for its innovative 'compressed true whole leaf tea dips and method' (patent name).
- Woolah's tea is made from a compressed bundle of eti koli duti paat (one bud and two leaves), bound by a natural string —eliminating the need for conventional tea bags.
- This helps to eliminate micro plastics that leach into tea from standard bags. This leads to eco-friendly brewing and zero plastic use.

PRADHAN MANTRI KISAN SAMPADA YOJANA (PMKSY)

Context: The Union Cabinet has increased the budgetary outlay of the Pradhan Mantri Kisan Sampada Yojana (PMKSY) by ₹1,920 crore, raising the total to ₹6,520 crore to strengthen the food processing sector.

- The additional funds will support the establishment of 50 multi-product food irradiation units and 100 food testing laboratories.

About Pradhan Mantri Kisan Sampada Yojana (PMKSY)

- Launched in **2017** as a **Central Sector Scheme**, PMKSY is a comprehensive package **aimed at developing modern food processing infrastructure** and **improving supply chain efficiency from the farm gate to the retail outlet.**
- It aims to boost the food processing sector, reduce post-harvest losses, provide better income to farmers, create large-scale rural employment, and increase the share of processed foods in exports, ultimately contributing to higher farmer incomes.
- It is managed by the **Ministry of Food Processing Industries (MoFPI).**
- It was first **implemented during 2016–2020,** aligned with the 14th Finance Commission period. The Government has now approved its **continuation up to 31 March 2026**, aligned with the 15th Finance Commission cycle.
- Under the **extended PMKSY**, the following **components** will be implemented:
  - Integrated Cold Chain and Value Addition Infrastructure
  - Creation/Expansion of Food Processing and Preservation Capacities (Unit Scheme)
  - Infrastructure for Agro-Processing Clusters
  - Food Safety and Quality Assurance Infrastructure
  - Human Resources and Institutions – Research & Development
  - Operation Greens

AI BASED AGRI ADVISORY SERVICES

Context: The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and the Indian Council of Agricultural Research (ICAR) have launched personalised, real-time climate advisory services powered by Artificial Intelligence (AI) and Machine Learning (ML).

About AI-powered Context-Specific Agromet Advisory Services for Climate-Resilient Agriculture at Scale

- The initiative is supported under the Government of India's Monsoon Mission III. **Monsoon Missions are aimed at improving the prediction of monsoon rainfall** on different time scales through state-of-the-art dynamical prediction systems and advanced weather models.
- Key partner institutions include the **Central Research Institute for Dryland Agriculture** (CRIDA–ICAR), the International Livestock Research Institute (ILRI), the Indian Institute of Tropical Meteorology (IITM), and the India Meteorological Department (IMD).
- The goal is to provide smallholder farmers with hyper-local and practical weather and climate information, helping them make informed choices on sowing, irrigation, and pest control, especially as climate variability increases.
- These advisories will be delivered through simple digital tools, including an AI-powered WhatsApp bot, ensuring accessibility even in remote rural areas.
- The project will **initially be implemented in Maharashtra** through ICAR's Agro-Meteorological Field Units (AMFUs).

Intelligent Systems Advisory Tool (iSAT)

- The iSAT, a digital platform developed earlier by ICRISAT and its partners under Monsoon Mission II, was originally created to convert complex climate and crop data into personalised, science-based guidance for farmers.
- Under the new initiative, iSAT is being upgraded into a fully functional AI-enabled advisory tool.

GRANT IN AID TO NATIONAL COOPERATIVE DEVELOPMENT CORPORATION

Context: The Union Cabinet has approved a Central Sector Scheme providing grant-in-aid to the National Cooperative Development Corporation (NCDC).

About National Cooperative Development Corporation (NCDC) (HQ: New Delhi)

- NCDC is a statutory organisation under the Ministry of Cooperation, established in 1963.
- **Functions**
  - Plans, promotes, and finances programmes related to the production, processing, marketing, storage, export, and import of agricultural produce, foodstuffs, and other notified commodities.
  - Provides loans and grants to State Governments for financing primary and secondary-level cooperative societies.
  - Gives direct financial assistance to national-level cooperative societies and other societies operating across more than one State.

Major Schemes under NCDC

- **Yuva Sahakar:** Supports newly formed cooperative societies with innovative or youth-led ideas.
- **Ayushman Sahakar:** Covers hospitals, healthcare services, medical and nursing education, paramedical training, health insurance, and holistic health systems including AYUSH.
- **Nandini Sahakar:** Aims to improve the socio-economic status of women and promotes women's entrepreneurial initiatives through women-led cooperatives.
- **Dairy Sahakar:** A framework for providing financial assistance to dairy cooperatives to enhance performance in ESG (environmental, social, and governance) activities.
- **Swayam Shakti Sahakar Yojana:** Provides NCDC's financial assistance to Agricultural Credit Cooperatives for extending loans and advances to Women Self-Help Groups (SHGs).
- **Deerghavadhi Krishak Punji Sahakar Yojana:** Offers long-term financial assistance to Agricultural Credit Cooperatives for onward lending of long-term loans.

SEA BUCKTHORN AND HIMALAYAN BUCKWHEAT

Context: Seeds of sea buckthorn and Himalayan buckwheat from Ladakh have been sent to the International Space Station (ISS) for experiments under NASA's Crew-11 mission.

About Sea Buckthorn

- Sea buckthorn is a **hardy deciduous shrub** known for its bright orange-yellow berries, which taste sour but are extremely rich in nutrients, especially Vitamin C.

- The plant is **native to the cold temperate regions of Europe and Asia**. More than 90% of the world's natural sea buckthorn habitat lies in China, Mongolia, Russia, northern Europe, and Canada.
- In India, the shrub **grows above the tree line in the Himalayas,** mainly in the cold desert regions of Ladakh and Spiti.
- Sea buckthorn **can survive extreme temperatures from –43°C to 40°C** and is naturally **drought-resistant.** These features make it ideal for restoring vegetation in harsh cold deserts.
- Because of its many uses and economic value, sea buckthorn is popularly called the "Wonder Plant," "Ladakh Gold," "Golden Bush," and the "Gold Mine" of the cold deserts.
- Every part of the plant (fruit, leaves, twigs, roots, and even thorns) has traditional uses as food, medicine, or household material.



Benefits of Sea Buckthorn

- **Environmental:** It acts as a soil-binding plant, preventing soil erosion, reducing the flow of silt into rivers, and helping protect local biodiversity.
- **Medicinal:** In traditional medicine, the plant has been used to treat stomach disorders, heart problems, and skin conditions. Its berries and leaves are packed with vitamins, carotenoids, and omega fatty acids, which support health and help soldiers adapt to high-altitude environments.
- **Household:** It provides valuable fuelwood and fodder, and is widely used to make juices, jams, oils, and nutritional capsules.

About Himalayan Tartary Buckwheat (HTB)

- HTB is a **nutrient-rich, ancient grain grown in the high-altitude Himalayan regions.** It is traditionally cultivated in parts of India (Ladakh, Uttarakhand, Himachal Pradesh) as well as China, Nepal, Bhutan, and Tibet.
- HTB thrives in harsh climates with extreme temperature tolerance (-43°C to +40°C). It grows well in poor soils and helps fix atmospheric nitrogen, preventing soil erosion and desertification
- HTB has **greater cold resistance compared to common buckwheat.** It also shows strong drought tolerance.
- HTB contains resistant starch, essential minerals, proteins, and powerful phenolic compounds that act as natural antioxidants. It is gluten-free as well.
- These nutrients help reduce the risk of hypertension, obesity, cardiovascular diseases, and gallstone formation, making HTB an important functional food for Himalayan communities.

INDIA & WORLD FOOD PROGRAMME PARTNERSHIP

Context: The Government of India and the World Food Programme (WFP) have signed a Letter of Intent (LoI) to support efforts to address the global hunger crisis.

- Under this arrangement, the Department of Food and Public Distribution (DFPD) will supply fortified rice from India to help meet the food and nutritional needs of the most vulnerable populations in crisis-affected regions worldwide.

About World Food Programme (WFP)	
Established	1961 by the United Nations to combat global hunger, focusing on achieving Sustainable Development Goal 2 (Zero Hunger).
Objective	The world's largest humanitarian organization aiming to save lives during emergencies and provide food assistance.
Achievements	Awarded the Nobel Peace Prize in 2020 for its efforts.
Funding	Supported by voluntary donations from governments, corporations, and individuals.
Reports	Publishes the State of Food Security and Nutrition in the World in collaboration with organizations like FAO and UNICEF.
WFP and India	• The World Food Programme has been active in India since 1963. • WFP supports India mainly in the following areas: ○ Improving the Targeted Public Distribution System (TPDS)

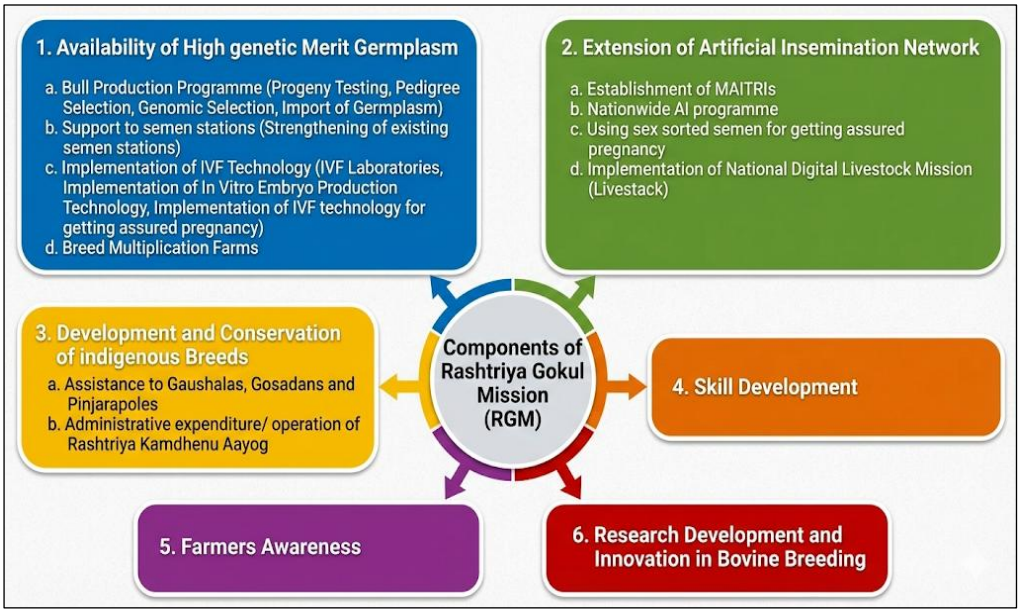
	○ Supporting fortification of government-distributed food ○ Mapping and monitoring food insecurity across regions • WFP is also helping the Poverty and Human Development Monitoring Agency (PHDMA) set up a State-level Food Security Analysis Unit as part of efforts to achieve the goal of Zero Hunger.

RASHTRIYA GOKUL MISSION (RGM)

Context: The Prime Minister inaugurated a ₹10-crore Sex-Sorted Semen facility under the Rashtriya Gokul Mission in Purnea, Bihar. The Purnea Semen Station is one of India's largest government-run stations and currently produces about 50 lakh semen doses annually.

About Rashtriya Gokul Mission (RGM)

- Launched in 2014, the Mission operates under the **National Programme for Bovine Breeding and Dairy Development.**
- It focuses on **conserving and improving India's indigenous cattle breeds through scientific methods.**
- The scheme is also continued under umbrella scheme Rashtriya Pashudhan Vikas Yojna from 2021 to 2026 with a budget outlay of Rs.2400 crore.
- The **Department of Animal Husbandry and Dairying** implements the Mission through State Implementing Agencies, mainly the Livestock Development Boards.
- RGM is a **Centrally Sponsored Scheme** that provides 100% grant-in-aid for all components except the following:
  - 50% capital subsidy for establishing Breed Multiplication Farms.
  - 50% subsidy for using sex-sorted semen to ensure guaranteed pregnancy.
  - ₹5,000 subsidy for farmers achieving guaranteed pregnancy through In-Vitro Fertilization (IVF).



Objectives of the Scheme

- To increase the productivity of cattle and raise milk production sustainably by using modern technologies.
- To encourage the use of high-quality, genetically superior bulls for breeding.
- To expand Artificial Insemination services by strengthening the breeding network and delivering services directly to farmers.
- To promote the rearing and scientific conservation of indigenous cattle and buffalo breeds in a holistic manner.

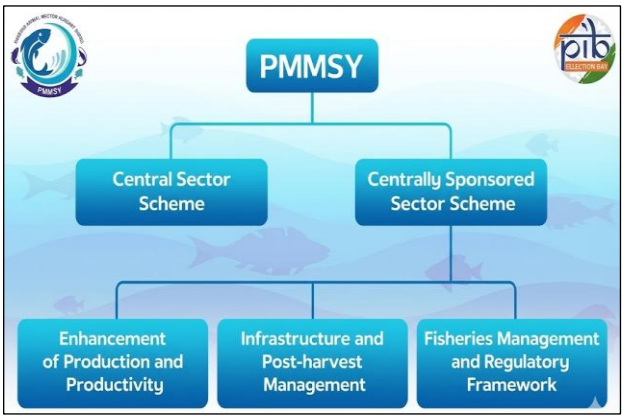
PRADHAN MANTRI MATSYA SAMPADA YOJANA (PMMSY)

Context: PMMSY launched in 2020 to drive a Blue Revolution in India's fisheries sector, has completed five years.

About Pradhan Mantri Matsya Sampada Yojana (PMMSY)

- PMMSY was introduced for five years (FY 2020–21 to FY 2024–25) with an outlay of ₹20,050 crore and has now been **extended up to 2025–26.**
- It is implemented by the **Ministry of Fisheries, Animal Husbandry and Dairying.**
- It **aims to bridge major gaps in fish production, productivity, technology, quality, and post-harvest systems.**
- It builds on earlier efforts under the Blue Revolution Scheme (2015–16), which mainly aimed at raising fish production.

- The scheme follows a **cluster-based approach**, linking activities from production to export. This approach promotes cooperation, closes value chain gaps, and creates livelihood and business opportunities.
- PMMSY also includes a **Central Sector sub-scheme**, the Pradhan Mantri Matsya Kisan Samridhi Sah-Yojana (PM-MKSSY), launched in 2023–24 with an outlay of over ₹6,000 crore. It **aims to formalise and support micro and small fisheries enterprises.**



Aims and Objectives of PMMSY

- Harness fisheries potential sustainably and inclusively.
- Increase fish production by expanding and intensifying aquaculture.
- Strengthen post-harvest systems and improve product quality.
- Raise incomes and create more employment in the sector.
- Enhance contribution to agricultural GVA and boost exports.
- Provide social and economic security for fishers.
- Build a modern and efficient fisheries management system.

MAKHANA

Context: The Prime Minister launched the National Makhana Board in Purnea, Bihar. The Centre has also approved a ₹475-crore development package for the makhana sector.

About Makhana



- Also called **fox nut,** it is the **dried edible seed of the prickly water lily** or gorgon plant, commonly found in **freshwater ponds** across South and East Asia.
- The plant has violet and white flowers and large, round, prickly leaves.
- Its edible seeds are small and round, with an outer layer that ranges from black to brown, earning it the name **"Black Diamond."**
- After processing, the seeds are eaten as popped snacks called **lava**.
- Makhana is **rich in carbohydrates, protein, and minerals,** and is widely used in food, healthcare, and traditional medicine.

Cultivation of Makhana	Climatic Conditions
• Bihar produces nearly 90% of India's makhana. • Production is concentrated in nine districts of the Mithilanchal region: **Darbhanga, Madhubani, Purnea, Katihar**, Saharsa, Supaul, Araria, Kishanganj, and Sitamarhi. • The first four districts contribute about 80% of Bihar's total output. **'Mithila Makhana' received a Geographical Indication (GI) tag in 2022.** • Smaller-scale cultivation also occurs in Assam, Manipur, West Bengal, Tripura, and Odisha, and in neighbouring countries such as Nepal, Bangladesh, China, Japan, and Korea.	• Makhana is an aquatic crop grown mainly in tropical and subtropical regions. • It thrives in stagnant water bodies (ponds, lakes, ditches, wetlands, and land depressions) with water depths of 4–6 feet. • Optimal conditions include temperatures of 20–35°C, relative humidity of 50–90%, and annual rainfall of 100–250 cm.

About National Makhana Board

- The board will be established under the **Makhana (Fox Nut) Industry (Promotion and Development) Bill**, with its headquarters in **Purnea, Bihar.**
- The board will fix grades and standards for makhana, formulate incentive schemes, and conduct research and seminars to promote the sector.

OPIUM CULTIVATION

Context: The Union Government has released the Annual Licensing Policy for Opium Cultivation for 2025–26, issued under the NDPS Rules, 1985, framed through the Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985. The policy is notified each year to regulate legal opium farming in India.

About Opium

- The opium poppy plant is the source of **opium gum**, which contains vital alkaloids such as **morphine, codeine, and thebaine.**
- Morphine is widely used as a pain-relief medicine. Codeine is commonly used in cough syrups. The plant is also cultivated for **edible seeds and seed oil.**
- India is one of the few countries that legally grow opium poppy and the **only country authorised** under the UN Single Convention on Narcotic Drugs (1961) **to produce gum opium.**
- Although 11 other countries grow opium poppies, they are not permitted to extract gum.

Opium Cultivation in India

- Under the NDPS Act, the Central Government regulates poppy cultivation strictly for medical and scientific purposes.
- The Government notifies licensed cultivation tracts **annually**, currently spread across 22 Districts 102 Tehsils/ Parganas in the States of Madhya Pradesh, Rajasthan and Uttar Pradesh.
- The **Central Bureau of Narcotics (CBN) issues cultivation licences** and oversees compliance. **Licensed farmers are required to sell their entire opium output to the CBN** at government-notified prices.

BHARATI INITIATIVE

Context: APEDA has launched **BHARATI (Bharat's Hub for Agritech, Resilience, Advancement and Incubation for Export Enablement)** to strengthen India's agricultural and processed food exports.

About BHARATI Initiative

- The initiative aims **to support 100 agri-food and agri-tech startups, promote innovation** and **create new export opportunities for young entrepreneurs.**
- It is designed to complement existing industry and government incubation programmes in agriculture and food processing.
- Selected startups will complete **a three-month acceleration programme** focused on export readiness, regulatory compliance, market access and practical solutions to export challenges.
- Rooted in APEDA's Farm to Foreign agenda, the BHARATI initiative fosters export-oriented entrepreneurship in the agri-food sector.
- APEDA will collaborate with state agricultural boards, agricultural universities, IITs, NITs, industry bodies and accelerators to build a strong ecosystem for export-oriented startups.

Agricultural and Processed Food Products Export Development Authority (APEDA)

एपीडा APEDA

- APEDA was established under the Agricultural and Processed Food Products Export Development Authority Act, 1985.
- Headquartered in New Delhi, it functions under the **Ministry of Commerce and Industry**.

Functions

- Promotion of export-oriented production and development of the Scheduled products;
- Registration of persons as exporters of the scheduled products;
- Fixing of standards & specifications for scheduled products for the purpose of exports;
- Improving of packaging of the scheduled products;
- Improving of marketing of the scheduled products outside India;
- Training in various aspects of the industries connected with the scheduled products;
- It also functions as the Secretariat to the National Accreditation Board (**NAB**) for the implementation of accreditation of the Certification Bodies under National Programme for Organic Production (**NPOP**) for Organic exports.

MAITRI 2.0

Context: The **Indian Council of Agricultural Research (ICAR)** has launched the second edition of the **Brazil–India Cross-Incubation Programme in Agritech,** known as Maitri 2.0.

About Maitri 2.0

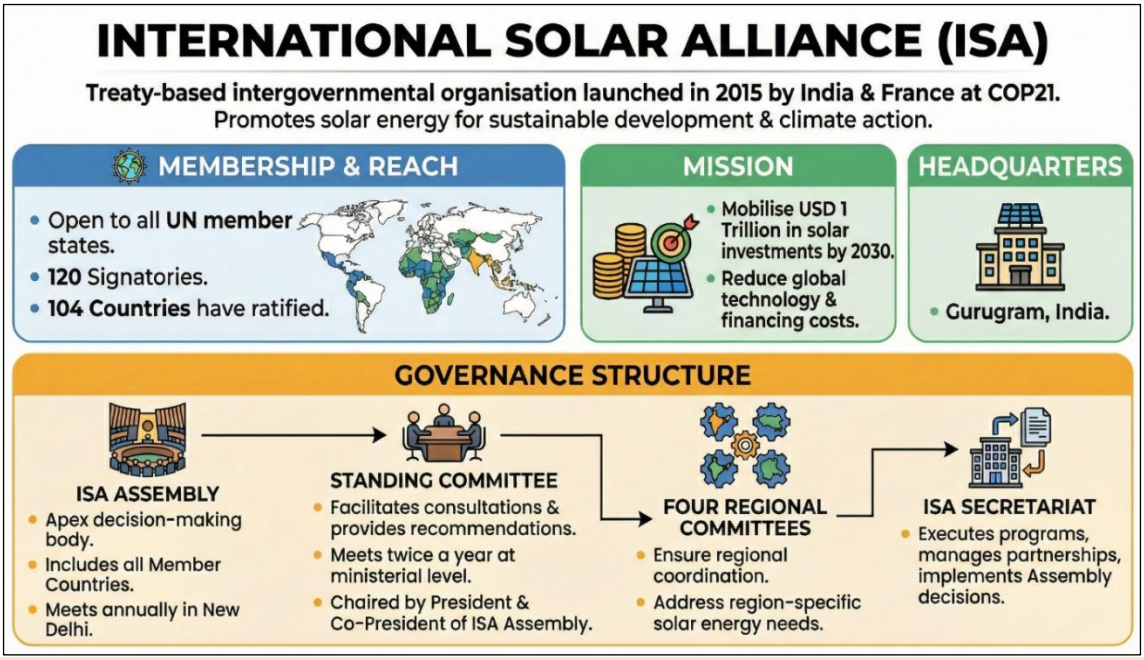
- Maitri 2.0 serves as a **two-way learning and co-creation platform for innovators from India and Brazil.** It supports both countries' shared goals in **agriculture, emerging technologies, and food and nutritional security.**
- The programme aims **to strengthen incubator linkages, exchange best practices, and promote co-incubation**. It also opens new opportunities in sustainable agriculture, digital technologies, value-chain development, and bilateral cooperation.

PM KUSUM

Context: The Union government is set to expand its PM-KUSUM (**Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan)** programme to several African countries and island nations through the International Solar Alliance (ISA).

About PM-KUSUM Scheme

- A centrally sponsored scheme launched in 2019 by the **Ministry of New and Renewable Energy (MNRE)**
- **Target:** Add 34,800 MW solar capacity by 2022 (deadline extended to March 2026).
- **Central financial support:** ₹34,422 crore.
- Implemented through State Nodal Agencies (SNAs) working with States/UTs, DISCOMs and farmers.
- **Aims:** Reduce dependence on diesel in agriculture; Provide water and energy security; Raise farmer incomes; Reduce environmental pollution.
- **Scheme Components**
  - **A:** Establish 10,000 MW of decentralised ground/stilt-mounted grid-connected renewable energy plants.
  - **B:** Installation of 14 lakh standalone solar agriculture pumps.
  - **C:** Solarisation of 35 lakh grid-connected agriculture pumps, including feeder-level solarisation.
- The scheme provides additional income for farmers by allowing them to sell surplus solar power to DISCOMs.



CHANGES IN PER DROP MORE CROP SCHEME

Context: The Central Government has introduced additional flexibility under the Per Drop More Crop (PDMC) scheme to promote efficient water use and support higher farmer incomes.

- States and Union Territories can now design micro-level water management systems (such as diggis, on-farm ponds, and other water harvesting structures) based on local needs.

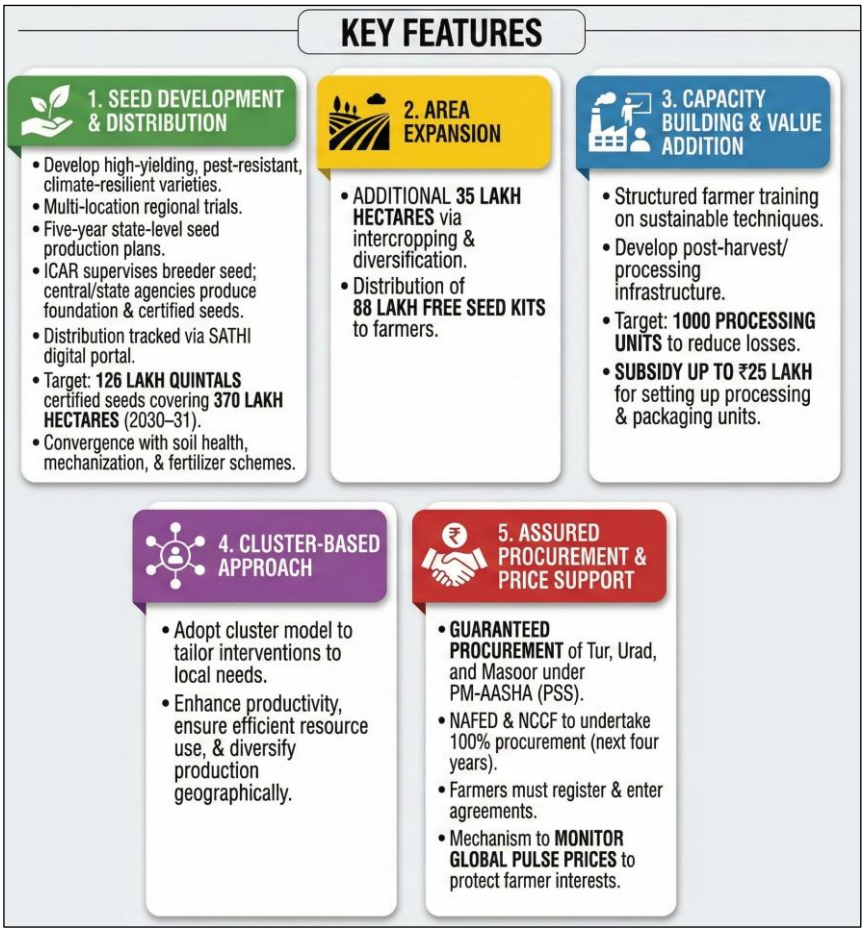
About Per Drop More Crop (PDMC) Scheme

- Launched in 2015, PDMC is a major **component of the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY).**
- It is implemented by the **Department of Agriculture and Farmers Welfare (DA&FW)** under the Ministry of Agriculture and Farmers Welfare.

- The scheme **focuses on improving on-farm water use efficiency** by promoting precision irrigation technologies such as drip and sprinkler systems to maximise crop output using minimal water.
- **Subsidy support includes:**
  - 55% of the unit cost for small and marginal farmers.
  - 45% of the unit cost for other farmers.
- A **Micro Irrigation Fund** of ₹5,000 crore, managed by NABARD, assists states in expanding micro-irrigation beyond regular PDMC support.

MISSION FOR ATMANIRBHARTA IN PULSES

Context: To address demand - production gap and achieve long-term self-sufficiency, the Union Cabinet has approved the Mission for Atmanirbharta in Pulses for 2025–26 to 2030–31, with an outlay of ₹11,440 crore.



About the Mission for Atmanirbharta in Pulses

- The Mission for Atmanirbharta in Pulses seeks to expand the area under pulses, improve productivity, strengthen seed systems, and ensure assured procurement. By 2030–31, it aims to:
  - Increase pulse area to 310 lakh hectares
  - Raise production to 350 lakh tonnes
  - Improve yield to 1130 kg/ha
- The Mission is also expected to generate employment, reduce import dependence, save foreign exchange, and promote climate-resilient, soil-friendly agricultural practices.
- It aims to ensure 100 percent procurement of Tur, Urad, and Masoor at MSP for four years.
- It will be implemented under the Ministry of Agriculture and Farmer Welfare.

WORLD FOOD DAY 2025

Context: World Food Day 2025 was observed on 16 October, coinciding with the 80th anniversary of the Food and Agriculture Organization (FAO).

About World Food Day

- The day highlights global efforts toward ensuring food security, better nutrition, and sustainable agriculture.
- First formally celebrated in 1981, it serves as a reminder that hunger and malnutrition persist despite technological and agricultural progress.
- Theme for 2025: "*Hand in Hand for Better Foods and a Better Future*"

EXPANSION OF NATIONAL AGRICULTURE MARKET

Context: The Department of Agriculture and Farmers' Welfare has expanded the National Agriculture Market (e-NAM) by **adding nine new commodities to the platform.** With this addition, e-NAM now supports trading in 247 agricultural commodities.

About National Agriculture Market (e-NAM)

- Introduced in **2016** by the Ministry of Agriculture and Farmers' Welfare, e-NAM is **an online trading platform for agricultural commodities.**
- It **connects Agricultural Produce Market Committee (APMC) mandis across different states** to create a unified national market.
- e-NAM enables transparent online trading, real-time price discovery, and direct online payments to farmers' bank accounts.
- The platform promotes transparent trading, protects farmer interests, and contributes to the long-term development of India's agricultural economy.
- The Directorate of Marketing and Inspection (DMI) [under MoA&FW] is responsible for setting tradable standards for commodities on e-NAM.
- e-NAM is **funded by the Central Government** and **implemented by the Small Farmers Agribusiness Consortium (SFAC)** under the Ministry of Agriculture and Farmers' Welfare.



CANNABIS

Context: The Kerala HC recently dismissed a plea seeking to quash a case related to the cultivation of cannabis.

What Is Cannabis?



- Cannabis is a plant of the genus Cannabis, commonly known as hemp. It has been used across societies for medicinal, industrial, recreational, and cultural purposes.
- The plant contains several chemical substances called cannabinoids.
- The most well-known cannabinoid is **THC (tetrahydrocannabinol)**, which has psychoactive (**intoxicating**) effects.
- Another important compound is **CBD** (**cannabidiol**), which is **non-intoxicating** and is used for medical purposes.
- Different parts of the cannabis plant are used for different purposes: **Flowers and resin have high THC content** and are associated with intoxicating effects. **Leaves and seeds contain very low levels of THC** and have traditionally been used in food, medicine, and rituals in India.
- **Fibres from the plant are used to make rope, textiles, and industrial products** (industrial hemp).

What Is "Cannabis" under Indian Law?

- Under the Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985, "cannabis (hemp)" is narrowly defined in Section 2(iii). It includes:
  - **Charas**: The resin extracted from the cannabis plant, including hashish oil.
  - **Ganja**: The flowering or fruiting tops of the cannabis plant.
  - **Mixtures or preparations:** Any mixture or drink prepared from charas or ganja.
- **Excluded: Seeds and leaves,** when not accompanied by flowering or fruiting tops, are not treated as cannabis under the Act.
- **NDPS Act prohibits the cultivation of any cannabis plant,** except with government authorization for medical or scientific purposes.

What Is the Legal Status of Bhang in India?

- **Bhang is legal under the NDPS Act because it is prepared from the leaves of the cannabis** plant, which are expressly excluded from the Act's definition of cannabis, provided they are not accompanied by flowering tops.

- As a result, bhang is not classified as a narcotic drug under the NDPS Act.
- However, bhang is not completely unregulated. **Its production, sale, and consumption are governed by State excise laws, not the NDPS Act.**

NATIONAL BEEKEEPING AND HONEY MISSION (NBHM)

Context: India's honey sector is undergoing a structured transformation as the NBHM continues to scale up scientific beekeeping practices across the country.

About National Beekeeping and Honey Mission (NBHM)

- The NBHM is a **Central Sector Scheme aimed at promoting scientific beekeeping and the production of quality honey and other beehive products**, with the larger vision of achieving a **"Sweet Revolution."**
- The Mission is implemented **through the National Bee Board (NBB).**
- It has a total budget outlay of ₹500 crore and is being implemented during the period FY 2020–21 to FY 2025–26.

Sub-schemes under NBHM

- **Mini Mission–I:** Focuses on improving crop production and productivity through enhanced pollination, supported by the adoption of scientific beekeeping practices.
- **Mini Mission–II:** Concentrates on post-harvest management of beekeeping and beehive products, including collection, processing, storage, marketing, and value addition.
- **Mini Mission–III:** Emphasizes research and technology generation, tailored to the diverse regional, agro-climatic, and socio-economic conditions across States and regions.

Achievements

- In 2024, India produced ~1.4 lakh metric tonnes (MT) of natural honey. Major Indian states producing honey are Uttar Pradesh (17%), West Bengal (16%), Punjab (14%), Bihar (12%) and Rajasthan (9%).
- I**ndia is the second-largest exporter of honey after China**, up from the 9th rank in 2020.
- Major export destinations included the USA, UAE, Saudi Arabia, Qatar and Libya.
- The **Madhukranti portal** has been launched for online registration and traceability of the source of honey and other bee products.

About National Bee Board (NBB)

- NBB is the **apex body for beekeeping development in India**. It was established in 2000 promoted by the **Small Farmers' Agri-business Consortium (SFAC)** and **registered under the Societies Registration Act, 1860.**
- It operates under the Department of Agriculture & Cooperation & Farmers Welfare.
- It is **headquartered in New Delhi.**

MARINE FISHERIES CENSUS 2025

Context: The Ministry of Fisheries, Animal Husbandry and Dairying has launched the national Marine Fisheries Census (MFC) 2025 for household-level enumeration.

About 2025 Marine Fisheries Census (MFC)

- It is jointly conducted by the Department of Fisheries (DoF), Ministry of Fisheries, Animal Husbandry and Dairying, and the ICAR-Central Marine Fisheries Research Institute (CMFRI), with the Fishery Survey of India (FSI) as the operational partner.
- The fifth edition of the Marine Fisheries Census will cover over 1.2 million fisher households across nearly 5,000 marine fishing villages in 13 coastal States and Union Territories.
- The census is fully digital, using dedicated mobile applications (VyAS-NAV, VyAS-BHARAT, VyAS-SUTRA) for real-time, geo-referenced data collection.

Key Objectives

- Document every marine fisher family, fishing village, craft, gear, and associated infrastructure across India's coastline.
- Gather comprehensive data on household demographics, socio-economic status, ownership of boats and equipment, credit, insurance, and access to government schemes.

WORLD COOPERATIVE MONITOR 2025

Context: Two farmer-owned cooperatives from India - AMUL and IFFCO have emerged as the world's top cooperatives. The ranking has been **conducted by the International Cooperative Alliance (ICA)** through the World Cooperative Monitor 2025.

About World Cooperative Monitor (WCM)

- The WCM is developed annually by the ICA in partnership with **EURICSE (European Research Institute on Cooperative and Social Enterprises).** This is WCM's 13th edition.
- It analyses the economic and social impact of the world's largest cooperatives across different sectors.
- The WCM is designed to collect reliable economic, organisational, and social data on cooperatives worldwide, and it is the only global report that compiles annual quantitative data on the international cooperative movement.
- By absolute turnover, leading organizations in the Top 300 include: Groupe Crédit Agricole (France), State Farm (USA), REWE Group (Germany).
- By turnover relative to GDP per capita, India's Gujarat Cooperative Milk Marketing Federation (Amul) and Indian Farmers Fertiliser Cooperative Limited (IFFCO) occupy the top two global positions respectively, marking a historic achievement for India's cooperative sector

About International Cooperative Alliance (ICA)

- **Headquartered in Brussels**, the ICA is the **apex body representing cooperatives worldwide and promotes the cooperative model as a sustainable form of business.**
- Founded in **1895**, it is one of the oldest non-governmental organisations and among the largest in terms of people represented, with around 1 billion cooperative members.
- Its membership includes international and national cooperative organisations from all sectors of the economy, with over 306 organisations from 105 countries.

DIGITAL INITIATIVES FOR PDS

Context: The Ministry of Consumer Affairs, Food and Public Distribution has launched several digital initiatives aimed at modernising warehousing operations, improving supply chain efficiency, and enhancing transparency across the Public Distribution System (PDS).

Bhandaran 360	• It is an **Enterprise Resource Planning (ERP) platform** developed by the Central Warehousing Corporation (CWC). • It integrates 41 modules covering HR, finance, marketing, warehouse operations, contract management, and project monitoring. • The system is linked with 35 external platforms, including ICEGATE, port systems, and FCI, enabling seamless digital coordination in food storage and movement. • It provides real-time dashboards and predictive analytics, helping standardise operations, improve accountability, and support faster decision-making.
Smart EXIM Warehouse System	• The Central Warehousing Corporation (CWC) has also introduced the Smart EXIM Warehouse System for **Container Freight Stations (CFS) and general warehouses.** • The system uses advanced technologies such as Artificial Intelligence (AI), Internet of Things (IoT), FASTag, Optical Character Recognition (OCR), and related tools to automate key processes. • Key features include automated gate entry, digital twin-based yard management, and real-time inventory tracking integrated with ERP–WMS (Warehouse Management System) integration.
ANNA DARPAN	• Launched by the **Food Corporation of India (FCI),** is a microservices-based platform replacing the Depot Online System. • It integrates procurement, storage, movement, sales, quality checks, labour, and contracts into a single information system.
Anna Sahayata	• It is an AI-based feedback platform launched by the Department of Food and Public Distribution (DFPD).

Holistic AI Solution (ASHA)	• It allows beneficiaries to share feedback on ration delivery through AI-enabled multilingual calls, supported by Bhashini under the IndiaAI Mission. • The system uses sentiment analysis, grievance categorisation, and dashboards to strengthen citizen participation and evidence-based governance in the PDS.

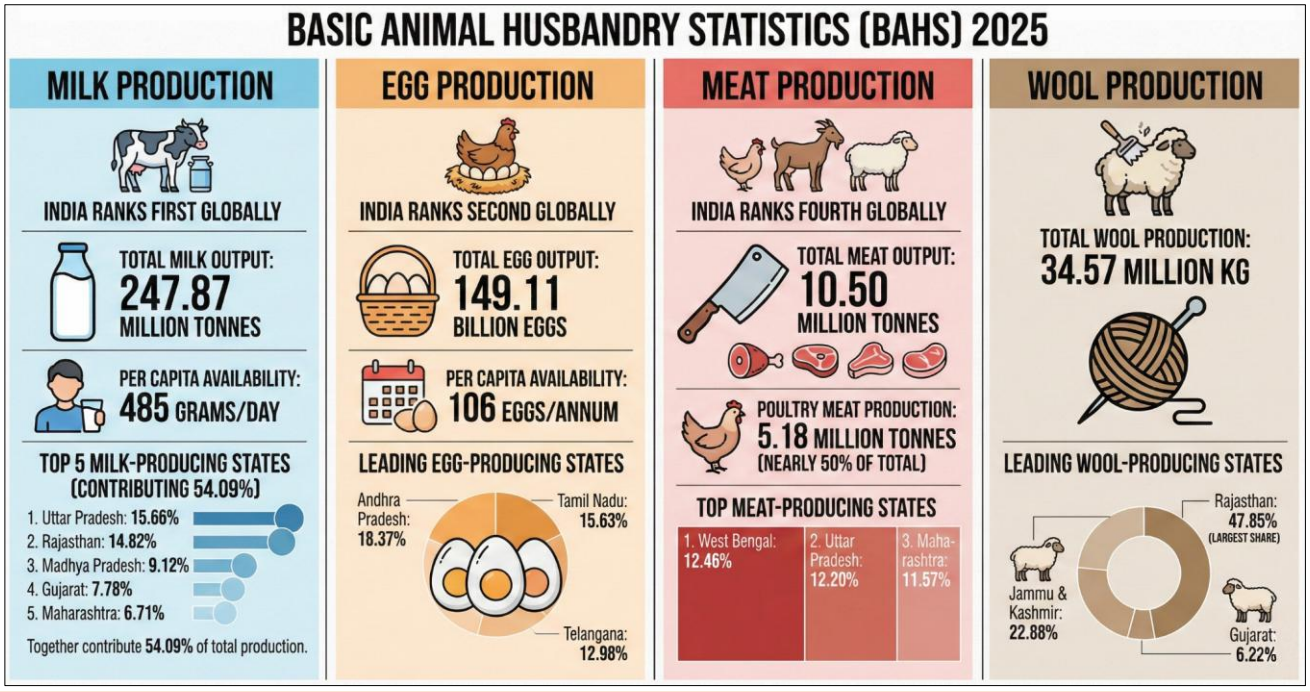
BASIC ANIMAL HUSBANDRY STATISTICS 2025

Context: The Department of Animal Husbandry and Dairying released the Basic Animal Husbandry Statistics (BAHS) 2025 on National Milk Day, observed on 26 November 2025.

- National Milk Day commemorates the birth anniversary of Dr. Verghese Kurien, the Father of the White Revolution in India.

About Basic Animal Husbandry Statistics (BAHS)

- BAHS presents comprehensive data on trends in the livestock and dairy sectors. It is based on the findings of the Integrated Sample Survey.
- The survey generates production estimates of Major Livestock Products (MLPs) such as milk, eggs, meat, and wool, which are vital for research, planning, and policy formulation in the livestock sector.



PROTECTION OF PLANT VARIETIES AND FARMERS' RIGHTS ACT, 2001

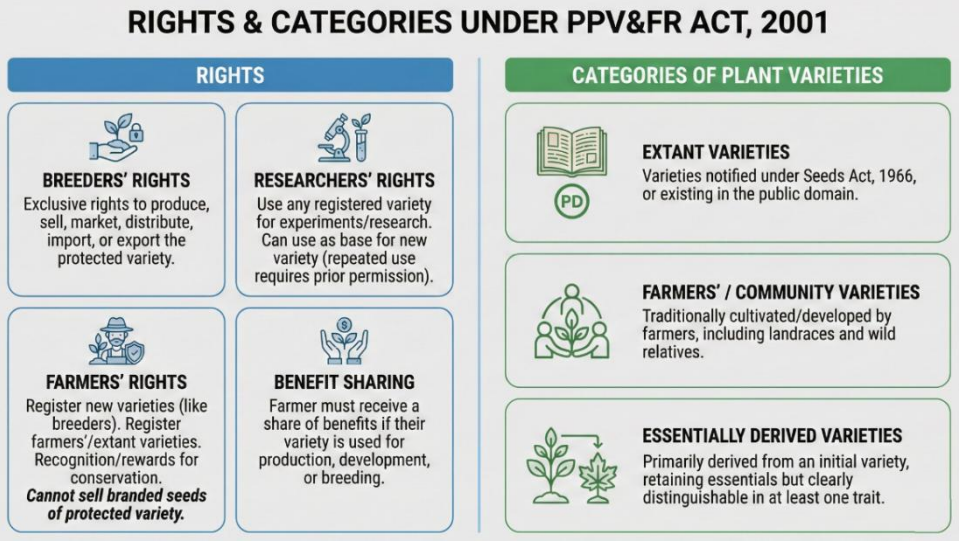
Context: Silver Jubilee (25th anniversary) of India's Protection of Plant Varieties and Farmers' Rights (PPV&FR) Act, 2001, was celebrated in November 2025.

About the PPV&FR Act 2001

- The Act **designed to protect the rights of plant breeders, researchers, and farmers**, while also **encouraging the development of new plant varieties.**
- The Act aims
  - **to provide a system for the protection of plant varieties**
  - **to recognize and protect the rights of farmers and plant breeders**
  - **to encourage the development of new varieties of plants** for the benefit of the agriculture sector .
- The Act **aligns with the 1978 Convention of the International Union for the Protection of New Varieties of Plants (UPOV),** while also protecting the interests of public sector breeding institutions and farmers.
- **Variety Registration:** A plant variety is eligible for registration if it satisfies the criteria of: **Distinctiveness, Uniformity, Stability (DUS)**
- The Act provides for the **establishment of a Protection of Plant Varieties and Farmers' Rights Authority (PPV&FRA)** to implement its provisions.

About Protection of Plant Varieties and Farmers' Rights Authority (PPV&FRA)

- It is a statutory body established under the Ministry of Agriculture & Farmers' Welfare, Government of India. The Authority is headquartered in New Delhi.
- **Key Objectives:**
  - Grant intellectual property rights to plant breeders for their innovations in developing new plant varieties
  - Recognise and reward farmers and communities who conserve traditional varieties and biodiversity
  - Promote the protection of farmers' rights to save, use, sow, resow, exchange, share, and sell farm-saved seed of registered varieties
  - Encourage research and innovation in plant breeding and agriculture
  - Maintain the National Register of Plant Varieties (NRPV) to document all registered varieties and their breeders.
  - Maintenance of National Gene Bank to preserve the seeds of Plant Genetic Resources (PGR) for future generations.



- **Composition:** The Authority consists of a Chairperson and 15 members, including representatives of farmers, tribal groups, the seed industry, and women's organisations.

TAXATION

SHORTFALL IN CESS TRANSFER

Context: As of 2023-24, the Central Government has failed to transfer Rs 3.69 lakh crore worth of cess collections to the relevant funds, the Comptroller and Auditor General (CAG) has found.

What is a Cess?

- **A cess is an additional tax charged on top of the regular tax.** Governments levy a cess when they need extra funds for a specific purpose.
- For example: An education cess may be imposed to collect money for improving schools or training teachers.
- Revenue from regular taxes such as income tax or GST goes into the Consolidated Fund of India (CFI), where it can be used for any public purpose.
- Although cess collections are also first deposited into the CFI, they are not treated like normal taxes. **They must be spent only on the particular objective for which the cess was created.**
- To ensure proper use, the **government may later transfer the cess money from the CFI to a dedicated fund** set up for that specific purpose.

How is it different from Surcharge?

- A surcharge is an **extra tax** on individuals or companies with taxable income above a certain threshold, intended as **a "tax on tax"** to increase tax burden on higher incomes.
- The collected amount goes into the government's general fund for various uses.
- Both cess and surcharge are **collected by the Central Government and are not shared with states.**

INCOME TAX ACT, 2025

Context: The President has approved the Income Tax Act, 2025, which replaces the Income-Tax Act, 1961. The new law will come into effect on 1 April 2026.

Key Highlights

- **Simpler Framework:** The Act uses clearer and more straightforward language than the earlier law. Provisions related to Minimum Alternate Tax (MAT) and Alternate Minimum Tax (AMT) are now placed in separate sub-sections for easier understanding.
    - **Minimum Alternate Tax (MAT):** MAT ensures that companies making high book profits do not avoid paying taxes by using various exemptions and incentives. It applies only to corporate taxpayers. MAT brings so-called "zero-tax companies" into the tax system by requiring them to pay a minimum amount of tax.
    - **Alternate Minimum Tax (AMT):** AMT works in a similar way to MAT but applies to non-corporate taxpayers, such as firms or limited liability partnerships.
- **Tax Year:** The 2025 Act introduces the concept of tax year, which has been defined as the 12-month period beginning April 1.
- **Stability in Tax Structure:** Core features such as tax rates and tax regimes for individuals and companies remain unchanged. Definitions, offences, and penalties continue largely as they were.
- **Faceless Processes:** The Act continues the system of faceless collection of information and faceless assessment, which reduces personal interaction and improves transparency.
- **Power to Frame Schemes:** The central government is authorised to introduce new schemes to enhance efficiency, transparency, and accountability in tax administration.
- **Expanded Definition of Undisclosed Income:** Items such as money, jewellery, or other valuables found during searches will now also include virtual digital assets.
- **Access to Virtual Digital Space:** During search and seizure operations, tax authorities can access a person's virtual digital space, even if it is protected by access codes. "Virtual digital space" includes: Email accounts; Social media profiles; Online trading or investment accounts; Digital platforms holding information about assets
- **Dispute Resolution Panel:** Certain taxpayers (such as those involved in transfer pricing cases, non-residents, or foreign companies) may refer draft assessment orders to a dispute resolution panel.
    - **Transfer pricing** refers to the prices charged in transactions between related companies of a multinational group.
- **Pending Proceedings:** Any case or appeal pending before an Income-Tax authority, the Appellate Tribunal, or a court at the time the new Act begins will continue under the old law until it is resolved.
- **Tax Treaties:** The Act allows the central government to sign agreements with other countries to avoid double taxation, ensuring that taxpayers are not taxed twice on the same income.

PAN 2.0 PROJECT

Context: The Income Tax (IT) Department has awarded LTIMindtree Limited a contract worth ₹792 crore to develop the PAN 2.0 system, expected to be operational within 18 months.

PAN 2.0 Project

- The project **aims to simplify PAN/TAN services,** ensure faster delivery, improve service quality, and strengthen grievance redressal by using advanced technologies.
- PAN 2.0 will provide a **single-window platform for all PAN and TAN-related services,** including allotment, corrections/updates, Aadhaar–PAN linking, re-issuance requests, online PAN validation (OPV), and more.
- At present, PAN services are distributed across three portals—e-Filing, UTIITSL, and Protean e-Gov. PAN 2.0 will consolidate these into one integrated system.
- The upgraded PAN system will include improvements such as:
    - An enhanced QR code on both new and old PAN cards; A fully online application process;
    - Integration of all existing identification numbers so that PAN becomes the universal identifier for businesses.
    - A secure PAN Data Vault will also be developed to protect PAN-related information and strengthen cybersecurity.
    - Completely online, paperless process as against the prevailing mode.
- **Existing PAN cards will remain valid under PAN 2.0.**

About PAN (Permanent Account Number)

- PAN is a unique identification number issued by the Income Tax Department. Once given, it stays the same for a person throughout their life.
- It helps the Income Tax Department track important financial activities such as tax payments, TDS/TCS credits, and the filing of income tax returns.

About TAN (Tax Deduction and Collection Account Number)

- TAN is a 10-digit alphanumeric number issued by the Income Tax Department to persons or entities responsible for deducting or collecting tax at source.
- Anyone deducting or collecting tax must obtain a TAN and mention it in all TDS/TCS returns, payment challans, and TDS/TCS certificates. It ensures proper tracking and credit of taxes deducted or collected.

FISCAL RESPONSIBILITY AND BUDGET MANAGEMENT (FRBM) ACT

Context: A recent report by the Comptroller and Auditor General of India (CAG) has pointed out several issues in how the government is following the provisions of the FRBM Act.

About the FRBM Act, 2003

- The FRBM Act was **introduced to promote responsible fiscal management** so that today's borrowing does not burden future generations.
- Its broader **aim is to ensure long-term economic stability** by keeping government finances on a sustainable path.
- The **Act requires the CAG to conduct an annual review** of whether the government has complied with its provisions.
- **Statements Required Before Parliament:** Along with the Union Budget, the government must present the following three documents mandated under the Act:
  - Macro-economic Framework Statement
  - Medium-Term Fiscal Policy Statement
  - Fiscal Policy Strategy Statement

Parameter	Target	Deadline	Status (as of 2023–24)
Fiscal Deficit (original FRBM target)	3% of GDP	31/3/2021	5.32%
Debt Limits	General Govt (Centre + States): ≤ 60% of GDP Central Govt: ≤ 40% of GDP	End of FY 2024–25	Central Govt: ~57% General Govt: ~81.3%
Revised Fiscal Consolidation Path	Fiscal deficit < 4.5% of GDP	FY 2025–26	–
Additional Guarantees (on Consolidated Fund of India)	≤ 0.5% of GDP per year	Annual	–

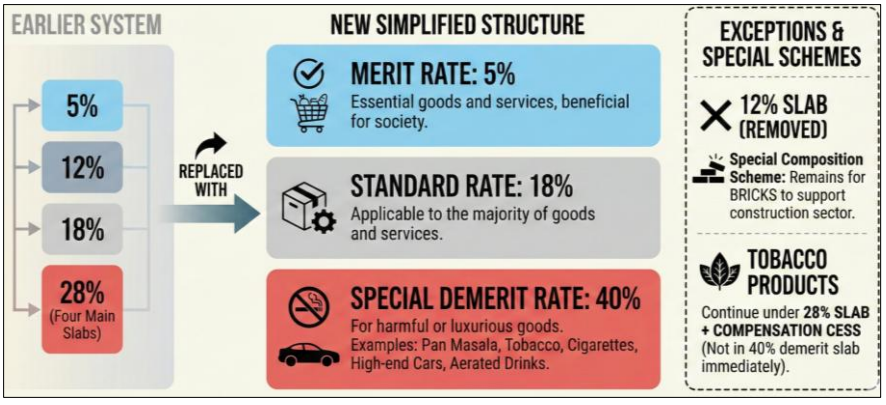
- The Act allows for an "escape clause" during exceptional situations such as national security threats, natural disasters, or severe economic downturns, permitting temporary deviation from fiscal targets.

GOODS AND SERVICES TAX 2.0 REFORMS

Context: The 56th meeting of the GST Council has approved the Next-Generation GST (GST 2.0) reforms.

Restructuring of Goods and Services Tax Slabs

- The earlier system of four main slabs (5%, 12%, 18%, and 28%) has been replaced with a simpler two-rate structure: **Merit Rate: 5% and Standard Rate: 18%**
- A **special demerit rate of 40%** has been introduced for **goods considered harmful or luxurious,** such as pan masala, tobacco, cigarettes, high-end cars, and aerated drinks.
- The **12% slab has been removed for most products** but continues for bricks under a special composition scheme to support the construction sector.



- **Tobacco products will continue under the 28% slab with compensation cess**, instead of shifting immediately to the 40% demerit slab.

About Goods and Services Tax (GST)

- GST is a **single indirect tax** applied to the supply of goods and services across India. It was introduced through the **101st Constitutional Amendment Act, 2016,** implemented from 1st July 2017.
- **Main Components**
  - **Central GST, State GST, UT GST:** Applied on intra-state transactions (within a state/UT).
  - **Integrated GST:** Applied on inter-state transactions (between states), collected by the Centre and shared with states.
- **Destination-Based Tax:** The **tax revenue goes to the state or UT where the goods or services are finally consumed.**

The GST Council	
What is?	The apex decision-making authority on all matters related to the GST
Constitutional Basis	Established under Article 279A of the Indian Constitution.
Headquarters	New Delhi (Secretariat).
Composition	• **Chairperson**: Union Finance Minister. • **Members**: Union Minister of State (Revenue/Finance) and Ministers in charge of Finance/Taxation of all States and Union Territories (UTs) with legislatures.
Voting Mechanism	• **Weightage**: Centre holds 1/3rd of total votes; States together hold 2/3rds. • **Decision Criteria**: Every decision requires a majority of at least 3/4ths of the weighted votes of members present and voting.
Key Role	• Recommends GST rates, exemptions, threshold limits, model GST laws, dispute resolution mechanisms, and special provisions for specific states.
Meetings	• Mandated to meet at least once every quarter. Special sessions can be convened for urgent issues.

GOODS AND SERVICES TAX APPELLATE TRIBUNAL

Context: In a major step toward dispute resolution, the Ministry of Finance has formally launched the Goods and Services Tax Appellate Tribunal (GSTAT).

About Goods and Services Tax Appellate Tribunal (GSTAT)

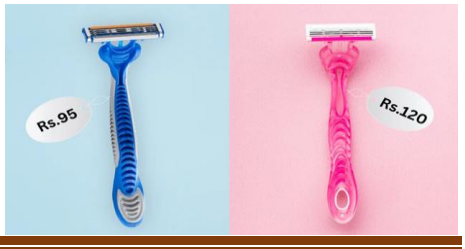
- The GSTAT is a **statutory appellate body** established under the **Central Goods and Services Tax Act, 2017.**
- It has been created **to hear appeals against orders issued by GST Appellate Authorities** and to provide taxpayers with an independent and reliable forum for justice.
- The Tribunal will operate through a **Principal Bench in New Delhi** and 31 State Benches, ensuring accessibility and nationwide coverage.
- Each Bench will consist of **two Judicial Members, one Technical Member (Centre), and one Technical Member (State).**

GSTAT e-Courts Portal

- This digital platform **will enable taxpayers and practitioners to file appeals online,** monitor case progress, and participate in hearings through virtual modes.
- Developed by the Goods and Services Tax Network (**GSTN**) in collaboration with the National Informatics Centre (**NIC**).

PINK TAX

Context: According to the International Finance Students Association's (IFSA) report "The Gender Tax: Assessing the Economic Toll on Women", ~67% of Indians have never heard of the Pink Tax.



What is Pink Tax?

- The Pink Tax is not an actual tax or a government-imposed fee. It refers to **a pricing pattern where women pay more for products or services marketed specifically to them.**

- The term originated in California, USA, in 1994. Common examples include **pink-coloured toys, haircuts,** dry-cleaning, razors, shampoos, lotions, deodorants, skincare and beauty products, clothing such as T-shirts and jeans, and salon services.
- Since there is **no legal ban on the Pink Tax,** companies often benefit by charging higher prices, gaining extra revenue without contributing additional tax to the government.
- In 2017, the United Nations urged member states to end gender-based price discrimination and improve women's economic participation.
- India has no specific law targeting the Pink Tax, but the **National Consumer Disputes Redressal Commission (NCDRC) has ruled that companies must follow fair pricing** practices and avoid gender-based price discrimination.

Tampon Tax / Menstrual Tax

- The tax charged on menstrual hygiene products like sanitary pads and tampons. In many countries, these items were taxed as non-essential luxury goods.
- *In India, sanitary napkins were made tax-free under GST in 2018.*

REMISSION OF DUTIES AND TAXES ON EXPORTED PRODUCTS SCHEME

Context: The Remission of Duties and Taxes on Exported Products (RoDTEP) Scheme has been extended until March 2026.

About RoDTEP (Remission of Duties and Taxes on Exported Products) scheme

- The RoDTEP scheme is an initiative launched in 2021, **to boost India's exports by reimbursing exporters for various central, state, and local duties and taxes that are not refunded under other schemes.**
- The scheme replaced the earlier Merchandise Exports from India Scheme (MEIS) after a WTO ruling against it.
- The scheme is an initiative under the Ministry of Commerce & Industry, **implemented by the Central Board of Indirect Taxes & Customs (CBIC)** (under the Ministry of Finance).
- **Aim:** To neutralize the embedded taxes and duties suffered on exported goods, which were previously non-recoverable, thereby providing Indian exporters a level playing field globally.
- **Eligibility and Coverage**
  - It covers a wide range of sectors including textiles, agriculture, leather, gems and jewellery, and electronics.
  - The scheme is available to all categories of exporters, including micro, small, and medium enterprises (MSMEs), as well as manufacturers and merchant exporters.

FINANCIAL MARKETS

BOND FORWARDS

Context: The new RBI norms have authorised the use of bond forwards in government securities.

What is Bond Forward?

- A bond forward is a **financial contract between two parties to buy or sell a bond at a future date for a pre-agreed price.**
- It is a type of **forward contract** but **used only for bonds** (government or company bonds).
- The pre-agreed price is called the **forward price,** and the contract value is realised at maturity.
- Scheduled commercial banks, standalone primary dealers, and institutional investors such as insurance companies will act as **market makers** for bond forwards.
  - However, small finance banks, payment banks, local area banks, and regional rural banks are excluded from engaging in market-making.
- The move is aimed at enabling market participants (especially long-term investors, such as insurance funds) to manage their cash flows and interest rate risks across different cycles.
- It will also help in the efficient pricing of derivatives linked to government securities and expand market participation.

Market Maker

- A market maker is a **financial firm** (sometimes an individual) **that continuously quotes both buy (bid) and**

sell (ask) prices for a financial instrument such as stocks, bonds, or currencies.

- Their main role is **to provide liquidity** (easy buying and selling) and ensure smooth functioning of financial markets.
- **Who are they?:** Brokerage firms, banks, and other financial institutions
- **How do they earn?:** They quote a bid price (highest price they are ready to pay for buying) and an ask price (lowest price at which they are willing to sell). The difference between the two prices is called the **bid-ask spread**, which is their profit margin.

FUTURES & OPTIONS

Context: Several financial experts, including the Finance Minister and the Chief Economic Advisor, have warned about the rising craze for Futures and Options (F&O) trading and cautioned investors against excessive use of derivatives.

Derivatives - Futures and Options (F&O)

- The financial market system in India can be broadly divided into two segments: the cash segment and the derivative segment. **Derivatives are contracts whose value is derived from an underlying asset.**
- **Derivative contracts** are **short-term financial instruments with a fixed expiry date**. The underlying asset can be stocks, commodities, currencies, indices, exchange rates, or even interest rates.
- **Derivative trading involves buying and selling these financial contracts in the market**. Profits can be made by predicting the future price movements of the underlying asset. Derivative contracts are of two main types: futures and options.

Futures Contract:

- A futures contract is an agreement between a buyer and a seller to buy or sell a specific underlying asset at a predetermined price on a future date. These contracts are standardized in terms of quantity, quality, delivery time, and place.
- They are **commonly used for hedging or speculative purposes** and require margin deposits due to ongoing price mark-to-market adjustments.

Options Contract:

- Similar to futures, options contracts allow the buyer and seller to trade an underlying asset at a specified price at a future date. However, unlike futures, options do not create an obligation for both parties.
- **The buyer has the right, but not the obligation, to execute the contract.** Options are further classified into:
  - **Put Option:** Gives the holder the **right** (but not the obligation) **to sell an asset** (such as stocks, bonds, or commodities) at a predetermined price within a specified time frame. One buys a call option when one thinks that the price of something will go up.
  - **Call Option:** Gives holder the **right** (but not the obligation) **to buy an asset** at a predetermined price within a specified time frame. One buys a put option when one thinks that the price of something will go down.
- The option buyer can choose to exercise the contract or let it expire, limiting their maximum loss to the premium paid for the option. For sellers, potential losses can be much higher.

Aspect	Futures Contract	Options Contract
Obligation	**Obligatory for both parties**; both must fulfill the contract	**Buyer has the right but not the obligation** to execute
Risk & Reward	Unlimited profit and loss potential for both parties	Limited risk for the buyer (premium), limited profit for the seller.
Flexibility	Less flexible; both parties are bound by the contract terms	More flexible; the buyer can choose not to execute
Market Exposure	Direct exposure to underlying asset price movements	Limited risk for the buyer (premium), but potentially unlimited loss for an uncovered seller

OPINION TRADING PLATFORMS

Context: The SEBI has issued a caution to investors against dealing with opinion trading platforms.

- Opinion trading platforms, also known as prediction markets, **are digital platforms that allow users to trade or bet on the outcome of real-world events based on yes/no propositions**.

- Users buy "contracts" predicting whether an event will happen, such as "Will the NIFTY50 reach 25000 points by the end of the month?" If the predicted event occurs, the user who bought the "Yes" contract wins a payout, while if it does not, the user who bought the "No" contract wins.
- The price of these contracts varies in real-time based on market demand and sentiment, reflecting the perceived probability of the event happening.
- They are not regulated by SEBI because the items being traded are not classified as securities under Indian law.

BONUS ISSUE

Context: HDFC Bank, one of India's largest private sector banks, has announced plans to reward its shareholders through a bonus issue along with a special interim dividend.

About Bonus Issue

- A bonus issue (or bonus shares) refers to the **practice of a company issuing additional shares to its existing shareholders free of cost.**
- These shares are **distributed in proportion to the number of shares already held.** For example, under a 1:1 bonus, a shareholder owning one share receives one additional share.
- The move does not change the overall value of a shareholder's investment, but it increases the number of shares they hold.
- For investors, bonus issues serve as a reward and often improve market liquidity. Companies typically issue bonus shares when they have strong reserves or profits.

QUALIFIED INSTITUTIONAL PLACEMENT (QIP)

Context: The State Bank of India (SBI), the country's largest public sector lender, has launched a Qualified Institutional Placement (QIP) to raise up to ₹25,000 crore.

About Qualified Institutional Placement (QIP):

- A QIP is a method through which a **listed company raises capital by issuing equity shares or related securities to Qualified Institutional Buyers (QIBs).**
- QIBs include entities such as mutual funds, insurance companies, pension funds, and venture capital firms.
- This mechanism **allows companies to access funds quickly from institutional investors** without going through lengthy public offerings.
- QIPs are **regulated by the Securities and Exchange Board of India (SEBI)**.

SKILL IMPACT BOND

Context: As India eyes its goal of becoming a $30 trillion economy by 2047, innovative models like Skill Impact Bond (SIB) are being utilized to address the challenges of skilling and unemployment.

What is a Skill Impact Bond (SIB)?

- A Skill Impact Bond (SIB) is a special type of funding model used to improve the skills and employment outcomes of young people.
- In this model, private investors and philanthropic organisations fund training programmes upfront.
- The government or another outcome funder repays the investors only if the training leads to real results, such as people getting jobs and staying employed.

About the India's Skill Impact Bond

- The Skill Impact Bond (SIB) is **India's first and largest development impact bond focused on improving employment outcomes.**
- It was launched in **November 2021** by the Ministry of Skill Development and Entrepreneurship **(MSDE)** through the National Skill Development Corporation **(NSDC).**
- The programme is supported by philanthropic and private partners, including the British Asian Trust and the Children's Investment Fund Foundation.
- SIB aims to train 50,000 youth, with at least 30,150 retained in jobs for a minimum of three months. So far, over 23,700 youth have been trained, of whom 72% are women, across 30 job roles in 13 sectors.
- Jharkhand accounts for the highest enrollment (26%), followed by Uttar Pradesh and Delhi.

SAKSHAM NIVESHAK

Context: The Investor Education and Protection Fund Authority (IEPFA) has launched a 100-day national campaign called Saksham Niveshak.

- The Saksham Niveshak drive aims to empower shareholders by **creating awareness about unclaimed dividends lying with companies** and **guiding them on how to update their KYC and nomination details to reclaim these dues.**
- It encourages companies to actively reach out to their shareholders, helping them recover unclaimed dividends and restart regular dividend payments by updating essential records.

Investor Education and Protection Fund Authority (IEPFA)

- IEPFA, a statutory body, was established in 2016 **under the Companies Act, 2013** and **functions under the Ministry of Corporate Affairs.**
- It **administers the Investor Education and Protection Fund (IEPF),** a fund where unclaimed dividends, shares, matured deposits, and debentures are transferred after remaining unclaimed for seven years.
- It works to **promote financial literacy, protect investor interests, and manage unclaimed dividends and shares.**
- **Programmes:** Niveshak Didi (in partnership with the India Post Payments Bank), Niveshak Panchayat, and Niveshak Shivir

SWAMIH FUND

Context: RBI has exempted the SWAMIH (Special Window for Affordable and Mid-Income Housing) Fund from its recently tightened regulatory norms for investments in Alternative Investment Funds (AIFs).

About SWAMIH Fund

- The SWAMIH Fund is a **government-backed initiative** launched in **2019 to revive stalled and distressed real estate projects in India**, particularly in the affordable and mid-income housing segments.
- It operates as a **Category II Alternative Investment Fund (AIF) registered with SEBI** and is managed by **SBICAP Ventures Limited**, a subsidiary of the State Bank of India.
- **Objective:** To provide last-mile debt financing to complete unfinished housing projects, ensuring timely delivery of homes to buyers and revitalizing the real estate sector.
- The fund acts as a lender of last resort for troubled projects, especially those with legal or NPA issues.
- The Sponsor of the Fund is the Secretary, Department of Economic Affairs, Ministry of Finance, Government of India on behalf of the Government of India.

CLEARING CORPORATION OF INDIA LIMITED (CCIL)

Context: The RBI Governor has urged the CCIL to develop infrastructure that supports trading and settlement of the rupee against a wider basket of currencies, beyond the current US dollar–rupee framework. **At present, CCIL facilitates settlement only in USD–INR.**

About Clearing Corporation of India Limited (CCIL)

- Established in **2001**, CCIL acts as a **central counterparty (CCP) offering clearing and settlement services for government securities**, **money market instruments, foreign exchange, and over-the-counter (OTC) derivatives.**
- In 2014, the Reserve Bank of India (RBI) recognised CCIL as a **Qualified Central Counterparty (QCCP).**
- **Promoters**: State Bank of India, IDBI Bank Ltd, ICICI Bank Ltd, Life Insurance Corporation of India (LIC), Bank of Baroda and HDFC Bank Ltd.

Clearing is the calculation of who owes what, and Settlement is the actual exchange of money and assets.

INDIA DEVELOPMENT AND STRATEGIC FUND (IDSF)

Context: The Confederation of Indian Industry (CII) has proposed a sovereign-backed, professionally managed India Development and Strategic Fund (IDSF)

About *proposed* India Development and Strategic Fund (IDSF)

- The IDSF aims to mobilise patient, long-term capital for India's growth needs. The proposal recognizes that ambitions in infrastructure, energy transition, manufacturing, technology, and human development cannot be financed through annual budgets alone.

- IDSF is envisaged as a twin-arm national fund.
  - **The development arm** would finance long-gestation domestic priorities through patient equity and blended finance, acting as an anchor investor to crowd in global capital; the NIIF could evolve into this arm.
  - **The strategic arm** would secure overseas assets in energy, critical minerals, semiconductors, AI, and logistics, strengthening India's economic and security interests.

About Confederation of Indian Industry (CII)

- CII is a non-government, not-for-profit, industry-led organisation that works with industry, government, and civil society to support India's development through consultation and policy engagement.
- CII originated as the Engineering and Iron Trades Association (EITA) in 1895. It became the Confederation of Engineering Industry in 1986 and adopted its current name in 1991.
- CII operates as a membership-based organization under the Societies Registration Act, 1860.
- Headquartered in New Delhi, it maintains 70 offices in India, including 12 Centres of Excellence, and 9 overseas offices with partnerships in nearly 100 countries.

SEBI FLAGS DIGITAL GOLD RISKS

Context: The Securities and Exchange Board of India (SEBI) has issued a public advisory cautioning investors against investing in digital gold or e-gold products. SEBI has clarified that these products fall outside its regulatory framework.

- SEBI has advised investors to prefer SEBI-regulated gold investment instruments, such as: Gold Exchange Traded Funds (ETFs), Exchange-traded commodity derivatives, Electronic Gold Receipts (EGRs) traded on recognised stock exchanges

Digital Gold	• Digital gold refers to the **purchase of gold in electronic form without taking physical possession of the metal.** The value of digital gold is linked to the market price of physical gold. • Investors can buy, sell, and store gold digitally, often in small denominations, without the need for physical storage or a demat account.
Gold Exchange Traded Funds (ETFs)	• Gold ETFs are **SEBI-regulated financial instruments that represent physical gold in dematerialized form.** • They are traded on recognised stock exchanges, similar to shares. • Each unit of a Gold ETF corresponds to a specific quantity of gold, and its price reflects changes in gold prices. Investment in Gold ETFs requires a demat account.
Exchange-Traded Commodity Derivatives	• Exchange-traded commodity derivatives are **standardized contracts (such as futures and options) traded on regulated exchanges.** • The underlying asset is a commodity, such as gold, crude oil, or agricultural products. • These contracts allow investors to speculate on or hedge against price movements in commodities. They are regulated by SEBI, and their value is derived from the underlying commodity's price.
Electronic Gold Receipts (EGRs)	• EGRs are **electronic receipts issued by SEBI-registered vault managers against physical gold deposited in secure vaults.** • EGRs can be traded on recognized stock exchanges, allowing investors to buy and sell gold in dematerialized form. • Investors can redeem EGRs for physical gold, and GST is only charged at the time of conversion to physical gold.

INITIAL PUBLIC OFFERING (IPO)

Context: India's Chief Economic Advisor has expressed concern that Initial Public Offerings (IPOs) are increasingly being used as an exit option for early-stage investors.

About Initial Public Offering (IPO)

- An IPO is the process **through which a private company offers its shares to the public for the first time, transitioning from private to public ownership**.

- This **allows both institutional and individual investors to buy shares**, providing the company with **new equity capital** and **liquidity for existing shareholders.**
- Through an IPO, a privately-owned company becomes a publicly listed company.
- It provides the company with a major source of funds that have long-term or indefinite maturity.



- **Types of IPOs:**
  - **Fixed Price Issue:** The price of shares is announced in advance.
  - **Book Building Issue:** There is no single fixed price; instead, shares are offered within a specified price band, and the final price is determined based on investor demand.

FSAP REPORT BY WORLD BANK

Context: The FSAP report has encouraged India to speed up financial sector reforms in order to achieve its long-term objective of becoming a USD 30 trillion economy by 2047.

About Financial Sector Assessment Program (FSAP)

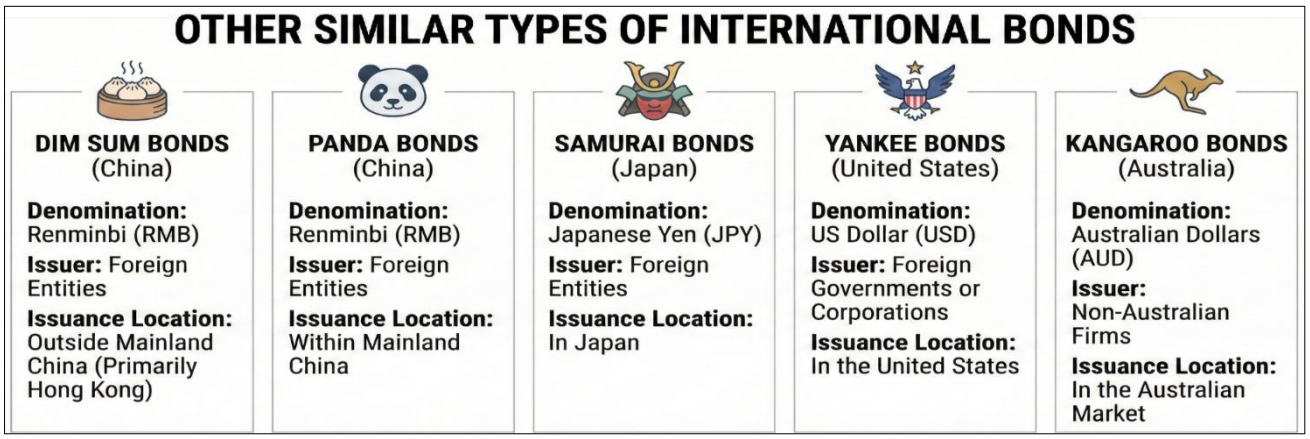
- The FSAP was launched in **1999** as a **joint initiative** of the **World Bank and the International Monetary Fund (IMF).** It is a **comprehensive and in-depth analysis of a country's financial sector.**
- The FSAP report **evaluates the strengths and vulnerabilities of the financial system,** assesses regulatory and supervisory frameworks, and recommends reforms to strengthen financial stability and resilience.
- Currently, it is mandatory for **32 jurisdictions, including India,** to be conducted every five years, and for another 15 jurisdictions every ten years.
- The last FSAP for India was conducted in 2017.

MASALA BOND

Context: The Enforcement Directorate has issued show-cause notices to Kerala CM over alleged FEMA and RBI violations linked to 2019 Masala Bond issuance.

What are Masala Bonds?

- Masala Bonds are rupee-denominated bonds issued overseas by Indian companies to raise funds from foreign investors.
- The bond value is fixed in Indian Rupees, but foreign investors pay and receive money in their own currency, converted at the market exchange rate.
- Unlike External Commercial Borrowings (ECBs), the currency risk is borne by the investor, not the Indian issuer.
- The International Finance Corporation (IFC) (World Bank's investment arm) issued ₹1,000 crore Bonds in 2014 to fund infrastructure projects in India. These bonds were listed on the London Stock Exchange, and **IFC coined the name "Masala Bonds"** to give them an Indian identity.
- Under RBI guidelines, the **minimum maturity is 3 years** for bonds raising up to USD 50 million equivalent and 5 years for amounts above that threshold.
- Eligible issuers include corporates, NBFCs, REITs and InvITs in FATF-compliant jurisdictions.
- Bond proceeds **cannot** be used for:
  - Real estate activities (except integrated townships and affordable housing),
  - Capital market or domestic equity investments,
  - Activities prohibited under FDI rules,
  - On-lending for restricted purposes, or
  - Purchase of land.

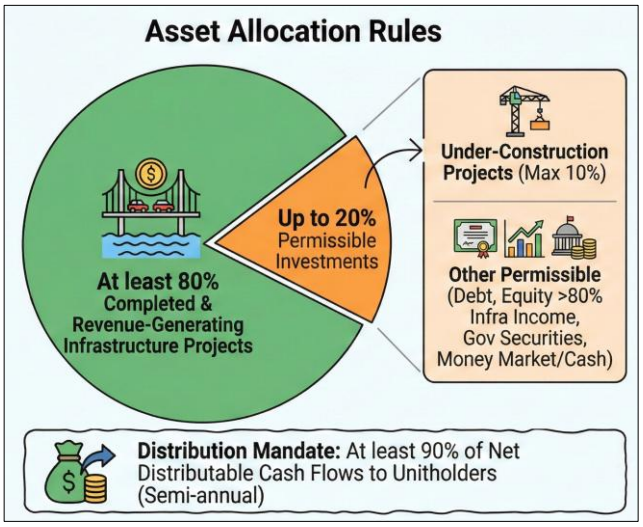


INFRASTRUCTURE INVESTMENT TRUST (INVIT)

Context: The Securities and Exchange Board of India (SEBI) has granted approval for the registration of NHAI sponsored Raajmarg Infra Investment Trust (RIIT) as an Infrastructure Investment Trust (InvIT).

What is Infrastructure Investment Trust (InvIT)?

- InvITs are Collective Investment Schemes like mutual funds that pool money from investors.
- InvITs own and operate operational infrastructure assets like highways, roads, pipelines, warehouses, power plants, etc. They offer regular income (via dividends) and long-term capital appreciation to the investors.
- This structure enables individual and institutional investors to invest in infrastructure projects and earn a portion of the income generated as returns. It allows pooling of money from multiple investors into a single trust.
- **InvITs are regulated by SEBI**, through the SEBI (Infrastructure Investment Trusts) Regulations, 2014 for the registration and regulation of InvITs.
- There are listed InvITs, which are traded on the stock exchanges. There are unlisted InvITs as well, in which large institutional investors can participate.



Structure of InvITs

There are four important parties to an InvIT:

- **Sponsors** are the promoters of the entity that sets up the InvIT. In the case of public–private partnership (PPP) projects, this refers to the infrastructure developer or a special purpose vehicle (SPV) developing the project.
- **The investment manager** is responsible for supervising the assets and investments of the InvIT, while the **project manager** is responsible for the execution of the project.
- The **trustee** (certified by SEBI) is responsible for ensuring that the activities of the InvIT, investment manager, and project manager comply with SEBI regulations.

Taxation Aspects in InvITs

- **Interest income:** Taxable in the hands of investors.
- **Dividend income**: Exempt if SPV has not opted for the lower tax regime; otherwise taxable
- **Revenue from underlying infrastructure assets:** Taxable.

What is Special Purpose Vehicle (SPV)?

- An SPV is an entity formed for a single, well-defined purpose and can be created for any lawful activity. It is primarily a business association of persons or entities eligible to participate in such an arrangement.
- Technically, an SPV is a company that must follow the rules of company formation as laid down in the Companies Act, 2013.

INDIA 4TH LARGEST ECONOMY

Context: IMF has projected that India will become the fourth-largest economy in 2025.

- This assessment is based on the recent World Economic Outlook report by the International Monetary Fund (IMF), which projects that **India will become the fourth-largest economy in 2025.** Currently, only the United States, China, and Germany are ahead of India.
- **India's nominal GDP is projected to rise to $4,187.017 billion,** surpassing Japan's estimated $4,186.431 billion.
- India continues to be the world's fastest-growing major economy and is the only country expected to record over 6% growth over the next two years.
- This rapid growth is expected to push India's GDP to $5,584.476 billion by 2028, enabling it to overtake Germany and become the third-largest economy.
- The United States, the world's largest economy, is projected to have a GDP of $30,507.217 billion in 2025, followed by China at $19,231.705 billion.

What is GDP?

- **GDP** is the total monetary value of all final goods and services produced within a country in a specific period. It can be calculated using three main methods:
  - **Expenditure Approach:**

    $$GDP = C+I+G+(X-M)$$

    Where: C = Consumption expenditure, I = Investment, G = Government spending, X = Exports,
  - **Income Approach:**

    $$GDP = Wages+ Rent + Interest + Profits + Depreciation + Net\ Foreign\ Factor\ Income$$
  - **Output (Production) Approach:**

    $$GDP=\sum(Gross\ Value\ Added\ of\ all\ sectors)+Taxes-Subsidies$$
- **Nominal GDP** measures the value of all finished goods and services produced within a country using current market prices during the time of measurement. It **does not adjust for inflation or deflation**.
- **Real GDP** is the inflation-adjusted measure of GDP that reflects the true value of goods and services produced by accounting for changes in the price level (inflation or deflation).

GAME AND NITI ALLIANCE FOR ENTREPRENEURSHIP

Context: GAME (Global Alliance for Mass Entrepreneurship) and NITI Aayog have formed a strategic partnership **to strengthen entrepreneurship ecosystems across India**. Initial pilot sites include Nagpur, Visakhapatnam, and Uttar Pradesh.

About the Partnership

- The collaboration aims **to empower local entrepreneurs** by engaging government, corporates, educational and financial institutions, and community organisations.
- Pilot projects will implement GAME's proven methods **to help entrepreneurs start and scale businesses through access to finance, markets, mentors, peer networks, training, and policy support.**
- By addressing systemic barriers and creating region-specific solutions, the initiative seeks to develop self-sustaining ecosystems that promote entrepreneurship, generate employment, and drive local economic growth.

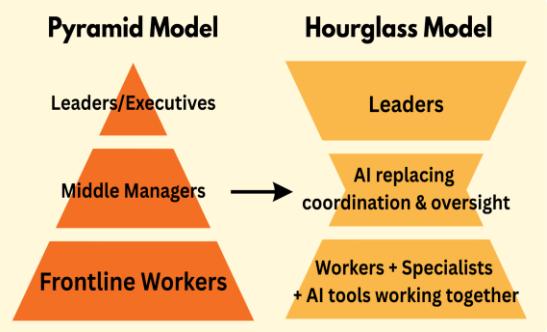
About GAME (Global Alliance for Mass Entrepreneurship)

- GAME is a non-profit organization founded in 2018 to drive a nationwide movement for mass entrepreneurship in India.
- It aims to create 50 million new jobs by 2030, with 25% of businesses owned by women. It unites partners, funders, and stakeholders to inspire a nationwide entrepreneurial movement.

HOURGLASS MODEL

Context: Artificial Intelligence (AI) has shifted from simple task automation to reshaping how companies are structured and managed.

About Hourglass Model



- The Hourglass Model describes **how Artificial Intelligence (AI) is reshaping the structure of organizations.**
- Traditionally, companies followed a pyramid model, with a wide base of frontline workers, a thick middle layer of managers, and a small group of leaders at the top.
- In the hourglass model, however, the middle layer becomes thinner because many coordination, monitoring, and routine decision-making tasks once handled by middle managers are now carried out by AI systems.
- At the top of the hourglass, leaders focus more on big-picture strategy, vision, and innovation, while at the base, frontline workers and specialists collaborate directly with AI tools to execute tasks.
- This creates an organization that is more agile, less hierarchical, and increasingly dependent on human–AI collaboration.

REMITTANCE TAX IN US

Context: The United States administration has proposed a 3.5% excise tax on remittance transfers from the US. Under the proposal, the tax will be collected by remittance-transfer providers at the point of transfer, who must deposit it quarterly with the Treasury Secretary.

What are Remittances?

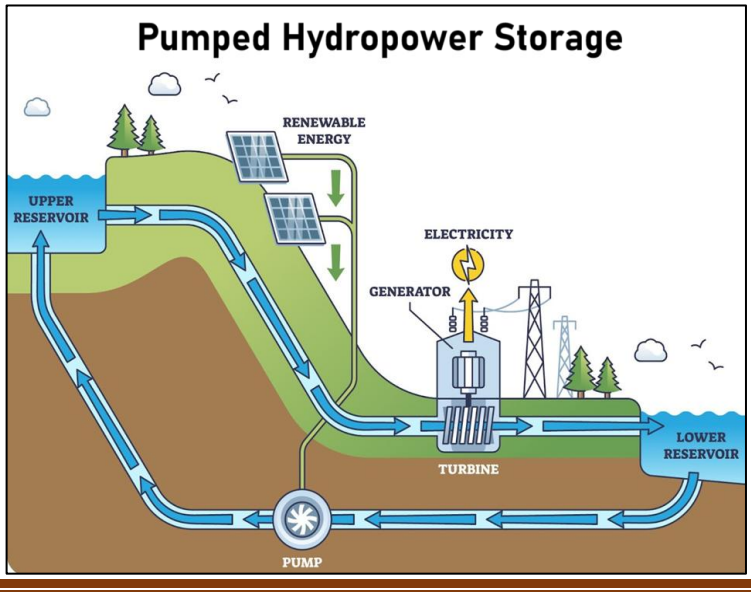
- Remittance refers to **money transferred, typically by a foreign worker, to family or others in their home country.**
- Remittances are a **vital income source for low- and middle-income countries**, consistently exceeding foreign direct investment (FDI) flows and Official Development Assistance (ODA) combined.
- According to the World Bank, **India has been the top recipient of remittances since 2008,** with its share in global remittances rising from 11% in 2001 to about 14% in 2024.
- The US hosts about 54 lakh overseas Indians, including 33 lakh Persons of Indian Origin (PIOs).
- As per an RBI bulletin, **the US contributed 27.7% of India's total remittances in 2023–24, the largest share from any single country.**

PUMPED STORAGE HYDROPOWER SYSTEM

Context: According to new data from the Central Electricity Authority (CEA), three major players (Greenko, Adani Green, and JSW Energy) are expected to develop nearly two-thirds of India's planned 51 gigawatt (GW) pumped storage hydropower (PSH) capacity by 2032.

About Pumped Storage Hydropower (PSH)

- A PSH system is a **large-scale method of storing and generating electricity using two water reservoirs at different heights.**
- When there is surplus electricity (often from renewable sources like solar or wind) the extra power is used to pump water from the lower reservoir to the upper reservoir, storing energy as gravitational potential.
- Later, when electricity demand rises, the stored water is released back down through turbines to generate power. In this way, **PSH works like a giant rechargeable battery for the grid**, storing energy when supply is high and releasing it when demand peaks.
- PSH is the largest form of grid energy storage, contributing over 90% of long-duration energy storage worldwide.



India and Pumped Storage Hydropower System

- India has a **total pumped storage potential of 176 GW,** of which around 40% (70 GW) lies in Maharashtra and Andhra Pradesh alone.
- At present, the country has less than 5 GW of installed pumped storage capacity.
- Alongside battery energy storage systems (BESS), pumped storage will be critical in balancing India's power grid, especially with the growing integration of variable renewable sources like solar and wind.

ORANGE ECONOMY

Context: At the inauguration of the World Audio Visual and Entertainment Summit (WAVES) in Mumbai, the Prime Minister appealed to global companies to create content in India and highlighted the importance of the Orange Economy for the country.

What is the Orange Economy?

- The Orange Economy, also known as the "**creative economy**," refers to **economic activities based on creativity, culture, and intellectual property.**
- It includes industries rooted in individual creativity, skill, and talent such as advertising, architecture, arts and crafts, design, fashion, film, music, performing arts, publishing, software, computer games, and digital media.
- The term "orange" symbolizes creativity and cultural identity, popularized by Colombian economists Felipe Buitrago and Iván Duque.
- Globally, the Orange Economy accounts for about 3% of GDP and 30 million jobs.

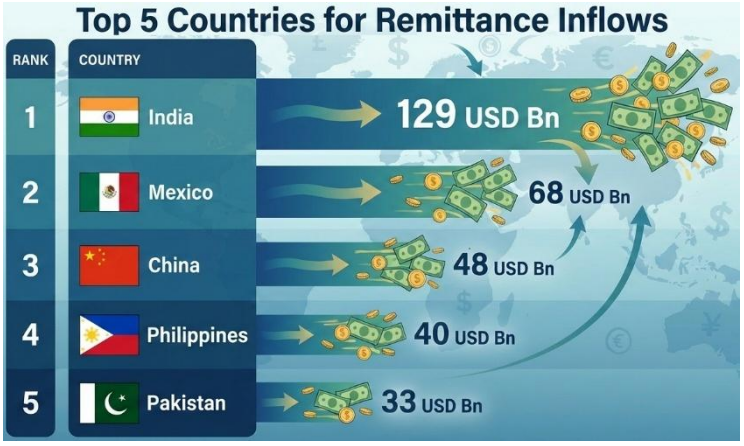
About World Audio Visual and Entertainment Summit (WAVES)

- WAVES is a global event organized to promote discussion, collaboration, and innovation in the Media & Entertainment (M&E) industry.
- It covers domains such as Advertising and Marketing, Animation, Visual Effects, Gaming, Comics, and Extended Reality (AVGC-XR).
- **Objectives:** Position India as a global creative hub by establishing it as a leading destination for M&E innovation, content creation, and intellectual property development.

DECLINE IN OUTWARD REMITTANCE UNDER LRS

Context: India's outward remittances under the Liberalised Remittance Scheme (LRS) moderated by 6.85% year-on-year to $29.56 billion in FY25, after touching an all-time high of $31.73 billion in FY24.

- **An Outward Remittance** is a transfer of money in foreign exchange, by a resident in India or an NRI to a beneficiary situated within or outside the country (except for Nepal and Bhutan) for a purpose as approved under FEMA (Foreign Exchange Management Act).



About Liberalized Remittance Scheme (LRS)

- The LRS was introduced in 2004, **allowing resident individuals, including minors, to freely remit up to $2,50,000 per financial year** for permissible current or capital account transactions.
- The scheme simplifies the process for Indian residents to send money abroad under the Foreign Exchange Management Act (FEMA), 1999.
- Permissible transactions include: Education, Medical treatment, Investments in foreign stocks and securities
- The remittance limit is per individual, including minors (with guardian consent), and **excludes entities like corporations, partnerships, and Hindu Undivided Families (HUF).**

INDIAN INSTITUTE OF CREATIVE TECHNOLOGY

Context: The Indian Institute of Creative Technology (IICT) has been establishedby the Ministry of Information and Broadcasting in collaboration with FICCI and CII.

About Indian Institute of Creative Technology (IICT):

- **Located in Mumbai**, IICT will function as a National Centre of Excellence (**NCoE**) dedicated to the **Animation, Visual Effects, Gaming, Comics, and Extended Reality (AVGC-XR) sector.**
- Extended Reality (XR) technologies combine physical and digital environments, including Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR).
- Modeled on the framework of IITs and IIMs, IICT aims to become a world-class education and training hub, preparing students for professional careers in the AVGC-XR industry.

HIGHEST EVER EXPORTS FROM INDIA

Context: India's total exports (including merchandise and services) reached a record high of $824.9 billion in the financial year 2024-25, marking a growth of 6.01% from the previous year's $778.1 billion.

- **Services exports** were a key driver, hitting a historic **US$387.5 billion in 2024–25**, up 13.6% from US$341.1 billion in 2023–24.
- Services exports are led predominantly by computer and information services, which include IT and IT-enabled services (IT-BPM). These accounted for about 68% of total services exports.



- **Merchandise exports** (excluding petroleum products) also surged, reaching a record **US$374.1 billion,** a 6.0% increase from US$352.9 billion in 2023–24, marking the highest-ever annual non-petroleum merchandise exports for India.
- **Top Export Markets of India:** USA (17.90%), United Arab Emirates (UAE) (8.23%), Netherlands (5.16%), China (3.85%).

FINANCIAL STABILITY AND DEVELOPMENT COUNCIL

Context: The 29th meeting of the Financial Stability and Development Council (FSDC), chaired by the Union Finance Minister, was held in Mumbai.

About Financial Stability and Development Council (FSDC)

- Established in 2010, the FSDC is a **non-statutory** apex body for financial sector coordination,
- It was established on the recommendation of the Raghuram Rajan Committee (2008) on financial sector reforms.
- It is chaired by the Finance Minister, with members including the RBI Governor and the heads of SEBI, IRDAI, and PFRDA.

Functions

- Ensures financial stability and strengthens inter-regulatory coordination.
- Conducts macro-prudential supervision of the economy and oversees large financial conglomerates.
- Coordinates India's engagement with global financial bodies like the Financial Action Task Force (FATF) and Financial Stability Board (FSB).
- Promotes financial inclusion and financial literacy across sectors.

BLACK BOX

Context: In the Air India Boeing 787 crash (June 12, Ahmedabad), one black box was recovered to assist the investigation.

About Black box

- A black box is a **flight recorder that stores key flight data and cockpit conversations to help determine the cause of air accidents.**
- It consists of two parts - the Flight Data Recorder (FDR) and the Cockpit Voice Recorder (CVR). Despite its name, the box is **bright orange** for easy identification after accidents.
- The device was first developed in the early 1950s, and Australia made it mandatory in 1963 after two fatal crashes.

INDIA 4TH MOST EQUAL COUNTRY

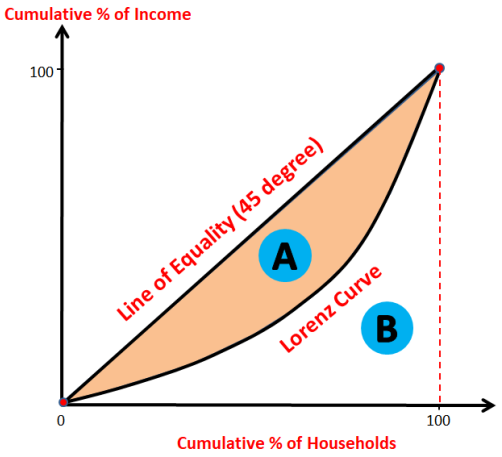
Context: According to the latest World Bank data, India's Gini Index stands at 25.5, making it the fourth most equal country in the world. The Index is based on primary household survey data obtained from government statistical agencies and World Bank country departments.

Gini Index or Gini Coefficient

- Developed in 1912 by Italian statistician Corrado Gini, it is the **most commonly used measure of inequality,** reflecting how income, wealth, or consumption is distributed among individuals or households within a country.
- **The value ranges from 0 to 100:** 0 represents perfect equality (everyone has the same income); 100 represents absolute inequality (one person has all the income, while others have none). **Thus, a higher Gini Index indicates greater inequality.**
- The Gini coefficient is derived from the Lorenz curve, which plots the cumulative percentage of the population against the cumulative percentage of income.

About Lorenz Curve

- The Lorenz Curve graphically represents income distribution. It plots the cumulative share of total income received against the cumulative share of recipients, beginning with the poorest.
- A diagonal line represents perfect equality, while the Lorenz curve shows the actual distribution.
- The Gini Index measures the area between the Lorenz curve and the line of equality, expressed as a percentage. **The larger the gap, the greater the inequality.**
- **Gini Coefficient = (Area A)/(Area A + Area B)**



Highlights from the Report

- India's Gini score fell from 28.8 (2011–12) to 25.5 (2022–23), indicating steady progress in combining economic growth with social equity.
- India falls in the "moderately low inequality" category (Gini scores between 25 and 30).
- Only about 30 countries worldwide are in this category, including several European nations with strong welfare systems.

RESTRUCTURING AND EXTENSION OF PM SVANIDHI

Context: The Union Cabinet has approved the restructuring and extension of the Prime Minister Street Vendor's AtmaNirbhar Nidhi (PM SVANidhi) Scheme, extending it till March 31, 2030.

About Prime Minister Street Vendor's AtmaNirbhar Nidhi (PM SVANidhi)

- Launched in 2020, PM SVANidhi is a **Central Sector Scheme** that provides **affordable, collateral-free loans to street vendors.**
- The revamped scheme aims to support 1.15 crore beneficiaries, including 50 lakh new beneficiaries, with a total outlay of ₹7,332 crore.
- The scheme will be **jointly implemented by the Ministry of Housing & Urban Affairs (MoHUA) and the Department of Financial Services (DFS).**

Key features of the restructured scheme:

- **Enhanced loan amounts across the first and second tranches.**
  - **First tranche:** up to ₹15,000 (earlier ₹10,000).
  - **Second tranche**: up to ₹25,000 (earlier ₹20,000).

- **Third tranche remains at ₹50,000.**

- **Introduction of a UPI-linked RuPay Credit Card** for beneficiaries who have successfully repaid the second loan, immediate access to credit for business or personal needs.
- **Digital cashback incentives up to ₹1,600 on retail and wholesale transactions**
- Expanded coverage beyond statutory towns to **include census towns, peri-urban areas, and similar settlements** in a phased manner.
- To support the holistic development of street vendors and their families, the **'SVANidhi se Samriddhi' component will be reinforced through monthly Lok Kalyan Melas.**
- The scheme has earned the **Prime Minister's Award for Excellence in Public Administration (2023) for Innovation** (Central Level) and **the Silver Award for Excellence in Government Process Re-engineering for Digital Transformation** (2022).

MEGA TINKERING DAY

Context: The Atal Innovation Mission (AIM) hosted Mega Tinkering Day, bringing together students from all 35 States and Union Territories.

- The event was held virtually and simultaneously in schools across the country, with participation from more than 4,73,000 students.
- Mega Tinkering Day served as a launchpad for the upcoming academic year's tinkering activities and became a collective celebration for students, teachers, mentors, higher education institutions, and industry partners.

About Atal Innovation Mission (AIM)

- AIM is a flagship initiative launched by NITI Aayog in 2016 to promote innovation and entrepreneurship across India.
- Since its inception, AIM has established over 10,000 Atal Tinkering Labs (ATLs) in schools, providing students with access to modern tools such as 3D printers, robotics kits, IoT devices, and more.
- These labs give middle- and high-school students hands-on exposure to emerging technologies and help them develop real-world problem-solving skills.

AIM 1.0	AIM 2.0
• AIM 1.0 focused on building new innovation infrastructure to strengthen India's then nascent startup and innovation ecosystem. **Key programmes included:** • **Atal Tinkering Labs** • **Atal Incubation Centres** • **Atal New India Challenges and Atal Grand Challenges** • **Mentor of Change Programme**	• AIM 2.0 focuses on piloting new initiatives to fill existing gaps in the ecosystem and scaling successful models through collaboration with central and state governments, industry, academia, and communities. It aims to strengthen India's innovation and entrepreneurship ecosystem in three key ways: • **Increasing input –** bringing more innovators and entrepreneurs into the system. • **Improving throughput** – helping a greater number of startups succeed. • **Enhancing output quality** – enabling the creation of better jobs, products, and services.

Programmes Under AIM 2.0

A. Increasing Input to the Innovation Ecosystem

1. **Language Inclusive Program of Innovation (LIPI):** Builds innovation ecosystems in all 22 scheduled languages.
2. **Frontier Program:** Designs customised innovation frameworks for: Jammu & Kashmir, Ladakh, North Eastern States, Aspirational Districts and Blocks.

B. Improving Throughput (Startup Success Rate)

1. **Human Capital Development Program:** Builds a professional workforce, managers, teachers, trainers, to run India's innovation infrastructure.
2. **Deeptech Reactor:** Creates a research sandbox to accelerate deep-tech startups requiring long development cycles and high investment.

3. **State Innovation Mission (SIM):** Helps States/UTs build strong innovation ecosystems aligned with their strengths. Functions as a part of NITI Aayog's State Support Mission.
4. **International Innovation Collaborations:** Annual Global Tinkering Olympiad, 10 bilateral/multilateral collaborations with advanced nations, Startup20 Engagement Group

C. Improving Output Quality (Jobs, Products, Services)

1. **Industrial Accelerator Programme:** Increases industry participation in scaling advanced startups. Plans to set up 10 industry accelerators in critical sectors through a PPP model.
2. **Atal Sectoral Innovation Launchpads (ASIL):** Builds iDEX-like platforms in key ministries for adopting and procuring solutions from startups.

END OF DUTY-FREE IMPORTS IN THE US

Context: Postal and courier companies across the world are facing delays and higher costs after the United States ended De Minimis Rule i.e. duty-free entry for low-value imports.

What Was the De Minimis Rule?

- The term de minimis means "**too small to matter.**" It was first introduced in the 1930 Tariff Act so that tourists could mail small souvenirs home without paying tax.
- During the 1990s, the rule was broadened to reduce paperwork and costs for both companies and consumers.
- In 2016, the limit was raised from $200 to $800, bringing a much larger volume of goods under duty-free entry.

BIMA SUGAM

Context: The **Bima Sugam India Federation (BSIF)** has launched the Bima Sugam portal.

About Bima Sugam

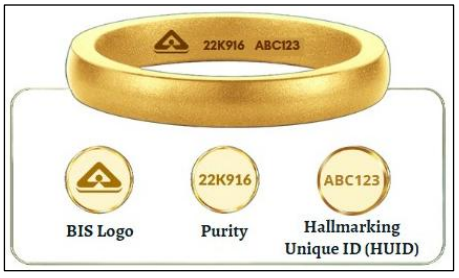
- Bima Sugam is India's first unified Digital Public Infrastructure for insurance, a single online marketplace where individuals can compare, buy, renew, port, and manage all types of insurance policies from different insurance companies under one digital platform.
- Bima Sugam **operates under the IRDAI (Bima Sugam – Insurance Electronic Marketplace) Regulations, 2024.**
- It forms a key component of the "**Bima Trinity"** conceptualized by IRDAI, alongside the composite product **Bima Vistaar** and the women-centric distribution channel **Bima Vahak.**
- The **Bima Sugam India Federation (BSIF)** has been established as a not-for-profit company under Section 8 of the Companies Act, 2013.
- Its primary objective is to establish, develop, operate, and maintain the Insurance Electronic Marketplace (Bima Sugam) as a strong and reliable Digital Public Infrastructure.
- **Bima Pehchaan** refers to a unique Bima Pehchaan ID, which is linked to an individual's Aadhaar, PAN, and mobile number.

HALLMARKING

Context: The Government of India has introduced voluntary Hallmarking Unique Identification (HUID)-based hallmarking for silver jewellery. The revised standards bring silver hallmarking in line with the gold hallmarking system, improving traceability, authenticity, and consumer protection.

About Hallmarking

- Hallmarking refers to the **precise assessment and official certification of the proportion of precious metal contained in jewellery or other precious metal articles.**
- It ensures authenticity, quality assurance, consumer protection, and traceability.
- The hallmarking process is overseen by the Bureau of Indian Standards (BIS).



About Bureau of Indian Standards (BIS)

- The **National Standards Body** functions under the **Ministry of Consumer Affairs.**
- Set up under the **BIS Act, 1986,** and currently governed by the BIS Act, 2016.
- Responsible for developing standards, certifying products (including ISI mark and Hallmarking), and managing a network of testing laboratories.

- **Headquarters:** New Delhi | **Regional Offices (ROs):** Kolkata (Eastern), Chennai (Southern), Mumbai (Western), Chandigarh (Northern) and Delhi (Central).

PUBLIC FINANCIAL ASSET MANAGEMENT PROGRAM

Context: Vivekanand Gupta, Regional Provident Fund Commissioner, has been selected for the Public Financial Asset Management (PFAM) Program 2025–26.

- He is the first representative from the Employees' Provident Fund Organisation (EPFO) to be chosen for this cohort.

About Public Financial Asset Management Program

- PFAM is a prestigious **capacity-building initiative jointly organised by the World Bank and the Milken Institute**, hosted at Bayes Business School, University of London.
- The program equips senior professionals with advanced knowledge in capital markets, governance systems, and strategic asset management.
- The 2025–26 cohort includes 16 participants from 13 countries: 11 from Central Banks, three from Sovereign Wealth Funds, and two from Pension Funds.

'WE RISE' INITIATIVE

Context: The 'WE RISE' (Women Entrepreneurs Reimagining Inclusive and Sustainable Enterprises) initiative was launched recently to strengthen women-led enterprises.

About WE RISE

- It is a **joint public-private partnership launched by NITI Aayog's Women Entrepreneurship Platform (WEP)** and **DP World.**
- It aims **to empower high-potential women-led Micro, Small, and Medium Enterprises (MSMEs)** by supporting them to become export-ready and scale their businesses in global markets.
- DP World will collaborate with WEP to design interventions that enhance the export readiness of **100 women entrepreneurs**, enabling them to meet global trade requirements and strengthen business capacity.
- This programme is under the aegis of WEP's Award to Reward (ATR) initiative.

About Award to Reward (ATR) initiative

- It is a key program under NITI Aayog's Women Entrepreneurship Platform (WEP), launched in 2023.
- It aims to support and scale women-led businesses by bringing stakeholders together for mentorship, market access, finance, and digital skills, acting as a "plug-and-play" model for targeted, scalable collaborations.

About Women Entrepreneurship Platform (WEP)

- WEP is a **flagship initiative launched by NITI Aayog in 2017** to create a supportive ecosystem for women entrepreneurs in India.
- It acts as a unified access portal and aggregator, connecting women entrepreneurs with resources, mentorship, funding, market linkages, and government schemes.
- WEP has launched several sub-initiatives such as EmpowHER Biz and the Award to Reward (ATR) program to further empower women in entrepreneurship.

NATIONAL HOUSEHOLD INCOME SURVEY

Context: The Ministry of Statistics and Programme Implementation (**MoSPI**) will conduct India's first nationwide Household Income Survey in February 2026.

About National Household Income Survey

- India's first-ever nationwide survey focused exclusively on measuring household income.
- The survey **aims to capture income from multiple sources across rural and urban households**, including wages and salaries, farm and business income, remittances, informal sector earnings, and the effects of technology adoption on livelihoods.
- A Technical Expert Group (TEG) chaired by economist Surjit S. Bhalla has been set up to guide the survey's methodology and design.
- The findings **will inform decisions on welfare programmes, income-based targeting, tax policy, inequality measurement, and broader economic planning**.

BHARAT TAXI

Context: The **National e-Governance Division (NeGD)** of the **Digital India Corporation** has signed an MoU with **Sahakar Taxi Cooperative Limited** to roll out the Bharat Taxi initiative.

About Bharat Taxi

- Bharat Taxi is a cooperative-based mobility initiative aimed at providing a fair, transparent, and driver-owned alternative in India's ride-hailing sector.
- The platform will be **operated by Sahakar Taxi Cooperative Limited,** with an initial capital of Rs 300 crore. The pilot phase launched in Delhi in November 2025.
- It is **jointly owned by taxi drivers** and supported by institutions like NCDC, IFFCO, GCMMF(AMUL), KRIBHCO, NAFED, NDDB, NCEL and NABARD.
- The platform reflects the values of India's cooperative movement while contributing to the Digital India vision of inclusive, technology-enabled public services.

SERIOUS FRAUD INVESTIGATION OFFICE

Context: The Serious Fraud Investigation Office (SFIO) has introduced new technical and procedural safeguards to prevent the misuse of summons.

About Serious Fraud Investigation Office (SFIO)

- The SFIO is a **statutory agency tasked with corporate fraud investigation.** It was established to probe serious and complex corporate frauds under the **Companies Act, 2013.** It functions under the Ministry of Corporate Affairs.
- It was created in 2003 on recommendations of the Naresh Chandra Committee on corporate governance (2002) through a resolution, later accorded the statutory status.
- It is a **multi-disciplinary organisation,** comprising experts from the financial sector, capital markets, accountancy, forensic auditing, taxation, law, information technology, company law, customs, and investigation.
- The Head Quarter of SFIO is at New Delhi, with five Regional Offices at Mumbai, New Delhi, Chennai, Hyderabad & Kolkata.
- The SFIO is **headed by a Director**, who serves as the Head of Department and holds the rank of Joint Secretary to the Government of India.
- The SFIO is also **empowered to arrest individuals for violations of company law.**

WOMANIYA INITIATIVE

Context: The Government e-Marketplace (GeM) and the UN Women have signed a MoU focussing on promoting gender-responsive procurement by encouraging greater sourcing from women-led businesses through GeM's Womaniya initiative.

About Womaniya Initiative

- Womaniya was launched in **2019** by **Government e-Marketplace (GeM) to promote the participation of women entrepreneurs and Self-Help Groups (SHGs) on the GeM portal.**
- It enables women-led enterprises to sell products directly to government buyers without intermediaries.
- The initiative addresses the triple challenge faced by women entrepreneurs: access to markets, access to finance, and access to value addition.
- It strengthens hyper-local procurement and integrates local value chains in line with the Vocal for Local and Make in India initiatives.
- Womaniya also supports the government's objective of achieving 3% public procurement from women-owned and women-led Micro and Small Enterprises (MSEs).

About UN Women

- Officially known as the **United Nations Entity for Gender Equality and the Empowerment of Women**, it is a **UN entity** dedicated to advancing gender equality and women's empowerment globally.
- UN Women was established in July 2010 by merging four previously distinct UN bodies focused on gender issues:
  - Division for the Advancement of Women (DAW),

- International Research and Training Institute for the Advancement of Women (INSTRAW),
- Office of the Special Adviser on Gender Issues and Advancement of Women (OSAGI),
- UN Development Fund for Women (UNIFEM).

- UN Women became fully operational from January 2011.
- The organization is led by an Executive Director and governed by an Executive Board representing various regions of the world.
- **Headquarters:** New York City, United States
- UN Women is charged with advocating for the rights of women and girls, and focusing on a number of issues, including violence against women and violence against LGBT people.

YBRANT PROGRAM

Context: The Indian Institute of Corporate Affairs (IICA), in collaboration with WNS Global Services, has launched the Ybrant Programme.

About the Ybrant Programme

- It is a six-month learning programme focused on Corporate Social Responsibility (CSR), Environmental, Social and Governance (ESG), and Sustainability.
- The core objective is to prepare students for leadership roles that align business performance with positive social impact.
- It marks a strategic step toward nurturing a new generation of sustainability-driven and socially responsible leaders. These future leaders will see business not just as a means for profit, but as a force multiplier for sustainable and inclusive development.
- It combines 22.5 hours of academic sessions with 18 hours of fieldwork. It has a blended learning model, developed through strategic collaboration among the government, academia, and the corporate sector.

ELECTRONICS DEVELOPMENT FUND

Context: India's electronics sector has undergone a significant transformation in recent years, driven by a series of government initiatives, including the Electronics Development Fund (EDF).

About Electronics Development Fund (EDF)

- The EDF was established in 2016 **to promote innovation, research, and entrepreneurship in the electronics, IT, and nanoelectronics sectors.**
- It operates as a "**Fund of Funds," investing in professionally managed venture and angel funds (called Daughter Funds),** which in turn provide risk capital to startups and companies developing new technologies in electronics and related fields.
- EDF is being promoted by the Department of Electronics and Information Technology (DeitY), Ministry of Communications and IT, Government of India as a Digital India initiative.
- Its primary objectives include supporting startups and early-stage companies in electronics system design, manufacturing, semiconductor design, IoT, medical electronics, and cybersecurity.
- **Fund manager is Canbank Venture Capital Funds Ltd. (CVCFL),** a subsidiary of Canara Bank.
- All participating funds (Daughter Funds) must be registered with SEBI as Category I or II Alternative Investment Funds.
- EDF has invested over ₹257 crore in eight professionally managed Daughter Funds, which have mobilized around ₹1,336 crore in follow-on investments, funding 128 startups and generating thousands of jobs and intellectual properties.

COAL INDIA LIMITED

Context: Coal India Limited (CIL) has completed 50 years since its establishment.

About Coal India Limited (CIL)

- CIL is a Maharatna Public Sector Undertaking (PSU) functioning under the Ministry of Coal.
- It was established in 1975 to consolidate India's coal mining operations and ensure energy security through organised, efficient, and sustainable coal production.
- Headquartered in **Kolkata**, CIL is the **largest coal-producing company in the world.**

- It **accounts for nearly 80% of India's domestic coal production** and supports about 75% of coal-based power generation in the country.
- CIL operates across eight Indian states, with 85 mining areas and a total of 310 working mines.

GI TAG FOR AMBAJI MARBLE

Context: Ambaji Marble, found in the Banaskantha district of north Gujarat, has been granted a Geographical Indication (GI) tag by the Union Government.

About Ambaji Marble

- Ambaji Marble is known for its milky white colour, high calcium content, durability, and natural aesthetic appeal.
- It has been widely used in the construction of the Ambaji Temple and several other religious structures, memorials, and prominent buildings across the country.

About Geographical Indication (GI) Tag

- A GI tag is a certification that **identifies a product as originating from a specific geographical location,** where its unique qualities, reputation, or characteristics are directly linked to that region.
- This tag **ensures authenticity, protects traditional knowledge, and prevents unauthorized use of the product name** by others.
- The **Geographical Indications of Goods (Registration and Protection) Act, 1999** seeks to provide for the registration and better protection of geographical indications relating to goods in India. This GI tag is **valid for 10 years** following which **it can be renewed.**
- The World Trade Organization (**WTO**) through the Agreement on Trade-Related Aspects of Intellectual Property Rights (**TRIPS**), **obligates all WTO member countries to provide protection for geographical indications (GIs) of goods.**
- India has registered a total of 658 GI tags (till December 2025) for various products, including handicrafts, agricultural goods, food items, and manufactured products.
- The top five states with the most GI tags in India are: Uttar Pradesh, Tamil Nadu , Karnataka, Kerala, Maharashtra.

GLOBAL INDICES FOR REFORMS AND GROWTH (GIRG)

Context: The government is undertaking the GIRG initiative to monitor progress across 26 global indices that support reforms and economic growth in the country.

About Global Indices for Reforms and Growth (GIRG) Initiative

- The GIRG Initiative tracks India's performance on 26 key global indices published by 16 international agencies, spanning four broad themes: economy, development, governance, and industry.
- It coordinates efforts across 17 nodal ministries to identify gaps, review methodologies, and drive reforms in four themes.
- GIRG aims to benchmark India's standing, address data discrepancies, and support growth-oriented reforms.
- **Framework Structure:**
    - The **Development Monitoring and Evaluation Office (DMEO) of NITI Aayog** acts as the **central coordinator and knowledge partner** for GIRG.
    - Nodal ministries engage with international agencies to ensure accurate use of Indian data and implement policy measures to improve rankings.

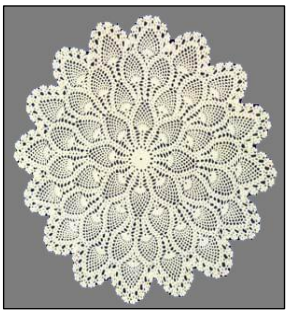
NARASAPURAM CROCHET LACE CRAFT

Context: The Department of Promotion of Industry and Internal Trade (DPIIT) under the Ministry of Commerce and Industry registered the craft in the Geographical Indications Registry (GIR) in 2024.

About Narasapuram Crochet Lace

- The Narasapuram crochet lace craft from **Narasapuram (West Godavari district of Andhra Pradesh)** has been awarded the **Geographical Indication (GI) tag,** recognising its unique regional identity.
- The crochet craft employs fine cotton threads and delicate crochet needles of varying sizes to produce an array of products i.e- pillow covers, cushion covers, bedspreads, table runners, and tablecloths etc. It is completely handwoven.

- **Origin**: In 1844, Macrae and his wife from Scotland introduced the lace craft to local women while associated with a Christian missionary at Dummugudem (presently in Telangana).
- The craft has survived major crises such as the Indian famine of 1899 and the Great Depression of 1929.
- It has received the **One District One Product** recognition and **GI Tag support** from the International Lace Trade Centre and the **Exports Promotion Council for Handicrafts (EPCH),** a statutory body under the Ministry of Textiles that promotes Indian handicrafts globally.



GI TAG FOR 5 PRODUCTS FROM TAMIL NADU

Context: Five products from Tamil Nadu have secured the Geographical Indications (GI) tag.

Woraiyur Cotton Sari 	• Woraiyur cotton saris, native to the **Tiruchirappalli** district, are woven in Manamedu on the banks of the Cauvery. • The saris are characterised by **thin borders with plain or minimal designs.** They are known for their **high thread count,** distinctive **Korvai border** (a continuous running pattern), block colour palettes, and geometric motifs. • The **Devanga community**, a traditionally skilled weaving group, has played a central role in sustaining this craft. • **Woraiyur, once the capital of the Chola dynasty**, was a major centre for textiles, spices, and gemstones. **Woraiyur cotton is celebrated in Greek and Tamil literature** for its fine quality.
Kavindapadi 'Naatu Sakkarai' 	• It is traditional, unrefined country sugar (jaggery powder) produced in Kavindapadi (or Kavundapadi) village in the Erode district • Extensive sugarcane fields in the region are irrigated by the Lower Bhavani Project canal. • The village's distinctive jaggery powder is produced locally by mechanically crushing sugarcane and slowly evaporating extracted juice.
Thooyamalli Rice 	• Thooyamalli, meaning **pure jasmine,** is a traditional **samba-season rice variety** grown over 135–140 days (August to January). • Fermented Thooyamalli rice, known as neeragaram, has a taste similar to tender coconut water. • Often called "**pearl rice"** due to its shiny appearance, it is valued for its nutritional benefits. • Although cultivated across Tamil Nadu, it is now grown mainly in Kanchipuram.
Namakkal 'Kalchatti' 	• Namakkal's **traditional cookware is made from soapstone (makkal pathirangal).** • Popularly known as kalchatti, these utensils have been used in South Indian kitchens for generations, with origins tracing back to ancient times. • Each Namakkal stoneware item is handmade. • These utensils are especially suited for cooking with tamarind and lime, as they are resistant to citrus and chemicals, making them ideal for storing pickles, milk, and curd without corrosion or contamination.
Ambasamudram 'Choppu Saman' 	• Choppu saman are **small wooden toys, typically shaped like kitchen utensils.** • The craft has been practiced for over two centuries, with origins dating back to the 18th century. • Traditionally made in **Ambasamudram**, these toys were carved from indigenous trees such as **Manjal Kadamba, teak, and rosewood.** • In recent times, artisans have shifted to using **rubber wood and eucalyptus.**

DEFENCE AND SECURITY

IMPORTANT ACTS AND AGENCIES

MULTI AGENCY CENTRE

Context: Union Home Minister inaugurated the revamped Multi Agency Centre (MAC), India's key intelligence-sharing hub.

What is a Multi-Agency Centre (MAC)?

- The MAC, under Intelligence Bureau (IB) in Ministry of Home Affairs (MHA), is India's foremost intelligence fusion centre. It brings together central and state security agencies for daily collaboration and analysis of terrorism-related inputs.
- Focus areas include: Jammu & Kashmir (J&K), Northeast, Left Wing Extremist (LWE) states, Rest of India
- It was **established in 2001** after the Kargil conflict, and further strengthened post the 2008 Mumbai attacks.
- **Objective:** To enable real-time intelligence sharing for combating terrorism and related threats, as part of India's zero-tolerance policy on terrorism.

Key Features of the Revamped MAC.

- **Nationwide Connectivity:** Connects all police districts via secure digital network; Links Subsidiary MAC (SMAC) at Subsidiary Intelligence Bureau (SIB), State Police Special Branch, and counter-terror agencies.
- **Multi-Agency Collaboration:** Involves 28 bodies (RAW, Armed Forces, State Police, others); Enables real-time intelligence sharing.

NATIONAL SECURITY ADVISORY BOARD REVAMPED

Context: The Union Government has reconstituted the National Security Advisory Board (NSAB), appointing former RAW chief Alok Joshi as the new Chairman. The revamped board now has seven members, representing diverse expertise in defence, policing, and diplomacy.

About National Security Advisory Board (NSAB)

- The NSAB was created in December 1998 as an **advisory platform** comprising distinguished individuals from outside the government, such as experts from industry, media, academia, and civil society.
- It works in close **coordination with the National Security Council Secretariat (NSCS)**, which provides administrative and analytical assistance.
- **Functions:**
  - Conducts long-term assessments and develops insights on issues related to India's national security.
  - Submits recommendations and suggests policy options to the National Security Council (NSC) on matters referred for its consideration.

About National Security Council Secretariat (NSCS)

- NSCS, established in the late 1990s, functions as **the secretariat to the National Security Council (NSC)** and serves as **India's apex advisory body on internal and external security matters.**
- It is headed by the National Security Advisor (NSA), who is also the Secretary to the NSC.
- It provides strategic direction, coordination, and long-term vision to ensure ministries and agencies are prepared to address present and emerging security threats.

SC RECOGNIZES CAPF AS ORGANISED SERVICES

Context: The Supreme Court has recognized the Central Armed Police Forces (CAPFs) as Organised Services for all purposes through a landmark judgment in May 2025.

- This ruling grants CAPF Group A officers parity with other organized services, ensuring Non Functional Financial Upgradation (NFFU) benefits, mandates faster promotions, and directs a progressive reduction of IPS officer deputations to senior ranks within these forces.

About Central Armed Police Forces (CAPF)

- The CAPF are India's centrally-administered security organizations under the Ministry of Home Affairs (MHA). They are tasked with maintaining internal security, border protection, counterinsurgency, law and order, and protection of vital infrastructure.

- CAPF consists of seven main forces:

Force	Ministry	Primary Role(s)
Border Security Force (BSF)	Ministry of Home Affairs (MHA)	Border Security on Pakistan, Bangladesh Borders, counterinsurgency, internal security
Central Reserve Police Force (CRPF)		Internal security, counterinsurgency, counter-Naxal operations, election duties, riot control, law & order
Indo-Tibetan Border Police (ITBP)		Guarding India–China border, high-altitude security, disaster relief in Himalayan regions
Sashastra Seema Bal (SSB)		Guarding India–Nepal and India–Bhutan borders, counterinsurgency, civic action in border areas
Central Industrial Security Force (CISF)		Protection of vital installations- airports, nuclear plants, major industries
National Security Guard (NSG)		Counterterrorism, anti-hijacking, hostage rescue, special operations
Assam Rifles (AR)	**Administrative**: MHA **Operational**: Ministry of Defence (MoD)	Border security along Indo–Myanmar border, counterinsurgency in Northeast India

Constitution and Deployment

- CAPFs are classified as "**other armed forces" under the Union List of the Indian Constitution.**
- Their deployment is linked to Article 355, which mandates the Union to protect states against external aggression and internal disturbances.
- While police and public order are state subjects, CAPFs are deployed by state governments (on request) to address serious internal security challenges, insurgencies, or natural disasters.

FUGITIVE ECONOMIC OFFENDER

Context: A Delhi Court has declared UK-based arms consultant Sanjay Bhandari a Fugitive Economic Offender (FEO) following an application by the Enforcement Directorate (ED).

Who is a Fugitive Economic Offender (FEO)?

- The term is defined under The Fugitive Economic Offenders (FEO) Act, 2018.
- An FEO is an **individual against whom a warrant for arrest has been issued by an Indian** court in relation to a scheduled offence where **the value involved is over Rs 100 crore,** and who has **left the country and refuses to return to face prosecution.**

Process of Declaring an Individual as FEO

- The Enforcement Directorate or a concerned agency files an application before a special court requesting declaration of an individual as an FEO.
- The application must include:
  - Reasons for believing the person is a fugitive economic offender.
  - Information about the individual's whereabouts.
  - A list of properties or their value believed to be proceeds of crime.
- The special court issues a notice directing the person to appear at a specified place and time.
- If the individual appears, proceedings may be dropped. If not, and the court is satisfied with the evidence, it may declare the person an FEO.
- Once declared, the court may confiscate the offender's properties, both in India and abroad.

Other Provisions for Economic Offences

- Economic offences include crimes such as fraud, counterfeiting, money laundering, and tax evasion.
- Major laws governing such offences include: The Prevention of Money Laundering Act (PMLA), 2002; The Benami Property Transactions Act, 1988; The Companies Act, 2013.

MONEY LAUNDERING

Context: The Finance Ministry informed the Rajya Sabha that the Enforcement Directorate (ED) has taken up 5,892 cases under the Prevention of Money Laundering Act (PMLA) since 2015 and secured the conviction of 15 individuals during this period.

What is Money Laundering

- Money laundering is the illegal process of turning money earned through unlawful activities (such as drug trafficking or corruption) into "clean" or legitimate-looking money.
- The process "cleans" the money so that its criminal origin becomes difficult to trace.
- Common methods include hawala transfers, bulk cash smuggling, fake loans, shell companies and trusts, real estate deals, gambling, and fake invoicing.

Process of Money Laundering

- **Placement**: Illegal money is first introduced into the formal financial system.
- **Layering**: The money is moved through several transactions, investments, or businesses to hide its origin. This makes tracing the source extremely difficult.
- **Integration**: The laundered money re-enters economy as apparently legitimate funds & can now be used openly.

About the Prevention of Money Laundering Act (PMLA), 2002

- The PMLA was enacted to address and combat money laundering in India.
- The Act has three main objectives: To prevent and control money laundering; To seize and confiscate property obtained through laundered money; To regulate issues connected with money laundering in India.
- A notable aspect of the Act is that i**t shifts the burden of proof onto the accused.**
- **Definition of Money Laundering (Section 3):** Any person who directly or indirectly attempts to engage in, or knowingly assists in, any process or activity connected with the proceeds of crime, and presents it as legitimate or untainted property, is guilty of money laundering.

Major Provisions of the Act

- **Obligations for Financial Institutions:** Banks, financial institutions, and intermediaries must verify and maintain records of the identity of clients and their transactions.
- **Powers of the Enforcement Directorate (ED):** The PMLA empowers the ED to investigate money laundering cases and attach properties involved in such offences.
- **Adjudicating Authority and Appellate Tribunal:** The Act sets up an Adjudicating Authority to confirm attachment orders or order confiscation of properties linked to money laundering. An Appellate Tribunal hears appeals against the decisions of the Adjudicating Authority.
- **Special Courts:** The PMLA provides for the designation of Special Courts, drawn from existing Courts of Sessions, to try offences under the Act.
- **International Cooperation:** The Act enables the Indian government to enter into agreements with foreign countries to enforce its provisions, facilitating global cooperation against money laundering.

About the Enforcement Directorate (ED)

- The ED is a specialised financial investigation agency under the Department of Revenue, Ministry of Finance, headquartered in New Delhi.
- Established in 1956 to handle violations of Exchange Control Laws, it was renamed the Enforcement Directorate in 1957.
- The ED enforces key laws: Foreign Exchange Management Act, 1999 (FEMA); Prevention of Money Laundering Act, 2002 (PMLA); Fugitive Economic Offenders Act, 2018 (FEOA)
- Under the Conservation of Foreign Exchange and Prevention of Smuggling Activities Act, 1974 (COFEPOSA), the ED is authorised to sponsor cases for preventive detention related to violations of FEMA.

NATIONAL SECURITY ACT (NSA)

Context: Climate activist Sonam Wangchuk, leading the movement for Ladakh's statehood and Sixth Schedule protections, was detained under the National Security Act (NSA).

About National Security Act (NSA) 1980

- The NSA is a **preventive detention law** enacted **to safeguard public order and national security.** Preventive detention means detaining a person not for a past crime, but to stop them from committing future acts harmful to the state or escaping future prosecution.
- **Constitutional Basis:**
  - **Article 22(3)(b)** permits preventive detention for reasons of national security and public order.
  - **Article 22(4)** limits such detention to three months, unless extended with advisory board approval.
- **Grounds for Preventive Detention:** The Central or State Government may detain a person if they are satisfied that it is necessary to prevent them from acting in a manner prejudicial to:
  - The defence of India, relations with foreign powers, or the security of India.
  - The security of the State or the maintenance of public order.
  - The maintenance of supplies and services essential to the community.
  - Additionally, foreigners may be detained to regulate their continued presence in India or to arrange for their expulsion.
- **Detention Period:** A person may be detained up to 12 months without formal charges. The government may extend detention if the individual is assessed to continue posing a threat.
- **Advisory Boards:** The Central and State governments must establish one or more Advisory Boards for reviewing detentions under the NSA.
  - The Board must examine each detention within three months of the date of detention. Each Board consists of three members qualified to be High Court judges. It must determine whether there is sufficient cause for continued detention.

INS MAHE

Context: INS Mahe, the first of the indigenously designed Mahe-class Anti-Submarine Warfare Shallow Water Craft (ASW-SWC), was commissioned in Mumbai.

- INS Mahe is the **largest Indian warship to be powered by diesel engine–waterjet propulsion.**
- Its key operational roles include: Anti-submarine warfare in littoral and shallow waters; Underwater surveillance; Search and Rescue operations; Low-intensity maritime operations (LIMO); Advanced mine-laying capabilities.
- The vessel has been designed and built by Cochin Shipyard Limited (CSL). It is named after **Mahe** on the Malabar Coast.
- The ship's crest features the Urumi, a flexible sword associated with Kalaripayattu; its mascot is the cheetah, and its motto is "Silent Hunters."

COMMISSIONING OF INS IKSHAK

Context: INS Ikshak, the **third Survey Vessel Large (SVL) class ship,** has been formally commissioned into the Indian Navy at the Kochi Naval Base.

- The vessel is **fitted with advanced hydrographic and oceanographic systems**, enabling accurate seabed mapping, enhancing maritime navigation safety, & strengthening India's operational presence in key sea lanes.
- INS Ikshak can also **function as a platform for Humanitarian Assistance and Disaster Relief (HADR) operations,** as well as medical support missions.
- Built by **Garden Reach Shipbuilders and Engineers (GRSE)**, the ship is a reflection of the Aatmanirbhar Bharat initiative.
- It is the **first SVL-class vessel to be designed with dedicated accommodation for women personnel.**

CHINA COMMISSIONS INDIGENOUS AIRCRAFT CARRIER 'FUJIAN'

Context: China has officially commissioned its first fully indigenously designed aircraft carrier, named Fujian. The name carries strategic significance, as Fujian province lies opposite Taiwan across the Taiwan Strait.

- Fujian is China's third aircraft carrier and is significantly more advanced than its earlier carriers, Liaoning and Shandong.
- Key features of the carrier include a flat flight deck, an electromagnetic catapult launch system, and the capacity to operate a larger number of heavier and more heavily armed fighter aircraft.

MAN- PORTABLE AUTONOMOUS UNDERWATER VEHICLES

Context: Recently, the Defence Research and Development Organisation (DRDO) successfully developed a new generation of man-portable autonomous underwater vehicles (MP-AUVs).

About Man- Portable Autonomous Underwater Vehicles (MP-AUVs)

- MP-AUVs are compact, lightweight robotic systems designed to be carried and deployed by personnels (human beings) for underwater missions, **especially in mine countermeasure (MCM) operations.**
- These vehicles are equipped with advanced sensors such as side-scan sonar and underwater cameras for high-resolution seabed imaging and real-time visual confirmation, allowing for autonomous detection and classification of mine-like objects.
- **Developer**: DRDO's Naval Science and Technological Laboratory (NSTL), Visakhapatnam.

Key Features

- **Rapid Response:** Lightweight and quickly deployable, reducing logistics burden and operational risk.
- **Autonomous Target Classification:** Uses deep-learning algorithms to automatically identify Mine-Like Objects (MLOs).
- **Advanced Sensors**: Multiple AUVs equipped with side-scan sonar and underwater cameras for real-time detection and classification.
- **Enhanced Situational Awareness:** Robust underwater acoustic communication enables data sharing among AUVs.
- **Validation Status:** Successful field trials at NSTL and harbour locations; systems are near production-ready.

BUREVESTNIK MISSILE

Context: Russia has successfully conducted a test of its Burevestnik missile.

About Burevestnik Missile *("Storm Petrel")*

- The Burevestnik missile is a Russian nuclear-powered, nuclear-armed **cruise missile.**
  - A cruise missile is **powered by jet engines**, which enable it to maintain continuous flight throughout its trajectory.
- It was publicly revealed by President Putin in 2018 and is designed to have an effectively unlimited range, allowing it to evade existing missile defense systems by flying at very low altitudes and for extended durations.
- The missile uses a nuclear reactor for propulsion, enabling it to remain airborne for days and theoretically circle the globe before striking its target.
- It is capable of carrying a nuclear warhead and is launched with a solid-fuel booster.

BUREAU OF PORT SECURITY (BOPS)

Context: The Ministry of Home Affairs (MHA) convened a meeting to initiate the constitution of a the Bureau of Port Security (BoPS).

About *proposed* BoPS

- The Bureau of Port Security (BoPS) will be a statutory body constituted under Section 13 of the Merchant Shipping Act. The Bureau is being modelled on the lines of the Bureau of Civil Aviation Security (BCAS)
- It will function under the **Ministry of Ports, Shipping and Waterways (MoPSW).**
- The organisation will be **headed by a Director General (DG),** who will be an IPS officer. During the one-year transition period, the Director General of Shipping will serve as the DG, BoPS.
- **Objective of BoPS:** Establish a robust, uniform, and risk-based port security framework across India and ensure the security of ships, port facilities, maritime trade infrastructure.

LINKING NATGRID WITH NPR

Context: The Ministry of Home Affairs has linked the National Intelligence Grid (NATGRID) with the National Population Register (NPR).

About National Intelligence Grid (NATGRID):

- Established after the **26/11 Mumbai attacks**, NATGRID is an integrated intelligence platform that enables **real-time access to multiple datasets**, such as telecom, banking, travel, vehicle, and identity records, to break information silos among security agencies.
- NATGRID is an attached office under the Ministry of Home Affairs.

- The NATGRID comes under the purview of 'Intelligence and Security Organizations' and is exempted from the RTI Act, 2005
- Initially restricted to a limited number of central agencies, access has now been expanded to include State police forces, particularly officers of Superintendent of Police rank and above.

About National Population Register (NPR):

- NPR is a **comprehensive demographic and household database,** first prepared during Census 2011 and updated in 2015. NPR collects basic demographic and biometric data.
- It is a **register of usual residents of India,** prepared at the local to national levels under the Citizenship Act, 1955 and the Citizenship Rules, 2003.
- Registration in the NPR is **mandatory** for all usual residents—defined as persons residing in an area for six months or more, or intending to do so.
- The NPR records basic details such as name, age, address, and family relationships.

DEFENCE TECHNOLOGY

DEFENSE TECHNOLOGY IN OPERATION SINDOOR

Context: Operation Sindoor showcased significant advancements and efficacy of indigenous defense technology, marking a pivotal shift in India's strategic and technological military posture.

Airspace Monitoring Systems			
System / Platform	**Role / Function**	**Key Features**	**Developer / Origin**
IAF – Integrated Air Command and Control System (IACCS)	Airspace monitoring & command control	• Integrates ground & airborne radars, civilian radars, and communication nodes • Provides a full battlefield picture	Bharat Electronics Limited (BEL)
Ballistic Missile Defence Network - Mission Control Centre (MCC)	Tracks missiles & air threats	• Long-Range Tracking Radars (Swordfish) with 600-800 km range. • Upgraded the capacity of Swordfish is 1,500 km. **Receives data from:** • **ELM-2090 Terra (Israel)** • **Netra AEW&C (DRDO)** • **Phalcon AWACS**	DRDO / IAF / Israel
Indian Army – Akashteer	Low-level airspace defence	• Detects, tracks, and engages aircraft, drones, missiles • Integrates radar, sensors, and communications • Autonomous control of ground-based air defence	Bharat Electronics Limited (BEL)
Indian Navy – TRIGUN	Maritime threat monitoring	• Integrates sea-based radars, sonars, and communication nodes • Provides real-time coastal & deep-sea threat detection	Indian Navy
NavIC (Navigation with Indian Constellation)	Satellite-based monitoring & positioning	• Provides accurate Position, Velocity, and Timing (PVT) service • Covers India + 1,500 km region • **7 satellites:** 3 geostationary, 4 inclined geosynchronous • Dual-band signals (L5 encrypted for military use)	ISRO

India's Multi-Layered Air Defence Systems			
System	**Role / Function**	**Key Features**	**Developer**
First Layer (Very Short Range)			
D4 – Drone Detect, Deter, Destroy	Detects and neutralizes drones	• **Dual-layer kill mechanism:** Hard Kill (Laser Directed Energy), Soft Kill (RF & GPS jamming) • RADAR and infrared camera for detection for tracking	DRDO, productionized by BEL
L/70 Anti-Aircraft Gun	Radar-guided AA gun	• 40 mm gun with radar & electro-optical sensors • Auto-tracking, 240–330 rounds/min, 4 km range	Bofors (Sweden), manufactured in India
ZU-23 mm Gun	Anti-aircraft autocannon	• Twin 23 mm barrels • **Range**: 2.5 km (air), 2 km (ground) • High volume of fire for static installations	Soviet Union
Shilka (ZSU-23-4)	Self-propelled, radar-guided anti-aircraft system	• 360° coverage with 3rd-gen electro-optical system • Phased-array 3D tracking radar • Protects ground forces day/night	Russia
MANPADS-man-portable air defence systems	Man-portable surface-to-air missiles	• Can be carried/fired by individuals or crews • Russian systems: Igla-M and Igla-S	Russia
Second Layer (Short Range)			
Akash	Short-range surface-to-air missile (SRSAM)	• **Range**: 30–35 km (Akash NG: up to 70 km) • **Altitude**: up to 18 km • Multi-target engagement, ECCM-enabled	DRDO
SPYDER (Surface-to-Air Python & Derby)	Quick-reaction SAM system	• Engages aircraft, helicopters, UAVs, precision munitions • **SPYDER-SR (short-range):** range of up to 15 km and can engage at altitudes between 20 m to 9,000 m. • **SPYDER-MR (medium-range):** range of up to 35 km and can engage at altitudes between 16 km and 20 km. • **Interceptors**: Python-5 & Derby	Israel
Legacy Soviet Systems	Air defence	• S-125 Pechora, 9K33 Osa-AK, 2K12 Kub/Kvadrat	Soviet Union
Third Layer (Medium Range)			
Barak-8 Missile Defence System	Naval & land-based medium to long-range SAM	• **Naval Long Range SAM**: range up to 100 km • **Medium-Range SAM**: range up to 70 km	DRDO & Israel Aerospace Industries (IAI)
Fourth Layer (Long Range)			
S-400 "Sudarshan Chakra"	Long-range air defence	• Integrated radar, autonomous detection & targeting • Four missile types: 40–400 km range • Engages aircraft, UAVs, ballistic & cruise missiles up to 30 km altitude	Russia (Almaz Central Design Bureau)

Ballistic Missile Defence (BMD) Programme	Intercepts incoming ballistic missiles	• **Prithvi Air Defence (PAD)**: intercepts missiles up to 2,000 km, alt. 80 km, speed Mach 5 • **Prithvi Defence Vehicle (PDV)**: Phase II, exo-atmospheric interception up to 100 km • **Advanced Air Defence (AAD)**: intercepts missiles up to 30 km altitude	

INDIA'S AMCA STEALTH JET PROJECT APPROVED

Context: Defence Minister has approved the execution model for the Advanced Medium Combat Aircraft, under which Hindustan Aeronautics Limited (HAL) will compete with the private industry to manufacture the indigenous fifth-generation fighter jet.

About Advanced Medium Combat Aircraft

- The AMCA is **India's indigenous, fifth-generation, twin-engine, multirole stealth fighter jet being developed primarily for the Indian Air Force and Indian Navy.**
- Designed by the **Aeronautical Development Agency (ADA) under the Ministry of Defence,** the AMCA aims to replace the Sukhoi Su-30MKI in the IAF fleet.
- It is designed for **all-weather, air superiority, ground strike, and electronic warfare missions** with advanced features such as low radar cross-section, supercruise capability (sustained supersonic speed without afterburners), and sensor fusion.
- The plan includes building five prototypes with an estimated budget of more than ₹15,000 crore.

Key facts about AMCA:

- Twin-engine, 25-tonne medium-weight stealth aircraft with internal weapons bays.
- Maximum speed approximately Mach 2.15 with a combat range of about 1,620 km.
- **Payload capacity:** 1,500 kg internal weapons, 5,500 kg external payload, and 6,500 kg internal fuel.
- Advanced avionics with Active Electronically Scanned Array (AESA) radar and integrated electronic warfare systems.

Global Comparisons

- Puts India in the league of advanced 5th-generation fighters like the F-35 Lightning II (USA), Sukhoi Su-57 (Russia), and Chengdu J-20 (China).

Aircraft	Generation	Role / Features
Sukhoi Su-30MKI	4.5	Multirole, air superiority, advanced avionics, strike capability
Dassault Rafale	4.5	Multirole, stealth features, air-to-air & air-to-ground missions
HAL Tejas	4.5	Indigenous Light Combat Aircraft, modern avionics
MiG-29UPG	4	Upgraded multirole, mainly air superiority
Mirage 2000	4	Primarily strike roles

INSV KAUNDINYA

Context: The Indian Navy has formally inducted INSV Kaundinya, a stitched sail ship modeled on a 5th-century CE vessel depicted in the Ajanta Caves, at a ceremonial event held at the Naval Base in Karwar.

Historical Inspiration

- Built using the ancient **"stitched ship" method** - wooden planks tied with coir rope and sealed with natural resin, without nails or screws.
- This technique, known as the **Tankai method**, is referenced in ancient texts like the Yukti Kalpataru and in accounts of foreign travelers.

Naming and Legacy

- The vessel is named after Kaundinya, a 1st-century Indian mariner who sailed to Southeast Asia, married Queen Soma of Funan (modern Cambodia), and co-founded the Funan kingdom.
- His legacy highlights India's historic Indo-Pacific ties and the spread of Indian maritime culture, trade, and diplomacy.

Project Genesis

- Initiated in July 2023 through a tripartite agreement between the Ministry of Culture, the Indian Navy, and Goa-based Hodi Innovations Pvt. Ltd.
- Funded by the Union Ministry of Culture as part of India's cultural diplomacy and heritage conservation.

Construction

- **Keel laid (Construction Started):** September 2023 → **Launched:** February 2025 in Goa.
- Constructed by skilled artisans from Kerala, led by master shipwright Babu Sankaran.
- **Materials**: Wooden planks, coir rope, coconut fibre, and natural resin.

BRAHMOS

Context: Raksha Mantri recently inaugurated the Brahmos Aerospace Testing Facility in Lucknow, Uttar Pradesh.

About Brahmos

- The BrahMos missile is a **long-range, supersonic cruise missile** developed jointly by **India's** Defence Research and Development Organisation (**DRDO**) and **Russia's NPO Mashinostroyeniya** through the BrahMos Aerospace venture. It is named after the Brahmaputra River in India and the Moskva River in Russia.
- The missile can be launched from multiple platforms, including land, sea (ships and submarines), and air (fighter aircraft).

Key Features

- **Speed**: Around Mach 3 (three times the speed of sound)
- **Range**: Initially about 290 km, with extended-range versions exceeding 350-400 km, and future plans to reach up to 800 km or more.
- **Propulsion**: **Two-stage system** with a solid-propellant rocket booster and a liquid-fueled ramjet
- **Flight profile:** Capable of flying as low as 3–10 meters above the surface to evade radar detection, and can reach altitudes up to 15 km. It uses a "fire-and-forget" guidance system.
- **Warhead:** Conventional warhead weighing between 200 to 300 kg, capable of precision strikes with very high accuracy (around 1 meter CEP)

Versions

- **BrahMos Air-Launched (BrahMos-A):** Modified for air launch from a Su-30MKI fighter aircraft; range extended up to 500 km while maintaining supersonic speed.
- **BrahMos-NG (Next Generation) Missile:** A lighter, smaller, and smarter version of the BrahMos missile, designed for enhanced precision and versatility.
- **BrahMos-II:** A hypersonic cruise missile capable of flying at speeds exceeding Mach 5, offering rapid strike capability.

GOLDEN DOME

Context: US President Trump has announced a new missile defense initiative called Golden Dome.

About Golden Dome

- Golden Dome is designed as a **comprehensive ground- and space-based system to safeguard the entire country.**
- It will feature multiple layers of defense to counter hypersonic and cruise missile threats.
- The system will integrate space-based interceptors and advanced tracking technologies.
- Golden Dome aims to detect, track, and neutralize missiles at various stages of their flight, potentially stopping them before launch or intercepting them mid-air.
- **Components:** The system will leverage existing U.S. missile defense assets, including Patriot missile batteries, Terminal High Altitude Area Defense (THAAD), Aegis Ballistic Missile Defense, and Ground-based Midcourse Defense (GMD).

BHARGAVASTRA

Context: Bhargavastra is an indigenously developed anti-drone system that India has successfully test-fired.

- Bhargavastra is a multi-layer micro-missile Anti-Drone/Counter-Unmanned Aerial System (C-UAS) designed as a **low-cost "hard kill" solution**. It neutralizes threats from drone swarms.

- Developed by **Solar Defence and Aerospace Limited (SDAL),** Bhargavastra **features a two-layer security system**: unguided micro-rockets with a 20-meter lethal radius for swarms and guided micro-missiles for precision strikes.
- It can detect drones up to 2.5 kilometers away, with radar coverage of 6–10 kilometers, and operates effectively at altitudes above 5,000 meters.
- Its modular design allows integration of soft-kill measures such as jamming and spoofing, while a Command, Control, Communication, Computers, and Intelligence (C4I) enabled command centre enhances network-centric warfare capabilities.

MULTI-INFLUENCE GROUND MINE (MIGM)

Context: The Indian Navy, in collaboration with the Defence Research and Development Organisation (DRDO), successfully tested the indigenously developed MIGM.

- This **advanced underwater naval mine,** designed by the Naval Science and Technological Laboratory (NSTL) under DRDO, strengthens the Navy's capabilities against modern stealth ships and submarines.
- MIGM is equipped with multiple sensors to detect acoustic, magnetic, and pressure signatures from marine vessels, along with onboard electronics and processors to analyze data and execute appropriate actions.
- The system is deployable from ships, submarines, and other naval platforms, enhancing India's maritime defense readiness.

HAWKEYE 360 TECHNOLOGY

Context: The United States has approved the sale of HawkEye 360 technology to India to enhance its surveillance capabilities.

- This system employs **clusters of three satellites in Low Earth Orbit to detect, geolocate, and analyze radio frequency signals.** It collects and analyses radio frequency (RF) signals.
- For India, it enables **tracking of vessels that switch off their Automatic Identification System to evade monitoring in sensitive or disputed areas.**
- The technology will **strengthen India's maritime domain awareness in the Indo-Pacific,** allowing more effective surveillance, monitoring of illegal fishing, smuggling, and other maritime activities.

IGLA-S MISSILES

Context: The Indian Army has received new Igla-S missiles from Russia to enhance its capability against drones, helicopters, and jets.

- The Igla-S is a **man-portable, shoulder-launched surface-to-air missile system** designed for mobile ground units in high-threat environments and is an **improved version of Very Short Range Air Defence Systems.**
- It automatically following engine heat after luses **infrared homing** to detect and lock onto the heat signatures of aerial targetsaunch, making it highly effective against fast and small targets.
- The system can engage threats at ranges up to 6 kilometers and altitudes up to 3.5 kilometers.

INDIAN NAVY TO INDUCT WARSHIPS

Context: The Indian Navy is set to induct 9–10 warships between June and December 2025, marking a significant enhancement of its operational capabilities.

First ASW-SWC Vessel: INS Arnala

- INS Arnala, the first **Anti-Submarine Warfare Shallow Water Craft (ASW-SWC), wa**s commissioned at Visakhapatnam.
- It is the first of 16 ASW-SWC ships, designed by Garden Reach Shipbuilders & Engineers and built in collaboration with L&T Shipbuilders.
- The vessel is equipped for anti-submarine warfare, search-and-rescue operations, and low-intensity maritime missions.
- Notably, it is the largest Indian warship powered by a diesel-engine–waterjet combination.
- Named after Arnala Fort in Vasai, Maharashtra.

PRALAY MISSILE TEST

Context: The Defence Research and Development Organisation (DRDO) successfully conducted consecutive test flights of the Pralay missile from Dr. A.P.J. Abdul Kalam Island, Odisha.

Key Features of the Pralay Missile

- **Type**: Indigenously developed solid-propellant quasi-ballistic missile.
- **Guidance**: Equipped with advanced navigation and guidance systems for high accuracy.
- **Warhead Capability**: Can carry multiple types of warheads to engage different target profiles.
- **Development**: Designed by the Research Centre Imarat (RCI) under DRDO, with support from BDL, BEL, and several MSMEs.
- **Range**: 150–500 km.
- **Payload Capacity**: 500–1,000 kg.
- **Mobility**: Can be launched from a mobile launcher, ensuring operational flexibility.

INS NISTAR & INS NIPUN

Context: India has commissioned two indigenously built **Diving Support Vessels (DSVs),** INS Nistar and INS Nipun, developed by Hindustan Shipyard Limited (Visakhapatnam).

- These specialized vessels are designed to support underwater diving, rescue, and repair operations for both military and commercial purposes.

About INS Nistar	About INS Nipun
• INS Nistar is the first indigenously designed and constructed Diving Support Vessel. • It is approximately 120 meters in length with a displacement of around 10,000 tons and has endurance of over 60 days at sea. • The ship is equipped with advanced diving equipment including Remotely Operated Vehicles (ROVs), a Self-Propelled Hyperbaric Lifeboat, Diving Compression Chambers, and a 15-tonne subsea crane. • INS Nistar can conduct diving and salvage operations up to depths of 300 meters. • It serves as the mother ship for a Deep Submergence Rescue Vehicle (DSRV) capable of rescuing personnel from distressed submarines. • It has a Dynamic Positioning System, Side-Scan Sonar, and supports helicopter operations.	• INS Nipun is the sister ship of INS Nistar. • Like INS Nistar, it is designed for deep-sea operations, submarine rescue, underwater salvage, and Search and Rescue (SAR) missions. • INS Nipun shares similar technical capabilities and indigenous construction strengths as INS Nistar.

PROJECT 17A

Context: INS Udaygiri, the second stealth frigate under Project 17A, has been delivered to the Indian Navy.

About Project 17A

- Also known as the **Nilgiri-class frigates**, it is a **series of advanced multi-mission stealth guided-missile frigates** being **built indigenously for the Indian Navy** by Mazagon Dock Shipbuilders (MDL) and Garden Reach Shipbuilders & Engineers (GRSE).
- A frigate is a versatile warship designed to protect fleet surface vessels from enemy ships and aerial threats.
- These frigates represent an **evolution over the preceding Project 17 (Shivalik-class) frigates.**
- It features enhanced stealth, improved hull design, and a more advanced suite of weapons and sensors including supersonic surface-to-surface missiles (BrahMos), medium-range surface-to-air missiles (Barak-8), and rapid-fire close-in weapon systems.
- **There are seven ships in the Project 17A series:** INS Nilgiri, INS Udaygiri, INS Himgiri, INS Taragiri, INS Mahendragiri, INS Dunagiri, and INS Vindhyagiri, with the delivery timeline spanning roughly from 2024 to 2027.

ASTRA MISSILE

Context: The Defence Research and Development Organisation (DRDO) and the Indian Air Force (IAF) successfully conducted a flight test of the Astra missile, equipped with an indigenous Radio Frequency (RF) seeker, from a Su-30 Mk-I aircraft.

About Astra

- Astra is an **indigenously developed Beyond Visual Range Air-to-Air Missile (BVRAAM)** designed to target and destroy highly manoeuvrable, supersonic aircraft.

- Developed by **DRDO**, it demonstrates India's growing capability in advanced missile technology.
- The missile operates effectively in all weather conditions, both day and night.
- With a range of 80 -110 km, it features advanced guidance, navigation, and control systems, ensuring high accuracy and reliability in combat missions.
- Astra Mk-2 (range 130–160 km) and Astra Mk-3 are under development and testing phases.

INS TAMAL

Context: The Indian Navy commissioned INS Tamal, a Russian-built guided-missile stealth frigate, into active service on June 1, 2025.

About INS Tamal

- The warship is equipped with **dual-role BrahMos supersonic cruise missiles**, enhancing India's maritime strike capabilities.
- The commissioning ceremony took place at the Yantar Shipyard in Kaliningrad, Russia, where the vessel was constructed. INS Tamal will soon sail to its homeport at Karwar, Karnataka.
- The ship is the **eighth multi-role frigate built under Project 1135.6**, a collaborative Indo-Russian programme, and the second vessel of the follow-on Tushil class.
- The earlier seven frigates under Project 1135.6 are part of the Western Fleet, known as the "Sword Arm" of the Indian Navy, under the Western Naval Command.
- **Key Features:**
  - BrahMos dual-role supersonic cruise missiles for both anti-ship and land-attack missions.
  - Vertical Launch System (VLS) for surface-to-air missiles with extended range.
  - 30 mm Close-in Weapon System (CIWS) for point defence.
  - 100 mm main gun, anti-submarine warfare (ASW) rockets, and heavyweight torpedoes, providing strong offensive and defensive capabilities.

MISSION SUDARSHAN CHAKRA

Context: Prime Minister Narendra Modi announced the launch of Mission Sudarshan Chakra during the 79th Independence Day celebrations.

About Mission Sudarshan Chakra

- The mission is envisioned as a **multi-layered defence framework** designed to protect India's citizens and vital infrastructure from a wide range of threats, including missile attacks, terrorism, cyber intrusions, and enemy infiltrations.
- It is conceptualised as **India's version of Israel's Iron Dome** and the U.S.'s proposed Golden Dome.
- Named after the **mythological Sudarshan Chakra of Lord Krishna,** it symbolises speed, precision, and protection.
- The system aims to **integrate surveillance, cyber protection, and physical security safeguards**, making it far more comprehensive than a traditional missile shield.

Key Features and Objectives

- **Comprehensive Defence:** Includes missile interception, precision counterstrike options, and protection against cyber warfare tactics such as hacking and phishing.
- **Indigenisation:** To be fully researched, developed, and manufactured within India under the Aatmanirbhar Bharat initiative.
- **Collaboration:** Will involve defence research organisations, the armed forces, and private-sector innovators.
- **Timeline:** Expansion, strengthening, and modernisation are targeted for completion by 2035.

Project Kusha

Alongside the mission, the Indian Air Force is pushing for rapid progress on Project Kusha ,**an indigenous long-range air defence missile system.**

- **Developing Agencies:** Defence Research and Development Organisation (DRDO) and Bharat Electronics Limited (BEL).
- **Aim**: To develop **Long-Range Surface-to-Air Missiles (LR-SAM)** as part of India's multi-layered missile defence architecture

- **Features**: Has a range of up to 400 km, Strengthens deterrent and offensive capacities, Provides advanced protection across strategic sectors
- **Expected completion timeline:** 2028–2029.

DRDO TESTS INDIGENOUS AIR DEFENCE SYSTEM

Context: The Ministry of Defence announced that the DRDO has successfully conducted the first flight tests of the Integrated Air Defence Weapon System (IADWS).

- The trials, held off the coast of Odisha, demonstrated the system's ability to simultaneously neutralise three targets at different ranges and altitudes, marking a major milestone in India's indigenous defence capability.

About Integrated Air Defence Weapon System (IADWS)

- IADWS is a multi-layered air defence system that includes three core components:
  - **Quick Reaction Surface-to-Air Missiles (QRSAM)**
    - Developed by DRDO
    - **Range**: 25–30 km; **Altitude**: up to ~10 km.
    - Designed to protect moving armoured formations from aerial attacks
    - Mounted on a mobile platform and capable of providing air defence on the move
  - **Advanced Very Short Range Air Defence System (VSHORADS)**
    - Developed by Research Centre Imarat (RCI)
    - **Range**: up to ~6 km; **Altitude**: up to ~4 km.
    - A Man-Portable Air Defence System (MANPADS)
    - Intended to neutralise low-altitude aerial threats at short distances
  - **Directed Energy Weapon (DEW)**
    - Developed by Centre for High Energy Systems and Sciences (CHESS)
    - Uses a concentrated laser beam to engage targets at the speed of light
    - Can slice through the target's structure or destroy it more effectively by striking the warhead
- The integrated functioning of all weapon components is **managed by a Centralised Command and Control Centre** developed by the **Defence Research & Development Laboratory (DRDL).**

INS HIMGIRI DELIVERED TO INDIAN NAVY

Context: Recently, INS Himgiri, the third Nilgiri-class (Project 17A) frigate and the first built by GRSE, Kolkata, was delivered to the Indian Navy.

About INS Himgiri

- The 6,670-tonne, nearly 149-metre-long Himgiri is an **Advanced Guided Missile Frigate** armed with Barak 8 anti-aircraft and BrahMos anti-ship/land attack missiles.
- Named after the earlier Leander-class frigate that was decommissioned in 2005.
- Equipped with a CODOG (Combined Diesel or Gas) propulsion system, a Controllable Pitch Propeller, and an advanced Integrated Platform Management System.
- About 75% of the ship's components are domestically sourced, supporting over 200 MSMEs.

About Project 17A

- Project 17A is an ongoing Indian Navy programme to build a **new generation of multi-mission stealth guided-missile frigates** that improve upon the earlier Shivalik-class (Project 17) ships.
- It is **aimed at boosting blue-water combat capability and indigenisation.**
- Project 17A comprises **seven advanced stealth frigates:** INS Nilgiri, INS Udaygiri, INS Himgiri, INS Taragiri, INS Dunagiri, INS Vindhyagiri and INS Mahendragiri.
- These ships are **designed by the Indian Navy's Warship Design Bureau** and built by Mazagon Dock Shipbuilders Limited (MDL), Mumbai and Garden Reach Shipbuilders & Engineers (GRSE), Kolkata.

MIG-21 FIGHTER JETS

Context: The Indian Air Force (IAF) will retire its MiG-21 fighter jets in September 2025, marking the end of nearly six decades of service. This retirement will bring the IAF's fighter strength down to 29 squadrons, significantly below the sanctioned 42 squadrons.

About MiG-21

- The MiG-21 is a supersonic jet fighter developed by the **Soviet Union's Mikoyan-Gurevich Design Bureau.** It is a **single-engine, single-seater, multi-role fighter aircraft** capable of both air combat and ground attack missions. MiG-21 was India's first supersonic jet fighter.
- **First inducted in 1963 as an interceptor**, it was later **upgraded for several combat roles**, including ground attacks. Its induction followed the 1962 India–China war.
- The aircraft saw action in multiple conflicts, including the Indo-Pak wars of 1965 and 1971, as well as the Kargil War of 1999.
- Most notably, in February 2019, a MiG-21 Bison flown by Wing Commander Abhinandan Varthaman shot down a Pakistani F-16 during an aerial dogfight.
- India has **procured over 700 MiG-21s** across various variants—Type-77, Type-96, BIS, and the latest Bison version, which features upgraded avionics, radars, and modern missiles.

INDIA SUCCESSFULLY TESTS AGNI-P MISSILE FROM RAIL-BASED LAUNCHER

Context: DRDO has successfully test-fired the Agni-Prime (Agni-P) missile from a rail-based mobile launcher.

Key Features of Agni P

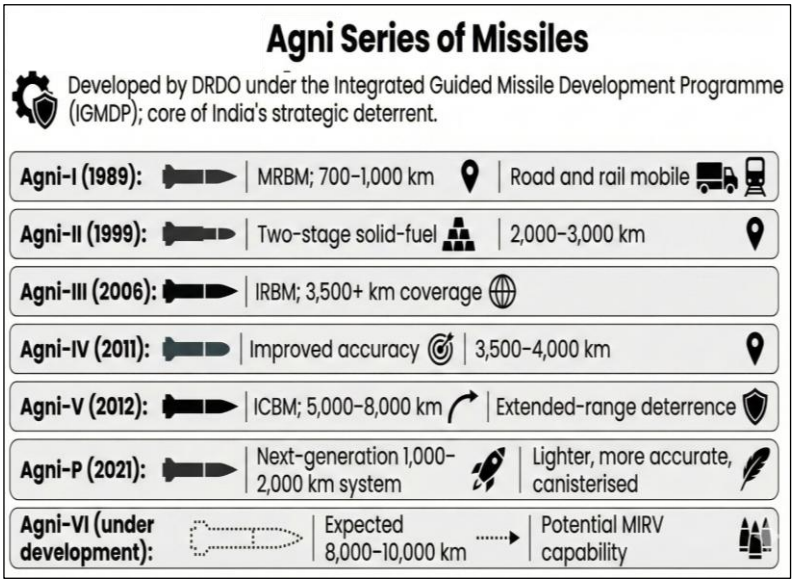
- **Weight**: ~11,000 kg
- **Type**: Two-stage, solid-fuel missile
- **Range**: 1,000–2,000 km
- **Warhead options:** High explosive, thermobaric, or nuclear
- **Technology: Fully canisterised**, stored and transported in a sealed, protective tube (called a canister). The missile stays inside this tube from storage to launch, without needing to be taken out or assembled.

About Agni-P (A Next-Generation Upgrade to Agni-I)

- India's Agni missile series began with Agni-I, a medium-range ballistic missile (700–1,000 km), first tested in 1989.
- Although Agni-I remains operational, India required a more advanced, lighter and accurate system, leading to the development of Agni-P.
- Agni-P combines the range of Agni-I with propulsion and navigation technologies drawn from Agni-IV and Agni-V. **It is the sixth missile in the Agni series.**

Advantages of Rail-Based Missile Launchers

- Mobile missile systems are central to a credible second-strike capability, which is essential for India's No First Use nuclear doctrine.
- Rail-based launchers offer benefits superior to road and some naval platforms:
  - India's 70,000 km railway network enables movement without special preparation.
  - Tunnels and varied terrain provide natural concealment from satellite surveillance.
  - Cheaper and easier to maintain than submarine-launched ballistic missiles (SLBM).
  - Less restricted by infrastructure limits compared to road-based launchers.



- This capability places India among a select group of nations — **Russia, the United States, China, and possibly North Korea** — that **can launch long-range ballistic missiles from railway platforms using canisterised systems.**

X-GUARD FIBRE-OPTIC TOWED DECOY (FOTD)

Context: During Operation Sindoor, the Indian Air Force reportedly deployed the X-Guard Fibre-Optic Towed Decoy (FOTD) system developed by Israel.

About X-Guard Fibre-Optic Towed Decoy (FOTD)

- The X-Guard FOTD is a state-of-the-art electronic warfare system developed by Israel's Rafael Advanced Defence Systems **to protect fighter aircraft from radar-guided missile threats.**
- It is lightweight (about 30 kg), reusable, and retractable, allowing for rapid deployment and retraction during flight.
- These AI-enabled decoys trail behind Rafale fighter jets, imitating their radar cross-section, speed, and spectral signature.
- The X-Guard decoy integrates smoothly with the Rafale's SPECTRA (Self-Protection Equipment Countering Threats to Rafale Aircraft) electronic warfare suite.
- While SPECTRA detects and suppresses threats, X-Guard acts as a trailing expendable shield, releasing jamming signals across multiple radar bands. Together, they create a multi-layered defensive protection system for the aircraft.

INDIA SUCCESSFULLY TEST-FIRES AGNI-5 MISSILE

Context: India successfully test-fired the Agni-5 Intermediate-Range Ballistic Missile (IRBM). The launch was conducted under the Strategic Forces Command (SFC).

About Agni-5

- The Agni-5 is a **nuclear-capable, surface-to-surface ballistic missile** powered by a three-stage solid-fuel engine. It has a range of over 5,000 km.
- It is capable of carrying multiple independently targetable reentry vehicles (MIRVs), allowing a single missile to strike several targets simultaneously.
- This ability was successfully demonstrated during the '**Mission Divyastra' trial in 2024**. In simple terms, one missile can strike multiple locations at the same time, which significantly strengthens India's strategic deterrence.
- With this technology, India joins a small group of countries (including the United States, Russia, China, and France) that possess such advanced ballistic missile capabilities.
- Agni forms part of the missile families developed under the **Integrated Guided Missile Development Programme (IGMDP).**
- Other IGMDP missiles include Prithvi, Trishul, Nag, and Akash.

INDIGENOUS PATROL VESSEL ADAMYA COMMISSIONED

Context: The Indian Coast Guard (ICG) has commissioned Adamya, the first of eight Adamya-class **fast patrol vessels**, at Paradip Port, Odisha.

- Built by **Goa Shipyard Limited** with over 60% indigenous content, the 51-metre vessel strengthens India's maritime capabilities under the Make in India initiative.
- The ship accommodates 39 personnel, has a displacement of 320 tonnes, and achieves speeds of 28 knots with an endurance of 1,500 nautical miles.
- It is the first ICG vessel to feature indigenously developed controllable pitch propellers (CPP) and gearboxes, enhancing manoeuvrability and operational flexibility.
- The name Adamya, meaning "indomitable," reflects the ICG's commitment to ensuring safe, secure, and clean seas in support of India's maritime interests.
- The vessel will be deployed for surveillance of maritime zones and for other operational responsibilities under the ICG charter to safeguard national maritime interests.

EXTENDED RANGE ATTACK MUNITIONS (ERAMS)

Context: The United States has approved the supply of ERAMs to Ukraine.

About Extended Range Attack Munitions (ERAMs)

- ERAMs are a new generation of air-launched, precision-guided standoff missiles developed by the United States Air Force, designed to provide affordable, long-range strike capability for modern air forces.
- It is designed for use against high-value fixed or mobile targets. It blends the destructive power of a heavy bomb with the standoff range of a cruise missile.
- **Range:** Capable of engaging targets at distances between 240 and 450 km.

- **Warhead:** Equipped with a 500-pound high-explosive warhead, enabling it to destroy fortified structures, fuel facilities, and ammunition depots.
- **Guidance System:** Uses a combination of GPS, inertial navigation, and a terminal seeker, achieving an accuracy of roughly ten meters.

RUSSIA TESTS NUCLEAR-POWERED UNDERWATER DRONE 'POSEIDON'

Context: Russian President Vladimir Putin announced the successful test of Poseidon, a nuclear-capable underwater drone.

About Poseidon

- Poseidon is a **nuclear-powered unmanned underwater vehicle (UUV)** designed to carry a **nuclear warhead of up to two megatons.** It is a drone that can be fired like a torpedo.
- Known in NATO as Kanyon, Poseidon is 20 metres long, 1.8 metres in diameter and weighs 100 tonnes.
- **Key capabilities include:**
  - The ability to operate at depths of over 1 km underwater,
  - A top speed of around 200km/h, and
  - Extremely low detectability, making it difficult to track or counter with current defence systems.
- Russia asserts that no other country possesses underwater weapons that match Poseidon's speed, range, or diving capacity, and claims it is effectively impossible to intercept.

SAKSHAM COUNTER-UNMANNED AERIAL SYSTEM (CUAS) GRID

Context: The Indian Army has initiated procurement of the indigenous 'Saksham' Counter-Unmanned Aerial System (CUAS) Grid

About Saksham' Counter-Unmanned Aerial System (CUAS) Grid

- Developed in collaboration with Bharat Electronics Limited (BEL), Ghaziabad, Saksham stands for **Situational Awareness for Kinetic Soft and Hard Kill Assets Management.**
- The system is built **to detect, track, identify, and neutralise hostile drones in real time.**

Key Features

- AI-enabled predictive threat assessment and real-time drone detection.
- Integration of multiple CUAS sensors and weapon systems to deliver a coordinated, automated response.
- 3D battlefield visualisation and automated decision-support tools for commanders.
- Seamless interoperability with other Army systems, including the Akashteer System, enabling mapping of friendly, neutral, and hostile airspace users.

INDIAN NAVY COMMISSIONS INS ANDROTH

Context: The Indian Navy has commissioned INS Androth, at the Naval Dockyard in Visakhapatnam.

About INS Androth

- INS Androth is the second **Anti-Submarine Warfare Shallow Water Craft (ASW-SWC)** vessel of India. The first ship of the class, INS Arnala, entered service in June 2025.
- Constructed by Garden Reach Shipbuilders & Engineers (GRSE), Kolkata, INS Androth features over 80% indigenous content, reflecting India's push for self-reliance in defence manufacturing.
- The ship is equipped for **maritime surveillance, search and rescue, coastal defence, and Low Intensity Maritime Operations (LIMO).**
- The ship has been named after Androth, the northernmost island of the Lakshadweep group, known for its historical and strategic importance in India's maritime domain.

ANANT SHASTRA AIR DEFENCE SYSTEM

Context: The Indian Army has issued a tender to Bharat Electronics Limited (BEL) for the induction of 5–6 regiments of the indigenously developed Anant Shastra surface-to-air missile (SAM) system.

About Anant Shastra

- Fully mobile and designed to provide air defence on the move, it features advanced radars, automatic fire control, multi-target tracking,
- It will replace the ageing OSA-AK systems, which were part of India's Soviet-era defence inventory from the 1980s and are now technologically outdated.

- **Earlier Name**: Quick Reaction Surface-to-Air Missile (QRSAM).
- **Development**: Jointly developed by DRDO, BEL, and Bharat Dynamics Limited (BDL).
- **Estimated Cost**: Around ₹30,000 crores.
- **Range**: Up to 30 km, with altitude coverage up to 10 km.

DRONE WALL

Context: Following suspected Russian drone intrusions in Denmark, the European Union has initiated plans to develop a so-called "drone wall."

About Drone Wall (Eirshield)

- A "Drone Wall" is not a physical barrier, but rather **a coordinated, multi-layered network of detection and interception systems designed to monitor, track, and neutralize unauthorized drones**, especially along the eastern borders of Europe and NATO countries.
- The system integrates advanced sensors such as micro-Doppler radar, cameras, and radio frequency detectors to identify and categorize hostile drones.
- The network may also deploy interceptor drones equipped with munitions to physically neutralize incoming threats, with future plans for AI-powered autonomous drone swarms.
- The drone wall is envisioned as a cooperative effort among European nations, especially those on NATO's eastern flank like Poland, Finland, Estonia, Latvia, and Lithuania. It is part of the EU's broader Eastern Flank Watch project.

MH-60R SEAHAWK

Context: Indian Navy has commissioned its second MH-60R Seahawk helicopter squadron, INAS 335, at INS Hansa, Goa.

- With INAS 335 joining the earlier squadron INAS 334 (commissioned at INS Garuda, Kochi, in March 2024), the Indian Navy has fully operationalised its MH-60R Seahawk fleet.

About MH-60R Seahawk

- The MH-60R Seahawk serves as an **advanced multi-mission maritime helicopter** primarily used for **anti-submarine and anti-surface warfare.**
- It is developed by Sikorsky (a Lockheed Martin company).
- It is equipped with **multi-mode radar,** dipping sonar, sonobuoys, infrared sensors, electronic warfare systems, advanced data links, and survivability systems.
- Its integrated mission system enables real-time detection, tracking, and targeting of surface and sub-surface threats.
- The helicopter **can be armed with torpedoes, missiles, rockets, and guns,** allowing it to perform both anti-submarine and anti-surface warfare roles effectively.

INDIGENOUS ANTI-SUBMARINE SHALLOW WATER CRAFT ANJADIP

Context: The Indian Navy has received Anjadip, the third of eight Anti-Submarine Warfare Shallow Water Crafts (ASW SWC).

- It has been indigenously designed and built by Garden Reach Shipbuilders and Engineers (GRSE) in Kolkata. The ASW SWC project is being **implemented under a Public–Private Partnership between GRSE and L&T Shipyard.**
- The ship derives its name from Anjadip Island located off coast of Karwar, Karnataka
- With a length of about 77 metres, ASW SWCs are the **largest Indian naval warships powered by waterjet propulsion.**
- They are equipped with: Lightweight torpedoes, Indigenously developed anti-submarine rockets, Shallow-water sonar systems
- These capabilities significantly strengthen anti-submarine warfare, coastal surveillance, and mine-laying operations, particularly in near-shore and littoral environments.
- It has **over 80% indigenous content** and is fitted with an **indigenous 30 mm Naval Surface Gun.**

INDIAN ARMY DEPLOYS 3D CONCRETE PRINTING IN FORWARD AREAS

Context: The Indian Army has operationally deployed on-site 3D concrete printing technology in Sikkim and adjoining forward areas.

- Designed for **high-altitude and rugged terrain**, the technology enables the rapid construction of bunkers, sentry posts, and protective structures with minimal manpower.
- This capability has been developed under **Project PRABAL** (Portable Robotic Arm for the construction of Bunkers and Ancillaries) in **collaboration with Indian Institute of Technology Hyderabad.**
- The system is being **fielded by the Trishakti Corps,** which is responsible for key northern border sectors.

IMPORTANT NEWS

CONFERENCE ON EXTRADITION OF FUGITIVES

Context: Union Home Minister attended a two-day conference titled "Extradition of Fugitives – Challenges and Strategies" in New Delhi.

About Conference on Extradition of Fugitives

- The conference aimed to strengthen international police cooperation and speed up the extradition of fugitives wanted in India.
- It comes at a time when India is expanding its efforts in cross-border criminal investigations.
- Over 300 extradition requests from India remain pending with foreign governments.
- The event was organised by the Central Bureau of Investigation (CBI).
- The Home Minister had earlier launched the **BHARATPOL portal**, developed by the CBI, which integrates district police units, state police, central law enforcement agencies, and the CBI on a single platform to enable seamless information exchange.

HISTORIC DOUBLE-HANDED CIRCUMNAVIGATION BY INSV TARINI

- Lieutenant Commanders Roopa A and Dilna K of the Indian Navy created history as the **first Indian double-handed circumnavigators** by completing Navika Sagar Parikrama II aboard INSV Tarini.
- "Double-handed" sailing means having two crew members managing the entire voyage, relying on each other for navigation, sailing, maintenance, and handling all aspects of the journey.
- Their eight-month voyage, which ended at Mormugao Port, Goa, covered **over 25,400 nautical miles across four continents, three oceans, and three Great Capes** (Cape Leeuwin, Cape Horn, and Cape of Good Hope)-entirely under sail, without external assistance.
- This milestone reflects India's maritime ambition, women-led achievements, and the Navy's motto: "Courageous Hearts, Boundless Seas."

FINANCIAL FRAUD RISK INDICATOR (FRI)

Context: The Department of Telecommunications (DoT) has introduced the Financial Fraud Risk Indicator to strengthen the fight against mobile-based cyber fraud.

- The FRI is a **risk-based metric that categorizes mobile numbers as Medium, High, or Very High risk for financial fraud.**
- This classification is based on data collected from: National Cybercrime Reporting Portal (**NCRP**); DoT's **Chakshu facility** and Digital Intelligence Platform (**DIP**); Intelligence shared by banks and financial institutions
- The indicator allows banks, non-banking financial companies (NBFCs), and UPI service providers to prioritize monitoring and adopt extra measures to protect customers linked to high-risk numbers.

VICTIMS OF TERRORISM ASSOCIATIONS NETWORK

Context: The Victims of Terrorism Associations Network (VoTAN) was launched by the United Nations Office of Counter-Terrorism on 28 April 2025.

- Established after the **2022 UN Global Congress of Victims of Terrorism,** VoTAN is inclusive, trauma-informed, and **aims to transform victims' pain into purpose while promoting global peace and security.** It has received **financial support from Spain.**

- VoTAN unites victims and survivors of terrorism, victims' associations, and civil society groups worldwide. It provides a safe platform for support, resilience, and advocacy, enabling members to influence victim-focused programs and policies.

FIELD MARSHAL

Context: The Pakistan government has announced that General Asim Munir, Chief of Army Staff of the Pakistan Army, will be promoted to the rank of Field Marshal, becoming only the second person in Pakistan's history to hold this rank after Ayub Khan in 1959.

- Both the Indian and Pakistani armies follow the British system of ranks. A Field Marshal (FM) is a five-star officer rank, the highest attainable, above a general.
- In India, the FM rank is equivalent to the Admiral of the Fleet in the Navy and the Marshal of the Indian Air Force. India has had two FMs: Sam Manekshaw (1973) and KM Cariappa (1986). India also has one Marshal of the Air Force, Arjan Singh (2002).
- The rank is usually conferred for ceremonial purposes or wartime leadership, and a Field Marshal remains on the active list until death.

UKRAINE'S OPERATION SPIDER'S WEB

Context: Ukraine recently launched a drone attack deep inside Russian territory, destroying over 40 aircraft, the deepest incursion since the war began in 2022. The operation, titled "Operation Spider's Web," employed First-Person View (FPV) drones.

About First-Person View (FPV) Drones

- FPV drones are remotely operated aircraft controlled through a live video feed, allowing the pilot to see exactly what the drone sees via goggles or a screen.
- Originally designed for drone racing and hobbies, FPV drones are now being used in war.
- They are often fitted with explosives and flown straight into enemy targets, where they explode on impact.
- Because of their limited range and the operator's restricted visibility, reconnaissance drones are often used first to locate and identify targets before FPV drones are launched.

Effectiveness of FPV Drones

- **Cost-Effective:** Each explosive-equipped drone can cost as little as $500.
- **Precision:** Small yet capable of highly accurate strikes.
- **Stealth and Agility:** Size and maneuverability help evade radar and reach deep targets.
- **Reduced Risk**: They limit human exposure in hostile zones.

SHANGRI-LA DIALOGUE 2025

Context: Chief of Defence Staff (CDS) General Anil Chauhan visited Singapore to attend the 22nd Shangri-La Dialogue, **Asia's premier defence and security summit.**

- The Dialogue is **organised by the International Institute for Strategic Studies (IISS)** and brings together defence ministers, military chiefs, and strategic experts from around 40 nations to discuss Indo-Pacific security challenges.
- **Held annually in Singapore**, it provides a platform for decision-makers from the Asia-Pacific, North America, Europe, and the Middle East to exchange views on key regional security issues and coordinate policy responses.

OPERATION DEEP MANIFEST

Context: The Directorate of Revenue Intelligence (DRI) has launched Operation Deep Manifest to curb the illegal import of Pakistani-origin goods routed through third countries, primarily via Dubai, UAE.

- Following the Pahalgam terror attacks, the Government imposed a comprehensive ban in May 2025 on the direct or indirect import or transit of goods originating from or exported by Pakistan. Previously, such goods faced a 200% customs duty.
- So far, the operation has led to the seizure of 1,115 metric tonnes of goods, valued at around Rs 9 crore, found in violation of import policy prohibitions.

OPERATION BLACK FOREST

Context: 'Operation Black Forest' is the biggest anti-Naxal operation ever conducted on Karregutta hill, located along the Chhattisgarh–Telangana border.

Other Major Anti-Naxal Operations

- **Mission Sankalp:** Launched in April 2025, in the rugged hills of Karregutta and adjoining areas along the Chhattisgarh–Telangana border. It aims to establish security dominance in regions that were traditionally Naxal strongholds.
- **Operation Kagar (2023-24):** Operation Kagar targeted Maoist leadership in the Abujmarh forests and Bastar region, resulting in the deaths of several top commanders and the surrender of cadres.
- **Operation Green Hunt:** Initiated in late 2009, it represents a large-scale coordinated offensive against Naxalites. The operation spans five states—West Bengal, Jharkhand, Bihar, Odisha, and Chhattisgarh.

COMBINED COMMANDERS' CONFERENCE (CCC) 2025

Context: The Combined Commanders' Conference (CCC) 2025 was held in Kolkata, West Bengal.

- **Theme**: "Year of Reforms – Transforming for the Future."
- **Focus Areas:** Defence reforms for modernisation | Transformation and change in force structures and capabilities | Enhanced operational preparedness across domains

About Combined Commanders' Conference (CCC)

- The CCC is the apex-level forum of the Indian Armed Forces, held biennially **to facilitate strategic and conceptual dialogue between country's top civil and military leadership.**
- The CCC serves as a brainstorming platform for reviewing and shaping the future roadmap of the Armed Forces.

NATIONAL CONFERENCE OF ANTI-NARCOTICS TASK FORCE (ANTF) CONFERENCE

Context: The 2nd National Conference of Anti-Narcotics Task Force (ANTF) Heads of States and Union Territories was held in New Delhi on September 16–17, 2025, under the theme "United Resolve, Shared Responsibility".

- The event was inaugurated by Union Home Minister Amit Shah and organized by the Narcotics Control Bureau (NCB).
- The conference brought together ANTF heads from 36 States and Union Territories, along with stakeholders from various government departments.

ALL-WOMEN SAILING EXPEDITION FLAGGED OFF

Context: Defence Minister Rajnath Singh virtually flagged off Samudra Pradakshina, the world's first tri-service all-women circumnavigation sailing expedition, from the Gateway of India, Mumbai.

- **Participants**: 10 women officers from the Army, Navy, and Air Force.
- **Vessel**: Indian Army Sailing Vessel (IASV) Triveni, a 50-foot indigenously built yacht from Puducherry.
- **Route**: A journey of 26,000 nautical miles over 9 months. They will return to Mumbai in May 2026.
- **Highlights**: Crossing the Equator twice and rounding the **Capes of Leeuwin, Horn, and Good Hope.**

Feature	Cape of Good Hope	Cape Leeuwin	Cape Horn
Continent	Africa	Australia	South America
Oceans Connected	Atlantic & Indian	Indian & Southern	Pacific & Atlantic

LINE OF ACTUAL CONTROL (LAC)

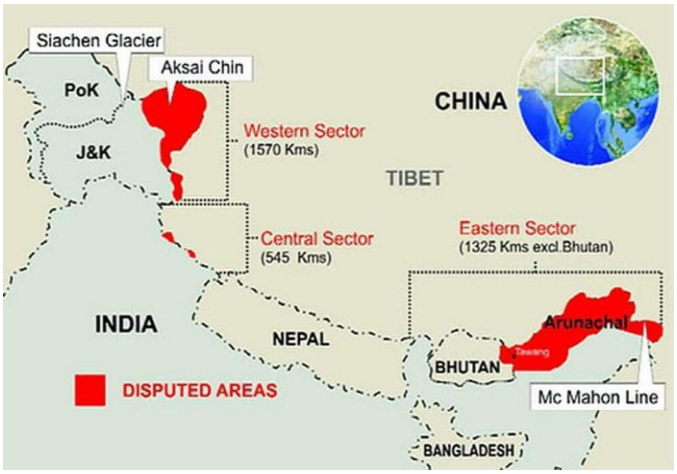
Context: China is preparing to build a rail link connecting Xinjiang to Tibet, with parts of the route expected to run close to the Line of Actual Control (LAC) with India.

About Line of Actual Control (LAC)

- The LAC is a notional demarcation line that separates Indian-controlled territory from Chinese-controlled territory along their mutual border.
- It is the **de facto border established after the 1962 Sino-Indian War** and is not a formally agreed upon or clearly demarcated international boundary.
- The LAC spans approximately 3,488 kms according to India, though China considers it to be around 2,000 kms.

A. Western Sector (Ladakh)

- The disagreement here goes back to two different boundary lines drawn in the 19th century. The **British-era Johnson Line (1860s)** placed the Aksai Chin region within the princely state of Jammu and Kashmir, **and India accepts this version.**
- **China, however, follows the later McDonald Line (1890s)**, which places Aksai Chin on its side.



B. Middle Sector (Uttarakhand and Himachal Pradesh)

- This is the calmest part of the India–China border. Both countries have exchanged maps for this sector and broadly agree on the alignment, even though the boundary has not been formally demarcated.

C. Eastern Sector (Arunachal Pradesh and Sikkim)

- The dispute here centres on the **McMahon Line,** drawn in **1914** during the **Simla Convention** between British India, Tibet, and a Chinese representative. **India recognises this line** as the official border.
- **China does not accept the McMahon Line** and claims the entire state of Arunachal Pradesh as part of the Tibet Autonomous Region.
- China also points to the historical religious links between Tawang Monastery in Arunachal Pradesh and the monastery in Lhasa to support its position.

ITBP TO ESTABLISH 10 ALL-WOMEN BORDER POSTS ALONG LAC

Context: The Indo-Tibetan Border Police (ITBP), responsible for guarding the 3,488 km India-China Line of Actual Control (LAC), is expanding its deployment under a major "forwardisation" plan initiated after the 2020 Ladakh clash.

About Indo-Tibetan Border Police (ITBP)

- The ITBP is **a central armed police force (CAPF)**, established on 24 October 1962, under the **Ministry of Home Affairs**.
- Its primary role is **to guard India's 3,488-km border with the Tibet Autonomous Region of China**, stretching **from the Karakoram Pass in Ladakh to Jachep La in Arunachal Pradesh.**
- The force also has important roles in many internal security duties and operations against the Left Wing Extremism in the state of Chhattisgarh.
- ITBP also conducts relief and rescue operations as 'First Responders' for natural calamities in the Himalayan region.

BIOSECURITY

Context: India's biosecurity framework has come under renewed scrutiny amid expert warnings about emerging biothreats.

What is Biosecurity?

- Biosecurity refers to the **systems, rules, and practices** designed **to prevent the intentional misuse of biological agents, toxins, or related technologies**. Its main aim is to ensure that harmful biological materials are not used to cause disease, fear, or damage.
- It includes measures such as laboratory security, prevention of deliberate disease outbreaks, and protection of human, animal, and plant health from intentional biological threats.
- Biosecurity is different from **biosafety**, which focuses on **preventing accidental releases of harmful biological agents.**

MAHACRIMEOS AI CYBERCRIME INVESTIGATION TOOL

Context: The Microsoft CEO announced the statewide deployment of MahaCrimeOS AI, an advanced AI-driven investigation platform, across all 1,100 police stations in Maharashtra.

About MahaCrimeOS AI

- MahaCrimeOS AI is an **AI-powered crime investigation platform built on Microsoft Foundry.** It was first **piloted in Nagpur Rural in April 2025**
- It is a customized crime investigation platform that helps police in processing complaints faster and navigating complex data and procedures.
- MahaCrimeOS AI is **part of MARVEL (Maharashtra Advanced Research and Vigilance for Enforcement of Reformed Laws),** a government-owned AI initiative established in 2024.
- Maharashtra has become the first Indian state to create a dedicated AI body focused exclusively on modernising law enforcement.
- The system has been localised in **Marathi** to ensure ease of use for police personnel.

EXERCISES IN NEWS

Exercise	Countries	Description
Shakti	India – France	• Held biennially, 8th edition (Shakti-VIII) held in France in June-July 2025
India–UK Naval Passage Exercise (PASSEX)	India – United Kingdom	• Conducted with the UK Carrier Strike Group in the North Arabian Sea in June 2025. • Part of deepening maritime cooperation.
Khaan Quest	India – Mongolia (Multinational)	• Held in Ulaanbaatar, Mongolia in June, 2025. • Started in 2003 as a US–Mongolia bilateral drill; became multinational in 2006.
Nomadic Elephant	India – Mongolia	• 17th edition was conducted at the Special Forces Training Centre, Ulaanbaatar in June 2025 • Annual joint military exercise
Exercise Bold Kurukshetra 2025	India – Singapore	• 14th edition of the joint military exercise. • Conducted as a Table-Top Exercise and Computer-Based Wargame to validate operational procedures for mechanised warfare.
Bharat NCX 2025 (National Cybersecurity Exercise)	India (Domestic)	• Conducted by National Security Council Secretariat (NSCS) with Rashtriya Raksha University (RRU), Gujarat. • Aims to strengthen national cyber resilience through real-world cyberattack simulations and AI-integrated cyber defence training.
SIMBEX (Singapore-India Maritime Bilateral Exercise)	India – Singapore	• 32nd edition of the annual naval exercise, started as Exercise Lion King in 1994. • Enhances maritime cooperation under India's SAGAR vision and Act East Policy. • One of India's longest-running maritime drills.
Exercise Talisman Sabre 2025	Multinational (Australia-led)	• Australia's largest multilateral military exercise with participation from 19 nations • **Main Participants:** U.S., India, Japan, France, U.K., etc.
Exercise Jaa Mata	India – Japan	• Joint sea exercise between Indian Coast Guard and Japanese Coast Guard ship Itsukushima.
Exercise Achook Prahar	Indian Army's Spear Corps and Indo-Tibetan Border Police (ITBP)	• Simulated battlefield conditions and tested operational preparedness • Held in August 2025 in Arunachal Pradesh
SLINEX	India and Sri Lanka	• 12th edition of Bilateral naval exercise, held in Colombo

Exercise Bright Star	Multinational tri-service military exercise hosted by Egypt in partnership with the United States	• Started in 1980 as a US-Egypt bilateral drill after the Egypt–Israel peace process and is now a biennial multilateral exercise held in Egypt • India also participated with around 43 countries.
Joint Tri-Service Exercise 'Cold Start'	Indian Army, Navy, Air Force; also industry, academia, and R&D partners	• A large-scale joint exercise in Madhya Pradesh (early October 2025) to test drones and counter-drone systems
Yudh Abhyas 2025	India and United States Armies	• 21st annual joint military exercise (September 1-14, 2025) • Conducted at Fort Wainwright and Yukon Training Area, Alaska
India–Italy Naval Exercise	Indian Navy (INS Surat) and Italian Navy (ITS Caio Duilio)	• Passage exercise (PASSEX) in the north Arabian Sea with tactical manoeuvres, aircraft tracking, communication drills, seamanship practices, and flying operations including cross-deck helicopter landings.
Bright Star 2025	India, USA, Egypt, and other participating nations	• Began as a bilateral US–Egypt exercise after the 1977 Camp David Accord; first held in 1980 • Expanded into one of the region's largest tri-service multilateral exercises since 1995.
Exercise Maitree-XIV	India and Thailand	• Instituted in 2006; 14th edition held in Meghalaya • Focuses on company-level counter-terrorism operations in semi-urban terrain under UN Charter Chapter VII.
Exercise Zapad-2025	Russia, Belarus, India, and other invited nations	• Started in 1999; conducted every four years since 2009 • Aims to test defence preparedness against external threats
Pacific Reach 2025	Multilateral naval exercise hosted by Singapore; India participating with INS Nistar	• Biennial exercise • Includes harbour phase (SME exchanges, medical symposium, cross-deck visits, rescue system discussions) and sea phase (intervention and submarine rescue operations).
Exercise Siyom Prahar	Indian Army	• Conducted in Arunachal Pradesh; • Aims to validate the integration of drones in tactical operations • Drones used for surveillance, reconnaissance, target acquisition, and precision strikes.
Exercise Yudh Kaushal 3.0	Indian Army	• Conducted in the Kameng region of the Eastern Himalayas • Focused on enhancing operational preparedness in high-altitude conditions.
Konkan-25 (India–UK Naval Exercise)	**India and the United Kingdom**	• The **biennial** naval exercise started in 2004, named after the Konkan coast. • Conducted off India's western coast by India's Carrier Strike Group (INS Vikrant–led) and the UK's CSG (HMS Prince of Wales–led). • This was first edition featuring joint operations of both nations' aircraft carrier groups
Trishul (Tri-Service Drill)	**India (Army, Navy, Air Force)** + BSF and	• Major tri-service exercise along the western border with Pakistan. • Conducted across Gujarat and Rajasthan.

	Coast Guard support	• Tests joint operational readiness, strategic coordination, and interoperability among the three services. • Auxiliary participation by BSF and Coast Guard strengthens unified national security response.
AUSTRAHIND 2025	**India and Australia** (Armies)	• 4th edition held in Perth, Australia, with a 120-member Indian Army contingent. • Annual bilateral exercise launched in 2022 (first edition held in India). • Focuses on joint operations in **sub-conventional warfare**, especially in **urban and semi-urban terrain**. • Aims to enhance cooperation, interoperability, and tactical coordination between the two armies.
Pacific Reach	**40 Nations hosting Singapore**	• A Biennial multinational submarine rescue exercise featuring participation from over 40 nations.
Samudra Shakti	**India and Indonesia**	• A bilateral maritime exercise conducted between the Indian Navy and the Indonesian Navy • 1st initiated in 2018, 5th edition held in October 2025
JAIMEX -2025	**Japan and India**	• A bilateral naval exercise between the Indian Navy and the Japanese Maritime Self-Defense Force (JMSDF)
Ocean Sky	**Multinational, hosted by Spain**	• A multinational air combat exercise hosted annually by Spain. • India made history by becoming the first non-NATO nation to participate in the 2025 edition.
NATPOLREX-X	**Indian Coast Guard (ICG)**	• National Level Pollution Response Exercise (NATPOLREX-X) is a biennial flagship exercise • It aimed to evaluate and enhance India's national preparedness to respond to marine oil spill incidents.
Ajeya Warrior-25	**India and UK**	• Conducted biennially since 2011, the exercise is held under a United Nations mandate. • It is aligned with Chapter VII of the UN Charter, which focuses on peacekeeping operations, including responses to threats to peace, breaches of peace, and counter-terrorism situations.
Desert Cyclone II	**India – UAE**	• Second edition of joint military exercise; held in Abu Dhabi. • First conducted in January 2024. • Focuses on joint urban warfare training for sub-conventional operations under a UN mandate, supporting peacekeeping, counter-terrorism, and stability missions.
Gulf Waves	**India – UAE**	• Bilateral naval exercise • Earlier known as Exercise Zayed Talwar, focuses on maritime cooperation and interoperability.
EKUVERIN 2025	**India – Maldives**	• Bilateral army exercise held in Thiruvananthapuram, Kerala. • Focused on counter-insurgency and counter-terrorist operations.
SURYAKIRAN-XIX	**India – Nepal**	• 19th Joint military exercise at Pithoragarh, Uttarakhand. • Emphasised coordinated operations at battalion, company, and small-team levels. • Previous edition held in Saljhandi, Nepal.

ENVIRONMENT AND GEOGRAPHY

CLIMATE

GREEN HYDROGEN CERTIFICATION SCHEME OF INDIA (GHCI)

Context: The Ministry of New and Renewable Energy (MNRE) has launched a Green Hydrogen Certification Scheme under the National Green Hydrogen Mission and notified rules for claiming emission offsets under the Carbon Credit Trading Scheme (CCTS).

About Green Hydrogen Certification Scheme of India (GHCI)

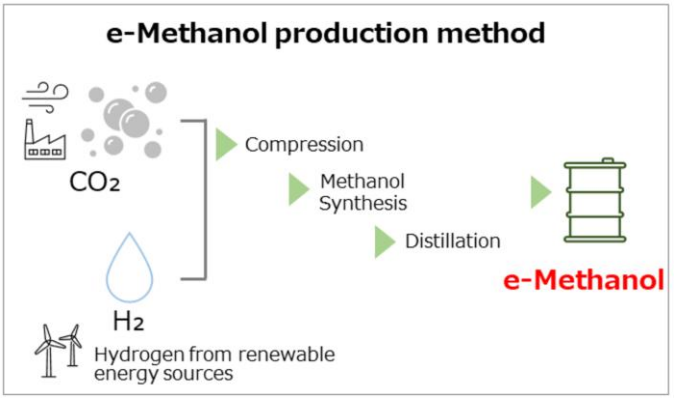
- GHCI is **India's first certification framework** aimed at **certifying that hydrogen is produced exclusively using renewable energy,** primarily through electrolysis or biomass conversion, with an emissions intensity of less than 2 kg of CO_2 equivalent per kg of hydrogen over 12 months.
- GHCI ensures transparency, traceability, and market credibility in green hydrogen production to curb greenwashing and promote genuine clean energy adoption.
- Certification is **mandatory for domestic producers availing incentives**. Exporters not using these benefits must report production and emissions but are exempt from certification.
- The **Bureau of Energy Efficiency (BEE) acts as the certifying authority,** with Accredited Carbon Verification (ACV) agencies conducting third-party verification.
- The scheme supports the **national goal of producing 5 million metric tonnes (MMT) of green hydrogen by 2030 under the National Green Hydrogen Mission**.

About National Green Hydrogen Mission (NGHM)	
Launched by	Ministry of New and Renewable Energy (MNRE)
Objective	Establish a green hydrogen ecosystem to make India a global hub for production, use, and export of green hydrogen and its derivatives
Targets by 2030	• **Production**: 5 MMT per year of green hydrogen • **Export**: 10 MMT potential export market (10% of global demand) • **Investment**: ₹8 lakh crore • **Employment**: 6 lakh clean jobs • **Emission reduction**: 50 MMT CO_2 annually • **Fossil fuel import savings**: ₹1 lakh crore cumulative

E-METHANOL PLANT

Context: The world's first commercial-scale e-methanol plant was inaugurated in Kasso, Denmark.

About E-methanol (electro-methanol)



- It is a low-carbon fuel produced by **combining green hydrogen with captured carbon dioxide (CO_2) using renewable electricity.** E-methanol is **stable, versatile,** and can be used without changing existing fuel infrastructure.
- **Production:** (i) Green Hydrogen is generated through water electrolysis powered by renewable energy sources like solar or wind. (ii) Carbon dioxide is captured either from industrial flue gases (such as those from steel mills or cement plants) or directly from the air, helping to reduce overall emissions. (iii) Methanol synthesis occurs when hydrogen and CO_2 are combined in a catalytic reactor under pressure, producing methanol with minimal by-products.
- **Challenge:** High cost compared to fossil-based methanol due to expensive renewable electricity and production inefficiencies.

- **Applications:** Shipping, Road transport, and Aviation fuels.

HYDROGEN FUEL CELL VEHICLES (HFCVS)

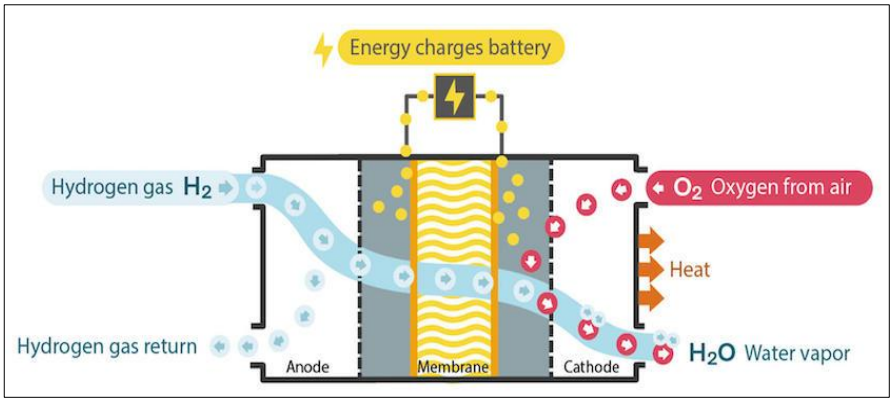
Context: Indian Oil Corporation signed an MoU with Hyundai to explore the feasibility of mass-market adoption of hydrogen fuel cell vehicles (HFCVs).

About Hydrogen Fuel Cell Vehicles (HFCVs)

- HFCVs, or Fuel Cell Electric Vehicles (FCEVs), are a type of electric vehicle that generate electricity on board using hydrogen.
- Unlike Battery Electric Vehicles (BEVs), which rely entirely on stored battery power, HFCVs produce electricity as they move, eliminating the need for long charging times.

How Hydrogen Fuel Cells Work

- Hydrogen Fuel Cells (HFCs) produce electricity by **converting hydrogen's chemical energy directly into electrical energy.** The two main components are the **Membrane Electrode Assembly (MEA) and bipolar plates.**



- The MEA is the core of the fuel cell, where the reaction happens. It has a **Proton Exchange Membrane (PEM)** between two catalyst layers: the anode, where hydrogen enters, and the cathode, where oxygen from air enters. Gas Diffusion Layers around these layers help distribute gases evenly and remove **byproducts like water and heat.**
- Hydrogen at the anode is split into protons and electrons by a catalyst. The PEM lets only protons pass to the cathode, while electrons flow through an external circuit, generating electricity. At the cathode, oxygen combines with protons and electrons to form **water—the only emission.**
- Bipolar plates manage gas flow, conduct electrons between cells, and control heat. There are no moving parts in HFC.

Benefits of HFCVs

- **Clean Emissions**: Produce only water vapor; no harmful air pollutants.
- **EV Advantage**: Run on electric motors, reducing greenhouse gas emissions.
- **Sustainable Fuel:** Hydrogen is abundant and a viable alternative to petrol or diesel.
- **Rapid Refueling:** Comparable to conventional vehicles, unlike battery EVs.
- **Long Driving Range**: Overcomes range limitations of battery electric vehicles.
- **Silent Operation:** Fuel cells have no moving parts, making vehicles quiet.
- **Efficient Energy Use:** Converts chemical energy to electricity effectively.
- **Suitable for Large Vehicles:** High energy-to-weight ratio allows longer ranges for buses and trucks.
- **Urban Benefits:** Helps reduce air pollution in cities with poor air quality.

Challenges of HFCVs

- **Limited Infrastructure:** Hydrogen refueling stations in India are scarce, restricting vehicle range and usability.
- **High Costs:** Producing, compressing, transporting, and storing hydrogen is expensive.
- **Capital Intensive:** Initial costs for vehicles and infrastructure are higher than for battery EVs.
- **Production Scale & Materials:** Limited production and expensive materials add to overall costs.
- **Durability Concerns:** Fuel cells need improvements in lifespan and reliability.
- **Safety Perceptions:** Public concerns about hydrogen safety may slow adoption, despite strict safety standards.
- **Sustainability Depends on Hydrogen Source:** Blue, Gray, Brown Hydrogen which are produced from fossil fuels or coal, emit carbon and are not fully clean.

Government Initiatives for HFCVs Development

- **National Green Hydrogen Mission (NGHM) – 2023:**
  - Aims to position India as a global hub for Green Hydrogen production, usage, and export.
  - Targets production capacity of 5 MMT per year.
- **Hydrogen Highways:**
  - Planned corridors with hydrogen production, distribution infrastructure, and refueling stations.
- **Hydrogen Valley Innovation Cluster (HVIC) Programme:**
  - Promotes deployment of hydrogen technologies in mobility, industry, and energy sectors.
  - Creates regional 'hydrogen ecosystems' or 'hydrogen valleys' for integrated development.
  - HVIC projects initiated in Kerala, Tamil Nadu, Gujarat, Maharashtra, and Rajasthan.

REVISED GREEN INDIA MISSION (GIM)

Context: On 17 June 2025, the Ministry of Environment, Forest and Climate Change released the revised GIM plan for 2021–2030 to coincide with World Day to Combat Desertification and Drought.

About National Mission for a Green India (GIM)

- GIM is one of the eight core missions under the National Action Plan on Climate Change (NAPCC). GIM was launched in February, 2014. It **aims to protect, restore, and enhance India's declining forest cover while addressing climate change through a mix of adaptation and mitigation strategies.**
- The Mission adopts a holistic and ecosystem-based approach, focusing not only on carbon sequestration but also on biodiversity conservation, water security, biomass generation, and the protection of mangroves, wetlands, and other critical habitats.
- A key feature of GIM is its integrated cross-sectoral approach, implemented on both public and private lands, with an emphasis on community participation in planning, execution, and monitoring.

Mission Goals

- Expand forest/tree cover by 5 million hectares (mha) and improve the quality of another 5 mha of forest and non-forest land.
- Enhance ecosystem services such as carbon storage, hydrological regulation, and biodiversity conservation, along with provisioning services like fuelwood, fodder, timber, and non-timber forest products (NTFPs).
- Increase forest-based livelihood income for about 3 million rural households.
- Afforestation of 6 million hectares of degraded forest lands and expanding forest cover from 23% to 33% of India's territory.

Revised Roadmap of the Green India Mission (GIM)

- Incorporates climate-related feedback from state governments and scientific institutions to improve implementation.
- Focuses on the restoration of vulnerable landscapes using region-specific ecological practices.
- Emphasizes collaboration with the Aravalli Green Wall Project to address land degradation and desertification.
- The project targets the restoration of 8 lakh hectares across 29 districts, creating a 5 km-wide green buffer zone along the Aravalli range.

Combatting Land Degradation and Desertification

- Nearly one-third of India's land area (97.85 million hectares) was classified as degraded in 2018–19, according to ISRO data.
- India's national climate goal aims to create an additional carbon sink of 2.5–3 billion tonnes of CO_2 through enhanced forest and tree cover by 2030.
- The Green India Mission and allied projects seek to restore 26 million hectares of degraded land by 2030.
- Between 2005 and 2021, India already achieved an additional carbon sink of 2.29 billion tonnes of CO_2 equivalent.
- Restoration of open forests is highlighted as a cost-effective strategy for large-scale carbon sequestration.

Projected Outcomes

- The Forest Survey of India (FSI) estimates that restoring degraded forests could sequester 1.89 billion tonnes of CO_2 across 15 million hectares.

- The revised mission envisions expanding forest and tree cover to 24.7 million hectares, which could generate a total carbon sink of 3.39 billion tonnes of CO_2 equivalent by 2030.

STATE AND TRENDS OF CARBON PRICING 2025

Context: The 2025 report by the **World Bank** states that **carbon pricing mechanisms now cover about 28% of global greenhouse gas emissions**, with more than 80 carbon pricing instruments operating worldwide. These generated more than USD 100 billion in public revenue in 2024.

What is Carbon Pricing?

Carbon pricing assigns a cost to greenhouse gas (GHG) emissions, encouraging polluters to reduce emissions and invest in low-carbon solutions.

Instrument	How It Works	Example
Emissions Trading Systems (ETS) – Cap-and-Trade	• Sets a limit (cap) on total emissions for sectors or the economy. • Governments issue permits that companies can trade. • Ensures overall emission limits; price per tonne is market-driven.	EU ETS (~40% of EU emissions)
Carbon Taxes	• Directly charges a price on carbon or fossil fuel emissions. • Provides price certainty but not guaranteed emission reductions. • Encourages emitters to reduce emissions or pay the tax.	Singapore and Canada's national carbon taxes
Carbon Credit Mechanisms	• Companies buy credits to offset emissions. • Credits come from verified projects like reforestation or renewable energy. • Prices vary; high-quality, nature-based credits are costlier.	India's Carbon Credit Trading Scheme

International and Indian Efforts

- **Article 6.4 Mechanism (Paris Agreement):** In October 2025, the UNFCCC Supervisory Body approved the first methodology under Article 6.4, launching a **unified global carbon crediting framework** known as the **Paris Agreement Crediting Mechanism (PACM).** This **modernizes the Kyoto-era Clean Development Mechanism**, enabling verified emission reductions trading among countries and companies.
- **Cross-Border and Trade Alignment:** Multilateral dialogues under the EU, G7, and World Bank **Carbon Pricing Leadership Coalition (CPLC)** aim to harmonize reporting standards, interoperability, and measurement rules to enable a future global carbon price floor and reduce "carbon leakage" through trade.
- **India's Carbon Credit Trading Scheme (CCTS):** The Energy Conservation (Amendment) Act, 2022 provides legal backing for India's carbon market, authorizing issuance and trading of Carbon Credit Certificates (CCCs). Notified in 2023 and expanded through 2025, CCTS has a two-tier structure:
  - **Compliance market** for energy-intensive sectors like cement, steel, and power.
  - **Voluntary market** for renewable energy, green hydrogen, afforestation, and industrial efficiency initiatives.

CARBON CAPTURE USAGE STORAGE (CCUS) TECHNOLOGY

Context: India has launched multiple initiatives to reach net-zero emissions by 2070, including a strong focus on developing and deploying Carbon Capture, Utilization, and Storage (CCUS) technology.

What is Carbon Capture, Usage and Storage (CCUS)?

- CCUS refers to a **set of technologies designed to reduce carbon dioxide (CO_2) emissions**. It does this either by **capturing CO_2** from large sources like power plants, oil refineries, and industrial facilities, or by **directly removing CO_2 from the atmosphere.**

Three Stages of CCUS Technology

1. Carbon Capture

- Carbon capture refers to technologies that capture CO_2 emissions, primarily from large point sources like power plants and industrial facilities, to prevent them from entering the atmosphere.
- The choice of capture method depends on the concentration of CO_2 in the gas stream and its end use.

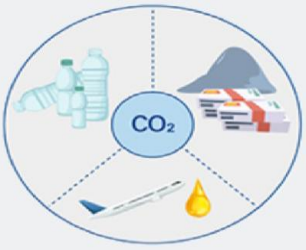
Types of capture technologies

- **Chemical solvent-based capture:** Used when CO_2 concentration is low, such as in flue gas from refineries.
- **Physical solvent-based capture:** Preferred when CO_2 concentration is high, like in gasification processes at thermal power plants.
- **Adsorption techniques:** Applied to gas streams with moderate CO_2 levels, such as those from Steam Methane Reforming (SMR).



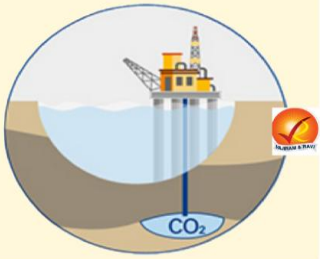
2. Carbon Usage

- In this stage, the captured CO_2 is converted into useful products rather than being released into the atmosphere.
- **Examples of CO_2-based products**: Green urea (fertiliser), Dry ice, Carbonated drinks, Building materials, Industrial chemicals
- **Gasification systems are cheaper** for capturing carbon since they are already designed with this function.
- Coal-based plants, which emit lower CO_2 concentrations, require more effort and thus incur higher capture costs.



3. Carbon Storage

- If the CO_2 is not used, it is stored underground in deep and stable geological formations.
- **Common storage sites: Saline** aquifers, Depleted oil and gas fields, Other geological formations suitable for permanent storage
- These sites are typically located at depths of 1 km or more, where the geological conditions can safely trap the CO_2 for thousands of years.



Benefits	Challenges
• **Decarbonising Hard-to-Abate Sectors**: Cuts emissions from industries like cement, steel, chemicals. • **Supporting Clean Energy Transitions**: Enables low-carbon electricity and hydrogen for shipping, aviation, and factories. • **Carbon Dioxide Removal (CDR)**: Removes CO_2 already in the air via DACCS or BECCS, essential for net-zero targets. • **Enhancing Energy Security**: Allows cleaner use of fossil fuels and stable low-carbon backup power. • **Economic & Social Benefits**: Preserves jobs in hard-to-abate industries while decarbonising.	• **High Costs & Energy Intensity**: Expensive to set up; capturing and compressing CO_2 consumes a lot of energy. • **Limited Financial Incentives**: Weak carbon pricing and incentives make investments unattractive. • **Technology Maturity**: Some methods like Direct Air Capture are still in early development or pilot stages. • **Regulatory & Legal Barriers**: Lack of standardised rules, weak monitoring, and unresolved long-term liability issues. • **Infrastructure & Storage Challenges**: Requires pipelines, compression stations, and safe geological storage, often lacking. • **Environmental Concerns**: Small risk of CO_2 leakage or induced seismic activity. • **NIMBY Syndrome**: Local opposition to plants, pipelines, and storage sites due to safety or environmental concerns.

India and CCUS

- NITI Aayog released a "**CCUS Policy Framework and Deployment Mechanism in India**" report in 2022, which sparked discussions and outlined a roadmap for CCUS adoption.
- It proposes policy initiatives like viability gap funding, carbon pricing mechanisms, carbon trading, and production-linked incentives (PLI) to encourage commercial-scale deployment.

WEATHER DERIVATIVES

Context: National Commodity and Derivatives Exchange Ltd (NCDEX) and India Meteorological Department (IMD) have established the foundation for **India's first weather derivatives market.**

What are Weather Derivatives?

- Weather derivatives are financial contracts whose value depends on measurable weather parameters like rainfall, temperature, or humidity, rather than on traditional commodities or stock prices.
- They serve as risk management tools, allowing participants to reduce financial losses arising from unfavourable weather patterns.
- For example, a farmer can buy a rainfall derivative contract that compensates for financial losses if rainfall falls below a certain level.
- **NCDEX** will design rainfall-based derivative products, later expanding to include other weather parameters, while **IMD** will provide historical and real-time weather datasets.
- The derivatives will be **seasonal and location-specific,** aligning closely with India's varied climatic zones and cropping patterns.

NATIONAL DESIGNATED AUTHORITY (NDA) FOR CARBON MARKETS

Context: The Ministry of Environment, Forest and Climate Change (MoEFCC) has constituted a 21-member National Designated Authority (NDA) to operationalise India's carbon market.

What are Designated National Authorities (DNAs)?

- A Designated National Authority (DNA) is the official body that each country must set up under Article 6 of the Paris Agreement to participate in international carbon markets.

India's National Designated Authority (NDA)

- On August 22, the Ministry of Environment, Forest and Climate Change notified the formation of India's NDA. This is a **mandatory requirement under Article 6 to make India's carbon emissions trading system functional.**
- The NDA is a 21-member committee headed by the Secretary of the Environment Ministry.
- It includes officials from the Ministry of External Affairs, Ministry of New and Renewable Energy, NITI Aayog, Ministry of Steel, and several other departments.
- It will serve as India's nodal authority to regulate, approve, and monitor international carbon trading mechanisms.
- **Roles and Functions**
  - Issue host country authorizations for mitigation activities and ITMOs.
  - Represent India in the Article 6 framework and enable cross-border carbon credit transfers.
  - Approve and recommend eligible projects for Article 6.4 registration before the UN Supervisory Body.
  - Facilitate bilateral and multilateral cooperation under Article 6.2.
  - Integrate international mechanisms with India's domestic Carbon Credit Trading Scheme (CCTS) to streamline both voluntary and compliance markets.

Article 6 of the Paris Agreement

- Article 6 outlines the framework for international carbon markets and emissions trading.
- It introduces three voluntary cooperation mechanisms:
  - **Article 6.2:** Bilateral or multilateral transfer of Internationally Transferred Mitigation Outcomes (ITMOs).
  - **Article 6.4:** A UN-supervised crediting mechanism, serving as the successor to the Kyoto Protocol's Clean Development Mechanism (CDM).
  - **Article 6.8:** Non-market approaches for climate cooperation.
- Article 6 was formally adopted at COP29 in Baku last year.

Carbon Market Mechanisms in India

Mechanism	Controlling Law / Act	Key Instrument	What Is Traded?	Purpose & Nature
Carbon Credits Trading Scheme (CCTS), 2023	Energy Conservation	Carbon Credit Certificates (CCCs)	Reduction of **1 tonne of CO_2 equivalent (tCO_2e)**	Sets compulsory emission-reduction targets for major

	(Amendment) Act, 2022			industries and also allows voluntary offset projects.
Green Credit Programme (GCP), 2023	Environment (Protection) Act, 1986	Green Credits (GCs)	Environment-friendly actions like tree planting, water conservation, or sustainable farming	Encourages activities that benefit the environment, separate from carbon-reduction goals.
Perform, Achieve and Trade (PAT), 2012	Energy Conservation Act, 2001	Energy Saving Certificates (ESCerts)	Reduction in **Specific Energy Consumption (SEC)**	Requires energy-intensive industries to improve energy efficiency. Will gradually merge with CCTS.
Renewable Energy Certificates (REC), 2010	Electricity Act, 2003	Renewable Energy Certificates (RECs)	**1 Megawatt-hour (MWh)** of electricity generated from renewable sources	Enables obligated entities (like power distributors) to meet their **Renewable Purchase Obligations (RPOs)**.

REVISED METHODOLOGY FOR CALCULATING GREEN CREDIT FOR TREE PLANTATION

Context: The Environment Ministry has notified a revised mechanism for calculating Green Credits in tree plantation activities

Aspect	Old Methodology	Revised Methodology
Type of land eligible	Degraded forest land or identified degraded/wasteland parcels managed by forest departments	Same categories of land, but with **stricter criteria** on tree survival and canopy cover
Time after which Green Credit awarded	Credit after **2 years** of plantation/restoration (minimum 1,100 trees per hectare)	Credit after a **minimum of 5 years** of restoration; **1 Green Credit = 1 new tree** (over 5 years old)
Criteria for credit	Based mainly on number of trees planted; limited emphasis on survival or canopy density; vegetation status less decisive	**Multi-parameter evaluation** including survival rate, change in vegetation status, and achieving **40% minimum canopy density** after 5 years
Tradability / Transferability	Credits were fully tradable in the market	Credits made **non-tradable and non-transferable**, except for **intra-corporate transfers** (holding company and subsidiary)

What is Green Credit?

- Green credits are rewards given for taking voluntary steps to protect the environment.
- Individuals, communities and companies can earn them through activities like planting trees, restoring mangroves, saving water, practising sustainable farming or managing waste in an eco-friendly way.

About Green Credit Programme (GCP)

- The Green Credit Programme (GCP) is a market-based mechanism notified under the Environment (Protection) Act, 1986 (rules issued in 2023; revised 2024–25).
- **Objective**: To incentivize environmentally positive actions by individuals, companies, and local bodies through the award of green credits, similar in concept to carbon credits but broader in scope.
- **Eligible activities**: Tree planting, mangrove restoration, water conservation, sustainable farming, and eco-friendly waste management.
- **Nodal Agency:** Ministry of Environment, Forest and Climate Change (MoEFCC).
- **Administered by**: Indian Council of Forestry Research and Education (ICFRE).

INDIA'S FIRST BAMBOO-BASED ETHANOL PLANT

Context: India inaugurated its first bamboo-based ethanol plant at Numaligarh Refinery Limited (NRL), Assam. The Prime Minister also laid the foundation stone for a polypropylene plant.

bout the Plant:

Key Features of the Bamboo-Based Ethanol Plant

- **Zero-Waste 2G Technology:** The plant is described as the world's first zero-waste 2G bioethanol facility. It uses all parts of bamboo to produce ethanol and other industrial chemicals such as furfural, acetic acid, and bio-coal.
- **Second-Generation (2G) Biofuel:** The technology converts lignocellulosic biomass (like bamboo, agricultural waste (stalks, husks), and forest residues) into ethanol. Unlike first-generation (1G) fuels, 2G sources do not compete with food crops.
- **Production Capacity:** It can produce 60,000 kilolitres of ethanol annually for blending with petrol under the national blending programme,

Policy & Institutional Framework for Biofuels	
National Policy on Biofuels (2018; amended 2022)	• Allows use of agricultural residues, forestry waste, bamboo, algae for 2G biofuels. • **Categorises biofuels:** ○ **1G** – ethanol, biodiesel; ○ **2G** – ethanol from lignocellulosic biomass ○ **3G** – algae-based fuels, bio-CNG. • Advanced **E20 blending target** from 2030 to **2025–26**, achieved early in 2024–25. • **Expands feedstocks:** sugarcane juice, sugar beet, sweet sorghum, corn, cassava, damaged grains, rotten potatoes.
SATAT Scheme (2018)	Promotes Compressed Bio-Gas (CBG) and strengthens rural biofuel supply chains.
Biodiesel Blending Programme (BBP)	Targets **5% biodiesel blending** in diesel by **2030**.
GOBAR-DHAN Scheme	Converts cattle dung and agricultural waste into bio-CNG and compost; supports rural sanitation and farmer income.
Global Biofuels Alliance (GBA)	Launched by India, USA, Brazil at **G20 Summit 2023** to enhance international cooperation on biofuels.
North-East Bamboo Development Mission	Supports bamboo cultivation, processing, and marketing to boost feedstock availability for bamboo-based 2G ethanol.

THE DEBATE ON CLIMATE MODELS

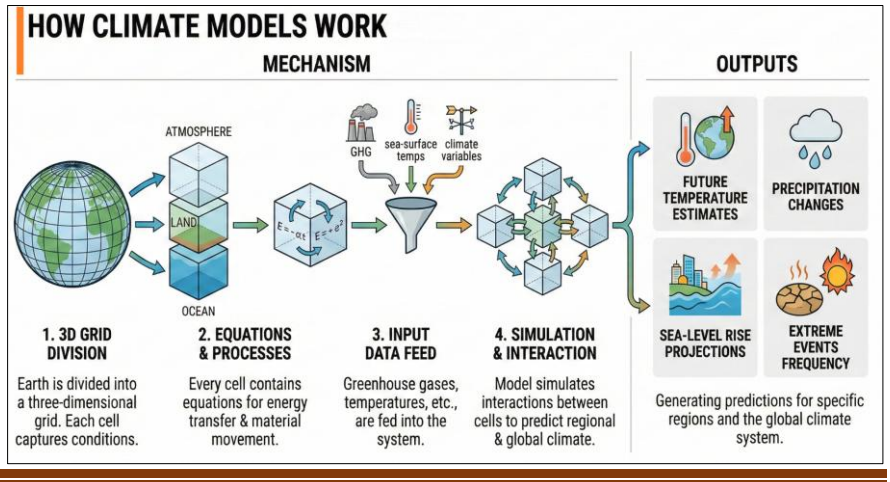
Context: President Trump dismissed climate change as a "con job" at the UN, criticised UN climate projections, and reignited debate over the accuracy and credibility of climate models.

What Are Climate Models?

- Climate models are **advanced computer simulations that use mathematical equations to represent interactions within the Earth's climate system**, including the atmosphere, oceans, land surfaces, and ice.
- They are built on established laws of physics, chemistry, and biology, and help scientists understand past climate trends, current changes, and possible future scenarios.

Functions of Climate Models

- Predict changes in temperature, humidity, rainfall, sea level, and ice cover under different emission pathways.
- Assess whether extreme weather events are caused by natural variability or human-induced climate change.



Strengths of Climate Models

- They reliably **capture global-scale patterns,** such as rising sea

levels and the melting of ice sheets.
- Many models are **tested against past climate behaviour**; if they reproduce historical climate trends accurately, their future projections are regarded as credible.

Limitations of Climate Models
- **Uncertainties** arise from **incomplete data and the complexity of natural processe**s such as cloud formation, volcanic eruptions, and El Niño events.
- Models often struggle with the **non-linear relationship between emissions and temperature rise.**
- **Regional projections**, such as urban flooding, local rainfall, or variations in the Indian monsoon, **are harder to simulate** because models use relatively large grid sizes (100–250 km).
- Most climate models were developed in North America and Europe, using data-rich environments. As a result, they tend to be **less accurate for countries in the Global South**, including India, where climate and environmental datasets are comparatively limited.

SAIME MODEL

Context: The Sustainable Aquaculture in Mangrove Ecosystems (SAIME) model has received Global Technical Recognition from the Food and Agriculture Organization (FAO).

About Sustainable Aquaculture in Mangrove Ecosystems (SAIME) Model
- It is a model developed by the Nature Environment and Wildlife Society (NEWS) in the Sundarbans of West Bengal.
- SAIME is an **ecosystem-based and climate-resilient livelihood model** that requires 5%–30% mangrove cover within aquaculture ponds to ensure environmental balance.
- This climate-adaptive model enhances coastal resilience, supports sustainable livelihoods, promotes chemical-free shrimp farming, and aids carbon sequestration and climate action in the context of global sea-level rise.

AMAZONFACE EXPERIMENT

Context: The AmazonFACE project addresses the overarching question of how climate change will affect the Amazon forest, the biodiversity it harbors, and the ecosystem services it provides to humanity.

About AmazonFACE (Free-Air CO_2 Enrichment) Experiment
- It is the first experiment of its kind in a tropical forest and uses Free-Air CO_2 Enrichment (FACE) technology to expose mature trees to elevated CO_2 concentrations, mimicking conditions expected by 2050–2060.
- AmazonFACE **aims to recreate the "atmosphere of the future"** by installing steel tower rings around groups of mature trees. Three rings are fumigated with CO_2 to simulate future levels, while the others serve as controls.
- Continuous sensors monitor photosynthesis, oxygen release, water vapor exchange, and other ecological parameters every ten minutes.
- The experiment is **conducted near Manaus, Brazil**, and is supported by Brazilian and UK scientific institutions.

GREENHOUSE GAS EMISSION INTENSITY (GEI) TARGET RULES

Context: Government has notified the first Greenhouse Gas Emission Intensity (GEI) Target Rules, 2025, marking a significant step toward legally binding climate action for key industrial sectors.

About GEI Target Rules, 2025
- The GEI Target Rules, 2025, are the **first legally enforceable emission standards for industry in Indi**a, moving beyond voluntary pledges to mandatory compliance.
- They aim to **reduce their carbon footprint and align with India's Paris Agreement commitment** to lower the emission intensity of GDP by 45% by 2030 compared to 2005 levels.
- These rules establish sector-specific emission intensity limits for **aluminium, cement, chlor-alkali, and pulp & paper industries.**
- The rules **cover 282 obligated industrial units across the** above-mentioned **four sector**s, setting specific emission intensity targets per unit of output (measured in tonnes of carbon dioxide equivalent per tonne of product).
- The baseline year for emissions is 2023-24, with compliance cycles for 2025-26 and 2026-27, and gradual reduction targets set for each year.

- According to the rules, facilities that emit less than their assigned target can earn tradable carbon credit certificates, while those exceeding the target must purchase equivalent credits from the Indian carbon market or pay a penalty.
- The move operationalises the Energy Conservation (Amendment) Act, 2022, which empowered the government to establish a domestic carbon market.

LEADERSHIP GROUP FOR INDUSTRY TRANSITION (LEADIT)

Context: India's Union Environment Minister addressed the LeadIT Industry Leaders' Roundtable at COP30 in Belém, Brazil.

About Leadership Group for Industry Transition (LeadIT)

- LeadIT is a global initiative launched in **2019** by the **Governments of India and Sweden** at the UN Climate Action Summit, with **support from the World Economic Forum.**
- It **brings together countries and companies** committed to **achieving net-zero carbon emissions from heavy industry by 2050**, aligning with the goals of the Paris Agreement.
- The LeadIT Management Board consists of representatives from India, Sweden, and the World Economic Forum. The Secretariat is hosted by the **Stockholm Environment Institute (SEI).**
- At UNFCCC **COP28** 2023, LeadIT initiated **LeadIT 2.0.** It is a joint commitment by members to shape policy frameworks and international cooperation for an inclusive industry transition.

Leadit
LEADERSHIP GROUP FOR INDUSTRY TRANSITION

Countries.
Argentina | Australia | Austria | Denmark | Ethiopia | Finland | France | Germany | India | Ireland | Japan | Luxembourg | Netherlands | Republic of Korea | South Africa | Sweden | United Kingdom of Great Britain and Northern Ireland | United States of America |

Companies.
Ambuja Cement | Ashok Leyland | CarbFix | Cemvision | Dalmia Cement | Ecometrix | FLSmidth | HeidelbergCement | JK Cement | JSW Steel | JSW Cement | LafargeHolcim | LKAB | Mahindra Group | SAIL (Steel Authority of India Ltd) | SaltX Technology | Salzgitter | Scania | Skanska | SKF | SpiceJet | SSAB | Stegra | ThyssenKrupp | Tata Steel Limited | Tata Motors | Tecnored | Vattenfall | Volvo | World Energy GH2 |

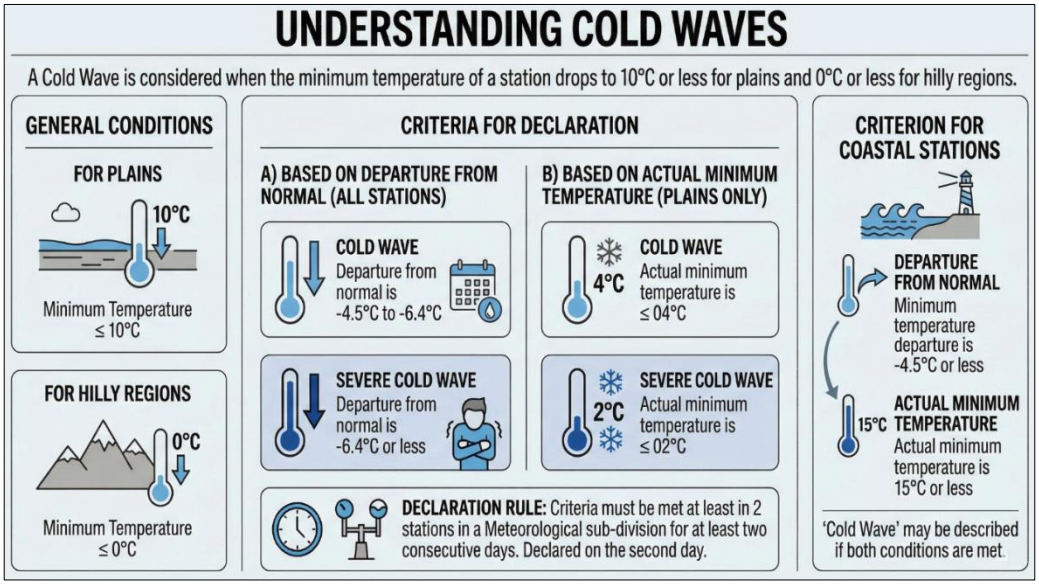
- As of 2025, LeadIT has 18 member countries and 27 global companies.

COLD WAVE IN INDIA & IMD CRITERIA

Context: IMD has issued alerts for cold wave, dense fog and snowfall across India.

What is Cold Wave?

- A cold wave refers to a condition in which air temperatures fall to levels that can be harmful or even fatal to the human body upon exposure.
- A cold wave is defined using specific temperature thresholds, based either on the actual minimum temperature recorded in a region or on its departure from the normal temperature for that area.
- India experiences severe winter cold waves mainly due to very low minimum temperatures. The impact of a cold wave is often intensified by strong winds, a phenomenon known as the wind chill effect, which makes the air feel colder than the measured temperature.



Mechanism and Causes of Cold Waves in India

- Cold waves over northwestern and central plains result from the interaction of large-scale atmospheric systems and local conditions.

1. Synoptic-Scale (Large-Scale) Factors

- **Western Disturbances (WDs):** Cold waves often follow a strong WD. After its passage, clearer skies and enhanced cold-air flow prevail.
- **Cold Air Advection:** Inflow of very cold air masses from Siberia, Central Asia, or the northwestern parts of the subcontinent.
- **High-Pressure Systems:** Formation of strong upper-air ridges over Northwest Asia and surface high pressure over North and Central India leads to subsidence of cold, dry air.
- **Snow Cover:** Extensive fresh snow over the Himalayas increases reflectivity (high albedo), reduces heating, and sends cold northerly/northwesterly winds into the plains.

2. Local Enhancing Factors

- **Clear Skies:** Promote strong night-time radiative cooling, sharply lowering minimum temperatures.
- **Dry Air:** Low humidity reduces heat retention, allowing faster temperature drops.
- **Fog and Smog:** During intense cold day events, dense fog/smog (notably over the Indo-Gangetic Plains) blocks daytime solar radiation, keeping temperatures low throughout the day.

BIODIVERSITY

TSARAP CHU CONSERVATION RESERVE

Context: Himachal Pradesh notified the Tsarap Chu Conservation Reserve under Section 36A(1) of the Wildlife (Protection) Act, 1972.

Tsarap Chu Conservation Reserve (Himachal Pradesh (HP))	
Location	Spiti Valley, Himachal Pradesh; 1,585 sq km; HP's fifth conservation reserve.
Significance	Prime snow leopard habitat ("ghost of the mountains"). It is India's largest conservation reserve.
Management	Conservation Reserve Management Committee with local stakeholders ensures participatory management, aligned with Wildlife (Protection) Amendment Act, 2003.
Boundaries	**North**: Union Territory of Ladakh **East**: Kibber Wildlife Sanctuary (up to Malang Nala and Lungar Lungpa) **South**: Kabjima Nala **West**: Chandratal Wildlife Sanctuary
Rivers	Confluence of Unam River and Charap Nala.
Wildlife	**Mammals**: Tibetan wolf, bharal (blue sheep), Himalayan ibex, kiang (wild ass), Tibetan argali. **Birds**: Rose Finch, Tibetan Raven, Yellow-billed Chough.

ASIATIC LIONS

Context: The latest 2025 estimate shows 891 Asiatic Lions in Gujarat, a 32% rise since 2020, with their range expanding to 35,000 sq km across 11 districts.

The Asiatic Lion

- The Asiatic lion (Panthera leo leo) is a **subspecies of lion found only in India,** mainly in Gir National Park and nearby sanctuaries in Gujarat.
- Historically, its range extended from Turkey through the Middle East to India, but today its wild population is restricted to this region.



Physical Characteristics

- The most striking morphological character, which is always seen in Asiatic lions, and rarely in African lions, is a longitudinal fold of skin running along its belly.
- **Coat Color:** Ruddy-tawny to sandy or buff-grey.
- **Mane**: Males have a shorter, sparser mane, leaving ears visible.
- **Size: Males:** 160–190 kg, shoulder height up to 120 cm. | **Females**: 100–130 kg.; Asiatic lions are slightly smaller than African lions.

- **Other Features**: Larger tail tuft and skull differences compared to African lions.

Habitat and Range

- Found in dry deciduous forests, thorny scrublands, and savannas of the Gir region.
- Present distribution covers 35,000 sq km across 11 districts of Gujarat.

Behaviour and Ecology

- **Social Structure:** Smaller prides (groups) than African lions; often with male coalitions separate from larger female groups.
- **Feeding Habits:** Apex predators, hunting mainly at night.
- **Diet**: Prey includes chital (spotted deer), antelope, wild boar, and water buffalo; occasionally livestock when wild prey is scarce.

Conservation Status

- Listed as **Vulnerable** on the IUCN Red List.
- **Protected under:** Schedule 1 of Wildlife Protection Act, 1972. CITES Appendix I (prohibiting international trade).

TISSUE-CULTURED TEAK

Context: Tissue-cultured teak has the potential to boost India's timber cultivation and trade, but success depends on identifying the best farm practices.

Concept of Tissue Culture for Teak:

- Tissue culture is a **biotechnological method used to grow new plants from a small piece of a plant** (like a leaf, stem, or root) **in a controlled, nutrient-rich environment.**
- For **teak**, it involves **culturing meristematic tissues** or nodal segments in a nutrient-rich medium under controlled conditions to produce genetically identical plantlets (clones). This method addresses several limitations of traditional propagation.
- National Agroforestry Policy (2014) encourages tree plantations on farmlands, identifying tissue-cultured teak as a viable option.

About Teak Wood ("King" of Timbers)

- Teak is one of the world's most valuable tropical hardwoods, used in shipbuilding, construction, and high-end furniture.
- Asia holds over 95% of the world's teak resources, with India managing 35% of planted teak forests.
- According to the Global Teak Resources and Market Assessment 2022 (FAO), **Madhya Pradesh and Maharashtra** have the largest areas of natural native teak forests.
- Green felling of timber from government-owned forests is prohibited under the Forest Conservation Act, 1980, and the National Forest Policy, 1988; therefore, private plantations meet the growing domestic and international demand for this prized timber.

20TH SESSION OF UNITED NATIONS FORUM ON FORESTS (UNFF-20)

Context: India participated in the 20th session of the United Nations Forum on Forests (UNFF-20), held at the United Nations Headquarters in New York.

Key Highlights of India's Participation in UNFF-20:

- **Commitment to VNCs**: India reaffirmed its commitment to achieving the Voluntary National Contributions (VNCs) under the United Nations Strategic Plan for Forests 2017–2030.
- **Country-Led Initiative (CLI) Outcomes:**
  - Called for **global action on outcomes of the CLI** hosted in Dehradun (October 2023), focusing on forest fire management and forest certification.
  - Proposed a **Global Fire Management Hub** under UNEP and FAO for knowledge sharing on forest fire mitigation.
  - **Mass Plantation Campaigns**: *"Ek Ped Maa Ke Naam"* campaign planted 1.4 billion seedlings.

About United Nations Forum on Forests (UNFF)

- UNFF is a high-level intergovernmental policy forum **established in 2000 by the UN Economic and Social Council (ECOSOC)** as a functional commission, **to promote the management, conservation, and sustainable development of all types of forests worldwide.**
- Membership includes all UN member states, permanent observers, and relevant organizations.

- The forum aims to strengthen long-term political commitment to sustainable forest management based on key international agreements, including the Rio Declaration, Forest Principles, and Agenda 21.
- UNFF adopted the **Non-Legally Binding Instrument on All Types of Forests** (Forest Instrument) in 2007, providing a policy framework for sustainable forest governance.
- UNFF facilitates cooperation and financing through mechanisms like the **Global Forest Financing Facilitation Network (GFFFN).**

BIOLOGICAL DIVERSITY REGULATION 2025

Context: National Biodiversity Authority (NBA) has notified The Biological Diversity (Access to Biological Resources and Associated Knowledge and Fair and Equitable Sharing of Benefits) Regulation, 2025.

About Biological Diversity (Access and Sharing of Benefits) Regulation, 2025

- It governs fair benefit sharing from the use of biological resources and associated knowledge, including digital sequence information.
- **Turnover-Based Sharing:** Entities with annual turnover above ₹1 crore must report the resources they use. Benefit sharing is set at 0.2% for ₹5–50 crore, 0.4% for ₹50–250 crore, and 0.6% for turnover above ₹250 crore.
- **Exemptions:** Users of cultivated medicinal plants are exempt, supporting AYUSH practices and traditional medicine.
- **High-Value Resources:** Red sanders, sandalwood, agarwood, and threatened species require at least 5% of sale or auction proceeds, potentially exceeding 20% for commercial use.
- **Researchers and IP Applicants:** Must share benefits, with 10–15% retained by the NBA.

Biological Diversity Act, 2002	
Purpose	Enacts India's obligations under the Convention on Biological Diversity; provides a legal framework for biodiversity conservation, sustainable use, and fair benefit sharing.
Key Objectives	• **Conservation**: Protect genetic, species, and ecosystem diversity • **Sustainable Use**: Ensure resources remain available for future generations • **Equitable Benefit Sharing:** Share monetary and non-monetary benefits with local communities and indigenous people
Institutional Structure	**Three-tier system**: National Biodiversity Authority (NBA), State Biodiversity Boards (SBBs), Biodiversity Management Committees (BMCs)
National Biodiversity Authority (NBA)	Approves access by foreign entities; regulates IPR applications; advises Central Government. Headquartered at Chennai
State Biodiversity Boards (SBBs)	**Operate at state level**; regulate access by Indian citizens/companies (excluding local/traditional users); advise State Government
Biodiversity Management Committees (BMCs)	**Constituted at local body level**; promote conservation, sustainable use, and documentation; prepare People's Biodiversity Registers (PBRs); consulted by NBA and SBBs on local resource use

SIX NEW SITES JOIN FAO'S GIAHS

Context: Six new sites have joined FAO's Globally Important Agricultural Heritage Systems (GIAHS) as recognized traditional farming systems from Brazil, China, Mexico, and Spain.

Globally Important Agricultural Heritage Systems (GIAHS)

- GIAHS are living heritage systems inhabited by communities that maintain an intricate relationship with their territory.
- These evolving and resilient systems are characterized by remarkable agrobiodiversity, traditional knowledge, invaluable cultures, and landscapes, sustainably managed by farmers, herders, fisherfolk, and forest people in ways that support their livelihoods and food security.
- The GIAHS Programme was **launched at the World Summit for Sustainable Development in 2002** in response to global trends threatening family farmers and traditional agricultural systems.

- Its aim is **to protect these systems from challenges such as climate change, community displacement, and biodiversity loss.**
- Using a multistakeholder approach, GIAHS provides technical support to farming communities, promotes traditional agricultural knowledge, and stimulates markets through farm products, agrotourism, and other opportunities.
- Currently, there are **102 GIAHS sites across 29 countries**.

India has three Globally Important Agricultural Heritage Systems (GIAHS) sites

- **Koraput region in Odish**a, known for diverse **paddy landraces** and traditional tribal farming
- **Kuttanad in Kerala**, a unique **below-sea-level system integrating ric**e, fishing, and coconut cultivation
- **Saffron Heritage of Kashmir,** centered on traditional saffron farming that sustains biodiversity, exports, and cultural heritage.

New Sites

- Brazil's **erva-mate plant agroforestry** in the Araucaria forest
- China's **Deqing Freshwater Pearl Mussels** composite fishery in Zhejiang Province, **Fuding White Tea Culture** system in Fujian Province, and **Gaolan Shichuan Ancient Pear Orchard** system in Gansu Province.
- Mexico's **Metepantle** ancestral farming
- Spain's **volcanic sand farming** in Lanzarote.

MORINGA

Context: PKM1, a variety of Moringa oleifera, has made a significant impact globally, particularly in Senegal, Rwanda, and Madagascar.

About Moringa ("tree of life" or "miracle tree")

- Commonly known as the drumstick tree, Moringa is a fast-growing, drought-resistant tree native to the Indian subcontinent.
- Its leaves, pods, seeds, and roots are rich in vitamins A, C, and E, minerals (calcium, iron), and antioxidants, making it a superfood with potential to address malnutrition.
- WHO and UNICEF recommend Moringa in **malnutrition and anemia control programs**, especially in Africa and South Asia.
- In Tamil Nadu's Dindigul and Theni districts, Farmer Producer Organisations (FPOs) export organic Moringa powder to Japan and Germany.

Botanical and Agro-Climatic Profile

- **Native to:** India (Western Ghats, Himalayas); now cultivated in Africa and Southeast Asia
- **Climate Suitability:** Thrives in arid and semi-arid tropical climates
- **Soil Preference:** Tolerates poor, alkaline, and sandy soils
- **Intercropping Use:** Often grown with maize or millets, enhancing farm resilience
- **Lifespan:** Perennial; produces flowers and fruits multiple times a year

SNOW LEOPARD

Context: A study by Ladakh's Department of Wildlife Protection has estimated the presence of 477 snow leopards in the region. Ladakh hosts one of the world's highest densities of snow leopards, accounting for 68% of India's total population of the species.

About Snow Leopard (Panthera uncia)

- **Global Spread:** found in Central and South Asia across 12 countries.
- **Geographical Spread In India:** Present in Jammu & Kashmir, Ladakh, Himachal Pradesh, Uttarakhand, Sikkim, and Arunachal Pradesh.
- **Conservation Status:** IUCN Red List: **Vulnerable** | CITES: **Appendix I** | CMS: **Appendix I | WPA1972: Schedule I**
- **Habitat:** Steep, rugged terrains with rocky outcrops and ravines, typically at 3,000–5,000 metres elevation.
- **Characteristics:** Solitary cats with smoky-grey fur patterned with dark rosettes; most active at dawn and dusk. Known as the "Ghost of the Mountains" due to its elusive nature.

About Global Snow Leopard and Ecosystem Protection Program (GSLEP)

- An intergovernmental alliance launched in 2013 to conserve snow leopards and their high-mountain ecosystems across 12 snow leopard range countries.

- It is based on the **Bishkek Declaration (2013)**, signed by these countries: Afghanistan, Bhutan, China, India, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan, and Uzbekistan.
- GSLEP aims to secure at least 20 snow leopard landscapes by 2020 **("Secure 20 by 2020")**

OPERATION OLIVIA

- Operation Olivia is an **annual conservation initiative launched by the Indian Coast Guard (ICG)** since the early 1980s.
- It runs from November to May every year along the Odisha coast, primarily aimed at protecting the nesting and breeding grounds of the endangered Olive Ridley turtles, particularly at key sites like Gahirmatha Beach, Rushikulya river mouth, and Devi river mouth.

About Olive Ridley Turtle (Lepidochelys olivacea)

- It is the smallest and most abundant species of sea turtle in the world. The species is known for its unique mass nesting behavior called "arribada".
- The olive ridley turtles are globally distributed in the tropical and warm-temperate regions of the South Atlantic, Pacific, and Indian Oceans.
- Olive Ridley turtles are omnivorous, feeding on algae, crustaceans, mollusks, jellyfish, fish, and fish eggs. They migrate long distances between feeding grounds and nesting beaches.
- Males and females grow to the same size; however, females have a slightly more rounded carapace.
- Indian Ocean olive ridley turtles are, on average, smaller than individuals found in the Pacific and the Atlantic
- **Protection: IUCN:** Vulnerable**; WPA:** Schedule I

MUSA INDANDAMANENSIS BANANA

Context: A species of wild banana, *Musa indandamanensis*, has been found to possess an infructescence measuring about 4.2 metres, making it the longest recorded infructescence among all banana species.

What is Infructescence?

- An infructescence refers to a cluster or group of fruits arranged on a common stalk or axis.
- It develops from the flowering part (inflorescence) and often exhibits a complex branching pattern.

About Musa indandamanensis

- First identified in 2012 from a remote tropical forest near the Krishna Nala Reserve Forest in the Andaman and Nicobar Islands. It is declared as **Critically Endangered** by the IUCN.
- Bears distinct green flowers and a fruit bunch axis (lux) that is three times longer than that of ordinary banana species.
- The plant grows to a height of around 11 metres, compared to the 3–4 metres typical of common banana varieties.
- It serves as a valuable genetic resource for plant breeding, helping scientists develop high-yielding and disease-resistant banana varieties.

GREATER FLAMINGO SANCTUARY

Context: It was recently declared as a protected wetland area located at Dhanushkodi in Ramanathapuram district, Tamil Nadu, within the Gulf of Mannar Biosphere Reserve.

- It serves as a major stopover along the Central Asian Flyway, hosting over 10,700 wetland birds from 128 species, including Greater and Lesser Flamingos, herons, and sandpipers.

About Greater Flamingo (Phoenicopterus roseus)	
IUCN Status	Least Concern
Distribution	Africa, Western Asia (including India), the Middle East, Southern Europe
Habitat	Breeds in shallow wetlands, either saline or alkaline
Key Features	Highly philopatric (returns to same site), strong dispersal outside breeding season
Notable Breeding Site	Kachchh Desert Wildlife Sanctuary, Great Rann of Kachchh, Gujarat – South Asia's only breeding ground, called "Flamingo City"

KULSI RIVER & RIVER DOLPHINS

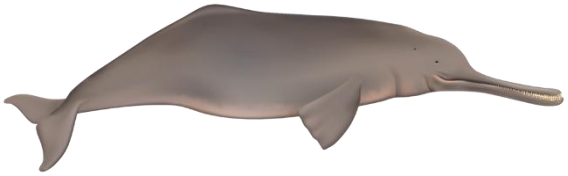
Context: Assam and Meghalaya governments have approved a 55 MW hydroelectric project on the Kulsi River, a key nesting ground for the endangered Ganges River Dolphin.

About Kulsi River (Tributary of the Brahmaputra)

- **Origin & Course:** Rises in **Meghalaya's West Khasi Hills** and flows through **Assam's Kamrup district**, joining the Brahmaputra River.
- The river's depth supports rich aquatic biodiversity, especially the Ganges River Dolphin, which uses echolocation to navigate its murky waters.
- WWF-India identified Kulsi as one of nine critical habitats for dolphin conservation. A nationwide dolphin census by the Wildlife Institute of India (WII) recorded 17 dolphins in a 60 km stretch of the river.
- Ganges River Dolphin (India's National Aquatic Animal (2009) and Assam's State Aquatic Animal), symbolizes ecological balance in the region.

About Ganges River Dolphin (Platanista gangetica)

- It is an **endangered freshwater species** found mainly in the Ganges-Brahmaputra-Meghna and Karnaphuli-Sangu river systems across India, Nepal, and Bangladesh.
- **Physical Features:**
  - Identified by its long snout, large flippers, rounded belly, and small dorsal fin. Females grow up to 2.7 m, larger than males (up to 2.1 m).
  - Nearly blind due to muddy waters; **uses echolocation (ultrasonic sounds)** to detect prey. Calves are chocolate-brown, turning grayish with age and have smooth, hairless skin. As mammals, they surface every 30–120 seconds to breathe, producing a distinctive "**susu**" sound.
- **Lifespan:** About 30 years; females give birth to one calf every 2–3 years after 9–11 months of gestation.
- **Habitat & Distribution:** Found in deep, slow-moving river stretches. In India, major populations occur in the Ganga and its tributaries—Ghagra, Kosi, Gandak, Chambal, Rupnarayan, and Yamuna.
- **Ecological Role & Diet:** A top predator and indicator species of river health. Feeds mainly on fish, mollusks, and crustaceans, helping maintain aquatic ecosystem balance.



- **Conservation Status:** IUCN Status - **Endangered**, **CITES Appendix I, Schedule I** of Wild Life (Protection) Act, 1972
- **Major threats:** Pollution, dam construction, entanglement in fishing nets, boat traffic, and water diversion.

India-Level Initiatives	Global Efforts
• **Project Dolphin (2021):** Launched by MoEFCC for dolphin conservation. • **National Dolphin Research Centre (2024, Patna):** India's first dedicated dolphin research facility. • **First Dolphin Tagging (2024):** WII, Assam Forest Dept., and Aaranyak tracked dolphin movement in the Brahmaputra system.	• **Bogotá Declaration:** Signed by 11 Asian & South American countries for protecting six surviving river dolphin species. • **CMS Appendices I & II:** Promote international cooperation for migratory dolphin species. • **CITES Appendices I & II:** Regulate international trade to curb poaching; aligns with **SDG 14 – Life Below Water**.

INTEGRATED BIODIVERSITY ASSESSMENT TOOL (IBAT) ALLIANCE

Context: In 2024, the Alliance doubled its investment in biodiversity data to $2.5 million, reinforcing updates to global biodiversity databases and supporting conservation science.

About Integrated Biodiversity Assessment Tool (IBAT) Alliance (HQ: Cambridge, UK)	
About	• Founded in 2008, it is an alliance of four of the world's most influential conservation organisations: Birdlife International, Conservation International, International Union of Conservation for Nature (IUCN), United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC),
Purpose	• Provides authoritative biodiversity data for research, policy, and business decision-making • Supports conservation strategies and global sustainability frameworks
Objectives	• Risk screening, environmental impact assessments, tracking biodiversity and sustainability goals (UN SDGs, Global Biodiversity Framework)

Core Datasets	• World Database on Protected Areas (WDPA), World Database of Key Biodiversity Areas (WDKBA), IUCN Red List of Threatened Species

INTERNATIONAL BIG CAT ALLIANCE (IBCA)

Context: The first IBCA assembly in New Delhi endorsed India's Environment Minister as its President. The Assembly is IBCA's top decision-making body, meeting annually or biannually.

About International Big Cat Alliance (IBCA) (HQ in New Delhi)	
Launch	Launched by India in April 2023 during Project Tiger's 50th anniversary at Mysuru as Multi-country, multi-agency coalition of 95 big cat range and interested non-range countries
Purpose	Conservation of the world's seven major big cats: Tiger, Lion, Leopard, Snow Leopard, Cheetah, Jaguar, Puma
Founding Members	Armenia, Bangladesh, Bhutan, Cambodia, Egypt, Ethiopia, Ecuador, India, Kenya, Malaysia, Mongolia, Nepal, Nigeria, Peru, Suriname, Uganda
Objectives	Conserve habitats, combat poaching/illegal trade, share expertise/resources, strengthen research, capacity building, and funding cooperation
Governance	Assembly of Members (apex body), Standing Committee, Secretariat, and Director-General leading the Secretariat

Big Cat Species	IUCN Status	CITES Status	Wildlife Protection Act (1972)
Tiger	Endangered	Appendix I	Schedule I
Lion	Vulnerable	Appendix I	Schedule I
Leopard	Vulnerable	Appendix I	Schedule I
Snow Leopard	Vulnerable	Appendix I	Schedule I
Cheetah	Vulnerable	Appendix I	Schedule I
Jaguar	Near Threatened	Appendix I	Not found in India
Puma	Least Concern	Appendix I	

SALKHAN FOSSIL PARK, UP

Context: In 2025, the park was added to UNESCO's Tentative List of World Heritage Sites, acknowledging its global geological and paleobiological significance.

About Salkhan Fossil Park (also known as Sonbhadra Fossil Park)

- It is **among the most ancient and significant fossil sites on Earth,** located in Salkhan village, Sonbhadra district, Uttar Pradesh.
- The park preserves **stromatolite fossils i.e. sedimentary structures formed by cyanobacteria** (blue-green algae) that thrived in ancient seas nearly 1.4–1.5 billion years ago. These cyanobacteria were **pivotal in Earth's Great Oxidation Event** (~2.4 billion years ago), which enriched the atmosphere with oxygen and paved the way for complex life.
- The park covers **around 25 hectares in the Kaimur Range, adjacent to the Kaimoor Wildlife Sanctuary.**

About UNESCO World Heritage Site

- It is a natural or cultural place recognized by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as having **Outstanding Universal Value (OUV) to humanity.**
- These sites are protected under the **1972 Convention Concerning the Protection of the World Cultural and Natural Heritage**, which encourages international cooperation in preserving humanity's shared heritage.
- **India's World Heritage Sites:**
  - **44 in total (6th highest worldwide) =** 36 cultural, 7 natural, 1 mixed (Khangchendzonga National Park)
  - **Tentative List**: 69 sites awaiting nomination
  - **Most Recent Addition:** Maratha Military Landscapes of India (2025)

FIRST-EVER GRASSLAND BIRD CENSUS

Context: Kaziranga National Park and Tiger Reserve (KNPTR), Assam, has released its first Grassland Bird Survey Report.

Key Takeaways from the Census

- **Species Recorded:** A total of 43 grassland bird species were documented, including:
  - **1 Critically Endangered:** Bengal Florican
  - **2 Endangered**: Finn's Weaver, Swamp Grass Babbler
  - **6 Vulnerable:** Black-breasted Parrotbill, Marsh Babbler, Swamp Francolin, Jerdon's Babbler, Slender-billed Babbler, Bristled Grassbird
  - **1 Near Threatened:** Indian Grassbird
- **Methodology:** The census combined traditional point count surveys with AI-powered Passive Acoustic Monitoring (PAM), a non-invasive technique for recording bird calls and identifying species.

About Grasslands

- Grasslands are ecosystems dominated primarily by grasses, though other plants like sedges, rushes, legumes, and herbs can also be present.
- They occur naturally on every continent except Antarctica and cover about 20–40% of the Earth's land surface, making them one of the largest biomes globally.
- Grasslands typically exist in areas where rainfall is moderate—more than deserts but less than forests—ranging from about 25 to 75 cm annually
- Different regions have different names for grasslands, such as: **Prairies** in North America, **Steppes** in Europe and Asia, **Savannas** in Africa and tropical regions, **Pampas** in South America, Meadows in UK.

GLOBAL WETLAND OUTLOOK 2025

Context: The Global Wetland Outlook (GWO) 2025 was **released by the Ramsar Convention's Scientific and Technical Review Panel (STRP)** ahead of the 15th Meeting of the Conference of the Contracting Parties (COP15) held in Victoria Falls, Zimbabwe.

- The GWO is the **most comprehensive global assessment of the current status, trends, and policy responses related to wetlands.**
- It aligns closely with the Kunming–Montreal Global Biodiversity Framework **(KM-GBF),** particularly **Target 3, which aims to conserve or restore 30% of land and water ecosystems by 2030.**

Key Findings of GWO 2025

- **Extent of Wetlands:**
  - Wetlands (including seagrass meadows, kelp forests, coral reefs, estuarine waters, salt marshes, mangroves, tidal flats, lakes, rivers, inland marshes, swamps, and peatlands) cover over 1,800 million hectares globally, spanning freshwater, coastal, and marine ecosystems.
  - Earlier editions of GWO reported wetland extents of over 1,210 million ha (2018) and 1,500–1,600 million ha (2021), indicating a gradual improvement in mapping accuracy and ecosystem recognition.
- **Loss and Degradation:** Since 1970, the world has lost approximately 411 million hectares of wetlands (about 22% of the global total) at an annual rate of 0.52%, which is three times faster than forest loss, as per the Wetland Extent Trends Index.
- **Economic and Ecological Value:** Wetlands generate an estimated USD 39.01 trillion annually in ecosystem services—equivalent to about 7.5% of global GDP. Their benefits include: Flood control and disaster mitigation, Water purification and groundwater recharge, Carbon storage and climate regulation, Sustainable livelihoods for millions of people,
- **Strategic Pathways and Recommendations:** Integrate the value of wetlands into national policies and land-use planning, treating them as essential natural infrastructure. Recognise wetlands' vital role in the global water cycle and climate resilience frameworks.

Regional Trends and Key Drivers

- **Africa & Latin America:** Rapid urbanisation, industrialisation, and infrastructure expansion are primary causes of degradation.
- **North America & Oceania**: Invasive species pose major threats to native wetland ecosystems.
- **Europe:** Prolonged droughts are the leading cause of decline.

RHODIS INDIA PROGRAMME

Context: Under the RhoDIS India Programme, a genetic analysis of 2,573 rhino horn samples from Kaziranga National Park (Assam) has been initiated to strengthen rhino conservation efforts.

About the Rhino DNA Index System (RhoDIS) India Programme

- **Launched:** 2016
- **Objective:** To conserve the greater one-horned rhinoceros using advanced DNA-based forensic tools. **Implemented by:** Wildlife Institute of India (WII) in collaboration with global conservation partners.

Key Objectives

- **Wildlife Crime Investigation:** Each rhino is assigned a unique DNA profile, enabling forensic tracing of seized horns. This helps authorities link confiscated horns to specific poaching incidents, strengthening anti-poaching enforcement.
- **Scientific Population Management:** The DNA database helps monitor genetic diversity among rhino populations. It tracks changes in Short Tandem Repeat (STR) allele frequencies, which are vital indicators of genetic health. The data guides conservation planning, including translocations and habitat management to ensure healthy breeding populations.

What is a Rhino Horn?



- A rhino horn is a solid, curved structure that grows from the nose of a rhinoceros. Unlike the horns of cows or buffaloes, which are attached to the skull and contain a bony core, **a rhino's horn is made entirely of keratin,** the same protein found in human hair and nails.
- Keratin is chemically complex, containing sulphur-rich amino acids like cysteine, along with tyrosine, histidine, lysine, arginine, and mineral salts such as calcium carbonate and calcium phosphate.
- They are structurally similar to horses' hooves, turtle beaks, and cockatoo bills.

ANIMAL DISCOVERIES & PLANT DISCOVERIES 2024

Context: The Animal Discoveries 2024 and Plant Discoveries 2024 reports were published respectively by the **Zoological Survey of India (ZSI) and the Botanical Survey of India (BSI)**.

Key Highlights of 2024 Report

- **Biodiversity Hotspots:** The Western Ghats and Northeast India together contributed 35% of the total discoveries, reaffirming their importance as global biodiversity hotspots.

Faunal Discoveries (ZSI Report)	Floral Discoveries (BSI Report)
Total Additions: 683 species • 459 new species described for the first time • 224 new records (species previously known elsewhere but newly recorded in India) **Top Contributing States:** • **Kerala**: 101 discoveries (80 new species, 21 new records) • **Karnataka**: 82 discoveries • **Arunachal Pradesh**: 72 discoveries • **Tamil Nadu**: 63 discoveries • **West Bengal**: 56 discoveries **Taxonomic Trends**: • Insects formed the largest group, especially Hymenoptera (bees, wasps) and Lepidoptera (butterflies, moths).	**Total Additions: 433 taxa** • 410 new species • 23 infra-specific taxa (varieties or subspecies) **Top Contributing States:** • **Kerala**: 58 discoveries • **Maharashtra**: 45 discoveries • **Uttarakhand**: 40 discoveries **Group-wise Breakdown:** • **Angiosperms** (Flowering plants): 154 • **Pteridophytes** (Ferns): 4 • **Bryophytes** (Mosses and liverworts): 15 • **Lichens**: 63 • **Fungi**: 156 • **Algae**: 32 • **Microbes**: 9

CSS-INTEGRATED DEVELOPMENT OF WILDLIFE HABITATS SCHEME

Context: The Standing Committee of National Board for Wildlife (SCNBWL) has recommended the inclusion of **gharial and sloth bear** in the Centre's Species Recovery Program of Centrally Sponsored Scheme- Integrated Development of Wildlife (CSS-IDWH).

About Integrated Development of Wildlife Habitats (CSS-IDWH)

- CSS-IDWH is an initiative of the Ministry of Environment, Forest and Climate Change, aimed at supporting wildlife conservation across India.

- It provides both financial and technical assistance to State and UT governments for the protection, restoration, and sustainable management of wildlife habitats both inside and outside designated protected areas.
- It also includes Project Tiger (launched in 1973) and Project Elephant (1992).

Key Components: The scheme focuses on the conservation and management of:

- **Protected Areas** such as National Parks, Wildlife Sanctuaries, Conservation Reserves, and Community Reserves.
- **Wildlife habitats** outside protected areas, targeting high-biodiversity regions and wildlife corridors.
- **Recovery programmes** for critically endangered species and their habitats (currently covers 22 species, including Snow Leopard, Asiatic Lion, Great Indian Bustard, Gangetic River Dolphin, and recently, Gharial and Sloth Bear have been added).

Gharial 	• A fish-eating crocodilian, it inhabits deep, fast-flowing rivers across Nepal's Rapti–Narayani system and several Indian rivers such as the Girwa, Son, Ramganga, Gandak, Chambal, and Mahanadi. • It is easily identified by its long, slender snout (males possess a bulbous growth called a ghara) and its specialized, interlocking teeth suited for catching fish. • Critically Endangered on the IUCN Red List, in Appendix I of CITES, and Schedule I of the Wildlife (Protection) Act, 1972.
Sloth Bear 	• It is native to India, Southern Nepal, and Sri Lanka, thriving in forests and grasslands. Unlike other bear species, sloth bears are insect-eaters. • It is distinguished by its shaggy black coat, long snout, and curved claws that help it feed primarily on termites and ants. • Unlike most bear species, it **does not hibernate** and is mostly nocturnal and solitary, yet known for its agility and aggression. • **Vulnerable** on the IUCN Red List, listed in Appendix I of CITES, and protected under Schedule I of the Wildlife (Protection) Act, 1972.

CITES

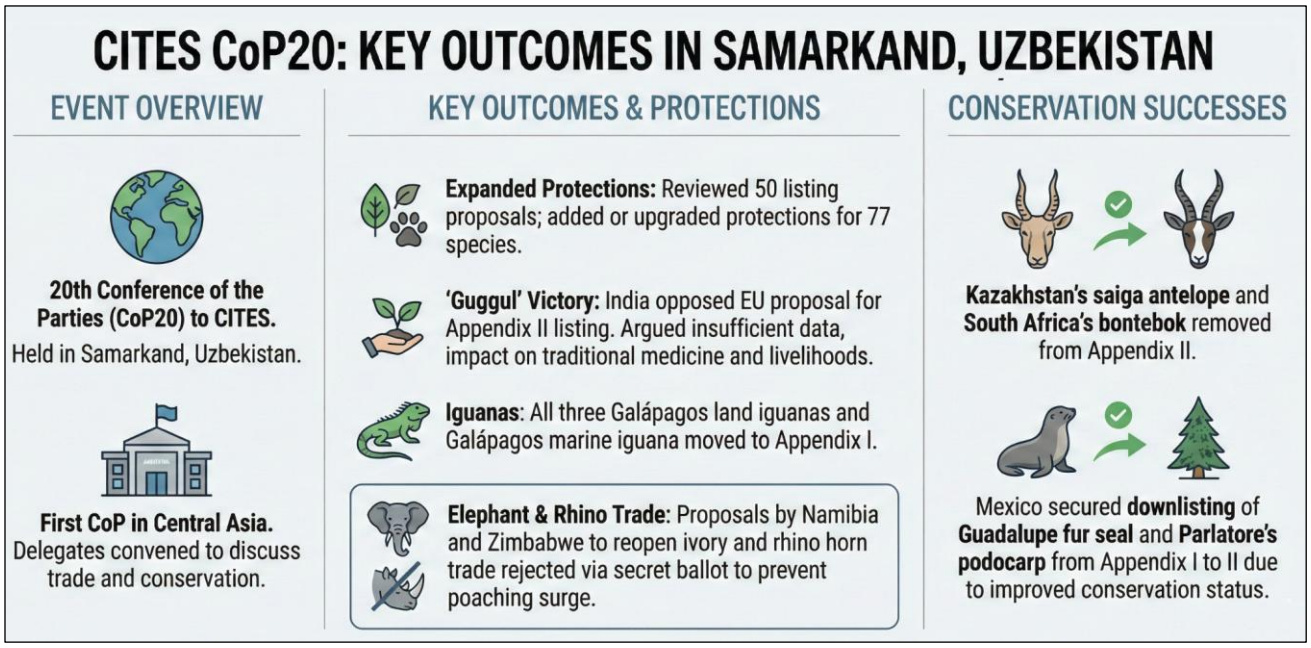
Context: The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) marked its 50th anniversary in 2025.

About Convention on International Trade in Endangered Species of Wild Fauna and Flora

- The CITES was first proposed at an IUCN meeting in 1963 and came into force in 1975.
- **Objective**: It is a **voluntary** international agreement among governments **to ensure that global trade in wild animals and plants does not endanger their survival.** The convention regulates international trade through a licensing system that governs import, export, and re-export of listed species.
- **Secretariat**: **Administered by the UN Environment Programme (UNEP)** and headquartered in Geneva, Switzerland.
- **Membership**: CITES has 185 member parties (countries or regional organizations). India became a signatory in 1976. While legally binding, **each member must implement CITES provisions through its own national legislation.**
- **Conference of Parties (CoP):** The highest decision-making body under CITES. CoP3 was held in New Delhi in 1981.
- **CITES Trade Database:** Managed by the UNEP–World Conservation Monitoring Centre (UNEP-WCMC) on behalf of the Secretariat.

Key Initiatives

- **MIKE Programme:** Monitors illegal elephant killings to support enforcement and management decisions.
- **Strategic Vision 2021–2030:** Guides CITES efforts toward biodiversity conservation and achievement of Sustainable Development Goals (SDGs).
- **CITES Tree Species Programme (CTSP):** Supports sustainable and legal trade in CITES-listed tree species.
- **International Consortium on Combating Wildlife Crime (2010):** Strengthens criminal justice systems to combat wildlife and forest crimes globally.



GLOBAL TIGER DAY 2025

- Observed every year on **July 29**, Global Tiger Day aims to spread awareness about the protection of tigers and the preservation of their natural habitats.
- The observance was **initiated in 2010 during the Saint Petersburg Tiger Summit,** where global leaders united to address the rapid decline in tiger populations and strengthen conservation commitments.
- The 2025 theme, "*Securing the Future of Tigers with Indigenous Peoples and Local Communities at the Heart*," emphasises the crucial role local communities play in ensuring the long-term survival of tigers.

PALMYRA PALM TREE

Context: The Palmyra palm has gained prominence in Odisha for its unique role in reducing lightning-related deaths and supporting wildlife, especially elephants during food-scarce months.

About the Palmyra Palm Tree

- Known by various names: **tala** (Odisha), taal (Bengali), tari (Hindi), nungu (Tamil), taati chettu (Telugu), munjal mara (Kannada).
- **It is the State Tree of Tamil Nadu.**
- Grows well in semi-arid regions receiving less than 750 mm of annual rainfall.
- Originally native to tropical Africa, but widely cultivated and naturalised across India.
- Highly drought-resistant and salt-tolerant, making it abundant in the Deccan Plateau, coastal belts, and Andaman & Nicobar Islands.
- A dioecious species (male and female trees separate). It matures in 15–20 years and can survive for up to 100 years.
- Odisha has launched a large-scale plantation programme across all 30 districts. Earlier, palm trees were not protected and were illegally felled for timber trade. **Since 2023, felling of these trees is restricted and illegal cutting is punishable.**

Benefits and Significance

- **Reducing Lightning Death:** Its tall, sturdy structure and fan-shaped leaves help it function as a natural lightning conductor. Its deep roots and high water content help safely channel electrical energy into the ground.
- **Food for Elephants:** Provides a vital **food source for elephants during dry periods** - fruits, sap, and tender shoots are consumed. This reduces human–elephant conflict by offering an alternative food supply within forests.
- **Soil Conservation:** The strong root system prevents soil erosion in coastal and riverine areas vulnerable to cyclones and flooding.

- **Economic Uses:** Sap is used to make toddy, neera, and jaggery, supporting rural livelihoods. Wood, leaves, fruits, and stems are used for multiple household and craft purposes.
- **Cultural Significance:** Historically, palm leaves were used to write manuscripts in languages such as Tamil, Sanskrit, Pali, and Prakrit.

About Pathaneer (Palm Nectar)

- In Thoothukudi district (Tamil Nadu), climbers tap the sap of Palmyra flower clusters to produce Pathaneer, **a refreshing drink.**
- The sap is collected in lime-coated mud pots to prevent fermentation.
- Can be processed into panangkarkandu (palm candy) and karupatti (palm jaggery).
- Sale of fermented toddy is prohibited in Tamil Nadu, so Pathaneer is kept unfermented.
- Traditionally, the Nadar community has relied on the Palmyra palm for livelihood, using its wood, sap, fruit, leaves, and other parts.

DIBRU-SAIKHOWA NATIONAL PARK (DSNP)

Context: Dibru-Saikhowa National Park (DSNP) in Assam is witnessing significant ecological changes due to native and invasive plant species.

About Dibru–Saikhowa National Park (DSNP)

- **Location**: Tinsukia and Dibrugarh districts, Assam; Located within the Eastern Himalaya–Indo-Burma Global Biodiversity Hotspot.
- **Rivers:** Bounded by the Brahmaputra and Lohit rivers to the north, with the Dibru river flowing through the southern part, forming a typical floodplain ecosystem.
- **Establishment**: Declared a Wildlife Sanctuary in 1986 and upgraded to a National Park in 1999. Recognised as a **Biosphere Reserve** under UNESCO's Man and the Biosphere (MAB) Programme.
- **Flora:** The park features moist mixed semi-evergreen and deciduous forests, canebrakes, grasslands, and wetlands, with a tropical monsoon climate characterized by hot, wet summers and cool, dry winters. It is the **largest salix swamp forest in Northeast India.**
- **Fauna:** Rare and endangered species such as the Bengal florican, hog deer, swamp grass babbler, Gangetic dolphin, and feral horses (found only in this park in India)

'MATRI VAN' INITIATIVE

Context: The Matri Van Initiative has been launched in Gurugram to develop a 750-acre urban forest in the Aravalli hills.

- It is a large-scale urban afforestation project launched on World Environment Day (5th June 2024) as part of the 'Ek Ped Maa Ke Naam' campaign.
- It aims to strengthen ecological conservation and encourage community participation, representing an important move toward urban environmental sustainability.
- Key ecological restoration activities include removing invasive plant species, planting native trees, and reviving biodiversity unique to the Aravalli region.

Ek Ped Maa Ke Naam

- The 'Ek Ped Maa Ke Naam' programme is a nationwide tree plantation initiative launched by PM Modi on World Environment Day, 5th June 2024, in New Delhi.
- The campaign encourages citizens to plant a tree in the name of their mother, symbolically honoring the nurturing role of mothers while contributing to environmental conservation.

RHISOTOPE PROJECT

Context: The University of the Witwatersrand, with support from the International Atomic Energy Agency (IAEA), has officially launched the Rhisotope Project, an innovative anti-poaching initiative.

About Rhisotope Project

- The project involves **injecting small amounts of radioactive isotopes into rhino horns**. This technique is safe for the animals but **enables authorities to easily detect trafficked horns.**
- As part of the project, **five rhinos in the Waterberg Biosphere Reserve, South Africa, received isotope injections.**

- The Rhisotope Project uses a **non-invasive tagging method** in which low-dose isotopes are placed inside the horn.
- These tagged horns can be detected using radiation portal monitors (RPMs) already installed at international borders, ports, and airports to track unauthorized nuclear materials.
- Radioactive isotopes, or **radioisotopes, are unstable forms of elements that release radiation** as they convert into stable forms. This radiation can be traced and often causes detectable changes in the material it interacts with.

LIVING LAB APPROACH

Context: Kanichar, located about 60 km from Kannur, has become India's first village panchayat to adopt a living lab approach aimed at strengthening climate awareness and community resilience.

- The initiative, implemented by the Kerala State Disaster Management Authority (KSDMA), focuses on helping the 4,600 households in the panchayat become better prepared for natural disasters.

What is the Living lab approach?

- The Living Lab approach is a method where new ideas, technologies, or solutions are tested directly in real-life settings instead of in laboratories or closed environments.
- Originating in the Netherlands, this approach involves multiple stakeholders — including government bodies, experts, private organisations, and civil society — working collaboratively to address real-life challenges.

SPERM WHALE VOMIT

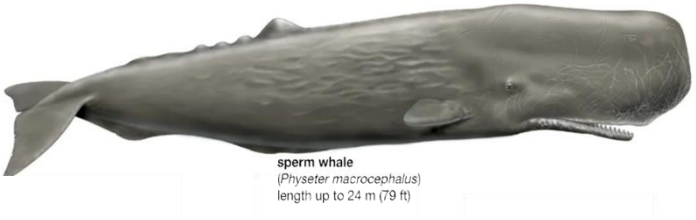
Context: The Special Operations Group (SOG) of Ahmedabad Rural Police has arrested two individuals for possessing 2.976 kg of illicit **ambergris** (commonly known as sperm whale vomit).

- The trade of ambergris is banned in India because the **sperm whale is protected under Schedule I of the Wildlife Protection Act, 1972.**

What is Ambergris?

- The term ambergris comes from French, meaning "grey amber." It is a waxy substance produced in the digestive system of sperm whales.
- Due to its rarity and use in high-end perfumery, it is often referred to as **"floating gold."**
- Ambergris is usually found floating in the ocean and occasionally washed ashore on beaches.
- It is highly valued for its ability to fix and enhance fragrance, which is why it is illegally used in perfumes.

About Sperm Whales



- Sperm whales are the largest toothed whales in the world. They are the only whale species with throats large enough to swallow a human, although such behaviour is not known to occur.
- They are named after spermaceti, a waxy oil found in their massive heads. The spermaceti organ helps the whales focus sound waves, aiding deep-sea navigation and echolocation.
- Sperm Whales are listed under the Convention on International Trade in Endangered Species (CITES). Sperm whales are classified as Vulnerable on the IUCN Red List.

UNESCO AND SEVEN NEW NATURAL HERITAGE SITES IN INDIA

Context: Seven natural heritage sites from India have been added to the **UNESCO Tentative World Heritage List**, increasing India's total tentative sites to 69 (49 cultural, 17 natural, and 3 mixed).

- The UNESCO Tentative List is a preliminary inventory of cultural and natural properties from which countries may nominate sites for full World Heritage status.

Site	State	Description & Significance
Deccan Traps (Panchgani & Mahabaleshwar)	Maharashtra	• These sites contain extensive layered basalt lava flows with sequences over 2,000 metres thick. • Located within the Koyna Wildlife Sanctuary, they provide important geological evidence of large volcanic events that shaped the Indian subcontinent.

St. Mary's Island Cluster	Karnataka	• The islands feature striking columnar basalt formations with hexagonal jointing, dating back to the Late Cretaceous period around 85 million years ago. • They offer a rare and valuable record of ancient geological processes.
Meghalayan Age Caves	Meghalaya	• Cave systems such as Mawmluh Cave contain deposits marking major transitions within the Holocene Epoch. • They provide stratigraphic proof for the Meghalayan Age and also show evidence of prehistoric human activity in the region.
Naga Hill Ophiolite	Nagaland	• This site comprises ophiolite rocks, which are remnants of ancient oceanic crust uplifted onto land due to tectonic activity. • It is significant for understanding plate tectonics and the formation of oceanic crust.
Erra Matti Dibbalu (Red Sand Hills)	Andhra Pradesh	• These coastal red sand dunes offer clear geological evidence of past climatic fluctuations and sea-level changes along the eastern coast of India. • They are located near to the Bay of Bengal at the coastal tract of Visakhapatnam
Natural Heritage of Tirumala Hills	Andhra Pradesh	• The site includes the Eparchaean Unconformity and the natural rock arch Silathoranam, together representing 1.5 billion years of geological evolution.
Varkala Cliffs	Kerala	• The coastal erosional cliffs belonging to the Warkalli Formation (Mio–Pliocene age) display unique geomorphological features and provide important indicators of marine stability and sedimentary history. • The Varkala Cliffs are unique as the only place in southern Kerala where cliffs are found adjacent to the sea.

COLD DESERT BIOSPHERE RESERVE (CDBR)

Context: UNESCO has included the Cold Desert Biosphere Reserve (CDBR) in the World Network of Biosphere Reserves (WNBR) during the 37th session of the International Coordinating Council of the Man and the Biosphere (MAB) Programme in Hangzhou, China.

- This makes it **India's 13th site in the global network** (out of 18 national biosphere reserves) and the first high-altitude cold desert ecosystem in India to receive this recognition.

Key Facts & Features of the Cold Desert Biosphere Reserve (CDBR)	
Location	Located in the Trans-Himalayan region of Lahaul–Spiti district, Himachal Pradesh; spans the Spiti Wildlife Division and adjoining areas of the Lahaul Forest Division, including Baralacha Pass, Bharatpur, and Sarchu.
Area & Altitude	Covers approximately **7,770 sq. km**; altitude ranges from **3,300 m to 6,600 m**.
Ecological Profile	Part of the **Trans-Himalaya biogeographic zone**; lies in the rain shadow of the Greater Himalayas, supporting **unique cold-desert endemism**.
Protected Areas Included	Encompasses **Pin Valley National Park**, **Kibber Wildlife Sanctuary**, **Chandratal Wetland** (a designated Ramsar Site), and the **Sarchu Plains**.
Human Communities & Livelihoods	Local communities rely on **pastoralism** (yak and goat herding), limited agriculture (barley, peas), collection of medicinal herbs, and traditional healing practices such as **Sowa Rigpa**. High-altitude settlements like **Kibber (4,270 m)** support resilient biodiversity.
Ecosystem Services	Provides **carbon sequestration** through alpine wetlands, regulates water for the **Indus River system**, and supports culturally important species such as **Caragana versicolor** used for fodder.

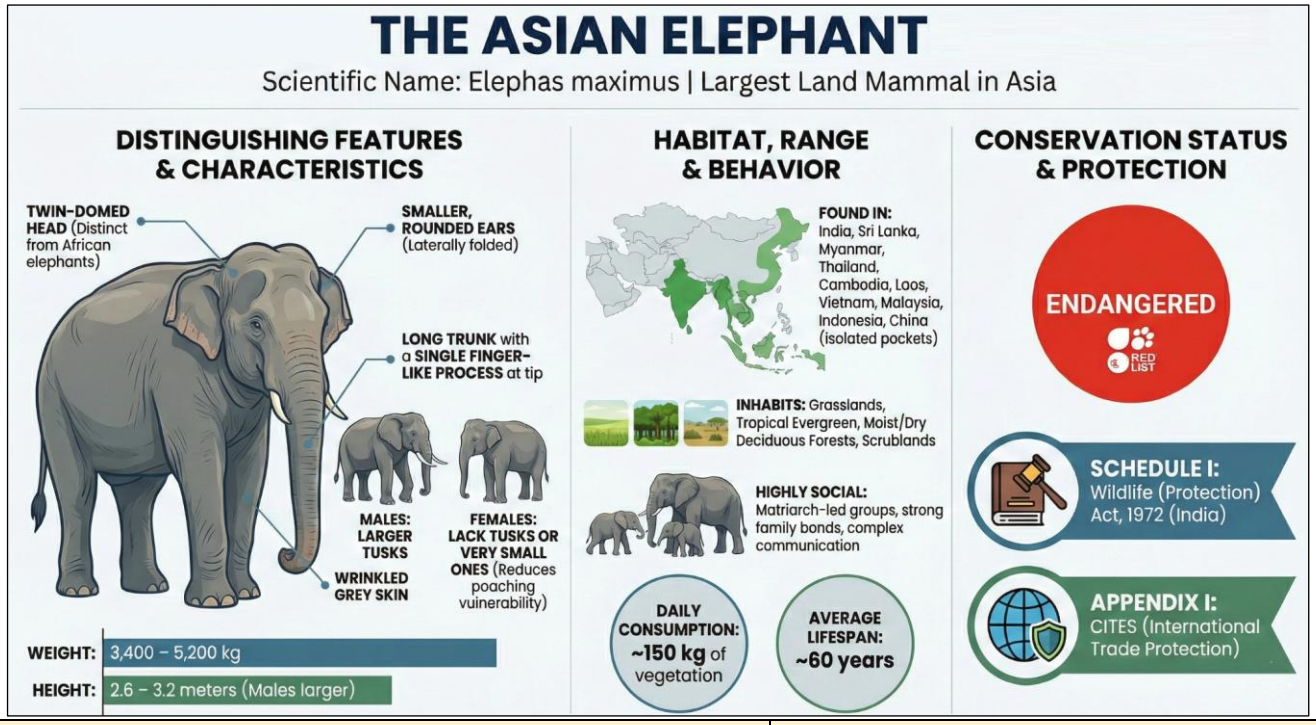
SYNCHRONOUS ALL INDIA ELEPHANT ESTIMATION (SAIEE) 2021-25

Context: The Ministry of Environment, Forest and Climate Change has carried out India's first-ever DNA-based population estimation of the Asian elephant (Elephas maximus).

- The exercise was led by the **Wildlife Institute of India (WII)** under **Project Elephant (1992)**.
- The results are published in the report titled "Status of Elephants in India: DNA-Based Synchronous All India Population Estimate of Elephants (SAIEE: 2021–2025)."

Key Highlights of SAIEE

- India's wild elephant population is estimated at 22,446 (range 18,255–26,645), indicating an 18–25% decline from 2017 estimates.
- SAIEE marks a shift to a standardised, technology-driven methodology, addressing inconsistencies in earlier approaches like direct counts, waterhole observations, or dung-decay methods.
- It relies on non-invasive genetic sampling com CXbined with Spatial Capture–Recapture (SECR) modelling to generate more reliable abundance estimates.



Landscape-wise Distribution	State-wise Estimates
• **Western Ghats:** ~11,934 elephants (53%) • **North-Eastern Hills & Brahmaputra Floodplains:** ~6,559 elephants (29%) • **Shivalik Hills & Gangetic Plains:** ~2,062 elephants (9%) • **Central India & Eastern Ghats:** ~1,891 elephants (8%)	• **Karnataka:** ~6,013 (highest in India) • **Assam:** ~4,159 • **Tamil Nadu:** ~3,136 • **Kerala:** ~2,785 • **Uttarakhand:** ~1,792 • **Odisha:** ~912

ENVIRONMENTAL ACCOUNTING ON FOREST 2025

Context: The Ministry of Statistics and Programme Implementation (MoSPI) released "**Environmental Accounting on Forest – 2025**", during the 29th Conference of Central and State Statistical Organizations (CoCSSO) held in Chandigarh.

About Environmental Accounting on Forest 2025

- This is the **first dedicated publication on forest accounting,** presenting comprehensive national and state-level forest accounts **aligned with the UN System of Environmental-Economic Accounting (SEEA) framework.**
- **MoSPI adopted the SEEA framework in 2018,** the globally agreed standard for compiling environmental-economic accounts.
- The **India State of Forest Report (ISFR) serves as a primary data source.** Other key sources for data and methodology include the Report on Forestry Statistics 2021 (ICFRE), the SEEA Central Framework, SEEA Ecosystem Accounting, the NCAVES Report, and National Accounts Statistics published by MoSPI.
- The publication consists of two volumes:
  - **Volume I:** National-level data and methodology.

- **Volume II:** State/UT-level data, decadal changes, and case studies.

- It **strengthens Natural Capital Accounting** by valuing non-market ecological services such as carbon sequestration, supporting objectives under the Biological Diversity Act, 2002, and the National Forest Policy, 1988.

BLUE FLAG CERTIFICATION

Context: Five beaches in Maharashtra have received the prestigious Blue Flag certification, adding to India's growing list of eco-friendly coastal sites. The five certified beaches in Maharashtra are Shrivardhan, Nagaon, Parnaka, Guhagar, and Ladghar—all located in Raigad district.

About Blue Flag Certification



- The certification is awarded by the Foundation for Environmental Education (FEE), based in Denmark.
- Launched in France in 1985, the programme originally focused on European beaches and expanded worldwide in 2001.
- As of October 2025, India now has 18 Blue Flag beaches, including the newly certified five in Maharashtra. Globally, Spain tops the list with 729 certified sites, followed by Greece.
- It is now among the most recognised global eco-labels for beaches and marinas.
- The programme was introduced in India in 2018 and is implemented under the **BEAMS (Beach Environment & Aesthetic Management Services) initiative of the Ministry of Environment, Forest and Climate Change.**
- BEAMS operate under the Integrated Coastal Zone Management Project (ICZMP).

Award Validity and Criteria

- The Blue Flag certification is valid for one year/season and must be renewed annually based on continued compliance.
- Beaches must meet 33 stringent criteria, grouped into four main categories: Environmental Education & Awareness, Bathing Water Quality, Environmental Management, Safety & Services
- The final selection is made by an international jury comprising representatives from UNEP, UNWTO, FEE, and IUCN.

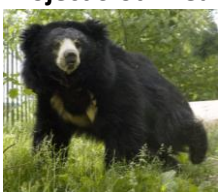
MINISTRY OF ENVIRONMENT'S MULTIPLE INITIATIVES

Context: India has recently initiated several national initiatives to improve wildlife conservation and reduce human–wildlife conflict, reflecting a shift from species-only protection to integrated, landscape-based management.

Project Dolphin (Phase II)



- Implements an action plan to strengthen conservation of riverine and marine cetaceans across India.
- India is home to freshwater dolphins such as the Ganges river dolphin (National Aquatic Animal) and the Indus river dolphin.
- Both are **Endangered** (IUCN) and listed under **Schedule I of the Wildlife**

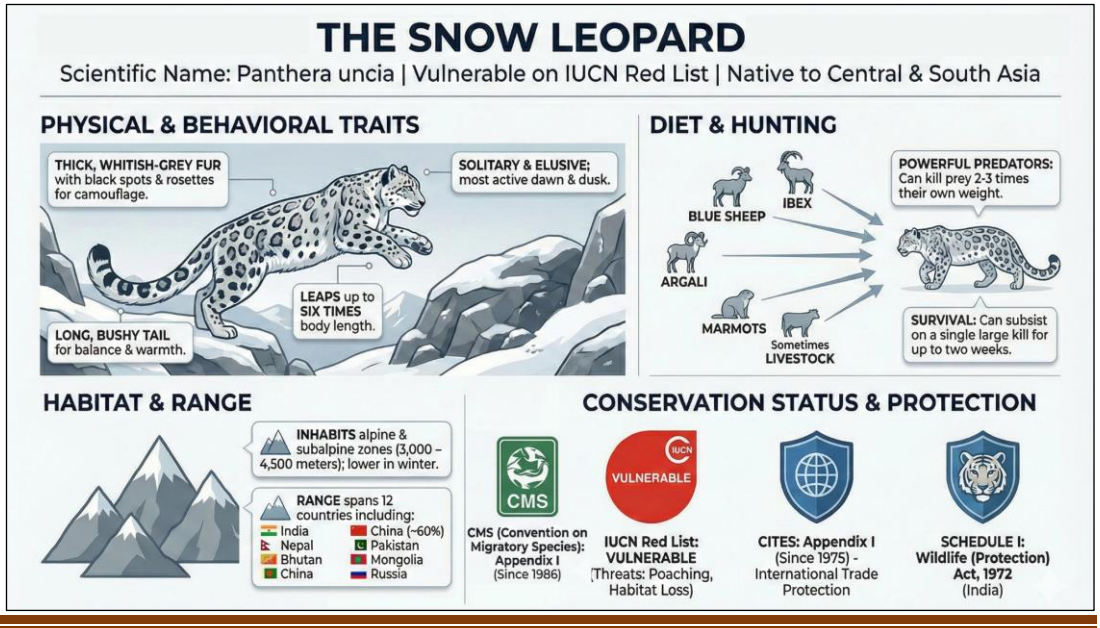
	(Protection) Act, 1972.
Project Sloth Bear 	• Launch of a national implementation framework for sloth bear conservation. • Sloth bears are mainly found in India, Nepal, and Sri Lanka. • They are **Vulnerable** (IUCN) and protected under **Schedule I (WPA, 1972).** • They primarily feed on termites and ants and are unique for carrying cubs on their backs.
Project Gharial 	• Introduction of an implementation action plan for gharial conservation. • Gharials are found mainly in India and Nepal. Male gharials develop a bulbous snout structure called a "ghara", which acts as a vocal resonator. • They are **Critically Endangered (IUCN)** and listed under **Schedule I (WPA, 1972).**
Tigers Outside Tiger Reserves	• Aimed at managing human–tiger conflict outside protected areas using a landscape-based approach, technology, capacity building, and community support. • Tigers occur in India, Bangladesh, Nepal, Bhutan, China, and Myanmar. • They are **Endangered (IUCN)** and protected under Schedule I (WPA, 1972). Each tiger has unique stripe patterns for individual identification.
Centre of Excellence for Human–Wildlife Conflict Management (CoE-HWC)	• Establishment of a national center at Salim Ali Centre for Ornithology and Natural History (SACON) to support policy formulation, research, and field-level mitigation of human–wildlife conflicts across India.

#23FOR23 INITIATIVE

Context: The #23for23 Initiative was launched on International Snow Leopard Day (23 October 2025) to promote the protection of the snow leopard and the fragile high-altitude ecosystems.

About #23for23 Initiative

- The campaign encourages citizens, institutions, and the armed forces **to devote 23 minutes to any physical activity** (such as walking, running, cycling, or yoga) **as a symbolic act of support for conservation.**
- The primary objective of #23for23 is to engage the public in snow leopard conservation, promote awareness about the species and its challenges, and inspire community-driven participation. **The number "23" symbolizes both the date (October 23).**
- **Organisational Support:** The initiative is led by the **Global Snow Leopard and Ecosystem Protection Programme (GSLEP)** and the **Snow Leopard Trust**, with celebrations in India coordinated by the Ministry of Environment, Forest and Climate Change (**MoEFCC**).



Significance for Snow Leopard Conservation

- **India's First National Census (2019–2023):** The campaign spotlighted the findings of the **Snow Leopard Population Assessment in India (SPAI)**, which documented 718 snow leopards across the Indian Himalayas, with Ladakh recording the highest numbers.
- **Global Commitment:** It reaffirms India's support for the goals of **GSLEP**, **a coalition of 12 snow leopard range countries,** and complements national initiatives such as **Project Snow Leopard** and the **SECURE Himalaya Project.**

IUCN WORLD CONSERVATION CONGRESS

Context: The International Union for Conservation of Nature (IUCN) World Conservation Congress 2025 was held in Abu Dhabi, United Arab Emirates.

About IUCN World Conservation Congress

- IUCN Congress is organised once every four years and brings together governments, scientists, civil society groups, and environmental organisations from across the world.
- The Congress hosts the Members' Assembly, which is the highest decision-making body of the IUCN.
- Major global policies, resolutions, and priorities related to nature conservation are discussed and adopted here.
- Decisions taken at this forum guide international conservation efforts for the next four years.



About International Union for Conservation of Nature (IUCN)

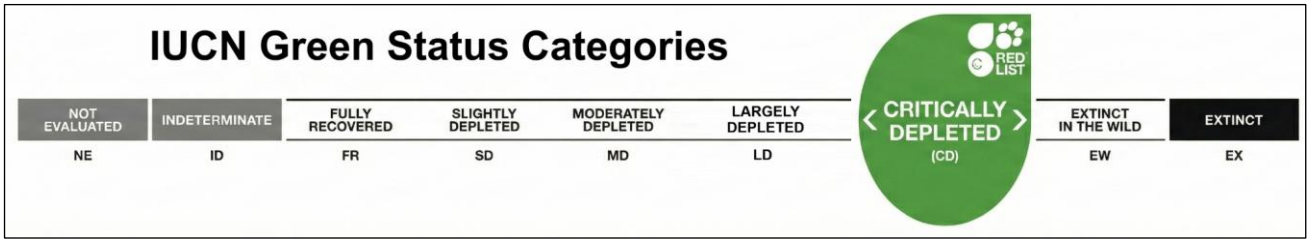
- IUCN is a membership Union of government and civil society organisations. It works to advance sustainable development and create a just world that values and conserves nature. It is not an UN organization.
- Founded in 1948 in Fontainebleau, France, IUCN is recognized as the **world's oldest and largest environmental network,** bringing together governments, NGOs, scientists, and indigenous peoples to address conservation challenges and promote sustainable development.
- **Membership**: Over 1,400 members, including states, non-governmental organisations, and research institutions. India has been a member since 1969. IUCN India Country Office was established in 2007 in New Delhi.
- **Governance**: The IUCN World Conservation Congress is the highest governing body, while the IUCN Council acts as the principal body between its sessions.
- **Headquarters**: Gland, Switzerland
- **Key Instruments:** IUCN Red List, World Heritage Outlook, and the World Database on Protected Areas.

IUCN GREEN STATUS OF SPECIES

Context: The International Union for Conservation of Nature (IUCN) has released the first Green Status of Species assessment for the tiger (Panthera tigris), placing it in the "Critically Depleted" category.

About IUCN Green Status of Species

- Introduced in 2021, the IUCN Green Status of Species works alongside the Red List but **shifts attention from extinction risk to recovery.**
- It **measures how close a species is to full recovery using a Green Score ranging from 0 to 100 per cent.**
- The framework also examines **how much a species depends on conservation actions** and its chances of improvement in the future, offering a more hopeful and forward-looking view of biodiversity protection.



DUGONG CONSERVATION RESERVE

Context: The IUCN has adopted a motion recognising India's first Dugong Conservation Reserve in Palk Bay at the IUCN World Conservation Congress 2025.

About Dugong



- The dugong (sea cow) is the **only marine mammal that feeds entirely on seagrass.**
- Dugongs are essential Ecosystem Engineers and are often called "Gardeners of the Sea" or "Farmers of the Sea".
- Dugong is the only living species in the family Dugongidae, making it the sole survivor of its lineage.
- It is found in warm coastal waters of the Indian and western Pacific Oceans, including regions like Australia, East Africa, Red Sea, Persian Gulf, and Indian subcontinent.
- **Distribution in India:** Confined to Gulf of Mannar & Palk Bay (largest and most stable population), Gulf of Kutch (critically low), and Andaman & Nicobar Islands. The total population in Indian waters is estimated to be around 200 individuals.
- Dugongs face threats from habitat loss, hunting, and accidental capture in fishing nets.
- They are listed as **Vulnerable** on the IUCN Red List and are protected under **Schedule I** of the Wildlife (Protection) Act, 1972.

About Dugong Conservation Reserve

- It was established in 2022 by the **Tamil Nadu government under the Wildlife (Protection) Act,** 1972.
- It covers about **448 sq. km in the northern Palk Bay** and contains more than 12,250 hectares of seagrass meadows.

CENTRAL ASIAN MAMMALS INITIATIVE (CAMI)

Context: CAMI Range Countries reaffirmed their commitment to conservation, showcasing successes with the saiga antelope, Bukhara deer, and Persian leopard.

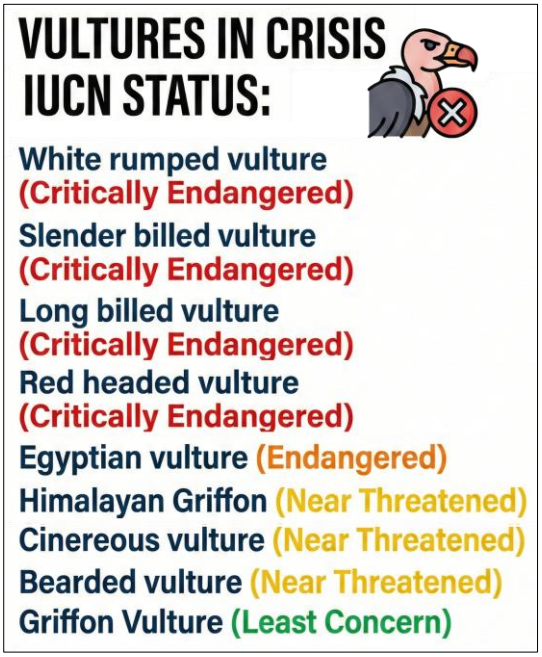
About Central Asian Mammals Initiative (CAMI)

- CAMI is a collaborative conservation framework **established under the Convention on the Conservation of Migratory Species of Wild Animals (CMS)**, launched in **2014** during the 11th Meeting of the Conference of the Parties (COP11) to CMS.
- CAMI aims **to strengthen the conservation of migratory mammals across Central Asia** by providing a regional framework for coordinated action **among range states.**
- CAMI **focuses on 17 iconic mammal species**, including the saiga antelope, snow leopard, Bukhara deer, Persian leopard, argali sheep, wild camel, and others that traverse international borders.
    - Snow leopard is not migratory in the classical sense but included due to its large transboundary range.
- **Range Countries:** Afghanistan, Bhutan, China, **India**, Iran, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan, Turkmenistan and Uzbekistan.

VULTURES

Context: The Wildlife Institute of India (WII) has released its first nationwide assessment on endangered vulture species.

- The study estimated the population of breeding adult vultures, with a focus on four Critically Endangered species: **the White-rumped Vulture, Indian Vulture, Slender-billed Vulture, and Red-headed Vulture.**



About Vultures

- India hosts nine vulture species, all protected under Schedule I of the Wildlife Protection Act, 1972. They are kept under Appendix II of CITES.
- Of these, three are migratory — Cinereous Vulture, Griffon Vulture, and Himalayan Vulture.
- South Asia, especially India, Pakistan, and Nepal, has witnessed a major vulture decline due to the veterinary drug **diclofenac** (late 1990s–early 2000s).
    - **Diclofenac** has been banned for veterinary use in India since 2006.

Ecological Importance

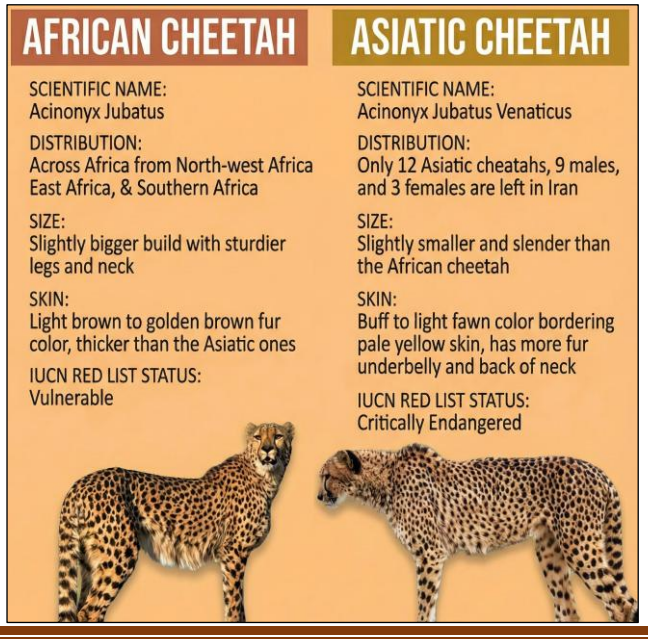
- **Decomposition & nutrient cycling:** Vultures rapidly consume animal carcasses, preventing decay and helping return nutrients to the soil.
- **Disease control:** Their highly acidic digestive system destroys harmful pathogens, blocking the spread of diseases such as anthrax and rabies.
- **Indicator species:** Population decline signals broader environmental stress, including pollution or reduced food availability.

INDIA-BOTSWANA CHEETAH TRANSLOCATION PACT

Context: India and Botswana have formally announced the translocation of eight cheetahs to India under Project Cheetah.

About Project Cheetah

- Launched in 2022, Project Cheetah seeks to reintroduce African cheetahs to India after the extinction of Asiatic Cheetahs in India in 1952. It is recognised as the world's first intercontinental large wild carnivore translocation initiative.
- In 2022, eight cheetahs from Namibia were relocated to **Kuno National Park** (Madhya Pradesh). In 2023, twelve cheetahs were brought from South Africa.
- The project is implemented by the **National Tiger Conservation Authority (NTCA)**.
- **Cheetah Project Steering Committee was set up by NTCA** in 2023 to monitor, review, and advise on implementation.



About National Tiger Conservation Authority (NTCA)

- NTCA is a **statutory body** under the Ministry of Environment, Forest and Climate Change (MoEFCC), established under the **Wildlife (Protection) Act, 1972 (as amended in 2006).**
- **Composition:** Minister of MoEFCC (as Chairperson), Minister of State in the MoEFCC (as Vice-Chairperson), 3 MPs, Secretary of MoEFCC and other members.

About the Cheetahs

- Cheetahs are the world's fastest land mammals, capable of running up to 60–70 miles per hour.
- They are distinguishable from other big cats by their narrow shoulders, long limbs, long tail, and semi-retractable claws that provide balance and traction while sprinting.
- They have a unique social structure: **females live independently** or with their cubs until about 18 months, while **males often live alone or in small coalitions of related males**.
- Once widespread across Africa and Asia, cheetahs now survive in only about 10% of their historic range, mainly in southern and eastern Africa, with a small, critically endangered Asiatic population in Iran.
- Two subspecies are recognised:
  - **African Cheetah — IUCN: Vulnerable**
  - **Asiatic Cheetah — IUCN: Critically Endangered**
- The cheetah is also the only large carnivore to have gone extinct in India.

FRESHWATER SPONGE AND MICROBES

Context: Scientists have found that **freshwater sponges** and the tiny microbes living inside them can help deal with metal pollution in water.

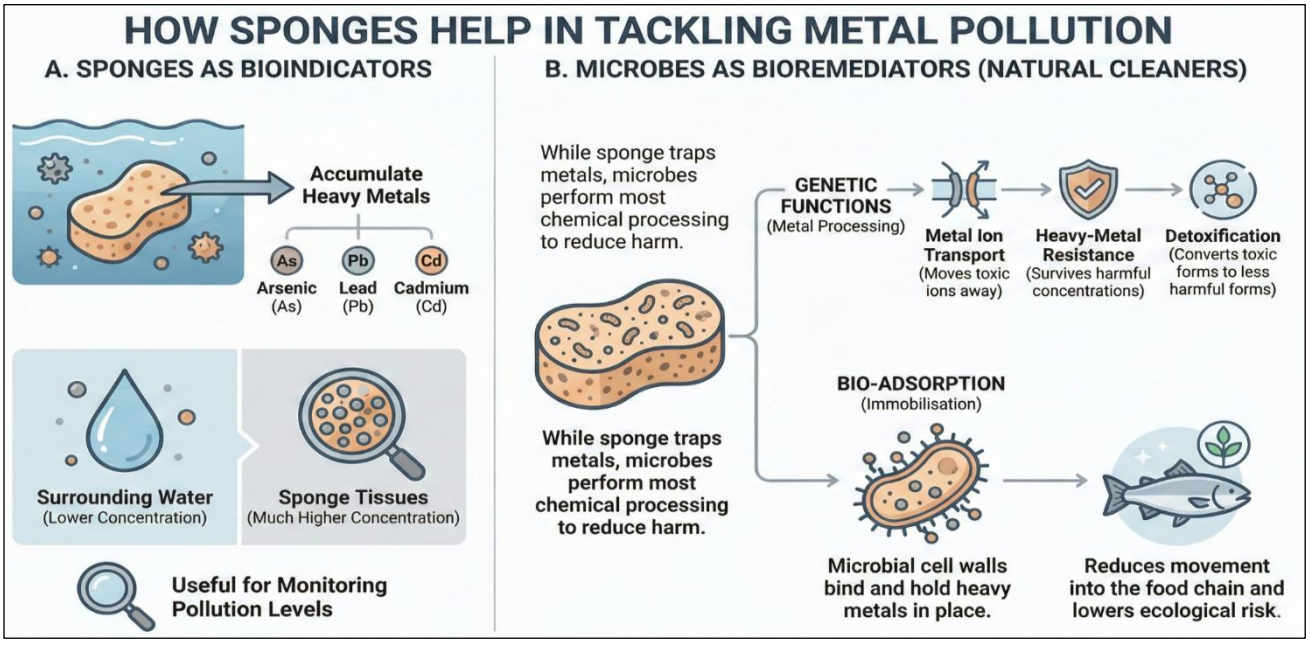
What are Sponges?



- Sponges are **basic multicellular eukaryotes** (with multiple cells containing nuclei and organelles) **marine animals** belonging to the **phylum Porifera**. They have around 5,000 described species, **nearly all marine** except for a **few freshwater types.**
- They lack nervous, digestive, and circulatory systems, but their porous body and inner tube network pump water through the organism, enabling efficient filter feeding.
- **Freshwater sponges** belong to the family Spongillidae within the phylum Porifera, primarily inhabiting lakes, rivers, and streams worldwide.
- **Filter-Feeding Mechanism:** Water enters through tiny pores (ostia) and exits through larger openings (oscula). During this process, sponges filter enormous volumes of water, sometimes thousands of litres per gram of tissue each day.

The "Holobiont" Concept

- A sponge is not just a single organism. It functions as a holobiont, which means the host sponge lives together with a large community of microbes such as bacteria, archaea, and fungi.
- These microbes support the sponge's survival and strengthen its ability to tolerate environmental stress.



GREAT INDIAN BUSTARD

Context: After a gap of six years, the Supreme Court of India issued its final order on the conservation of the Great Indian Bustard (GIB).

About the Great Indian Bustard (GIB) *(Ardeotis nigriceps)*



- GIB is a **critically endangered (IUCN) bird species endemic to the Indian subcontinent**. **Rajasthan's state bird** and **one of the world's heaviest flying birds.**
- It's **one of four Indian bustard species**, alongside Lesser Florican, Bengal Florican, and Macqueen's Bustard.
- GIB falls under **Schedule I of the Wildlife Protection Act (WPA), 1972 and Listed in Appendix I of CITES.**
- **Physical Traits:** GIB stands about **1 meter tall** with males larger than females. **Omnivorous by diet,** it faces **vision limitations**. GIB has an **extremely low reproductive rate,** laying only one egg per breeding season.
- **Population Status:** Around **100-140 individuals survive mainly in Rajasthan** (~100), with smaller groups in Gujarat (6-7), Maharashtra (2-3), Karnataka (~10), and Andhra Pradesh (3-4). It is **extinct in over 90% of its historical range across 11 states.**
- **Habitat Range: It thrives in arid grasslands.** Core habitats include Rajasthan's Desert National Park and Gujarat's Kutch Bustard Sanctuary.
- **Key Threats:**
  - Loss and fragmentation of grasslands due to agriculture, irrigation projects, and infrastructure expansion.
  - Fatal collisions and electrocution caused by high-voltage power lines, especially those linked to wind and solar energy projects.

POLLUTION

COPS TO BASEL, ROTTERDAM, AND STOCKHOLM (BRS) CONVENTIONS

Context: An Inter-Ministerial delegation from India, led by the Union Minister of Environment, participated in the Conference of the Parties (COPs) to the Basel, Rotterdam, and Stockholm (BRS) Conventions in Geneva.

- The theme of this year's high-level segment is: "*Make visible the invisible: Sound management of chemicals and wastes.*"

Basel Convention	*Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal* • **Overview:** Adopted on 22 March 1989 in Basel, Switzerland. India is a party, and ratified it 1992. • **Objective:** To minimize and control the transboundary movement (TBM) of hazardous wastes and ensure environmentally sound management. • **Scope:** Covers hazardous wastes by origin, composition, or characteristics; includes 4 categories of "other wastes" like household and certain plastics. *(does not include radioactive waste)* • **Transboundary Control:** Enforces **Prior Informed Consent (PIC)** for international shipments of hazardous waste.
Rotterdam Convention	*Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade* • **Genesis:** Entered into force in 2004; India acceded in 2006. • **Objective:** Promote shared responsibility and cooperation among Parties in the international trade of certain hazardous chemicals, protecting human health and the environment.

	• A core principle is the **Prior Informed Consent (PIC) procedure**, requiring that before hazardous waste is exported, the exporting country must notify and obtain written consent from the importing and any transit countries. • **Scope:** Covers pesticides and industrial chemicals that are banned or severely restricted due to health or environmental risks.
Stockholm Convention	*Stockholm Convention on Persistent Organic Pollutants* • **Genesis:** Adopted in 2001 (Stockholm, Sweden); entered into force 2004; ratified by India in 2006. • **Objective:** Protect health and environment from **Persistent Organic Pollutants (POPs)** that accumulate in humans and wildlife. • The Convention requires Parties to eliminate or restrict the production, use, import, and export of these POPs. • Chemicals controlled under the treaty are listed in annexes: **Annex A** (elimination), **Annex B** (restriction), and **Annex C** (unintentional production minimization). • The treaty originated to address the health risks linked to the "dirty dozen" POPs and has since expanded to include more chemicals due to emerging evidence and risk assessments.

Key Outcomes of the Three COPs (2025)

- **Joint Commitment:** All three COPs emphasized enhanced collaboration with other environmental agreements and initiatives.
- **Basel Convention (BC COP-17):**
  - Updated technical guidelines for managing Persistent Organic Pollutants (POPs) wastes.
  - Adopted a new strategic framework (2025–2031).
  - New work area: transboundary movements of textile wastes
- **Rotterdam Convention (RC COP-12):**
  - Added two chemicals to Annex III: Carbosulfan (pesticide) and Fenthion.
  - Adopted the 2026–2027 Compliance Committee work programme.
- **Stockholm Convention (SC COP-12):**
  - Amended Annex A to include: Chlorpyrifos (pesticide), Long-chain perfluorocarboxylic acids (LC-PFCAs), Medium-chain chlorinated paraffins (MCCPs)
  - Adopted inaugural Compliance Committee work programme

FLUE GAS DESULPHURISATION (FGD)

Context: A high-level expert committee led by Principal Scientific Adviser has proposed ending the rule mandating all coal-based thermal power plants to install Flue Gas Desulphurisation (FGD) units.

- The panel recommends FGD installation only for plants using imported or high-sulphur coal (>0.5%), making emission control more cost-effective and targeted.
- About 92% of Indian coal has low sulphur content (0.3%-0.5%), reducing the need for universal FGD adoption.

What is Flue Gas?

- Flue gas is the **mixture of gases released through the flue** or chimney of fossil fuel–burning units such as thermal power plants, industrial furnaces, and boilers.
- It is a by-product of combustion involving fuels like coal, oil, natural gas, or biomass.
- The composition of Flue Gas varies depending on the fuel type, combustion process, and technology used.
- It mainly contains: Carbon Dioxide (CO_2), Sulphur Dioxide (SO_2), Nitrogen Oxides (NO_x), Particulate Matter (PM), Unburnt Hydrocarbons, Heavy Metals (e.g., mercury and lead), Water Vapor (H2O) and Carbon Monoxide (CO)
- These pollutants must be treated before release to prevent air pollution.

What is Flue Gas Desulphurisation (FGD)?

- FGD refers to technologies used to remove sulphur dioxide (SO_2) from the exhaust gases of coal-based power plants and industrial facilities.
- **Environmental Benefits:** Reduces acid rain formation, Improves air quality.

Types of FGD Systems	Technologies to Reduce Flue Gas Emissions
• **Wet FGD:** Uses lime/limestone slurry to absorb SO_2; removes 90–98% of SO_2. • **Dry FGD**: Uses dry sorbents (lime or sodium-based); removes 50–90% of SO_2; less efficient than wet FGD. • **Semi-dry FGD:** Uses atomized water and absorbent mixture; moderately efficient and cost-effective for older units. Dry and semi-dry systems are preferred where water availability or cost constraints exist.	• **Flue Gas Desulphurisation (FGD):** Removes SO_2 • **Electrostatic Precipitators (ESPs):** Remove Particulate Matter (PM) • **Selective Catalytic Reduction (SCR**): Reduces NO_x emissions • **Carbon Capture & Storage (CCS**): Captures CO_2 from flue gas • **Low-NO_x Burners**: Optimize combustion to lower NO_x formation

Working of an FGD System

- **Absorption**: An absorbent such as lime, limestone, or ammonia reacts with SO_2.
- **Scrubbing**: The absorbent, usually in slurry form, is sprayed into a scrubber tower, where it comes into contact with flue gases.
- **Chemical Reaction:** SO_2 reacts with the absorbent to form compounds like calcium sulphite or calcium sulphate.
- **By-products:** Some wet FGD systems produce gypsum, which can be reused in construction materials.

GLOBAL METHANE TRACKER 2025

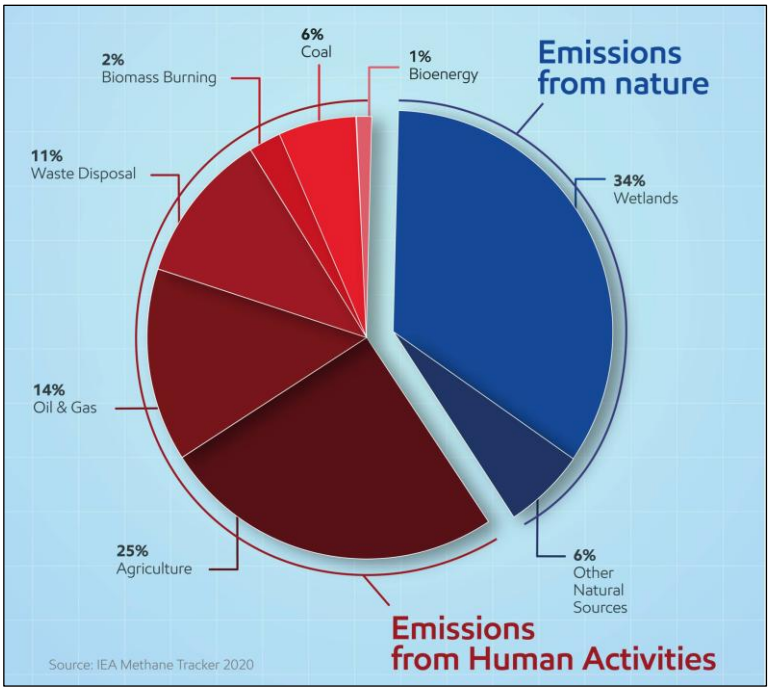
Context: International Energy Agency (IEA) released Global Methane Tracker.

About Global Methane Tracker

- The Global Methane Tracker is an **annual report released by the International Energy Agency (IEA)** that provides the **latest estimates of methane emissions across sector**s, focusing mainly on the energy sector (oil, gas, coal) and other human activities.
- It utilizes data from satellites, measurement campaigns, and relevant studies to track methane emissions and evaluate abatement options and costs.

Key Findings of 2025 Report

- **Methane's Potency:** Methane is responsible for around 30% of the rise in global temperatures since the Industrial Revolution.
- **Energy Sector Emissions:** The **energy sector (oil, gas, coal, bioenergy) contributes over 35% of anthropogenic methane emissions**.
- **Large Methane Leaks:** New methane-focused satellites, MethaneSAT and Tanager-1, became operational in 2024, providing high-resolution, sensitive detection.
- **Investment Needs:** Achieving a 75% reduction in methane emissions by 2030 requires an estimated USD 170 billion.



About Methane (CH_4) Emissions

- Methane is a potent greenhouse gas with significant environmental and ecological implications.
- Methane contributes substantially to global warming due to its high global warming potential, which is over 25 times greater than that of carbon dioxide over a

100-year period and approximately 80 times over 20 years.

- **Methane emissions arise from both natural sources such as wetlands and termites, and anthropogenic sources** including **agriculture** (especially livestock digestion and manure management), fossil fuel extraction, landfills, and biomass burning.
- Different databases rank countries differently for methane emissions. According to the Initiative (GMI), the top three emitters are China, Russia, and the USA. **India ranks fourth**, with emissions at about one-third of China's levels.

Global Methane Pledge (GMP)

Launched at COP26 UNFCCC (2021), it aims to reduce methane emissions by 30% from 2020 levels by 2030. India is currently not a member of this U.S.-E.U.-led initiative.

INTERGOVERNMENTAL SCIENCE-POLICY PANEL ON CHEMICALS, WASTE AND POLLUTION

Context: ISP-CWP was established on 20 June 2025 at an intergovernmental meeting in Punta del Este, Uruguay, under the auspices of the **United Nations Environment Programme (UNEP).**

About Intergovernmental Science-Policy Panel on Chemicals, Waste and Pollution (ISP-CWP)

- The ISP-CWP is an **independent intergovernmental body** established to **strengthen the global science-policy interface.**
- The panel was proposed under **UNEA Resolution 5/8 (2022)** to create a global scientific mechanism for evidence-based policymaking on chemicals, waste, and pollution prevention.
- An Open-Ended Working Group (OEWG) conducted negotiations from 2022 to 2025 to define its scope, governance, and modalities.
- Its creation marks the third major global science-policy body alongside the **Intergovernmental Panel on Climate Change (IPCC)** and the **Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).**

The ISP-CWP seeks to:

- Provide scientifically credible, policy-relevant assessments on chemicals, waste, and pollution.
- Act as a bridge between science and policymaking, like the IPCC and IPBES.
- Support multilateral environmental agreements (MEAs) and global frameworks for hazardous substances and waste management.
- Identify risks, propose mitigation strategies, and promote integrated pollution prevention across air, water, and soil.

MICROPLASTICS

Context: Recent studies conducted globally have indicated a possible link between microplastics and the severity of Cardiovascular diseases (CVDs)

What are Microplastics?

- Microplastics are small plastic particles measuring less than five millimetres.
- **Types**:
  - **Primary microplastics:** Intentionally manufactured tiny plastics used in cosmetics, toothpaste, and industrial applications.
  - **Secondary microplastics:** Result from the breakdown of larger plastic materials such as bottles and packaging waste.
- **Common forms:** These include plastics like polyethylene terephthalate (PET), polystyrene (PS), polypropylene (PP), polyvinyl chloride (PVC), and polyethylene (PE) — materials commonly used in bottles, bags, pipes, and disposable items.
- **Environmental Impact**: Plastics are non-biodegradable and remain in the environment for decades, breaking into smaller fragments through sunlight, heat, or mechanical wear.

How Microplastics Enter and Affect the Human Body

- **Routes of exposure:** Microplastics enter the body through inhalation, ingestion of contaminated food and water, and skin contact.
- **Everyday exposure:** Studies have found microplastics in drinking water, table salt, fruits and vegetables, and seafood.

- **Accumulation in organs:** Once inside, these particles can circulate through the bloodstream and accumulate in vital organs such as the heart, liver, lungs, brain, and kidneys.
- **Health effects:** Digestive and respiratory dysfunction, Liver and kidney toxicity, Reproductive and developmental problems, Neurological damage, Cardiovascular diseases (CVDs)

EPR FRAMEWORK FOR NON-FERROUS METALS

Context: The MoEF&CC has notified the Hazardous and Other Wastes (Management and Transboundary Movement) Amendment Rules, 2025. These rules will come into effect from April 1, 2026, introducing a comprehensive Extended Producer Responsibility (EPR) framework for non-ferrous metals such as aluminum, copper, zinc, and their alloys.

What is Extended Producer Responsibility (EPR)?

- The EPR framework is an environmental policy approach that holds producers, importers, and brand owners responsible for the entire lifecycle of their products, especially for managing and recycling post-consumer waste.

Key Features of the 2025 Amendment Rules

1. Environmental Potential of the EPR Framework

- **Recycling Targets:** Recycling obligations will gradually increase from 10% in 2026–27 to 75% by 2032–33 for products containing non-ferrous metals.
- **Product Coverage:** The framework includes a wide range of products such as beverage cans, packaging foils, electrical fittings, and furniture—reflecting the extensive use of non-ferrous metals in the Indian economy.
- **Recycled Content Requirement:** From FY 2028, products must include at least 5% recycled content, rising to 10% by FY 2029. By FY 2031, specific minimum recycled content targets are: Aluminum – 10%, Copper – 20%, Zinc – 25%

2. Institutional Mechanisms

- **Central Pollution Control Board (CPCB):** Acts as the nodal agency for implementation. Operates an online portal for registration, annual reporting, and EPR certificate management. Certificates are valid for two years (post financial year) and can be traded among producers to fulfill recycling targets.
- **Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC):** Supports formalization through its Recycling Promotion Division. Focuses on technology upgrades and capacity building in the recycling sector.
- **Steering Committee:** Chaired by the CPCB Chairperson. Responsible for monitoring compliance, resolving disputes, and recommending revisions to targets.
- **Bureau of Indian Standards (BIS):** Will revise standards within six months to ensure the quality and safety of recycling processes.

3. Responsibilities Across the Value Chain

- **Producers:** Must register with CPCB. Fulfill recycling and recycled content targets. Incorporate recycled materials into new products.
- **Bulk Consumers:** Entities using over 1,000 tonnes of non-ferrous metals annually must set up collection points and ensure scrap is sent to registered recyclers.
- **Refurbishers and Recyclers:** Must register with CPCB and use environmentally sound technologies. Refurbishers may issue certificates to defer producers' EPR obligations.
- **Reporting and Compliance:** Entities must submit half-yearly and annual reports on production, collection, and recycling activities.

- EPR Certificates can be purchased from registered recyclers through the online portal to meet obligations.
- Environmental Compensation will be imposed for non-compliance, with CPCB setting the EPR certificate value between 30% and 100% of the compensation amount.

ETHANOL BLENDING

Context: India has achieved 20% Ethanol Blending Target in Petrol.

About Ethanol

- Ethanol (C_2H_5OH) is a **renewable form of ethyl alcohol obtained mainly from crops rich in sugar or starch such as sugarcane, maize, and wheat.**

- **Production:** It is produced either by the fermentation of sugars using yeast or through petrochemical methods like ethylene hydration.

Generations of Ethanol	
1st Generation	Made from food-based crops such as rice, wheat, corn, sugarcane, and sugar beet.
2nd Generation	Produced from agricultural residues or non-food biomass like wheat straw, corn stalks, and woody materials.
3rd Generation	Derived from aquatic biomass, mainly algae.
4th Generation	Generated using genetically engineered plants or microorganisms designed to enhance ethanol yield. It also involves carbon capture.

About Ethanol Blended Petrol (EBP) Programme

- **Launch**: Introduced in 2003 to promote the blending of ethanol with petrol, reducing fossil fuel dependency and emissions.
- **What is Ethanol Blending?**
  - The process of mixing ethanol with petrol to create a cleaner, more environment-friendly fuel.
  - **Common blends include:**
    - **E10**: 10% ethanol and 90% petrol
    - **E20**: 20% ethanol and 80% petrol
    - **E85**: 85% ethanol and 15% petrol (used in flex-fuel vehicles)
  - E20 fuel provides smoother acceleration, improved engine performance, and about 30% lower carbon emissions than E10 fuel.

Policy Framework and Targets

- Under the National Policy on Biofuels (2018), revised in 2022, the target for 20% ethanol blending was advanced to 2025–26 (earlier 2030).
- **Key Policy Provisions:**
  - Allows ethanol production from a range of feedstocks such as sugarcane juice, sugar beet, cassava, damaged or surplus food grains, and potatoes unfit for consumption.
  - Encourages use of surplus agricultural produce to enhance energy security and farmers' income.
- **Progress**: Ethanol production in India has increased remarkably—from 38 crore litres in 2014 to over 660 crore litres in 2025.

Government Initiatives Supporting Ethanol Blending

- **PM JIVAN Yojana (Jaiv Indhan Vatavaran Anukool Fasal Awashesh Nivaran):** Provides financial assistance for establishing Second Generation (2G) ethanol plants that use agricultural waste and residues.
- **Ethanol Interest Subvention Scheme (EISS):** Offers interest support for setting up Dedicated Ethanol Plants (DEPs) to boost domestic ethanol production.
- **Tax Reforms:** GST on ethanol supplied for the blending programme reduced from 18% to 5%, though crude ethanol remains taxed at 18%.
- **Regulatory Changes:** The Industries (Development and Regulation) Act, 1951 was amended to facilitate free movement and supply of ethanol across states.

LANDSLIDES

Context: A major landslide occurred near the Vaishno Devi Shrine in Jammu & Kashmir, triggered by intense and continuous rainfall.

About Landslides

- A landslide is the downslope movement of rock, soil, debris, or earth material due to gravity. It is considered a mass-wasting process in geomorphology.
- Landslides are caused when the gravitational force on a slope exceeds the resisting forces.
- **Types of Landslides**
  - **Falls**: Sudden free fall of material (e.g., rockfalls).
  - **Topples**: Forward tilting of rock blocks due to gravity.
  - **Slides**: Can be translational (movement along a flat surface) or rotational (movement along a curved surface).

- **Flows**: Fast-moving mixtures such as debris flow, mudflow, earth flow, or volcanic lahar.
- **Creep**: Very slow and continuous downslope movement of soil or rock.

- **Causes**
  - Heavy rainfall saturating the ground and increasing pore water pressure.
  - Earthquakes and volcanic eruptions, which destabilize slopes.
  - Erosion by rivers, glaciers, or sea waves.
  - Human activities such as deforestation, improper excavation, and vibrations from mining or traffic.
  - Climate change and permafrost degradation, which weaken soil cohesion.
- **Difference from Avalanches**
  - While both landslides and avalanches are gravity-driven mass movements, landslides involve soil, rock, or debris, whereas avalanches specifically refer to the rapid movement of snow, ice and debris.

DISTRICT FLOOD SEVERITY INDEX (DFSI)

Context: Researchers from IIT Delhi and IIT Gandhinagar have developed a District Flood Severity Index (DFSI).

About the District Flood Severity Index (DFSI)

- The DFSI is a **new tool created to measure how severely floods affect each district in India**. **It addresses an existing gap:** although national agencies like IMD, CWC, and NDMA track floods, there was no district-level index that combined both physical damage and human impacts.
- Districts are used as the focus because they are the main administrative units responsible for disaster planning under the Disaster Management Act, 2005.
- The index also supports India's larger global commitments, such as the Sendai Framework for Disaster Risk Reduction (2015–2030) and Sustainable Development Goal 13, which emphasises climate action and resilience.

Parameters Used

- Average duration (in days) of all flood events in a district.
- Percentage of the district's area that has historically experienced flooding.
- Total number of deaths and injuries caused by floods.
- Total population of the district, which helps measure the scale of human exposure.

Data Sources for DFSI

- **India Flood Inventory with Impacts (IFI-Impacts):** A curated database covering 1967–2023, created from IMD's Disastrous Weather Events reports, capturing flood events and related impacts.
- **Indian Land Data Assimilation System (ILDAS):** Provides historical flooded-area data (1981–2021) using hydrologic and hydrodynamic models. It relies on rainfall information from IMD and atmospheric data from MERRA-2 reanalysis.

SWACHH VAYU SURVEKSHAN' (CLEAN AIR SURVEY) 2025

Context: The Ministry of Environment, Forest and Climate Change (MoEF&CC) launched the fourth edition of Swachh Vayu Survekshan (SVS) 2025 under the National Clean Air Programme (NCAP).

About Swachh Vayu Survekshan (SVS)

- SVS is an annual competitive assessment that ranks cities on actions taken to improve air quality in areas such as planning, implementation, monitoring, public awareness, and outcome indicators.
  - NCAP, launched in 2019, aims to reduce PM2.5 and PM10 levels by 20–30% by 2024 (target enhanced to 40% by 2026) using 2017 as the baseline.
- 130 NCAP cities are covered, including 122 non-attainment cities identified by the Central Pollution Control Board in 2018.

Implementing Agencies	City Categories
• **MoEF&CC**: Policy oversight • **Central Pollution Control Board (CPCB)**: Methodology and verification • **State Urban Bodies & Municipal Corporations:** On-ground implementation	• **Category I:** >10 lakh population • **Category II:** 3–10 lakh • **Category III:** <3 lakh

- **Data Sources:** Self-assessments by cities, documentary proofs, CPCB field verification, and air quality data from Continuous Ambient Air Quality Monitoring Stations (CAAQMS) and manual monitoring stations.

Key Findings of SVS 2025

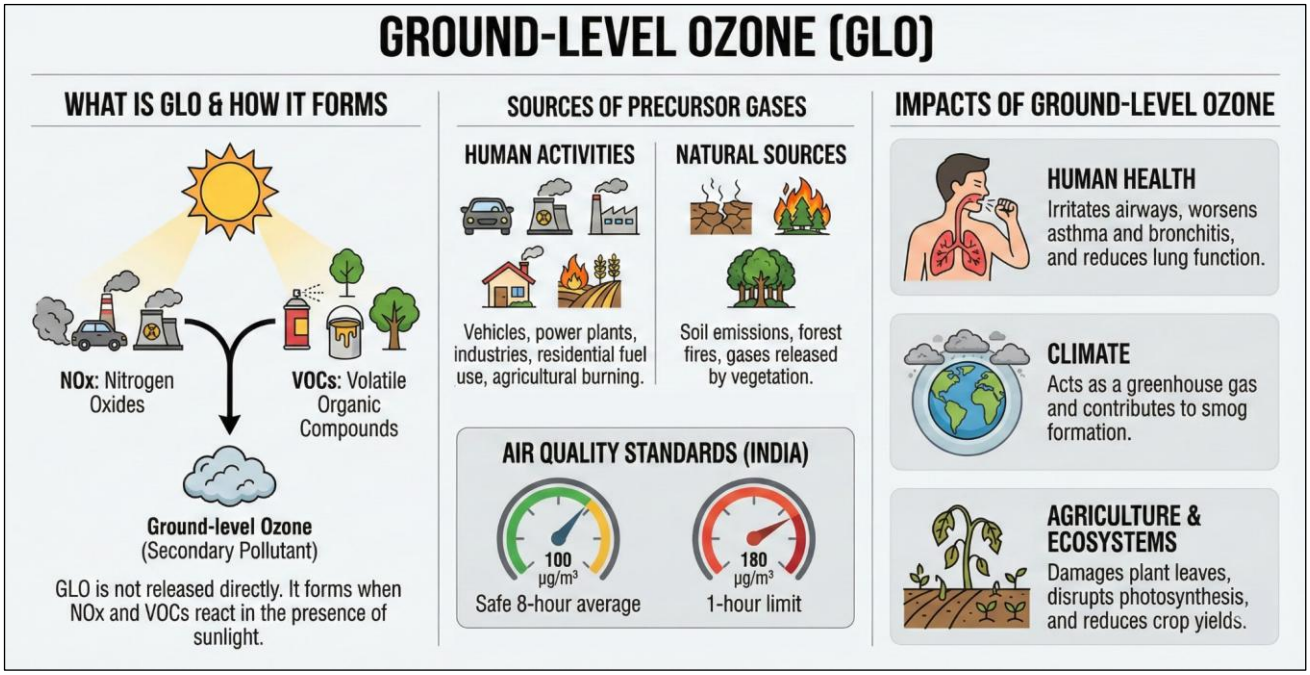
- **Top Performers:** Indore ranked first in the million-plus (Category I) group. Other high-ranking cities included Jabalpur, Agra, and Surat across various categories.
- **Lower Performance:** Delhi ranked relatively low (around 32nd) among large cities despite multiple measures.
- **Progress on Air Quality:** 103 of 130 cities recorded a reduction in PM10 levels since 2017–18. Only 22 cities met the National Ambient Air Quality Standards (PM10 < 60 µg/m³ annually), highlighting significant challenges, especially in northern India.

OZONE POLLUTION

Context: The Central Pollution Control Board (CPCB) has reported that the National Capital Region (NCR) is the most severely affected region in India by high ground-level ozone pollution, followed by the Mumbai Metropolitan Region (MMR).

What is Ozone (O_3)?

- Ozone is a form of oxygen made up of three oxygen atoms. It exists in two parts of the atmosphere:
  - **Stratospheric ozone (upper atmosphere:** 10–50 km above Earth**):** Protects life by blocking harmful ultraviolet (UV) rays from the Sun.
  - **Tropospheric or ground-level ozone:** Acts as an air pollutant and is harmful to health and the environment.



GREEN FIREWORKS

Context: The Supreme Court has eased the blanket ban on fireworks in Delhi–NCR, permitting the use of NEERI- and PESO-approved "green fireworks" during Deepavali.

What Makes a Cracker "Green"?

- Green crackers are defined as **producing at least 30% lower emissions of particulate matter, sulphur dioxide, and nitrogen dioxide compared to traditional fireworks.**
- Developed under CSIR–NEERI's TAPFIRE project (2018), they minimise harm using reformulated, cleaner chemical compositions.

Key Features of Green Crackers:

- **Reduced Emission Formulations (REF):** Use of alternative oxidisers and low-emission chemicals such as potassium nitrate, zinc, and magnesium, replacing banned barium nitrate.
- **No toxic chemicals: Completely eliminates lithium, arsenic, lead, mercury, and barium** compounds.
- **Lower particulate emissions**: Around 30% reduction in particulate matter and gaseous pollutants such as SO_2, NO_x, and CO.
- **Noise restriction**: Sound intensity is kept below 125 decibels at a distance of 4 metres.

- **QR-code certification:** Every approved product carries a unique NEERI QR code for traceability and authenticity.

Types of Green Crackers		
SWAS (Safe Water Releaser)	Releases water vapour to suppress dust and particulate matter.	~30–35%
STAR (Safe Thermite Cracker)	Produces minimal NO_x and SO_2; thermite reactions create less smoke.	~35–40%
SAFAL (Safe Minimal Aluminium)	Uses reduced aluminium content to control smoke and particulate emissions.	~25–30%

About CSIR–National Environmental Engineering Research Institute (NEERI):

- NEERI is a premier research institute in India focused on environmental science and engineering. It is headquartered in Nagpur.
- Established in 1958 in Nagpur as the Central Public Health Engineering Research Institute (CPHERI), it was renamed NEERI in 1974.
- It operates under the **Council of Scientific and Industrial Research (CSIR), Ministry of Science and Technology.**

About Petroleum and Explosives Safety Organisation (PESO)

- PESO regulates the safety of hazardous substances like explosives, petroleum, and compressed gases in India.
- PESO originated as the Department of Explosives in 1898, under British rule.
- Now operates under the **Department for Promotion of Industry and Internal Trade (DPIIT)** in the Ministry of Commerce and Industry.
- Headquartered in Nagpur, Maharashtra, it holds autonomous status led by the Chief Controller of Explosives

MONTREAL PROTOCOL

Context: The Thirty-Seventh Meeting of the Parties to the Montreal Protocol (MOP-37) has recently concluded.

About the Montreal Protocol on Substances that Deplete the Ozone Layer

- The Montreal Protocol, adopted on **September 16, 1987,** is an international agreement that **controls chemicals that damage the Earth's ozone layer,** such as **chlorofluorocarbons (CFCs) and halons.**
- It works under the **Vienna Convention of 1985** and is one of the **first global environmental treaties** successfully followed by almost all countries in the world.
- The treaty sets a **gradual plan to phase out ozone-depleting substances (ODS).** It gives different timelines to developed and developing countries, following the idea of "common but differentiated responsibilities".
- The **Ozone Secretariat under the UN Environment Programme in Nairobi** supports the countries in implementing the treaty.

Key Amendments

- **Montreal Amendment (1997): Phase out HCFCs**
  - **Hydrochlorofluorocarbons (HCFCs)** were introduced as temporary substitutes for CFCs, mainly in cooling and foam industries. Although less harmful, they still affect the ozone layer and add to global warming.
  - The amendment set deadlines to **phase out HCFCs** and encouraged a shift toward low-emission and energy-efficient alternatives.
- **Kigali Amendment (2016): Phase out HFCs**
  - Hydrofluorocarbons (HFCs), developed as replacements for HCFCs, do not harm the ozone layer but have **very high global warming potential.**
  - The amendment brought HFCs under the Montreal Protocol and introduced legally binding targets to reduce their use by about 80–85% by the 2040s.
  - It came into force on January 1, 2019, for countries that ratified it.

India and Montreal Protocol

- India **acceded to the Vienna Convention in 1991** and **ratified** the Montreal Protocol in June 1992. India has **ratified all subsequent amendments** to the Montreal Protocol.
- India is listed as a Party operating under Article 5 **(developing countries).**
- Implementation is coordinated by the **Ozone Cell in the Ministry of Environment, Forest and Climate Change (MoEFCC).**

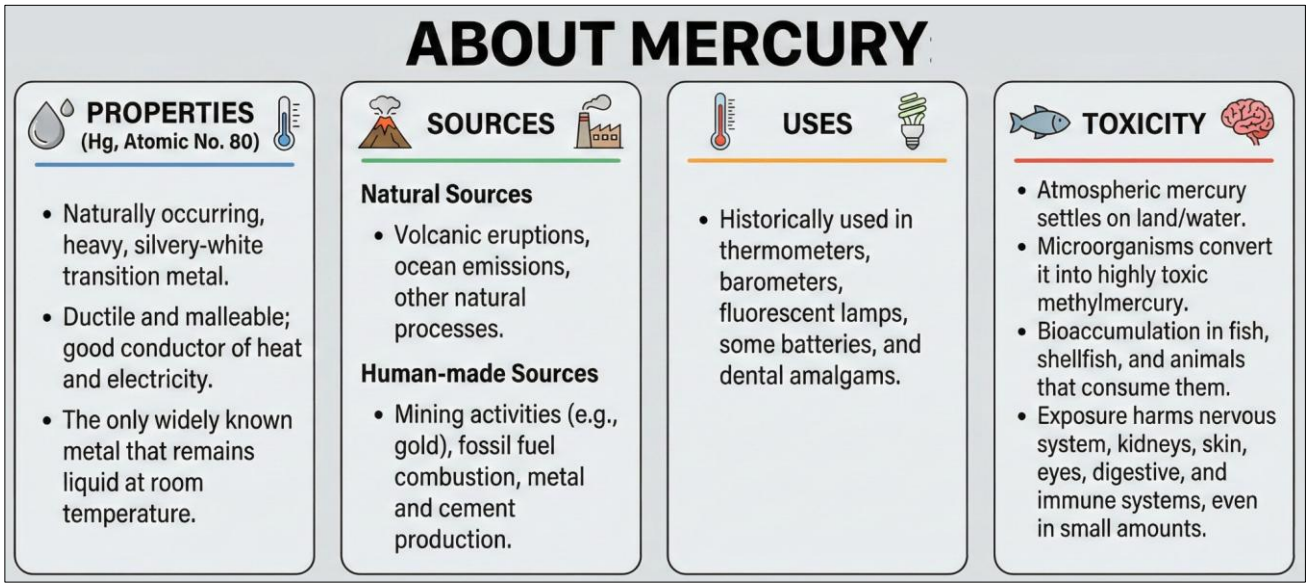
- India has notified the Ozone Depleting Substances (Regulation and Control) Rules, 2000 under the Environment (Protection) Act, 1986 to control production, consumption, trade and use of ODS.

MINAMATA CONVENTION

Context: The Sixth Conference of the Parties (COP-6) to the Minamata Convention on Mercury, held in Geneva, decided to phase out the use of dental amalgam by 2034.

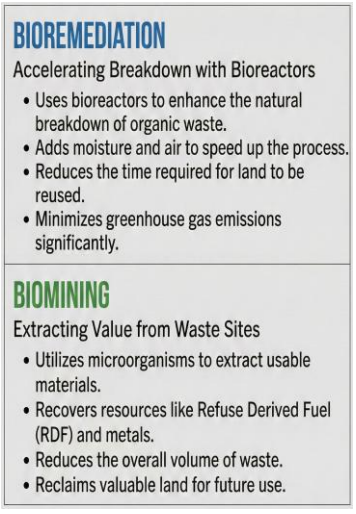
About Minamata Convention on Mercury

- It is a **legally binding global treaty** designed to protect human health and the environment **from the adverse effects of mercury and mercury compounds.**
- It was adopted on January 19, 2013, and opened for signature in Kumamoto, Japan, in October 2013, entering into force in August 2017.
- The convention **aims to reduce and, where feasible, eliminate the use and release of mercury from various sources**, including artisanal and small-scale gold mining, industrial processes, and products.
- The treaty is named after Minamata, Japan, where severe mercury poisoning occurred due to industrial discharge in the mid-20th century.
- The Convention has 153 Parties, and **India** is among its members. **The United Nations Environment Programme (UNEP)** serves as the Convention's secretariat.



DUMPSITE REMEDIATION ACCELERATOR PROGRAMME (DRAP)

Context: The Union Housing and Urban Affairs Ministry launched the Dumpsite Remediation Accelerator Programme (DRAP)



About Dumpsite Remediation Accelerator Programme (DRAP)

- The DRAP is a **year-long, mission-mode initiative** launched under **Swachh Bharat Mission–Urban 2.0 (SBM-U 2.0) to fast-track the scientific remediation of India's legacy dumpsites** and achieve the **national goal of "Lakshya Zero Dumpsites" by September 2026.**
- **Objective:** To prioritise high-impact locations and address around 8.8 crore metric tonnes of legacy waste. Nearly 80% of this waste is concentrated at 214 sites across 202 Urban Local Bodies.
- **Ministry:** Implemented by the Ministry of Housing and Urban Affairs (MoHUA).
- **Eligibility:** Applicable to all States and UTs with ongoing legacy waste remediation projects, with priority given to sites containing over 45,000 MT of legacy waste. No minimum threshold applies to Union Territories and North-Eastern States.
- DRAP follows SBM's proven **5P approach:** Political Leadership, Public Finance, Partnerships, People's Participation, and Project Management

CYCLONE DITWAH

Context: Following the widespread devastation caused by Cyclone Ditwah in Sri Lanka, India launched **Operation Sagar Bandhu** to provide urgent Search and Rescue (SAR) and Humanitarian Assistance and Disaster Relief (HADR) support.

About Cyclone Ditwah

- Cyclone Ditwah was a **tropical cyclone that struck Sri Lanka and affected southern India** in late November and early December 2025.
- It was the fourteenth cyclonic storm of the 2025 North Indian Ocean cyclone season and caused catastrophic flooding and landslides, especially in Sri Lanka, making it **one of the deadliest natural disasters in Sri Lanka since the 2004 Indian Ocean tsunami.**
- Cyclone Ditwah was **named by Yemen, refers to Detwah Lagoon, a coastal waterbody on Socotra Island in Yemen.**

Naming of Cyclones

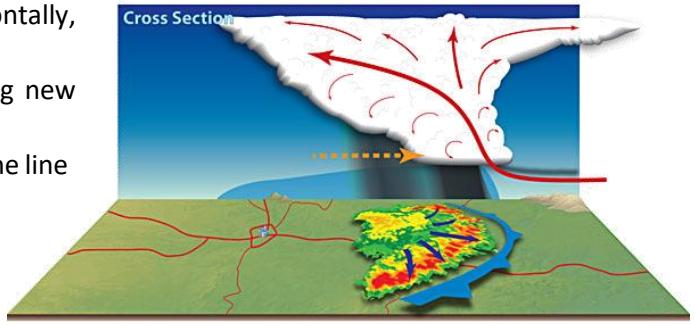
- **The WMO/ESCAP Panel on Tropical Cyclones** decided in 2000 to introduce a naming system for tropical cyclones in the Bay of Bengal and the Arabian Sea, and naming began in September 2004 with contributions from eight-member countries. Since then, five more countries have joined the Panel.
  - Cyclone names are arranged alphabetically by country and are used sequentially column-wise.
  - Once a name is used, it is not repeated and must not duplicate names in any global Regional Specialized Meteorological Centre (RSMC) list.
  - A cyclone moving from the South China Sea into the Bay of Bengal keeps its original name.
- **The RSMC New Delhi – Tropical Cyclone Centre** is responsible for assigning names to cyclones over the Bay of Bengal and the Arabian Sea once they reach the prescribed intensity.

BOW ECHOES

Context: The intense storm that hit Delhi in May 2025 appeared in an unusual crescent or archer's bow shape on the India Meteorological Department (IMD) weather radar.

What is a 'Bow Echo'?

- A bow echo is a meteorological phenomenon in which **a line of thunderstorms forms a bow-shaped appearance on weather radar.**
- Often associated with severe weather such as straight-line winds, heavy rainfall, hail, and occasional tornadoes.
- The term "bow" refers to the curved radar signature, resembling an archer's bow, caused by strong winds pushing the storm line's center forward.
- **Mechanism:**
  - Rain-cooled air descends and spreads horizontally, creating a gust front.
  - The gust front lifts warm, moist air, forming new thunderstorms.
  - This cycle repeats, and trailing inflows bend the line into a bow shape.



Where Bow Echoes Occur

- **Midwestern USA:** Most frequent; part of "Tornado Alley"
- **India (Rare):** Can form during pre- or post-monsoon thunderstorms in NE states
- **Europe (Occasional):** Observed during intense summer convective events

TAPTI BASIN MEGA RECHARGE PROJECT

Context: CMs of Madhya Pradesh and Maharashtra signed an MoU to implement the Tapti Basin Mega Recharge Project, touted as the world's largest groundwater recharge scheme.

About Tapti Basin Mega Recharge Project

- The project aims to harness the waters of the Tapti River to meet drinking water needs in northeastern Maharashtra (e.g., Nagpur) and provide irrigation support to southern Madhya Pradesh (e.g., Burhanpur, Khandwa).
- It is the third major inter-state river project involving Madhya Pradesh, after: Ken-Betwa Link Project (with Uttar Pradesh), Parbati-Kalisindh-Chambal Link Project (with Rajasthan)
- **Key Objectives:** Groundwater Recharge, Irrigation Expansion

Tapti River and Its Basin

- The Tapti River (or Tapi) is a **west-flowing river in central India,** flowing through the states of Madhya Pradesh, Maharashtra, and Gujarat before **draining into the Arabian Sea via the Gulf of Khambhat.** It is the **second longest west-flowing river in India,** with a length of about 724 km.
- The river **originates in Multai in Madhya Pradesh** in the Satpura range.
- It lies on the Deccan Plateau and is bounded by the Satpura range on the north, the Mahadev hills on the east, the Ajanta Range and Satmala hills on the south, and the Arabian Sea on the west.
- **Left Bank Tributaries of Tapti River**: Nesu, Amravati, Buray, Panjhra (Panzara), Bori, Girna, Waghur (Vaghur), Purna (principal left-bank tributary), Mona, Sipna
- **Right Bank Tributaries:** Vaki (or Suki), Aner, Arunavati, Gomai

NATIONAL CENTRE OF POLAR AND OCEAN RESEARCH (NCPOR)

Context: The NCPOR celebrated its 25th anniversary in early 2025.

- The National Centre of Polar and Ocean Research (NCPOR), headquartered in Goa, is an autonomous institution under the Ministry of Earth Sciences established in 1998.
- Governed by a 13-member body chaired by the Secretary of MoES, NCPOR plays a key role in polar and ocean research.
- It manages India's research stations in Antarctica (Maitri and Bharati), the Arctic (Himadri), and the Himalayas (Himansh).
- It also leads the Deep Ocean Mission, which explores deep-sea minerals and hydrothermal systems in the Indian Ocean.
- NCPOR supports the implementation of India's Arctic Policy (2022) and the Indian Antarctic Act (2022), which provide legal and policy frameworks for governance, international cooperation, environmental protection, and capacity building in polar regions.

YALA GLACIER DECLARED DEAD

Context: Glaciologists and local communities in Nepal mourned the loss of the Yala Glacier.

Glacier Funeral

- Glaciers are declared dead when they no longer show movement or flow under their own weight.
- A glacier funeral is a symbolic ceremony held to mark the rapid disappearance of glaciers due to climate change. The world's first glacier funeral took place for Iceland's Okjokull Glacier in 2019.

Did You Know?

2025 designated as the International Year of Glaciers' Preservation. March 21 to be observed annually as World Day for Glaciers.

About Yala Glacier

- **Location**: Langtang Valley, Nepal (Hindu Kush Himalayan region)
- **Shrinkage**: 66% loss of ice mass and 784 meters retreat since the 1970s
- **Declared dead:** May 12, 2025 (no longer moves under its own weight)
- First glacier in Asia with a climate memorial plaque, first Nepalese glacier declared dead

RIMES DECLARATION ON DISASTER PREPAREDNESS

Context: The Declaration on Disaster Preparedness was adopted at the 4th Ministerial Conference of the Regional Integrated Multi-Hazard Early Warning System (RIMES) for Africa and Asia, held in Colombo.

About Regional Integrated Multi-Hazard Early Warning System (RIMES) for Africa and Asia

- RIMES is an intergovernmental institution owned and managed by its member states, for building capacities in the generation and application of user-relevant early warning.

- RIMES was established on 30 April 2009 and was registered with the United Nations, under Article 102 of the UN Charter,
- **Origin**: It was created following the 2004 Indian Ocean tsunami, when countries across Africa, Asia, and the Pacific recognized the need for a regional mechanism to monitor and warn against natural hazards.
- **Headquarters**: Its Regional Early Warning Centre is located at the Asian Institute of Technology (AIT), Thailand.
- **Membership**: RIMES comprises 22 Member States (including India) and 26 Collaborating States.

ATMOSPHERIC MEMORY

Context: A recent study has revealed that atmospheric memory, and not just sunlight, plays a crucial role in determining the onset and retreat of monsoons.

What is Atmospheric memory?

- Atmospheric memory refers to the atmosphere's ability to store physical information, particularly in the form of accumulated water vapor, which influences the timing and persistence of monsoon rainfall. This memory effect allows the atmosphere to maintain a rainy or dry state based on its prior condition, leading to abrupt seasonal transitions between these states.
- **Earlier Understanding:** Scientists previously believed that the monsoon cycle was mainly an immediate response to changes in solar radiation (sunlight intensity).
- **Revised Understanding:** The new study shows that the atmosphere's current state depends on its recent weather history:
  - If it has been raining, conditions tend to favour continued rainfall.
  - If it has been dry, it becomes difficult to trigger rain.
  - This phenomenon, where the system can exist in two stable states (wet or dry) under the same solar conditions, is called **bistability**.

INDIA EXPANDS COASTLINE BY 3,500 KM

Context: India's coastline has been officially revised to 11,098 km, up from 7,516 km—an increase of about 48%. This change is not due to territorial expansion, but to more precise and high-resolution mapping techniques.

Reasons for the Increase

- **From Low- to High-Resolution Mapping:** Earlier measurements were based on low-resolution data (1:4,500,000 scale), which missed small coastal details. The latest survey used high-resolution mapping (1:250,000 scale), capturing finer bends, curves, and irregularities along the shore. This enhanced accuracy naturally increased the total measured length.
- **Inclusion of Offshore Islands:** The new assessment includes offshore islands that were previously uncounted or invisible in earlier datasets. Some islands, often submerged during high tide, were missed earlier due to manual mapping limitations.

Statewise Coastlines

State / Union Territory	Length (in km)	State /UT	Length
Andaman and Nicobar Islands	3,083.50	Odisha	574.7
Gujarat	2,340.62	Karnataka	343.3
Tamil Nadu	1,068.69	Goa	194
Andhra Pradesh	1,053.07	Lakshadweep	144.8
Maharashtra	877.97	Daman and Diu	54.38
West Bengal	721.02	Puducherry	42.65
Kerala	600.15		

Islands of India

- A recent data reconciliation exercise has updated the count to: 1,298 offshore islands, and 91 inshore islands. This brings the total number of islands to 1,389.
- The count excludes river islands, such as those in Assam and West Bengal,

GLOBAL OCEAN DARKENING

Context: A UK study found that 21% of the world's oceans became darker between 2003 and 2022, especially in the Arctic, Antarctic, and Gulf Stream regions.

What is Ocean Darkening?

- It is the reduction in the amount of sunlight that can penetrate the upper layers of the ocean, leading to a **shallower "photic zone"** where light-dependent life can survive and photosynthesis can occur.
- In practice, this means the sunlit layer of the sea (normally extending to about 200 metres and supporting nearly 90% of marine life) is shrinking in many regions.

Causes	Impacts
• **Coastal Waters:** Increased nutrients, sediments, and organic matter from runoff and rainfall. • **Open Oceans**: Surface warming promotes algal blooms, and climate-driven changes affect circulation patterns.	• **Marine Life:** Less light reduces photosynthesis, growth, reproduction, and communication. • **Fisheries:** Shrinking habitats and disrupted breeding lower fish stocks. • **Climate:** Reduced carbon absorption and oxygen production can affect global climate regulation.

NEW RAMSAR SITES

Context: India's total Ramsar Sites have reached 96, after several new additions.

Khichan Wetland (Phalodi, Jodhpur, Rajasthan)	• Situated in the northern Thar Desert, Khichan Wetland consists of two water bodies- **Ratri Nadi (river) and Vijaysagar Talab (pond).** • Supports over **150 bird species**, including large wintering flocks of more than 22,000 migratory demoiselle cranes. • Serves as a crucial stopover along the **Central Asian Flyway (CAF)** for migratory birds.
Menar Wetland Complex (Udaipur, Rajashtan)	• Known as the "**Bird Village**", Menar Wetland is a freshwater monsoon wetland formed by three ponds-Brahma Talab, Dhand Talab, and Kheroda Talab, covering about 463.4 hectares. • Hosts **110 species of waterbirds**, including 67 migratory species. • Home to critically endangered white-rumped vultures and long-billed vultures. • **Declared an Important Bird Area (IBA) in 2016.** • Supports over 70 plant species, including mango trees around Brahma Talab that provide roosting sites for Indian flying foxes
Udaipur Lake (West Champaran, Bihar)	• An oxbow lake formed from an abandoned river meander. • Stores excess monsoon water, recharges groundwater, and sustains water availability during dry seasons. • Provides nesting and resting habitats for resident and migratory birds.
Gokul Reservoir (Buxar, Bihar)	• Acts as a natural buffer during the monsoon, absorbing excess water and reducing flood damage in nearby villages. • Supports 50+ bird species, including migratory Bar-headed Geese and resident Kingfishers. • Important stopover for Central Asian Flyway migrants.
Gogabil Lake (Bihar)	• Gogabil Lake is an ox-bow wetland located in the Trans-Gangetic Plains of Katihar, Bihar, bordered by the Mahananda River to the northeast and the Ganga River to the south. • **It is Bihar's first Community Reserve and the 15th Protected Area in the state.** • Ecologically, it is a permanent waterbody that shrinks in summer but does not dry up and serves as an important wintering site on the Central Asian Flyway. • Endangered and rare species recorded here include the Black-bellied Tern, Lesser Adjutant Stork, Painted Stork, Ferruginous Duck, Darter, and Black-headed Ibis. • Owing to its avian diversity, the wetland is recognised as an Important Bird Area (IBA).
Siliserh Lake (Alwar, Rajasthan)	• A man-made freshwater lake constructed in 1845 by Maharaja Vinay Singh. It was originally designed to supply drinking water to Alwar through an intricate system of aqueducts, some of which still survive. • **Ecological Context:** Uniquely located within the buffer zone of the Sariska Tiger Reserve, it serves as a critical water source in a semi-arid landscape.

	• **Biodiversity:** The wetland supports the endangered tiger, the vulnerable river tern, and the Indian pangolin. • **Avifaunal Significance:** It sustains more than 1% of the biogeographic population of the black stork.
Kopra Jalashay (Bilaspur District, Chhattisgarh)	• It is the first-ever Ramsar Site in Chhattisgarh. • **Type**: A reservoir-type, man-made wetland situated in the upper catchments of the Mahanadi River. • **Avifauna Diversity:** Hosts over 60 migratory bird species, functioning as an important nesting, feeding, and stopover site during migration along the Central Asian Flyway. • **Notable Residents**: Includes vulnerable species such as the greater spotted eagle and the endangered Egyptian vulture, along with waterfowl like sarus cranes.

Ramsar Convention and India's Role

- The Ramsar Convention (1971, Ramsar, Iran) is an international treaty aimed at the conservation and sustainable use of wetlands.
- **Definition of Wetlands:** "Areas of marsh, fen, peatland, or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish, or salt, including areas of marine water with a depth not exceeding six metres at low tide.
- **India's Role:** India became a signatory in 1982.
  - **Currently, India has 96 Ramsar Sites**, the highest in Asia and third globally, after the UK (176) and Mexico (144).

Ramsar Site Selection Criteria

A wetland may be designated as a **Ramsar Site** if it meets one or more of the following criteria:

- **Criterion 1:** Represents a rare, unique, or typical natural/near-natural wetland type within its biogeographic region.
- **Criterion 2:** Supports vulnerable, endangered, or critically endangered species or threatened ecological communities.
- **Criterion 3**: Maintains biological diversity by supporting plant or animal species important to the region.
- **Criterion 4:** Provides critical habitat for species at important stages of their life cycle, or acts as a refuge during adverse conditions.
- **Criterion 5:** Regularly supports 20,000 or more waterbirds.
- **Criterion 6:** Regularly supports 1% of the population of a species or subspecies of waterbird.
- **Criterion 7:** Supports a significant proportion of indigenous fish — including subspecies, species, families, life-history stages, or interactions — reflecting wetland benefits and contributing to global biodiversity.
- **Criterion 8:** Serves as an important fish habitat, such as a source of food, spawning ground, nursery, or migration pathway, essential for local or distant fish populations.
- **Criterion 9:** Regularly supports 1% of the population of a wetland-dependent non-avian animal species or subspecies.

VOLCANIC ERUPTIONS

Context: Several significant volcanic eruptions were recorded globally in June 2025.

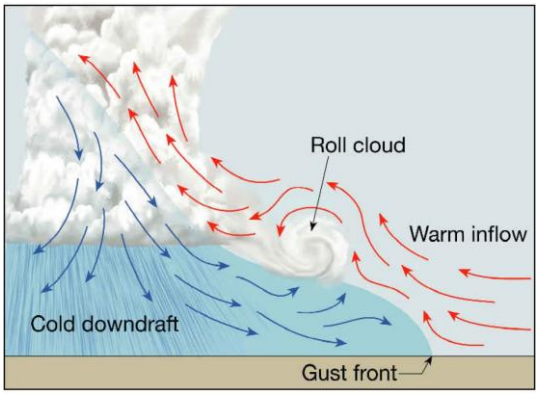
Mount Etna (Italy)	• Largest and most active volcano in Europe, located on the east coast of Sicily, the largest island in the Mediterranean Sea. • Etna's peak is the highest in Italy south of the Alps. • The stratovolcano has five summit craters and over 300 flank vents along its slopes, both responsible for frequent eruptions. • Declared a UNESCO World Heritage Site in 2013.
Mount Lewotobi Laki-laki (Indonesia)	• Located in East Nusa Tenggara province, south-central Indonesia. • Classified as a stratovolcano (a steep, layered volcano made of lava, ash, and volcanic debris.) • Recorded history includes at least 19 eruptions between 1675 and 1991, according to Volcano World.

RARE ROLL CLOUD

Context: A rare meteorological phenomenon known as a roll cloud was recently sighted along Portugal's northern and central coastline.

About Roll Cloud

- A roll cloud (scientific name: *volutus*) is a rare, low-level, tube-shaped arcus cloud that appears completely detached from other cloud formations.
- **It seems to "roll" along a horizontal axis due to wind shear.**
- Arcus clouds are **low, horizontal cloud formations** that often form at the leading edge of a thunderstorm outflow or a cold front.
- **Appearance:**
  - Long, horizontal, tube-like shape, usually solitary in the sky.
  - **Altitude:** Altocumulus volutus: 2,000–7,000m, Stratocumulus volutus: Below 2,000m
- **Formation Mechanism:**
  - Caused by cold outflows from thunderstorms or cold fronts that push cooler air beneath warm, moist air.
  - This uplift causes condensation and forms a rolling cloud detached from the main cumulonimbus system.
  - Coastal or lake breezes can also trigger density currents that generate roll clouds.
  - **Example**: The famous "Morning Glory" cloud in Australia's Gulf of Carpentaria.
- **Behavior and Impact:**
  - Moves steadily at about 30–55 km/h, maintaining its shape as a solitary wave (soliton).
  - Despite its dramatic appearance, it does not produce tornadoes—its rotation is horizontal, not vertical.



Comparison with Other Atmospheric Phenomena

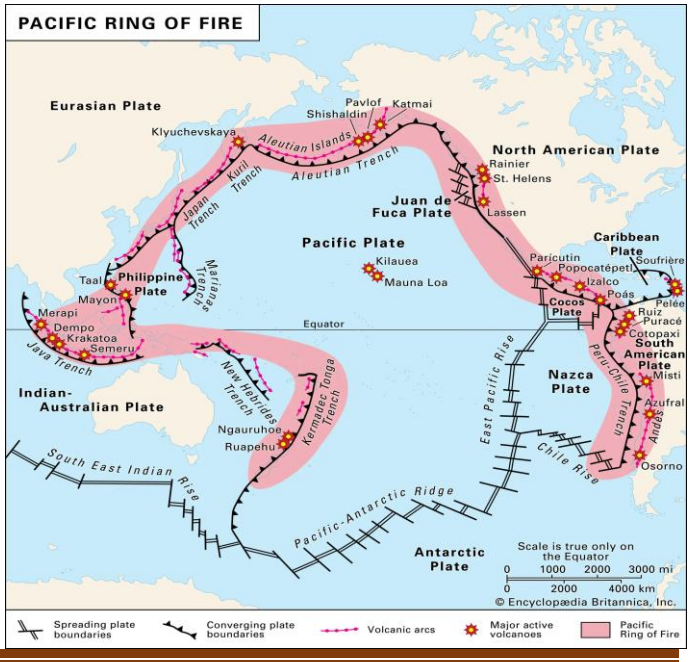
Feature	Roll Cloud	Shelf Cloud	Tornado
Shape	Tube-like	Wedge-shaped	Funnel-shaped
Attachment	Detached from storm	Attached to storm front	Part of storm system
Danger Level	Low (minor turbulence)	Associated with severe storms	Extremely destructive

PACIFIC RING OF FIRE

Context: A massive magnitude 8.8 earthquake struck near Russia's Kamchatka Peninsula, a region within the seismically active Pacific Ring of Fire. The quake triggered tsunami waves that reached coastal towns in Russia and Japan.

About the Pacific Ring of Fire

- Also known as the Circum-Pacific Belt, it is a horseshoe-shaped zone of intense earthquake and volcanic activity surrounding the Pacific Ocean basin.
- It accounts for around 75% of the world's active volcanoes and nearly 90% of global earthquakes
- **Extent and Location:** Stretches approximately 40,000 km around the Pacific Ocean. Lies along the boundaries of major tectonic plates- Pacific, Juan de Fuca, Cocos, Indo-Australian, Nazca, North American, and Philippine Plates.



Features of the Pacific Ring of Fire

- **Geographical Formations:** Responsible for mountains, island arcs, and deep ocean trenches such as the Mariana Trench, the deepest point on Earth.
- **Geothermal Potential**: Contains over 40% of the world's geothermal energy resources.
- **Mineral Wealth:** Rich in gold, copper, molybdenum, and other metallic minerals.
- **Agricultural Value:** Volcanic soils in the region are extremely fertile, supporting crops like rice and coffee.

Why Earthquakes and Volcanoes Are Common Here

1. **Subduction Zones:** Found where one tectonic plate slides beneath another at convergent boundaries. The subducted rock melts into magma near the surface, triggering volcanic eruptions. Example: Taupo Volcanic Arc (New Zealand), where the Pacific Plate moves beneath the Australian Plate.
2. **Divergent Boundaries (Mid-Ocean Ridges):** Plates move apart, creating seafloor spreading and rift valleys. Example: East Pacific Rise, where the Pacific Plate diverges from the Cocos, Nazca, and Antarctic Plates.
3. **Transform Faults:** Plates slide past each other horizontally, generating powerful earthquakes. Example: San Andreas Fault, California.
4. **Hot Spots:** Deep mantle heat melts rock, producing magma that rises through crustal cracks to form volcanoes.

HUMAN-MADE DAMS SHIFTED EARTH'S POLES

Context: Recent research has uncovered that the construction of thousands of dams worldwide has shifted the Earth's poles by nearly one metre.

Understanding True Polar Wander (TPW)

- TPW means a shift in the Earth's outer surface (the crust and mantle) relative to its rotational axis. This happens when the planet's mass distribution changes, causing the Earth to slightly "tilt" or reorient itself.
- Over Earth's history, TPW has been linked to major geological changes like the breakup and movement of supercontinents.
- When large amounts of material inside the Earth (such as molten rock in the mantle) move or rise, it can push the planet's balance off-centre, leading to a shift in the geographic poles.
- In the geological record, scientists have found evidence that at times, the poles shifted by several tens of degrees, followed by long periods of stability.
- Such movements may also influence climate, possibly triggering ice ages if continents and oceans change position relative to the poles.
- **TPW is different from Magnetic polar wander,** which refers to shifts in Earth's magnetic field, and **Plate tectonics (continental drift),** which is the slow movement of continents on Earth's surface.

How dams affect True Polar Wander?

- When water is trapped behind dams, mass is moved from the oceans to land, altering the Earth's balance and slightly adjusting its spin.
- Since the 19th century, humans have built approximately 6,862 dams around the world.
- These dams collectively store such vast amounts of water that they have redistributed Earth's mass, shifting its rotational poles by nearly 1 metre (around 3 feet).

CHENAB RIVER

Context: The Forest Advisory Committee (FAC) has granted 'in-principle' approval for the diversion of forest land required for the construction of the Sawalkot Hydroelectric Project (HEP) on the Chenab River in Jammu and Kashmir.

About Sawalkot Hydroelectric Project (HEP)

- The Sawalkot HEP is part of a **cluster of six major hydropower projects on the Indus River system**, designed to maximize India's utilization of the Indus waters under the Indus Waters Treaty (1960).
- It is planned as a **run-of-the-river project.** National Hydroelectric Power Corporation (NHPC) will build, operate, and manage the project until 2061.
- The project involves a **192.5-metre high Roller Compacted Concrete (RCC) gravity dam**. It will have an installed **capacity of 1,856 MW,** with multiple power generation units.
- **It will be developed in two stages,** and is expected to **generate about 8,000 million units of electricity annually.**

About the Chenab River

- The river originates near the Bara Lacha Pass in Himachal Pradesh.
- It is formed by the confluence of two streams - Chandra and Bhaga, which rise on opposite sides of the pass. The Chenab Valley is a structural trough, lying between the Great Himalayan Range and the Pir Panjal Range.
- **Major Tributaries:**
  - **Right Bank:** Miyar Nalla (First major tributary), Thirot, Sohal, Bhut Nalla, Liddrari, Marusudar (Largest tributary)
  - **Left Bank:** Niru, Tawi (Major left-bank tributary)
- In ancient Indian texts, the river was known as Chandrabhaga, and also referred to as Ashkini or Iskmati during the Vedic period.

BITRA ISLAND

Context: The Lakshadweep administration is evaluating a proposal for the acquisition of Bitra Island for defence purposes, given its strategic location in the Arabian Sea.

About Bitra Island

- Bitra is the **smallest inhabited island of the Lakshadweep archipelago**, with a total land area of 0.105 sq km.
- Situated close to Agatti Island, it lies in the Arabian Sea, forming part of the northern cluster of Lakshadweep islands.
- The island receives an average annual rainfall of around 1,600 mm, supporting sparse vegetation and limited freshwater sources.

LOTUS BLOOMS IN KASHMIR'S WULAR LAKE

Context: After nearly three decades, Wular Lake in Kashmir has once again witnessed the return of lotuses, due to efforts of the Wular Conservation and Management Authority.

About Wular Lake

- Located in **Bandipora district**, Wular Lake is the **largest freshwater lake in India**, about 67 km from Srinagar, and surrounded by the scenic Harmukh mountains.
- The Jhelum River serves as its main water source, and a small island in the lake, called 'Zaina Lank', adds to its charm.
- The blooming lotus in Wular Lake is a sign that it is recovering from the effects of the devastating floods that destroyed its ecosystem back in 1992.

About Lotus (Nelumbo nucifera)

- The lotus grows best in **moist, loamy clay soil** with ample sunlight- **about six hours daily.**
- During the initial growth stage, it requires minimal fertilization, and its roots must be protected from freezing to ensure healthy growth.
- The lotus stems, known locally as ***Nadru***, hold great culinary importance in Kashmir. They are often cooked with fish or yoghurt to prepare the traditional dish **'Nadru Yakhni'.**

ROLE OF MELTING ICE AND VOLCANIC ERUPTION

Context: Research presented at the 2025 Goldschmidt Conference suggests that the rapid melting of glaciers and ice caps may lead to more frequent and powerful volcanic eruptions.

- Scientists explain that **when ice melts**, the **pressure on the Earth's crust decreases,** allowing rocks to melt more easily and form magma, which **increases the likelihood of eruptions.**
- **Precipitation**, influenced by climate change, can also **seep deep underground and interact with magma systems,** sometimes **triggering volcanic activity.**

Volcanic Eruptions and Temporary Global Cooling

- Large eruptions can cause a short-term drop in global temperatures because volcanic ash and dust block sunlight.
- More significantly, sulfur dioxide (SO_2) released during eruptions enters the stratosphere, where it reacts with water vapour to create sulfuric acid aerosols. These fine particles reflect solar radiation, resulting in temporary cooling of the Earth's surface.

A Vicious Climate Cycle

- Over time, continuous volcanic activity can also release greenhouse gases such as carbon dioxide (CO_2) and methane (CH_4), which trap heat and contribute to global warming.
- Rising global temperatures then accelerate ice melt, which can in turn increase volcanic activity, creating a self-reinforcing cycle of warming and eruption.

MAITRI-2: INDIA'S 4TH RESEARCH STATION IN ANTARCTICA

Context: The Union Finance Ministry has granted in-principle approval for the establishment of Maitri-2, which will become **India's fourth Antarctic research station.**

Key Features of the Maitri-2 Project

- The project will be designed and executed by the **National Centre for Polar and Ocean Research (NCPOR**), Goa, under the Ministry of Earth Sciences (MoES).
- **Location**: Maitri-2 will be set up in the **Schirmacher Oasis of East Antarctica**, close to the existing Maitri station.
- The new station will be **significantly larger and technologically more advanced** than the current Maitri base.
- It will house **state-of-the-art laboratories, enhanced accommodation, and improved sanitation systems.**
- **Capacity:** About 90 scientists and staff during the Antarctic summer and around 40 personnel during winter.
- **Automated Systems:** Equipped with automated research instruments, the station will allow continuous remote data transmission to India, even when unstaffed.
- **Operational Life:** Designed to function for 30–45 years, far exceeding the lifespan of the current Maitri base.
- Maitri-2 will **rely on renewable energy sources,** including solar power and strong Antarctic wind energy, aligning with sustainable research practices.

India's Other Antarctic Research Stations		
Dakshin Gangotri (1983)	Queen Maud Land	India's first Antarctic station; decommissioned in 1990 after being buried under ice; now used as a supply base.
Maitri (1989)	Schirmacher Oasis	Initially built for 10 years but operational for over three decades; located near Priyadarshini Lake.
Bharati (2012)	Larsemann Hills, East Antarctica	A modern station supporting multi-disciplinary research with advanced technology.

SUPER TYPHOON

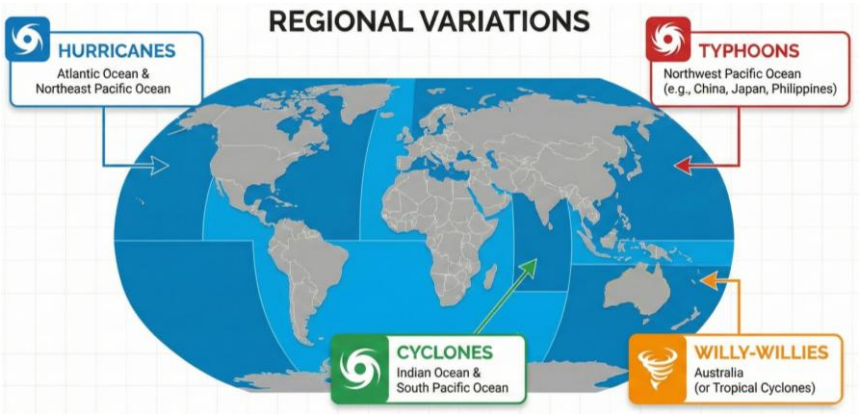
Context: The Philippines was recently struck by Super Typhoon Ragasa.

About Super Typhoons

- A Super Typhoon is **a tropical cyclone with maximum sustained winds exceeding 240 km/h** (over 130 knots).

About Tropical Cyclones

- Tropical cyclones are intense circular storms that form over **warm tropical oceans** and are characterized by **low atmospheric pressure, high winds** (often exceeding 119 km/h), and heavy rainfall.
- Tropical cyclones are warm-core, low-pressure systems characterised by spiral inflow near the surface and spiral outflow at higher altitudes.



- Their formation requires **warm sea surface temperatures (above 26–27°C), sufficient Coriolis force** (which is why they rarely form near the equator), and **atmospheric disturbances.** As warm air rises, it cools and condenses, releasing latent heat that fuels further development and creates towering clouds and heavy rains.

- In India, cyclones frequently impact both the Bay of Bengal and Arabian Sea coasts, with the Bay of Bengal seeing about four times more cyclones than the Arabian Sea.

THE AXIAL SEAMOUNT

Context: Scientists from the U.S. National Oceanic and Atmospheric Administration (NOAA) have reported renewed volcanic activity at the Axial Seamount

About Axial Seamount

- It is a **submarine volcano** located about 480 km west of Oregon in the **Pacific Ocean, sitting atop the Juan de Fuca Ridge** at the intersection of a geological hotspot and a mid-ocean ridge. It is the **most active submarine volcano in the northeast Pacific** and the **youngest volcano in the Cobb–Eickelberg Seamount chain.**
- **Morphology:** It is an underwater shield volcano, characterised by broad, gently sloping sides. The volcano contains a large rectangular caldera at its summit, situated roughly 1,400 metres below sea level.
- **Hydrothermal Vent Ecosystems:** Axial Seamount supports chemosynthetic ecosystems, communities that derive energy from hydrogen sulfide and methane rather than sunlight. These deep-sea habitats serve as important biodiversity hotspots, offering insights into life on early Earth and possible life on other planetary bodies, making them valuable for astrobiology research.
- **New Millennium Observatory (NeMO) Observatory:** The seamount hosts the NeMO, the **world's first permanent underwater volcanic observatory,** enabling long-term monitoring of submarine volcanic processes.

ARABIAN SEA MINI WARM POOL

Context: Recent studies show that Arabian Sea Mini Warm Pool functions as a natural balancing system that helps Indian monsoon regain strength after disturbances caused by events like El Niño.

What is the Arabian Sea Mini Warm Pool (MWP)?

- The Arabian Sea MWP is a region of **unusually warm sea surface water in the southeastern Arabian Sea,** near the Kerala coast, that forms every year in April–May just before the onset of the Indian Summer Monsoon.
- The sea surface temperature (SST) in this area often exceeds 30°C, making it the warmest region in the Arabian Sea during the pre-monsoon months.
- This warm pool acts as a silent stabilizer (a kind of "self-correcting" mechanism of nature) that helps the monsoon recover from the disruptions caused by the previous El Niño.
- Understanding the role of the Arabian Sea Mini Warm Pool helps scientists make more accurate monsoon forecasts

MUD VOLCANO

Context: India's only mud volcano, located on **Baratang Island in the Andaman and Nicobar Islands**, has erupted after a gap of nearly 20 years.

About Mud Volcano

- A mud volcano is a geological feature in which **mud, water, and gases erupt at the surface instead of molten rock,** unlike ordinary volcanoes.
- It forms when pressurised underground water mixes with mineral-rich sediments and clay, creating a thick slurry that rises through cracks or weak zones in the Earth's crust.
- Mud volcanoes range from small, centimeter-size structures to large edifices up to a few hundred meters high and several kilometers across.
- They can occur on land as well as underwater and are commonly found in regions affected by tectonic activity, such as plate boundaries or areas rich in organic matter.
- The eruptions are mainly driven by the release of gases like methane and carbon dioxide, which force the mud and water upward to the surface.

SOUTH ATLANTIC ANOMALY

Context: Using 11 years of data from the Swarm mission, an Earth observation programme of the European Space Agency (ESA), scientists found that South Atlantic Anomaly (SAA) has expanded significantly since 2014.

About South Atlantic Anomaly (SAA)

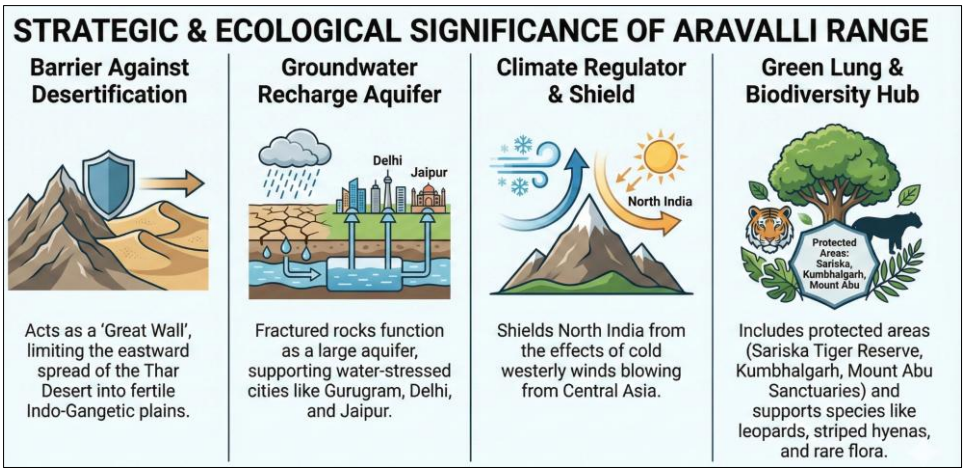
- The SAA is a **region over the South Atlantic Ocean where Earth's magnetic field is unusually weak.**

- The SAA is **caused by the tilt of Earth's magnetic axis** and the **movement of molten metals in the planet's outer core,** which together weaken the magnetic field in this region.
- Normally, Earth's magnetic field acts like a protective shield, preventing harmful charged particles from the Sun from reaching the planet and nearby satellites.
- **In the SAA region, this shield is weaker, allowing solar particles to come closer to Earth's surface than usual.**
- As a result, **satellites passing through this zone face a higher risk of electronic interference,** which can damage onboard computers and disrupt data collection.
- The size of the anomaly has grown to nearly half the area of continental Europe, indicating a noticeable change in Earth's magnetic behaviour.
- The SAA creates no visible impacts on daily life on the surface, and its weakening magnetic intensity is still within the bounds of what scientists consider normal variation.
- Observational data from 2015-2020 found that the SAA has recently started to split from a single valley, or region of minimum field strength, into two cells.

ARAVALLI HILLS

Context: Protests erupted across northern India after the Supreme Court redefined the Aravalli hills. The Court has since stayed its order on the Aravalli hills and the Aravalli range definition.

About Aravalli Mountain Ranges



- The Aravallis are **among the world's oldest mountain systems,** dating back to the Proterozoic Era (around 2 billion years ago) and oldest fold-mountain belt in India.
- **Residual Mountains:** Over long periods, they have been heavily weathered and eroded, and now exist as "residual" (relict) mountains.
- **Extent**: They stretch roughly 670–700 km from Himmatnagar (Gujarat), through Rajasthan and Haryana, up to the Delhi Ridge.
- **Highest Peak: Guru Shikhar (1,722 m) on Mount Abu.**
- The range acts as a **water divide between the Ganges basin (east) and the Indus basin (west).** Major rivers originating here include the **Luni, Sabarmati, Banas, and Sahibi.**

Comparison between Aravalli & Himalaya Mountains		
Feature	**Aravalli Range**	**Himalayan Range**
Origin	Pre-Cambrian (Oldest)	Tertiary (Youngest)
Type	Residual Fold Mountains	Young Fold Mountains
Stability	Geologically stable	Geologically unstable (seismic)

- **Mineralogy: T**he Aravallis contain metamorphic and igneous rocks with mineral deposits such as **marble, quartz, feldspar, building stone**, and other non-metallic minerals.

Major Conservation Initiatives

- **Aravalli Green Wall Project:** An ambitious plan to create a 5 km-wide green belt (buffer zone) around the range across three states and the National Capital Territory (Delhi), to combat land degradation and desertification.
- **Matri Van Initiative (2025)**: A project under the "Ek Ped Maa Ke Naam" programme, aimed at creating a 750-acre urban forest in the Aravallis.

GONIOPORA CORALS

Context: The University of Sydney has reported that the combined impact of record-breaking heat stress and an aggressive outbreak of Black Band Disease (BBD) has wiped out 75% of **Goniopora coral colonies** at **One Tree Reef** in the southern **Great Barrier Reef (GBR).**



- This event is particularly alarming because **Goniopora corals** ("flowerpot" or "daisy" corals) have historically been known for their high thermal tolerance and long lifespan.
- The incident occurred during the **fourth global mass bleaching event,** which has affected nearly 84% of the world's reefs.
- The mortality was not driven by heat alone, but by the synergistic effect of two stressors:
    - **Extreme Heat Stress (2024 El Niño):** Water temperatures at One Tree Reef stayed above 28°C for 74 consecutive days. This triggered mass bleaching, affecting 75% of the Goniopora population.
    - **Black Band Disease (BBD):** Black band disease is an infectious coral disease marked by a dark microbial band that moves slowly across the colony. As the band advances, it destroys the living coral tissue behind it, leaving a bare skeleton exposed.
- The large-scale loss of Goniopora colonies suggests a **shift from "bleaching–recovery" cycles to "bleaching–disease–death" trajectories.**

What are Corals?

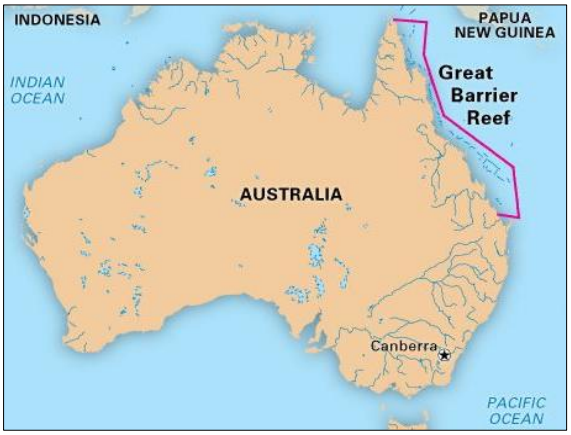
- Corals are **colonies of genetically identical polyps that house tiny algae called zooxanthellae within their tissues.**
- This relationship is **mutualistic**: corals supply the algae with compounds needed for photosynthesis, while zooxanthellae provide the corals with nutrients and energy-rich carbohydrates, essential for building their calcium carbonate skeletons. Additionally, the algae give corals their vibrant colors.

What is Coral Bleaching?

- Coral bleaching occurs when corals are stressed by factors such as temperature changes, pollution, or high ocean acidity.
- Under stress, the algae within corals (zooxanthellae) produce harmful substances, causing the corals to expel them. This loss exposes the corals' white skeletons, making them appear bleached and ending the algae-coral symbiosis essential for coral survival.

Causes of Coral Bleaching

- **Rising Ocean Temperatures:** Climate-induced temperature increases are the main cause.
- **Runoff and Pollution:** Freshwater runoff and pollutants dilute ocean waters, harming corals.
- **High Sunlight Exposure:** High temperatures combined with strong sunlight bleach shallow-water corals.
- **Low Tides:** Air exposure during extremely low tides can cause bleaching
- **Additional Threats:** Biological Invasions; Chemical Pollutants; Diseases



What is the Great Barrier Reef?

- Australia's Great Barrier Reef, the world's largest system with nearly 3,000 individual reefs, hosts 400 coral species, shelters 1,500 fish species, and 4,000 molluscs.
- Coral reefs support over 25% of marine biodiversity, despite only occupying 1% of the seafloor.
- The Great Barrier Reef, located in the Coral Sea off Queensland, Australia is made up of billions of coral polyps and was designated a World Heritage Site in 1981.

GERMANIUM

Context: India engaged with China on germanium (a critical mineral for Semiconductors) export restrictions.

About Germanium	
Occurrence	Germanium is not found in its pure form; it is obtained as a byproduct of zinc and copper mining or from coal fly ash.
Critical Minerals Status	India's Ministry of Mines has classified germanium as a critical mineral due to its importance in defense and renewable energy technologies.
Chemical Nature	• Germanium is a metalloid in Group 14 of the periodic table • Distinct from 17 rare earth elements (REEs), which include the 15 lanthanides, scandium, and yttrium • Its inclusion in critical mineral discussions is due to its scarcity, high-tech applications, and geopolitical significance
Key Applications	• **Semiconductors**: Conducts electricity under specific conditions; used in early transistors before silicon dominance • **Infrared Optics**: Essential for night-vision goggles, thermal imaging cameras, and missile guidance systems • **Example**: Military-grade infrared lenses in defense systems rely on germanium
Global Production	• The largest producer of germanium in the world is China, which accounted for around 60% to over 90% of global germanium production in recent years. • Other notable producers include Russia, United States and Canada • India lacks significant deposits; relies on imports, primarily from China. GSI has not identified viable reserves.

GEOTUBING TECHNOLOGY

Context: A study by scientists from the National Institute of Ocean Technology (NIOT) found that geotube technology has produced transformations in coastal landscapes behind offshore breakwater stretches.

What is Geotube Technology?



- Geotube technology **uses large, permeable geotextile tubes filled with dredged or locally sourced sediment** (typically sand) **to construct offshore breakwaters, groynes, or shoreline protection barriers.**
- Example: Odisha and Tamil Nadu coastlines have used geotubes to control coastal erosion after cyclones like Phailin and Gaja.
- The **tubes are made of high-strength, permeable fabric**, allowing water to pass through while retaining sediment.
- Once filled and sealed, geotubes act as flexible, durable barriers that: Absorb and dissipate wave energy, Reduce coastal erosion, Promote sediment deposition, forming stable beaches

About National Institute of Ocean Technology (NIOT)

- The NIOT was established in November 1993 as an **autonomous society under the Ministry of Earth Sciences**.
- NIOT is managed by a Governing Council and the Director is the head of the Institute.
- **Aim:** To develop reliable indigenous technologies to solve the various engineering problems associated with harvesting of non-living and living resources in the Indian Exclusive Economic Zone (EEZ), which is about two-thirds of the land area of India.

ENVISTATS INDIA 2025

Context: The Ministry of Statistics & Programme Implementation (MoSPI) has released the 8th edition of its publication titled "EnviStats India 2025: Environment Statistics."

Important Highlights of EnviStats India 2025

- **Rising Temperatures:** The annual mean temperature rose from 25.05°C (2001) to 25.74°C (2024). The annual minimum temperature increased from 19.32°C to 20.24°C, and the annual maximum temperature rose from 30.78°C to 31.25°C over the same period.
- **Inland Fish Production:** Production increased from 61.36 lakh tonnes (2013–14) to 139.07 lakh tonnes (2023–24), reflecting growth in inland aquaculture and freshwater fisheries.
- **Energy Generation:** Thermal power generation rose from 7,92,053 GWh to 13,26,549 GWh. Electricity generation from renewable sources increased from 65,520 GWh to 2,25,835 GWh during 2013–14 to 2023–24.

About EnviStats India

- It is issued **annually** since 2018, compiled by the National Statistics Office (NSO) according to the UN Framework for the Development of Environment Statistics (FDES) 2013.
- It covers six core components: 1) Environmental Conditions & Quality, 2) Environmental Resources & Their Use, 3) Residuals (waste/pollution), 4) Extreme Events & Disasters, 5) Human Settlements & Environmental Health, and 6) Environmental Protection, Management & Engagement.

THIRSTWAVE

Context: Researchers Meetpal Kukal and Mike Hobbins coined the term "thirstwaves" to describe extended periods of high atmospheric thirst, or evaporative demand.

- **What is thirstwave?:** A period of at least three consecutive days where the atmosphere is "thirsty" and pulls moisture from the soil and plants at an extreme rate.
- **Measurement**: It's a measure of atmospheric evaporative demand, influenced by factors like temperature, humidity, solar radiation, and wind speed.

Impact: Thirstwaves can cause faster soil moisture loss, greater irrigation needs, and a higher risk of crop stress and yield reduction.

- **Cause**: Climate change is increasing the frequency and intensity of thirstwaves, as global warming creates thirstier air with higher evaporative demand.
- **Distinction from heatwaves:** While heatwaves are primarily driven by high temperatures, thirstwaves are a more comprehensive measure that includes multiple factors like humidity, wind, and solar radiation.

DISASTER RISK REDUCTION (DRR) FINANCING

Context: The United Nations Office for Disaster Risk Reduction (UNDRR) released its Global Assessment Report (GAR) 2025, titled “Resilience Pays: Financing and Investing for Our Future.”

What is Disaster Risk Reduction (DRR)?

- DRR means taking planned actions to prevent or lessen the impact of natural and human-made disasters before they happen.
- It focuses on reducing the damage caused by hazards such as floods, earthquakes, cyclones, droughts, or pandemics by making communities, systems, and infrastructure more prepared and resilient.

About United Nations Office for Disaster Risk Reduction (UNDRR)	
Role	• Lead UN agency for coordinating disaster risk reduction (DRR). • Provides leadership and support to accelerate global efforts in DRR.
History	Originally established as UNISDR in 1999 to facilitate the implementation of the International Strategy for Disaster Reduction (ISDR).
HQ	Geneva, Switzerland
Purpose	Supports countries to achieve inclusive sustainable development and the goals of the Sendai Framework for Disaster Risk Reduction (2015–2030).
Sendai Framework 2015–2030	• A 15-year non-binding agreement with 7 targets. • An improved version of the Hyogo Framework for Action (2005–2015). • Adopted at the 3rd UN World Conference on DRR in 2015, Sendai, Japan.

REVISED GUIDELINES ON NATIONAL BIOENERGY PROGRAMME

Context: Ministry of New and Renewable Energy (MNRE) issued revised guidelines for Waste to Energy and Biomass subcomponents to streamline project approval, incentivize specific segments, and improve programme outreach.

About National Bioenergy Programme

- It is a major initiative of MNRE aimed **at promoting the sustainable use of biomass and other renewable resources to produce electricity, biogas, BioCNG, and advanced biofuels.**
- It was launched in November 2022 and is being implemented from FY 2021-22 to 2025-26.
- Its main objectives are to **utilize surplus biomass**, **industrial and urban biowaste** for energy recovery, **reduce rural pollution** (especially crop residue burning), **foster rural incomes**, and **support decentralized energy systems**

Sub-Schemes of National Bioenergy Programme

- **Waste to Energy Programme:** Focuses on projects for generating biogas, BioCNG, power, or syngas from urban, industrial, and agricultural waste.
- **Biomass Programme:** Supports biomass briquette/pellet manufacturing plants and biomass cogeneration projects (excluding bagasse).
- **Biogas Programme:** Promotes family and medium-size biogas plants in rural areas for clean cooking fuel, small power needs, improved sanitation, and women's empowerment.

STATE ENERGY EFFICIENCY INDEX (SEEI)

Context: The Bureau of Energy Efficiency (BEE), under the Ministry of Power, has released the State Energy Efficiency Index (SEEI) 2024 in collaboration with the Alliance for an Energy Efficient Economy (AEEE).

About the State Energy Efficiency Index 2024 (Sixth Edition)

- The index evaluates the energy-efficiency performance of 36 States and Union Territories for FY 2023–24.
- It uses 66 indicators across seven major demand sectors: Buildings, Industry, Transport, Agriculture, Municipal Services, Electricity Distribution Companies (DISCOMs), and Cross-sector Initiatives.
- New features in the 2024 framework include: Integration of the Energy Service Companies (ESCO) model, Star-rating systems for buildings, Profiling of MSME clusters, Expansion of the PAT (Perform, Achieve, and Trade) scheme, Incentives to support electric vehicle (EV) adoption.
- States are grouped into four performance categories: Front Runners (>60%), Achievers (50–60%), Contenders (30–50%), Aspirants (<30%)

GLOBAL REPORTING INITIATIVE

Context: The Global Reporting Initiative (GRI) has launched the Integrity Matters Checklist.

- Integrity Matters Checklist is a UN-endorsed framework that helps organisations align their climate-related disclosures with the United Nations' net-zero standards.

About the Global Reporting Initiative (GRI)

- The GRI is an independent not-for-profit organization that leads a global multi-stakeholder process to develop and refine rigorous yet practical sustainability reporting.
- Using the GRI Standards, organizations can understand and act on the full range of their impacts.
- GRI's consistent, comparable and globally-applicable standards have become the world's most widely-used sustainability reporting standards. They are trusted by thousands of organizations around the world, providing the building blocks for transparent reporting, and helping them to manage risks and opportunities and support strategic decision-making.
- For nearly 30 years, GRI has engaged in a multi-stakeholder approach to define and refine the global best practice for sustainability reporting.
- GRI is a non-profit foundation registered with the Netherlands Chamber of Commerce as a Public Benefit Organization.
- The framework is organised into three components: **Universal Standards, Sector Standards, Topic Standards.**

GRADED RESPONSE ACTION PLAN (GRAP)

Context: The Commission for Air Quality Management (CAQM) has enforced Stage-IV of the Graded Response Action Plan (GRAP) across the entire National Capital Region (NCR).

About the Graded Response Action Plan (GRAP)

- GRAP is an emergency response framework implemented by the **CAQM**, based on the **Air Quality Index (AQI) and forecasts of meteorological and weather conditions in Delhi.**
- It was first introduced following directions of the Supreme Court in the M.C. Mehta vs. Union of India case.
- The plan categorises actions into four stages according to AQI levels.
  - **GRAP Stage 1:** AQI Poor: 201–300
  - **GRAP Stage 2:** AQI Very Poor: 301–400
  - **GRAP Stage 3:** AQI Severe: 401–450
  - **GRAP Stage 4:** AQI Severe+: 451 and above

About Commission for Air Quality Management (CAQM)

- CAQM is a **statutory body** established by the Union Government under the **Commission for Air Quality Management in National Capital Region and Adjoining Areas Act, 2021.**
- It was created to address the persistent air pollution issues in Delhi-NCR and adjoining areas, including Punjab, Haryana, Uttar Pradesh, and Rajasthan.
- The Commission has been set up for better co-ordination, research, identification and resolution of problems surrounding the air quality index and for matters connected.
- The commission is directly accountable to the parliament. It replaced the Environment Pollution (Prevention and Control) Authority (EPCA), a Supreme Court-mandated body.
- **Powers:**
  - Restricting activities influencing air quality.
  - Investigating and conducting research related to environmental pollution impacting air quality, preparing codes and guidelines to prevent and control air pollution,
  - Issuing directions on matters including inspections, or regulations, which will be binding on the concerned person or authority.
  - All the directions and orders by the Commission are of binding nature, and any person, officer, or authority shall be bound to comply with the same.
- **Composition:**
  - **Chairperson:** A senior government officer of Secretary or Chief Secretary rank, appointed for three years or until the age of 70 years.
  - It will also have **five ex officio members** who are either Chief Secretaries or Secretaries in charge of the department dealing with environment protection in the States of Delhi, Punjab, Haryana, Rajasthan, and Uttar Pradesh.
  - Three full time technical members.
  - Three members from non-government organisations.
  - Technical members from Central Pollution Control Board (CPCB), Indian Space Research Organisation, and NITI Aayog.

TOBACCO GENERATIONAL BAN

Context: The Maldives has become the first country to introduce a generational ban on tobacco.

- The Generational Tobacco Ban, also called a Lifetime Tobacco Ban, is a policy that **permanently prohibits the sale of cigarettes and other tobacco products to individuals born after a fixed cutoff date**. This means they can never legally buy tobacco at any age.

About Tobacco Crop

- Tobacco has been **used in the Americas**, and was **introduced to India by Portuguese merchants** in the early 17th century, during the reign of Akbar.
- Tobacco refers to several **plant species belonging to the genus Nicotiana,** most notably *Nicotiana tabacum,* which is the main commercial crop used for producing tobacco-based products.

- Tobacco requires a **frost-free period of 90-120 days** and temperatures between 20-30°C for best growth. Annual rainfall of about 100 cm, well-distributed, suits most tobacco crops. Well-drained, friable sandy loams are ideal, with soil being more critical than climate.

About Tobacco Board of India

- The Tobacco Board of India is a statutory body established on 1 January 1976 under the Tobacco Board Act, 1975 (Act 4 of 1975).
- The Board is headed by a Chairperson and is responsible for the overall development of the tobacco industry.
- **Headquarters**: Guntur, Andhra Pradesh
- **Nodal Ministry**: Ministry of Commerce and Industry
- **Functions:** Promotes tobacco exports, regulates FCV tobacco production and marketing, ensures fair prices for farmers, provides financial and input support, and promotes sustainable, quality-focused cultivation.

India's Tobacco Industry

- India is the second-largest producer of tobacco in the world, after China.
- It is the fourth-largest producer of FCV tobacco globally, after China, Brazil, and Zimbabwe.
- India is also the second-largest exporter of unmanufactured tobacco (in terms of quantity), after Brazil.
- India's major tobacco manufacturing states are Gujarat, Andhra Pradesh, Uttar Pradesh, Karnataka, West Bengal, Telangana and Bihar.

NATIONAL ONE HEALTH MISSION

Context: The meeting of the Scientific Steering Committee on One Health, chaired by Prof. Ajay K. Sood, Principal Scientific Adviser, was held in December 2025.

About National One Health Mission (NOHM)

- The NOHM has been launched by the Government of India under the **guidance of the Indian Council of Medical Research (ICMR)** steered by the Office of the Principal Scientific Adviser (PSA).
- The mission **aims to build long-term health resilience** by **addressing human, animal, and environmental health** in an integrated and holistic manner.
- Several ministries and government agencies are working together to support its implementation.
- The mission **focuses on strengthening pandemic preparedness and integrated disease control** across priority human, animal, and environmental health sectors.
- It also supports key preparedness pillars, including
  - Targeted research and development for vaccines, diagnostics, and therapeutics;
  - Strengthening clinical care capacity;
  - Improving data and information linkages across sectors;
  - Encouraging community participation to enable timely and coordinated responses.
- **Central Anchor Institution**: National Institute of One Health, Nagpur.
- **Governance Structure**
  - **Executive Committee:** Chaired by the Union Minister of Health and Family Welfare, with the Principal Scientific Adviser (PSA) as Vice-Chair. The Member (Health) from NITI Aayog is a permanent invitee, and Secretaries of stakeholder departments and representatives from two States (on a rotational basis) are members. This committee **provides overall policy direction and guidance for the mission.**
  - **Scientific Steering Committee:** Chaired by the PSA, with Secretaries/Director Generals of stakeholder departments and representatives from two States (on a rotational basis) as members. This committee provides **scientific oversight and strategic direction to the mission.**

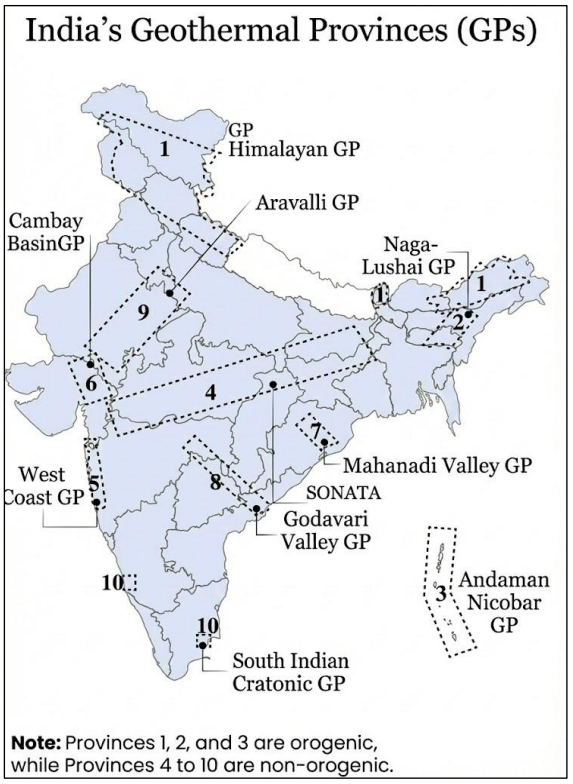
- The 'One Health' approach is an integrated, collaborative strategy that recognizes the interconnectedness of human, animal, and environmental health, aiming to optimize health outcomes for all.
- It emphasizes that the health of people, animals, plants, and ecosystems are closely linked and interdependent, requiring coordinated efforts across sectors and disciplines.

NATIONAL POLICY ON GEOTHERMAL ENERGY 2025

Context: The Ministry of New and Renewable Energy (MNRE) has released India's first National Policy on Geothermal Energy to tap the geothermal potential as a clean and reliable energy source.

Key Provisions of the Policy

- **Objectives:**
  - Strengthen energy security by enabling 24×7 baseload renewable power.
  - Cut greenhouse gas emissions and support India's Net Zero 2070 target.
  - Promote hybrid systems such as solar–geothermal and advanced technologies like Enhanced Geothermal Systems (EGS).
- **Institutional Framework:**
  - MNRE is the nodal ministry.
  - An inter-ministerial coordination mechanism and state nodal agencies will support implementation.
- **Resource Mapping and Exploration:**
  - National-level mapping, geoscientific surveys, and phased exploration including drilling.
  - GSI has identified 381 hot springs across 10 geothermal provinces, including: Himalayas, Cambay Graben, Godavari Basin, Aravalli, Mahanadi Basin
  - **Additional zones:** Sohana, West Coast, Son–Narmada–Tapti, South India Cratons
  - **Priority sites:** Puga (Ladakh), Tattapani (Chhattisgarh), Dirang (Arunachal Pradesh).



- **Financial and Fiscal Support:**
  - Concessional finance, viability gap funding for costly drilling, and concessional loans.
  - 100% FDI permitted where relevant.
- **Tenure and Project Life:** Long-term project contracts of up to 30 years, with possible extensions based on resource sustainability.

About Geothermal Energy

- Geothermal energy is heat derived from within the Earth's crust, generated by the planet's formation and ongoing radioactive decay of minerals.
- It is a clean, constant (baseload) renewable source that helps balance intermittent sources like solar and wind. It supports global goals such as SDG 7 (Affordable Energy) and SDG 13 (Climate Action).

How Geothermal Energy Works

- Geothermal energy is accessed by drilling wells into underground reservoirs of hot water or steam, which can then be used directly for heating or to drive turbines for electricity production.
- The heat comes from deep within the Earth, where temperatures can exceed 4,000°C, and is transported to the surface through natural processes or engineered systems.

Applications and Uses

- **Direct use:** Heating buildings, greenhouses, swimming pools, and spas.
- **Electricity generation:** Geothermal power plants use steam or hot water to generate electricity reliably, independent of weather conditions.
- **Geothermal heat pumps:** These systems use the stable temperatures underground to heat and cool buildings efficiently.

GREY RHINO EVENT

Context: In 'Sliding Earth, Scattered Lives' study, Wayanad Landslides were termed as Grey Rhino Event.

What is a Grey Rhino Event?

- Grey Rhino events refer to **high-probability, high-impact systemic disruptions** that are often overlooked despite clear warning signs.

- Unlike Black Swan events, which are rare and unpredictable, Grey Rhinos occur after visible patterns and accumulating evidence.

Why the Wayanad Landslides Qualify as a Grey Rhino Event

- The study notes that the landslides occurred in a well-documented landslide-prone zone.
- The region has experienced repeated landslides in recent years.
- Despite these clear risks, government intervention and mitigation measures were insufficient, making the disaster a classic Grey Rhino event.

Other Common Risk Terms

- **Black Swan:** A very rare event that nobody expects, but when it occurs, it changes everything.
- **Black Elephant:** A mix of a "Black Swan" and an "elephant in the room." A problem that everyone knows exists, but its full danger becomes clear only after it causes a crisis.
- **Dragon King:** A rare, extremely high-impact event or effect or activity that is so big, so calamitous, that it doesn't fit in the range of expected magnitudes.

EARLY WARNINGS FOR ALL (EW4ALL)

Context: The World Meteorological Organization (WMO) has convened an Extraordinary Congress of its 193-member states to speed up the Early Warnings for All (EW4ALL) initiative.

About Early Warnings for All (EW4ALL) initiative.

- Launched by UN Secretary-General António Guterres in 2022, the programme **aims to ensure that every person in the world is covered by life-saving early warning systems by 2027**
- **Led by WMO, UNDRR, ITU, and IFRC,** the initiative strengthens global collaboration to enhance risk knowledge, monitoring, communication, and preparedness for climate-related hazards.
- It aims to address the gap faced by nearly one-third of the global population, especially in poorer and island countries.
- It was initially focused on 30 high-risk countries, EW4All has expanded to more than 100 participating nations.
- Early Warnings for All (EW4ALL) rests on four pillars.
    - **Disaster Risk Knowledge:** led by United Nations Office for Disaster Risk Reduction (UNDRR), improves risk assessment and sharing of hazard information.
    - **Detection and Forecasting:** led by the World Meteorological Organization (WMO), focuses on accurate monitoring and prediction of hazards.
    - **Warning Communication:** led by the International Telecommunication Union (ITU), ensures alerts reach all people, including those in remote areas.
    - **Preparedness and Response:** led by the International Federation of Red Cross and Red Crescent Societies (IFRC), strengthens community readiness to act on warnings.

KUTTANAD WETLAND AGRICULTURAL SYSTEM

Context: Soil tests in Kuttanad (the "rice bowl of Kerala") have reported dangerously high aluminium concentrations in paddy fields, posing a serious risk to crop health and productivity.

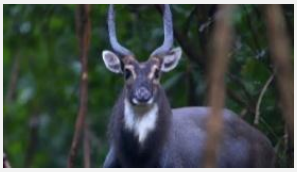
- This aluminium is not "introduced" as an external pollutant; instead, it becomes chemically mobilised due to extreme soil acidification.
- It is leading to **Root Morphogenesis**. High aluminium primarily damages root tips (apex). Roots become short, thick, brittle, and brown, reducing their ability to penetrate the soil.

About Kuttanad Wetland Agricultural System

- It is the only system in India (and one of the few globally) where rice is cultivated 1.2 to 3.0 metres below sea level, primarily in **Kerala's Alappuzha, Kottayam, and Pathanamthitta districts.** The system contributes 25% of Kerala's rice production
- It was designated a Globally Important Agricultural Heritage System (GIAHS) by the FAO in 2013.
- It lies at the confluence of five major rivers: Pamba, Meenachil, Achancovil, Manimala, and Periyar.
- **Landscape Mosaic:** The region includes three distinct land types:
    - **Kayal (Wetland):** Paddy fields reclaimed from backwaters.
    - **Karapadam (Upland):** Rice fields at slightly higher elevations.
    - **Kari (Peat):** Deep, carbon-rich black soil zones.

- **Bund System**: Farmers created **Padasekharams (polders)** by building large earthen bunds to prevent saline intrusion and protect fields from river flooding.
    - Similar to the **polders of the Netherlands**, Kuttanad uses bunds (embankments) and dewatering systems. However, unlike Dutch concrete bunds, **Kuttanad relies on bio-bunds made of clay, coir, and coconut husks.**
- **Integrated Farming:** The **traditional "One Paddy, One Fish" cycle** (paddy–fish rotation) supports soil fertility and provides multiple income sources.

SPECIES IN NEWS

Red-Crowned Roofed Turtle 	• After 30 years, 20 critically endangered red-crowned roofed turtles were reintroduced into the Ganga (at Haiderpur Wetland in Uttar Pradesh) • **IUCN:** Critically Endangered; **WPA 1972:** Schedule I • **Physical Traits:** Shell length can reach up to 56 cm. Weight can be up to 25 kg. • **Sexual dimorphism**: Males are shorter, about half the length of females. • **Habitat**: Only in the Chambal River (fewer than 300 individuals).
Mosura Fentoni 	• Newly identified extinct species dating back ~506 million years (Cambrian Period). • **Taxonomy**: Belongs to the Radiodonta group, a distant relative of modern arthropods (insects, spiders). • **Size:** Small predator, 1.5–6 cm long. • Specialized adaptations indicate an active marine lifestyle.
Saola 	• An international team has successfully **mapped the genome** of the saola, one of the world's rarest large land mammals. • Categorized as **Critically Endangered**; estimated population size: 50–300 individuals (2015 assessment). • **Habitat:** Found in the **Annamite Mountain range**, spanning the border of **Vietnam and Laos**. • **Rarity:** Has **never been observed alive in the wild by scientists**; most knowledge comes from **skulls and skins**.
Fishing Cat 	• Recently, WII-Dehradun collared three individuals in Coringa Wildlife Sanctuary to study their behaviour. • About twice the size of a domestic cat, with a muscular build and stocky legs. • Found in wetlands, especially mangrove forests, river valleys, and grasslands near water bodies. • The fishing cat is nocturnal and apart from fish also preys on frogs, crustaceans, snakes, birds etc. • Listed as Vulnerable (IUCN). Schedule I - WPA and CITES Appendix II.
Bonnet Macaque 	• Kerala has sought the Centre's approval for a birth control programme for the Bonnet Macaque. • It is an omnivorous animal, endemic to southern India and known for its distinct tuft of hair resembling a bonnet. • Like other macaques, the Bonnet Macaque is very sociable. • Found across Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, Goa, and Maharashtra; largely absent from dense Western Ghats forests. • Listed as Vulnerable (IUCN, 2020) and protected under Schedule I - WPA and CITES Appendix II

Begonia nyishiorum 	• A new flowering plant species discovered in the East Kameng district of Arunachal Pradesh (endemic). • Located in the Indo-Burma biodiversity hotspot, known for high endemism and species diversity. • **Name Origin:** Honors the Nyishi tribe, the largest indigenous community in Arunachal Pradesh. • **Distinct Feature:** Crimson-fringed petioles, a unique trait not seen in any other Asian Begonia species. • **Ecosystem**: Adapted to sub-zero conditions and steep slopes, highlighting its resilience in extreme environments. • **Conservation Status:** Classified as Data Deficient on the IUCN Red List.
Kharai Camel 	• A herd of 33 rare Kharai camels was rescued after being caught in a rising sea tide near Vadinar Jetty, off Jamnagar coast, Gujarat. • **Unique Adaptation:** Native to Kutch, this rare breed can swim and survive in coastal and marshy ecosystems. • Unlike desert camels, Kharai camels feed on saline mangroves and can swim 3–5 km in seawater to reach grazing islands. • Reared mainly by the **Rabari pastoralist** community in **Kutch**. • The camels' milk and wool support Rabari livelihoods through sustenance and handicrafts.
Zographetus mathewi (Sahyadri Spotted Flitter) 	• A new butterfly species discovered in the Western Ghats, named after entomologist George Mathew. • **Common Name:** Sahyadri Spotted Flitter, referring to its habitat in the Western Ghats. • **Habitat**: Endemic to low-elevation tropical forests of Kerala, indicating a highly specialized ecological niche.
Neelakurinji (Strobilanthes kunthiana) 	• Tamil Nadu, Kerala, and Karnataka have not proposed declaring Neelakurinji as a threatened species under the Biological Diversity Act, 2002, as per the Botanical Survey of India's submission to the NGT. • **Habitat and Distribution:** Found mainly in the Nilgiris, Munnar, Palani–Kodaikanal, and Anamalai hills, with a small subpopulation in the Eastern Ghats (Yercaud, Shevaroy Hills). • **Unique Trait:** A flagship species of the shola-grassland ecosystem in the Western Ghats, blooming once every 12 years at elevations between 1,340–2,600 meters. • **Threats**: IUCN reports a 40% habitat loss due to tea and softwood plantations and invasive species such as eucalyptus and black wattle.
Sliteye Shark 	• Scientists have recorded the sliteye shark for the first time in the **Great Chagos Bank, the world's largest coral atoll.** • **Physical Features:** Grows up to 95 cm, with a slender body, long narrow snout, and slit-like eyes with vertical pupils for better low-light vision. • **Habitat & Distribution:** Found in shallow coastal waters of the Indo–West Pacific, including India, Sri Lanka, Indonesia, and Australia. • **Conservation Status:** 'Near Threatened' on the IUCN Red List.
Mycetia malayana	• This plant species, earlier known only from Southeast Asia, has been recorded for the first time in India at **Sepahijala Wildlife Sanctuary, Tripura.** • **Physical Characteristics:** A perennial shrub with slender stems, opposite leaves, and small tubular flowers and berries from the Rubiaceae family. • **Biodiversity Role:** Supports pollinators and seed dispersers, helping maintain

	ecosystem balance. • Tripura lies within the **Indo-Burma biodiversity hotspo**t, one of the world's 36 hotspots known for high species diversity.
Pallas's Cat 	• The WWF-India survey recorded the first photographic evidence of the Pallas's cat in Arunachal Pradesh. • It has a stocky body, thick fur, a flattened face, and low-set ears. • It lives in high-altitude steppes, grasslands, and rocky areas at elevations of 3,000–5,000 metres. • It is native to Central Asia, including Mongolia, China, Russia, and Kazakhstan. • In India, it was earlier known only from Ladakh and Sikkim. • It is solitary and nocturnal. They are primarily crepuscular carnivores, hunting during dusk and dawn to avoid their own predators like eagles and foxes. • **IUCN Red List:** Least Concern; **CITES:** Appendix II
Black Aspergilli (a group of fungi)	• Scientists from the MACS-Agharkar Research Institute in Pune identified two new species of black aspergilli in the Western Ghats. • ***Aspergillus dhakephalkarii*** grows rapidly and produces brown spores and orange sclerotia. It has smooth, oval-shaped spores. • ***Aspergillus patriciawiltshireae*** also grows quickly and forms abundant sclerotia. It produces fewer spores, which are spiny and have branching structures. • Both species are important decomposers and have industrial uses in fermentation, enzyme production, and citric acid synthesis.
Giant African Snail (GAS) 	• The Giant African Snail is an invasive species found recently in parts of Chennai. • It can carry parasites that cause brain inflammation in humans. • It is an air-breathing hermaphrodite and can self-fertilize. • It feeds on more than 500 plant species, including vegetables and ornamental plants. It also eats decaying matter and calcium-rich materials like plaster and stucco from buildings.
Green Sea Turtle 	• The global population of green sea turtles has grown by about 28% since the 1970s, according to the IUCN. • As adults, they are the **only sea turtle species that mainly eat plants, especially seagrasses and algae**. They live in shallow coastal waters, lagoons, coral reefs, and seagrass meadows. • Green turtles are **found across tropical and subtropical oceans worldwide**, including the Atlantic, Pacific, and Indian Oceans, and even the Mediterranean Sea. • In India, they are **commonly seen along Odisha's coastline and the Andaman & Nicobar Islands.** • They play an important ecological role by grazing on seagrasses, which helps maintain healthy marine ecosystems. • Their conservation status has improved over the years, moving from Endangered to **Least Concern on the IUCN Red List.**

Blackbuck 	• The blackbuck has returned to Chhattisgarh's **Barnawapara Wildlife Sanctuary** after being locally extinct for nearly fifty years. • Male blackbucks are easily recognised by their sharp black-and-white colouring and long, spiral horns. • These animals are **native to the Indian subcontinent** and usually live in open grasslands and scrub forests. Their presence indicates a healthy ecosystem with balanced predator–prey relationships involving foxes, jackals, and sometimes leopards. • Although local threats remain, the species is listed as **Least Concern on the IUCN Red List** because of strong recovery efforts. It is listed under Schedule I of the Wildlife Protection Act (WPA), 1972
Indian Wolf 	• The IUCN has, for the first time, assessed the Indian wolf separately, recognising it as a potentially distinct species within the Canis genus. • The Indian wolf mainly inhabits thorn forests, scrublands, and arid to semi-arid grasslands of India, with a small presence in Pakistan. • It is one of the few large carnivores that commonly lives in agro-pastoral landscapes of semi-arid India. • Vulnerable (IUCN), Schedule I of WPA, 1972
Pallas's Gull 	• This rare migratory bird was spotted in Udhwa Bird Sanctuary, after nearly a decade. Udhwa is Jharkhand's only bird sanctuary and a Ramsar Site, comprising two main lakes: Patora and Berhel. • They are birds of saline, brackish, and fresh water bodies. • **Pallas's Gull's Size:** Third-largest gull species in the world. • **Indian Distribution:** Winters across the Gangetic Plains, coastal regions, and large inland water bodies (e.g., Chilika Lake, Harike) • **Migratory Path:** Uses the Central Asian Flyway (CAF), one of the world's nine major migratory routes. • **IUCN:** Least Concern |
Western Tragopan 	• The Sarahan Pheasantry's captive-breeding initiative in **Himachal Pradesh** has helped stabilise the Western Tragopan population. • Also called **Jujurana** or the "**king of birds,**" it is among the world's rarest **pheasants** and the **state bird of Himachal Pradesh**. • **Endemic Range:** Western Himalayas (Himachal Pradesh, Jammu & Kashmir, Uttarakhand; also parts of northern Pakistan). • **Key Habitat**: Great Himalayan National Park (Himachal Pradesh) holds the world's largest known wild population. • **IUCN:** Vulnerable (VU) | **WPA:** Schedule I | **CITES:** Appendix I.
Senna spectabilis 	• The Tamil Nadu government has launched a drive to remove Senna spectabilis from forests by March 2026. • **Common Names:** Golden Wonder, American Cassia. • **Appearance:** A medium-sized deciduous tree (10–15 m) with bright yellow flowers. • **Native Range:** Tropical South and Central America (e.g., Brazil, Peru). • **Current Status:** Listed among the most highly invasive species in the Western Ghats' Nilgiri Biosphere Reserve. • **IUCN Status:** Least Concern.

SCIENCE AND TECHNOLOGY

SPACE AND SPACE TECH

EOS 09 SATELLITE

Context: ISRO attempted to launch the EOS-09 (RISAT-1B) aboard PSLV C-61, but the rocket failed to reach its intended sun-synchronous polar orbit (SSPO) due to a glitch in its third stage. This marks the third PSLV failure since 1997, after PSLV-D1 (1993) and PSLV-C39 (2017)

About EOS-09 Earth Observation Satellite

- The EOS-09 is designed to deliver continuous and reliable remote sensing data for various operational sectors.
- As a dual-use satellite, it aimed to serve both military and civilian purposes:
  - **For defense**, it aimed to detect unauthorized border activities, infiltration routes, and hidden structures
  - **For civilian applications**, it aimed to support flood mapping, cyclone monitoring, soil moisture analysis, and crop health assessment, crucial for disaster response and agricultural planning.

RISAT Series

- The RISAT series comprises dual-use satellites launched after the 2008 Mumbai terror attack for border surveillance and infiltration monitoring.

Key Characteristics:

- Active remote sensing satellites using **Synthetic Aperture Radar (SAR)**, which sends radio signals to the Earth and detects the reflections, enabling all-weather, day-and-night observation.
- **Two types based on sensors:**
  - **RISAT-1 series:** Uses C-band SAR with all-weather, day-and-night earth observation; The first satellite in this series, RISAT-1, was launched in 2012.
  - **RISAT-2 series:** Uses X-band SAR with very high-resolution imagery; launched in response to the 2008 Mumbai attacks, in 2009.

CHINA'S TIANWEN-2 MISSION

Context: China has successfully launched Tianwen-2 aboard a Long March 3B rocket to explore a near-Earth asteroid and later a comet.

Mission Objectives of Tianwen-2:

- Collect and return samples from the near-Earth asteroid 469219 **Kamo'oalewa (a possible fragment of the Moon)** by 2027.
- Orbit and study Comet 311P, located in the asteroid belt between Mars and Jupiter, by 2035.

About Kamo'oalewa:

- Discovered in 2016 by the **Pan-STARRS 1 telescope** in Hawaii, it lies about **15 million km from Earth, classifying it as a near-Earth object.**
- It is a **quasi-satellite of Earth**, orbiting the Sun while staying close to the planet due to gravitational resonance, and has been orbiting for over 100 years

Significance:

- If its lunar origin is confirmed, Kamo'oalewa could serve as a "living fossil" of the Moon
- Most similarly sized near-Earth objects are short-lived, making this asteroid unusual
- Studying its structure and orbit could inform planetary defense strategies against future asteroid threats.

Other Notable Asteroid Sample-Return Missions:		
Hayabusa 1	JAXA (Japan)	Returned minimal samples from asteroid Itokawa (2010)
Hayabusa 2	JAXA	Returned samples from asteroid Ryugu (2020)
OSIRIS-REx	NASA (USA)	Returned rocks and dust from asteroid Bennu (2023)
Tianwen-3	CNSA (China)	Planned Mars sample-return by 2028, placing China among nations aiming for interplanetary sample missions

GLOBAL SPACE EXPLORATION CONFERENCE (GLEX) 2025

Context: GLEX 2025 was held in New Delhi for the first time in 2025, under the theme "Reaching New Worlds: A Space Exploration Renaissance."

- It was jointly organized by the International Astronautical Federation (IAF), with the Indian Space Research Organisation (ISRO) as host and the Astronautical Society of India (ASI) as co-host.
- GLEX 2025 aimed to foster the exchange of programmatic, technical, and policy information, as well as collaborative solutions, lessons learned, and future pathways among nations pursuing space exploration.
- On the sidelines of the conference, ISRO and the European Space Agency (ESA) signed a Joint Statement of Intent on Human Space Exploration.

AXIOM 4: INDIA'S LEAP TO ISS

Context: Shubhanshu Shukla became the first Indian astronaut on the ISS and only the second Indian in space after Rakesh Sharma (1984). An Indian Air Force Captain, he is also slated to pilot India's Gaganyaan mission in 2027 with Prashant Nair.

About Axiom-4 Mission

- The Axiom-4 Mission (Ax-4) was a **private crewed spaceflight to the International Space Station (ISS**) operated by **Axiom Space in partnership with SpaceX and NASA.**
- It launched on June 25, 2025, aboard a SpaceX Falcon 9 rocket carrying the Crew Dragon spacecraft named Grace.
- The mission had an 18-day duration at the ISS before safely returning to Earth on July 15, 2025.
- The crew consisted of four astronauts from the USA, India, Poland, and Hungary.
- The mission focused on advancing commercial spaceflight capabilities in low Earth orbit (LEO) and conducting over 60 scientific studies spanning human research, Earth observation, life sciences, material science, and technology demonstrations.
- India's participation in Ax-4 is significant in the context of the **Artemis Accords**, which India signed in 2023, committing to peaceful and cooperative lunar exploration.



Significance for India:

- Precursor to Gaganyaan (2027), moon missions (2040), and long-term plan to establish Bharatiya Antariksh Station (BAS) by 2035.
- Supports India's goal to increase its global space market share from 2% to 10% by 2030.

Key Experiments and Impact

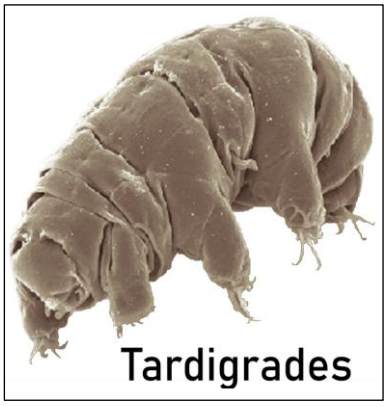
- **Microorganisms:** Study *cyanobacteria* for oxygen/food potential and biochemical responses in microgravity.
- **Small Organisms:** Study *tardigrades* to understand survival mechanisms in extreme conditions.
- **Agriculture:** Identify space-hardy varieties of six crops for long-duration missions.
- **Health – Cerebral Hemodynamics:** Examine brain blood circulation under microgravity to inform cardiovascular care on Earth.
- **Myogenesis:** Investigate muscle degeneration pathways to aid treatment of related disorders on Earth.
- **Diabetes:** Assess blood-sugar variations in microgravity for insulin-dependent conditions.
- **Miscellaneous:** Experiments include cancer behaviour, DNA repair, 3D-printed polymers, and space-adapted technology.
- **Human Factors:** Study physical and cognitive effects of using screens in microgravity, including gaze and eye movement adaptations.

VOYAGER TARDIGRADES EXPERIMENT

Context: Astronauts of Axiom-4 (Ax-4) will conduct the 'Voyager Tardigrades experiment' to study one of nature's most indestructible lifeforms - tardigrades - in the harsh environment of space.

About Tardigrades

- Tardigrades, also known as water bears or moss piglets, are **microscopic, eight-legged segmented micro-animals** belonging to the phylum Tardigrada. They are about 0.5 mm long when fully grown and have a short, plump body with four pairs of legs ending in claws or sticky pads.
- First described in 1773, tardigrades are **found in diverse environments from mountaintops to deep oceans**, thriving especially in moist habitats like mosses and lichens. They have existed for over 600 million years, outliving all five major mass extinction events.
- They are renowned for their exceptional resilience, capable of surviving extreme conditions that are fatal to most other life forms, such as extreme temperatures (from -328°F to 304°F), high and low pressures, radiation, dehydration, and even the vacuum of outer space.
- When water is scarce, they enter a cryptobiosis state called the "tun," drastically reducing their metabolism. They produce unique proteins that form gel-like structures, shielding their cells from damage under stress.



- Tardigrades feed on plant cells and microorganisms, using specialized mouthparts to pierce and suck out cell contents

Relevance of Tardigrades

- **Biotechnology:** Their proteins and genes can inspire improved biomaterials, vaccines, and sunscreens. Key targets include TRID1 and CAHS proteins, which form protective gels in cells.
- **Medical Preservation:** Their desiccation survival could help store human tissues and organs long-term.
- **Astrobiology:** Studying them reveals how life might survive in space, supporting panspermia theories; they may have survived the 2019 Beresheet lunar probe crash.
- **Space Missions:** Tardigrades serve as models for astronaut protection against radiation and muscle loss. They first went to space in 2007 on ESA's Foton-M3 mission.

SMALL SATELLITE LAUNCH VEHICLE (SSLV)

Context: Hindustan Aeronautics Limited (HAL) is set to manufacture the Small Satellite Launch Vehicle (SSLV) independently, marking a major step after two years of ISRO collaboration. The rocket technology transfer aligns with the space sector reforms initiated in 2020.

About Small Satellite Launch Vehicle (SSLV)

- The SSLV is a small-lift launch vehicle developed by the Indian Space Research Organisation (ISRO) designed to **deliver payloads of about 500 kg to low Earth orbit (500 km) or 300 kg to sun-synchronous orbit.**
- It is a **three-stage vehicle** with 3 solid propulsion stages and a liquid propulsion-based Velocity Trimming Module (VTM) as the terminal stage for precise orbit insertion.
- It supports multiple orbital drop-offs, allowing the deployment of several satellites in one mission.
- Compared to ISRO's PSLV, SSLV offers much **lower cost (estimated to be about one-tenth the cost of PSLV)** and a drastically reduced turnaround time, capable of launch readiness within 72 hours versus the PSLV's 70 days.
- The launch operations require significantly fewer personnel (about six, compared to over 60 for PSLV) and minimal infrastructure.
- The SSLV had its maiden flight (SSLV-D1) in August 2022, which was unsuccessful in achieving the intended orbit.
- Commercialisation of SSLV is led by **NewSpace India Limited (NSIL)** with private Indian industry partners involved in manufacturing SSLVs under technology transfer agreements.

VERA C. RUBIN OBSERVATORY (VRO)

Context: The VRO released its first test images, capturing the Trifid and Lagoon Nebulae, the Virgo Galaxy Cluster, and discovering 2,104 new asteroids within just 10 hours of data.

About Vera C. Rubin Observatory (VRO)

- Located at 8,684 feet (2,647 meters) on **Cerro Pachón in the Andes Mountains** of northern **Chile**

- It is a state-of-the-art astronomical facility **jointly funded by the U.S. National Science Foundation (NSF) and the U.S Department of Energy (DOE).** It is expected to become fully operational by 2025.
- It is designed to conduct a comprehensive, 10-year survey of the southern sky called the **Legacy Survey of Space and Time (LSST)**, capturing images every few nights to create an ultra-wide, ultra-high-definition time-lapse record of the night sky.
- The observatory houses the 8.4-meter **Simonyi Survey Telescope** equipped with the largest digital camera ever built, having 3,200 megapixels, which can capture an area of the sky about 40 times the size of the full moon in a single shot.

Key Concepts

Asteroid

- A small, rocky object that orbits the Sun, mostly found between Mars and Jupiter.
- Asteroids are remnants from the early solar system, vary greatly in size, and lack a stable atmosphere.
- Some approach Earth closely and are known as Near-Earth Objects (NEOs).

Nebulae

- They are clouds of gas and dust in space that serve as the birthplace of new stars or mark the death of old ones, sometimes both.
- Depending on surrounding light, they can appear bright (emission/reflection nebulae) or dark (absorption nebulae).

GOSAT-GW SATELLITE

Context: Japan has successfully launched the GOSAT-GW (Global Observing Satellite for Greenhouse gases and Water Cycle) from the Tanegashima Space Centre **to enhance monitoring of global greenhouse gas (GHG) emissions and water cycle dynamics.**

About the GOSAT-GW Satellite

- **Developed by:** Japan Aerospace Exploration Agency (JAXA)
- **Launch Vehicle:** H-2A rocket
- **Orbit Type**: Sun-synchronous orbit at an altitude of approximately 666 km
- **Instruments Onboard**
  - **TANSO-3 (Total Anthropogenic and Natural Emissions Mapping Spectrometer-3):** Measures atmospheric concentrations of greenhouse gases such as carbon dioxide (CO_2) and methane (CH_4).
  - **AMSR3 (Advanced Microwave Scanning Radiometer-3):** Observes elements of the water cycle, including precipitation, soil moisture, and sea surface temperature.
- **Key Objectives**
  - Monitor global atmospheric concentrations of greenhouse gases.
  - Verify national inventories of anthropogenic (human-caused) GHG emissions.
  - Detect large emission sources, such as megacities and power plants, to support climate policy and mitigation efforts.

ASTEROID TERRESTRIAL-IMPACT LAST ALERT SYSTEM (ATLAS)

Context: A comet 3I/ATLAS, originating from outside our solar system, was recently discovered by the Asteroid Terrestrial-Impact Last Alert System (ATLAS) in Chile. It is only the third interstellar object ever detected by scientists.

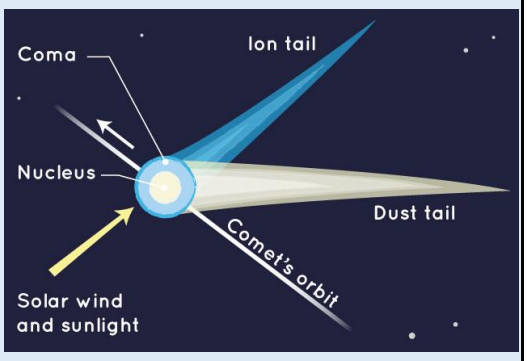
- The first was 1I/'Oumuamua (2017). The second was 2I/Borisov (2019).

What is Asteroid Terrestrial-Impact Last Alert System (ATLAS)?

- The ATLAS is an **asteroid impact early warning system** developed by the **University of Hawaii and funded by NASA.** Its main goal is to **detect asteroids that could potentially collide with Earth.**
- **Consists of four telescopes:** Two in Hawaii, One in Chile, One in South Africa
- Each telescope automatically scans the entire sky several times every night, searching for moving or new objects.
- Apart from asteroid detection, ATLAS also helps in discovering: Dwarf planets, Supernovae (exploding stars), Tidal disruption events.

What are Comets?

- Comets are **small celestial bodies made of ice, rock, dust, and frozen gases such as water and carbon dioxide**. They orbit the Sun in highly elliptical paths.
- When comets approach the Sun, their icy surface vaporizes (sublimes), creating their bright, visible features:
  - **Nucleus**: The solid, frozen core—dark and only a few kilometers wide
  - **Coma**: A glowing cloud of gas and dust around the nucleus.
  - **Tails**: Two distinct tails form as solar radiation pushes material away from the Sun (i) **Dust Tail:** Curved and whitish, made of dust particles; (ii) **Ion Tail:** Straight and bluish, made of charged gases.



- Comets come from two distant regions of the Solar System:
  - **Kuiper Belt:** Produces short-period comets (orbit < 200 years), e.g., Halley's Comet.
  - **Oort Cloud:** Source of long-period comets (orbit thousands of years).
- Gravitational disturbances can send these icy bodies toward the inner Solar System, where they become visible from Earth.

TRACERS

Context: NASA has launched its twin TRACERS satellites to study how magnetic reconnection affects Earth's upper atmosphere and space environment.

What is Magnetic Reconnection?

- When solar wind (a stream of charged particles from the Sun) collides with Earth's magnetic field, it can cause the field lines to break and reconnect. This process releases huge amounts of energy, accelerating particles to high speeds.
- It produces **auroras (Northern and Southern Lights).** It can disrupt satellites, GPS signals, and astronaut safety due to intense radiation bursts.

About TRACERS (Tandem Reconnection and Cusp Electrodynamics Reconnaissance Satellites)

- **Objective:** To study magnetic reconnection and its influence on the near-Earth atmosphere and space weather.
- **Method:** Two identical satellites will orbit through polar cusps—the funnel-shaped regions in Earth's magnetic field where the solar wind can directly enter the atmosphere.
- **Development:** Developed primarily by the University of Iowa with NASA funding, TRACERS also complements other missions like NASA's Magnetospheric Multiscale (MMS) mission by providing broader context to the reconnection phenomena.
- **Focus Areas:**
  - Understand how solar wind and charged solar particles interact with Earth's magnetosphere (the planet's magnetic shield).
  - Measure energy transfer and particle motion in these regions.
- **Significance:**
  - Improves our understanding of space weather—disturbances caused by solar activity.
  - Helps in better forecasting and protecting critical technologies such as communication networks, navigation systems, and power grids.

INVICTUS PROGRAMME

Context: European Space Agency (ESA) and UK-based Frazer-Nash have kicked off INVICTUS research programme.

About Invictus:

- **Objective:** To develop hypersonic technologies for future reusable vehicles capable of horizontal takeoff and landing.

- **Key Feature:** A fully reusable experimental aerospace vehicle designed to fly at Mach 5 (five times the speed of sound).
- **Technology Demonstration:** Will test key technologies for sustained hypersonic atmospheric flight with modular upgrades for materials, software, and propulsion.
- **Propulsion Focus:** Aims to validate a hydrogen-fueled precooled air-breathing propulsion system for horizontal take-off and hypersonic flight.

NISAR: NASA-ISRO SYNTHETIC APERTURE RADAR MISSION

Context: NISAR was recently launched from Satish Dhawan Space Centre, Sriharikota aboard GSLV-F16 into a 747 km sun-synchronous orbit.

Launch Details (Launched On July 30, 2025)	
Launch Vehicle	Geosynchronous Satellite Launch Vehicle (GSLV-F16)
Launch Significance	First-ever GSLV mission to successfully place a satellite into a Sun-Synchronous Orbit (SSO)
Satellite Weight	2,392 kilograms
Orbit Type	Sun-Synchronous Polar Orbit at an altitude of approximately 743 km
Mission Life	Designed for an operational lifespan of 5 years

About NISAR (NASA-ISRO Synthetic Aperture Radar)

- The NISAR satellite is a **joint Earth-observation mission** developed by **NASA** (USA) and **ISRO** (India). It uses **advanced L-band and S-band microwave radars** to study c**hanges on Earth's surface** with exceptional precision.
- It is the **first global imaging mission to provide fully polarimetric and interferometric radar data**, allowing detailed tracking of natural and human-made changes on land and ice.

Objectives

- To monitor earthquakes, landslides, volcanic activity, and ice-sheet movements.
- To track forest biomass, agricultural changes, and ground deformation caused by climate change or human activity.
- To support disaster management, agriculture, and environmental research through accurate Earth surface data.

NASA's Contribution	ISRO's Contribution
• L-band radar, GPS receiver, high-rate telecom system, Solid-State Recorder, and 12-metre deployable antenna • **Cost**: USD 1.16 billion	• S-band radar, spacecraft bus, GSLV-F16 launch vehicle, ground systems, and mission services • **Cost**: USD 90 million

Key Technical Features

1. Dual-Band Synthetic Aperture Radar (SAR)

- **L-band SAR (24 cm wavelength):** Penetrates forest canopies, ice sheets, and soil layers. Useful for studying biomass, glacier movement, and land deformation.
- **S-band SAR (12 cm wavelength):** Detects surface-level changes, such as tree height, urban expansion, and melting snow.

2. SweepSAR Technology

- Uses a method called Swept Synthetic Aperture Radar (SweepSAR) to capture wide-area, high-resolution images efficiently.
- Provides global coverage with remarkable detail

3. High-Frequency Observation

- Every 12 days, NISAR revisits the same area, enabling continuous monitoring of environmental and geological changes.

4. Large Antenna System

- Equipped with a 12-meter unfurlable reflector antenna, which acts like a massive radar dish.
- The radar's effective resolution is comparable to a 20 km-wide ground-based antenna, thanks to its synthetic aperture design.

About Synthetic Aperture Radar (SAR)

- SAR is an active sensing system that sends out microwave pulses and measures how much energy bounces back after hitting the Earth's surface.
- Unlike optical sensors, which rely on sunlight, SAR can capture images day and night, and even through clouds, smoke, or rain.

Why "Synthetic" Aperture?

- A radar's image resolution depends on its antenna size; a 10-meter resolution would normally require a 4 km-long antenna, which is impractical in space.
- Instead, SAR simulates this effect by combining multiple small radar observations as the satellite moves, creating a "synthetic" large antenna.

HUMAN OUTER PLANET EXPLORATION (HOPE) STATION

Context: Bengaluru-based company Protoplanet, in collaboration with ISRO, has developed an analogue research facility called HOPE station in Ladakh's Tso Kar valley, at an altitude of 14,500 ft.

What is Human Outer Planet Exploration (HOPE) Station?

- The HOPE station is designed as a Habitat Module for crew living and a Utility Module for operations and support systems. These interconnected units create a seamless working environment.
- Developed by ISRO, the station replicates space-like conditions on Earth to support research for future missions to the Moon, Mars, and beyond.
- Such stations help test new technologies, raise technology readiness levels, support engineering integration, and enable studies on human adaptability, crew training, geology, habitability, and life-detection methods.
- Comparable research stations include the Mars Desert Research Station (USA), the Flashline Mars Arctic Station (Canada), and BIOS-3 (Russia).

Significance for India

- India's first analogue space research station strengthens India's preparation for future human missions to the Moon and Mars, and supports the goal of establishing the Bharatiya Antariksh Station by 2035.
- Enhances public–private collaboration in the space sector (Protoplanet + ISRO) and positions India among countries leading in analogue space science.

Why was Tso Kar Valley Selected?

- The region offers Mars-like conditions, including: High UV radiation, Low atmospheric pressure, Extreme cold, Saline permafrost
- These features make it ideal for technology testing and astrobiology research.

LVM3 LAUNCH VEHICLE

Context: ISRO is aiming for a 2027 launch of its first LVM3 rocket equipped with a semi-cryogenic propulsion stage.

About Launch Vehicle Mark-3 (LMV3)

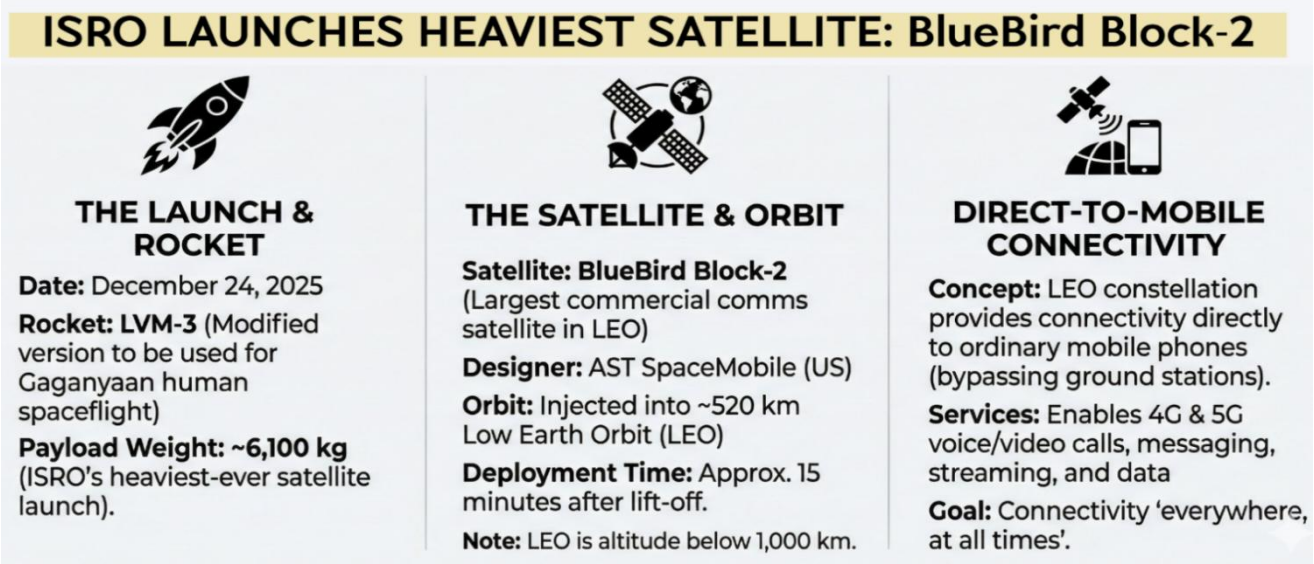
- Launch Vehicle Mark-3 (also known as GSLV Mk-III) is **India's heaviest and most powerful rocket developed by ISRO.**
- It is designed to launch heavy communication satellites and support deep space missions. The first experimental launch took place in 2014, and it has been operational since 2017.
- **Payload Capacity:** About **4 tonnes to GTO** (Geosynchronous Transfer Orbit). About **8 tonnes to LEO** (Low Earth Orbit)
- **Major Launches:** Launched Chandrayaan-2 (2019), Launched Chandrayaan-3 (2023), Successful OneWeb satellite launches (2022–23)
- LVM3 is configured as a **three-stage vehicle** with two solid strap-on motors (S200), one liquid core stage (L110) and a high thrust cryogenic upper stage (C25).
- It will launch crewed missions under the **Indian Human Spaceflight Programme** (Gaganyaan Mission).

Stages in LMV3	
Stage 1: Two S200 Solid Boosters	• Among the largest solid rocket boosters in the world • Each carries ~204–205 tonnes of solid fuel (HTPB) • Provide strong thrust at launch. Burn for about 134 seconds before separation

Stage 2: L110 Liquid Core Stage	• Uses two Vikas engines • Carries 115 tonnes of liquid fuel (UDMH + oxidizer) • Ignites mid-flight after boosters burn out
Stage 3: C25 Cryogenic Upper Stage	• Powered by CE-20, which is India's largest cryogenic engine • Uses liquid oxygen + liquid hydrogen (28 tonnes) • Places the satellite into GTO (180 × 36,000 km orbit)

LEAP-1 MISSION

Context: Dhruva Space (Indian space-tech startup), is set to launch its first commercial satellite mission, LEAP-1.



What is the Leap-1 Mission?

- The mission is built on Dhruva's indigenous P-30 platform, previously tested on PSLV-C58 in 2024.
- It carries payloads designed for artificial intelligence applications and Earth observation.
- Collaboration involves partners from India (Dhruva Space), Australia (Akula Tech, Esper), with support from the United States.
- **Payloads:**
  - **Nexus-01:** An AI payload with onboard processing and the ability to retrain machine learning models in orbit.
  - **Esper OTR-2:** A hyperspectral imaging payload for high-quality Earth observation.
- **Uses:** Defence and security, Disaster response, Agriculture, Mining, Environmental monitoring

ORBITING CARBON OBSERVATORIES (OCO) PROGRAM

Context: Recently, the Trump administration called for shutting down NASA's Orbiting Carbon Observatories (OCO) program.

What is Orbiting Carbon Observatories (OCO)?

- It is a NASA program consisting of Earth-observing satellites dedicated to monitoring atmospheric CO_2 from space. It operates under NASA's Earth System Science Pathfinder (ESSP) program.
- **Objective**: To provide precise, global measurements of CO_2 sources and sinks, improving scientific understanding of climate change and the global carbon cycle.
- It remains one of the most accurate and sensitive CO_2 monitoring systems globally.

Timeline of Missions

- **OCO-1 (2009):** Launch failure due to the Taurus XL rocket fairing not separating.
- **OCO-2 (2014):** Successfully launched; first fully functional mission providing high-resolution CO_2 data.
- **OCO-3 (2019):** Installed on the International Space Station (ISS) to continue and broaden CO_2 monitoring.

Significance

- Creating high-resolution maps of plant growth (photosynthesis, vegetation health)

- Agricultural applications such as crop-yield forecasting and forest mapping
- Climate science insights, including identifying the Amazon rainforest as a net CO_2 emitter and boreal forests as significant carbon sinks
- Food security analysis by tracking droughts and helping predict shortages linked to unrest and famine

LUPEX MISSION

Context: Recently, PM Modi welcomed the agreement between ISRO and the Japan Aerospace Exploration Agency (JAXA) for the Chandrayaan-5 mission under the Lunar Polar Exploration (LUPEX) programme.

What is the LUPEX Mission?

- LUPEX is a joint mission of ISRO (providing the lander) and JAXA (providing the rover), planned for launch in 2025 using Japan's H3 rocket as part of India's Chandrayaan-5 programme.
- **Objective:** To explore the Moon's South Pole (especially the permanently shadowed regions) to detect water-ice and assess resource potential for future lunar bases.

Key Features

- The rover will carry instruments from ISRO, JAXA, NASA, and ESA. It will drive autonomously, drill and collect soil samples, and analyze lunar regolith for water content, dust behaviour, and thermal properties.
- Proposed Indian payloads– **PRATHIMA:** Detects and quantifies water-ice; **LEDEX:** Studies charged lunar dust

BLUEBIRD SATELLITE

Context: ISRO is expected to launch the Block-2 BlueBird communications satellite soon.

What is the BlueBird Satellite?

- The BlueBird satellite is a next-generation communications satellite designed to transform mobile connectivity by enabling direct calls and broadband access from space using ordinary smartphones. It represents a major advancement in the integration of space and telecom technologies.
- **Developer:** AST SpaceMobile, a U.S.-based company
- **Weight**: approximately 6,000–6,500 kg
- **Orbit**: Low Earth Orbit (LEO)

Key Features

- A large 64 m^2 antenna for strong signal reception
- Direct satellite-to-smartphone connectivity, eliminating the need for ground towers
- Supports voice calls and broadband internet access from space
- Offers up to 40 MHz capacity and peak speeds of around 120 Mbps

MIRA STARS

Context: Scientists from Inter-University Centre for Astronomy and Astrophysics (IUCAA) have recently made the precise determination of the expansion rate of the Universe using Mira stars.

What are Mira Stars?

- Mira stars, also known as Mira variables are **a type of giant star that go through regular cycles of expanding and contracting.** These cycles cause their brightness to vary in a predictable way, typically over periods ranging from 100 to 1,000 days
- The **prototype for this class is Mira (Omicron Ceti)**, a binary star system in the constellation Cetus, which was the **first non-supernova variable star discovered by astronomers in the 17th century.**



- They have **temperatures of around 3,000 K,** making them much **cooler than the Sun**. They are much larger and more luminous than the Sun.

Significance of Mira Stars

- They serve as "standard candles" for measuring distances to faraway galaxies.
- They help build and refine the extragalactic distance ladder.
- They contribute to determining the Hubble constant, which measures the expansion rate of the Universe.

- They offer insights into the late stages of stellar evolution.

Standard Candles

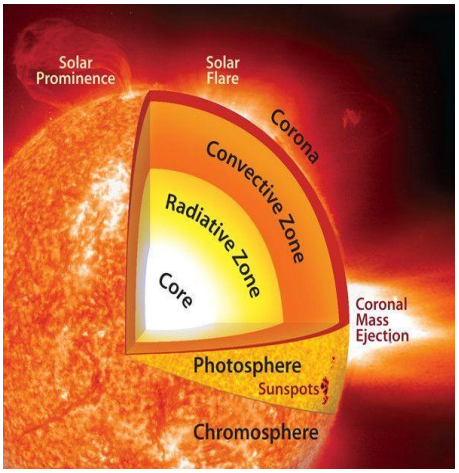
- A standard candle is an object in space whose true brightness is known. By comparing how bright the object appears from Earth to how bright it actually is, scientists can calculate how far away it is.
- One of the most important things about Mira variables is that there is a strong relationship between how bright they are and how long their pulsation cycles last. This relationship allows astronomers to use them as "standard candles."

SOLAR ORBITER MISSION

Context: A recent study reports that the European Space Agency's (ESA) Solar Orbiter Mission has successfully traced the origin of **Solar Energetic Electrons (SEEs)** emerging from the Sun.

About the Solar Orbiter Mission (SOM)

- The mission was **launched in 2020** as **a joint partnership between ESA and NASA** using the **Atlas V** launch vehicle.
- Its main objective is **to study the Sun and the heliosphere up close,** including capturing the first-ever images of the Sun's poles.
- The spacecraft travels as close as 42 million km to the Sun and uses Venus flybys to gradually tilt its orbit up to 33° out of the ecliptic plane.
- A specialised heatshield protects the spacecraft from extreme temperatures reaching 500°C.



What are Solar Energetic Electrons (SEEs)?

- SEEs are **high-energy electrons** accelerated by the Sun, often travelling at speeds close to that of light. They originate from two major solar events:
  - **Solar flares,** which produce impulsive bursts of energetic particles.
  - **Coronal Mass Ejections (CMEs)**, which generate gradual and sustained high-energy particle flows.
- SEEs contribute to space weather disturbances and pose risks to spacecraft, satellites, and astronauts.

PRATYUSH TELESCOPE

Context: Scientists at the Raman Research Institute (RRI) have proposed a pioneering mission called PRATUSH, designed to study the early Universe and unlock insights from the Cosmic Dawn.

What is the PRATUSH Telescope?

- The PRATUSH Telescope **(Probing ReionizATion of the Universe using Signal from Hydrogen)** is a ***proposed*** **lunar-orbit radiometer** intended to detect faint 21-cm hydrogen signals from the Cosmic Dawn. The mission is being **funded by ISRO.**

Objectives

- To study the first stars and galaxies and the Epoch of Reionization (EoR).
- To determine when and how the Universe was reionized.
- To observe from the lunar far side, which avoids Earth's radio interference and ionospheric distortion.

Key Features

- It will use a **compact payload with a Single-Board Computer (SBC),** based on the Raspberry Pi. The SBC acts as the master controller of the radiometer and coordinates the antenna and receiver while managing data recording, calibration, and preliminary processing.
- It will include a **digital receiver and a Field Programmable Gate Array (FPGA)** for high-resolution data processing.
- It will **operate in a lunar far-side orbit,** which provides a radio-quiet environment ideal for detecting weak cosmological signals.
- The mission has a **planned two-year nominal duratio**n, wide sky coverage, and high spectral resolution of 100 kHz.

NE-SPARKS PROGRAMME

Context: The Union Minister of Development of the Northeastern Region and Communications recently interacted virtually with school students who visited ISRO under NE-SPARKS.

What is the NE-SPARKS Programme?

- NE-SPARKS (Northeast Students' Programme for Awareness, Reach, and Knowledge on Space) is a flagship **initiative of the Ministry of Development of the North Eastern Region** (MDoNER) in collaboration with NESAC-ISRO and 8 North Eastern state governments.
- It aims to expose Northeastern students to ISRO's cutting-edge space technology, with the goal of sparking interest in Science, Technology, Engineering, and Mathematics (STEM)

Key Features

- **Exposure Visits:** A total of 800 meritorious students (100 from each state) visit ISRO centres in Bengaluru.
- **Learning Experience:** Students observe satellite integration facilities, interact with ISRO scientists, and learn about major space missions such as Chandrayaan-3, Aditya-L1, and Gaganyaan.
- **Funding:** The programme is funded jointly by MDoNER and state governments (60:40 ratio)

ASTROSAT

Context: India's first dedicated Space Astronomy Observatory, AstroSat, has recently completed ten years of operations.

About AstroSat

- Astrosat is **India's first dedicated multi-wavelength space observatory.**
- It was launched with a lift-off mass of 1515 kg, into a 650 km orbit by the Indian Space Research Organisation (ISRO) on September 28, **2015**, using the **PSLV**-C30 rocket from Sriharikota.
- The mission is designed **to study celestial sources in X-ray, ultraviolet (UV), and optical wavelengths simultaneously**, providing a comprehensive view of cosmic phenomena.
- One of the unique features of the AstroSat mission is that it enables the simultaneous multi-wavelength observations of various astronomical objects with a single satellite.

Scientific instruments	Mission Objectives
• Ultra Violet Imaging Telescope (UVIT) • Soft X-ray Telescope (SXT) • Large Area X-ray Proportional Counter (LAXPC) • Cadmium-Zinc-Telluride Imager (CZTI) • Scanning Sky Monitor (SSM)	• To understand high-energy processes in binary star systems with neutron stars and black holes • Monitor the X-ray sky for new transients • Conduct sky surveys in hard X-ray and UV bands • Study periodic and non-periodic variability of X-ray sources

GAIA TELESCOPE 3D MAP

Context: A new 3D map created using data from the Gaia Telescope shows star-forming regions (stellar nurseries) within 4,000 light-years of the Sun in all directions.

About Gaia (Global Astrometric Interferometer for Astrophysics) Telescope

- The Gaia Telescope is a **space observatory launched by the European Space Agency (ESA)** in **2013** to map the positions, distances, and motions of over a billion stars in the Milky Way with unprecedented precision.
- Gaia operated until March 2025, completing its mission by providing the largest and most accurate three-dimensional map of our galaxy to date.
- The mission also contributed to Solar System science by mapping over 150,000 asteroids and identifying possible moons around them.
- **Location:** Operates from Lagrange Point 2 (L2).
- **Goal:** To **create the most precise 3D map of the Milky Way** using astrometry—the measurement of stellar positions, distances, and motions.
- **Instruments:** Astrometer (for precise positions), Photometer (for brightness and temperature), and Spectrometer (for chemical composition and motion).

AONEUM-04

Context: The Technology Development Board (TDB) under the Department of Science and Technology (DST) has extended support to Hyderabad-based **Aodh Lifesciences** for the development of AONEUM-04.

What is AONEUM-04?

- AONEUM-04 is an indigenous **antibiotic nebulization suspension** designed for the **treatment of pneumonia and antimicrobial resistance (AMR).**
- Unlike conventional oral or intravenous therapies, AONEUM-04 enables direct, localized delivery of antibiotics through nebulization, ensuring higher drug concentration at the site of infection in the lungs while reducing systemic side effects.
- It provides **sustained release of the drug for longer therapeutic action.**
- Its **mucoadhesive properties** help the medicine adhere to lung mucus for better absorption.
- It **offers biofilm disruption**, improving drug penetration and reducing the chances of antibiotic resistance.

SPACEX'S STARSHIP COMPLETES CRITICAL TEST FLIGHT

Context: SpaceX's Starship, the world's largest rocket, has successfully completed a major test flight on its 10th attempt.

- During the mission, the Super Heavy booster splashed down in the Gulf of Mexico, and the Starship spacecraft reached the Indian Ocean.

About Starship

- Starship is a **two-stage, fully reusable heavy-lift launch vehicle** developed by **SpaceX**.
- **Dimensions:** It stands at approximately 120 metres, making it the **largest rocket ever flown**, surpassing NASA's Saturn V, which carried astronauts to the Moon.
- **Components**:
  - **Super Heavy Booster,** powered by 33 Raptor engines (that burn liquid methane and liquid oxygen.)
  - **Starship spacecraft,** designed to carry crew and cargo to Earth orbit, the Moon, and Mars.
- **Significance**
  - Reusability promises to significantly reduce the cost of access to space.
  - It features an advanced heat shield and aims for booster recovery to enable rapid reflight.
  - It has strong potential for deep-space missions and is a key element of NASA's Artemis programme.

EXTREME NUCLEAR TRANSIENTS (ENTS)

Context: Astronomers have identified a new class of cosmic events known as ENTs.

About Extreme Nuclear Transients (ENTs)

- ENTs are a **class of cosmic explosions,** considered the **most powerful events observed** since the Big Bang, surpassing even gamma-ray bursts (GRBs) in energy output and luminosity.
- ENTs are powered by massive stars (with a weight of about 3 to 10 solar masses) being ripped apart by a supermassive black hole.
- ENTs occur when stars with masses at least three times greater than the Sun are disrupted by supermassive black holes. While their brightness makes them visible at great distances and their flare is visible for a very long time, their occurrence is extremely rare.
- As such a star approaches the event horizon, intense tidal forces stretch and compress it into a long, thin, spaghetti-like form. The resulting release of immense electromagnetic energy during this tidal disruption produces what is observed as an ENT.

About Event Horizon

- An event horizon is a **boundary in spacetime beyond which events cannot affect an outside observer**. Wolfgang Rindler coined the term in the 1950s.
- It is most famously associated with black holes. For a black hole, the event horizon marks the "**point of no return**" where the escape velocity equals the speed of light, so **nothing, including light, can escape once it crosses this boundary.**
- Events beyond this horizon are forever unobservable and cannot influence us, as light from those regions will never reach us.

QUASI-MOON/MINI MOON

Context: Astronomers have identified a small quasi-moon, 2025 PN7, which has been moving near Earth for roughly 60 years.

About Quasi-Moons (Quasi-Satellites)

- Quasi-moons, also known as quasi-satellites, are small celestial bodies that appear to orbit a planet but are actually in a Sun-centered (heliocentric) orbit. Their orbit is closely synchronized with that of the planet, making them seem like companions even though they are not gravitationally bound to the planet.
- Quasi-moons typically emerge when small asteroids enter a region where the gravitational interplay between the Sun and a planet creates a synchronized orbital pattern that keeps them close for long periods.
- Earth has approximately six known quasi-moons identified so far.

Feature	Quasi-Moon	Mini-Moon (Temporary Satellite)
Orbit Type	Sun-centered (heliocentric) orbit very similar to Earth's	Captured temporarily by Earth's gravity and orbits Earth
Bound to Earth?	**Not** gravitationally bound to Earth	**Gravitationally bound** for months to years
Appearance from Earth	Appears to orbit Earth, but actually orbits the Sun	Behaves as a true (temporary) moon
Stability	Typically decades	Short-lived: months to a few years
Examples	**2025 PN7**, 469219 Kamoʻoalewa	**2024 PT5**, 2020 CD3

CREW ESCAPE SYSTEM

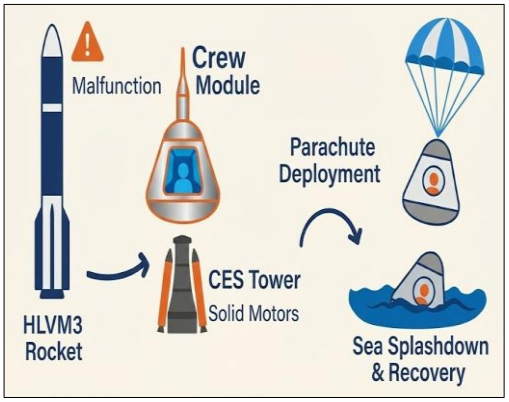
Context: ISRO has developed a cost-effective, single-stage test vehicle, powered by the Vikas engine, to validate the Crew Escape System (CES).

What is a Crew Escape System?

- It is an **emergency safety mechanism designed to rapidly move the crew module and astronauts** away from the launch vehicle if a serious failure occurs during launch.
- **Function:** Uses high-thrust solid rocket motors to quickly separate and carry the crew module to a safe distance within seconds, minimizing risk to astronauts.

Types of Crew Escape Systems

- **Puller Type:** The escape system pulls the crew module away from the rocket. Used in Gaganyaan, Soyuz, Saturn V, and China's Long March rockets.
- **Pusher Type:** The escape system pushes the crew module away from the launch vehicle. Used by SpaceX's Falcon 9.



Working Mechanism

- **Activation:** Automatically triggered by the Integrated Vehicle Health Management (IVHM) system when a critical anomaly is detected.
- **Descent:** After separation, the crew module deploys a multi-stage parachute system, gradually reducing speed.
- **Landing:** Ensures a safe sea splashdown within human safety limits, with the crew remaining inside the module until recovery.

CASSINI SPACECRAFT

Context: A reanalysis of data from NASA's Cassini spacecraft has strengthened evidence that Enceladus, one of Saturn's moons, may possess conditions favourable for life. Scientists suggest that Enceladus' hydrothermal vents and mineral-rich subsurface ocean could support microbial life.

About Cassini	
About	• The Cassini spacecraft was a flagship NASA mission to study Saturn, its rings, and its moons. • Cassini is among the largest and most advanced interplanetary spacecraft ever built. • Cassini was the first spacecraft to orbit Saturn. Before Cassini, other spacecraft such as

	Pioneer 11 and Voyager 1 & 2 had only performed quick flybys of Saturn in the late 1970s and early 1980s. Cassini allowed long-term, detailed study. • It enabled the exploration of river-like channels that flow into methane seas, and icy moons where powerful jets of ice and gas are expelled into space from a subsurface liquid-water ocean that may contain the essential ingredients for supporting life.
Launch	1997
Agencies	NASA, European Space Agency (ESA), and Italian Space Agency (ASI)
Mission Objectives	• **Saturn**: Study its atmosphere, internal structure, rotation, ionosphere, and evolutionary history. • **Rings**: Analyse ring composition, dynamics, and interactions between rings and moons. • **Titan (Saturn's largest moon**): Examine its dense atmosphere, weather system, and surface chemistry. • **Magnetosphere**: Investigate its structure, energetic particles, and how it interacts with the solar wind.
Mission Components	• **Cassini Orbiter (NASA):** The first spacecraft to orbit Saturn. Carried instruments such as radar (for mapping Titan), a magnetometer, cameras, and spectrometers. • **Huygens Probe (ESA):** Cassini carried a probe called Huygens to the Saturn system. It parachuted to the surface of Titan (Saturn's largest moon) in January 2005. This became the most distant landing ever achieved in our solar system. It studied Titan's Atmosphere, Weather patterns, Surface and soil properties. It also sent back the first-ever images from Titan's surface.

INTERSTELLAR MAPPING AND ACCELERATION PROBE (IMAP)

Context: NASA has launched the Interstellar Mapping and Acceleration Probe (IMAP) to study how solar particles are energized and how the heliosphere protects Earth from cosmic radiation.

About Interstellar Mapping and Acceleration Probe (IMAP)

- The IMAP is a NASA mission **designed to study the boundary of our heliosphere**, the region **where the Sun's influence meets interstellar space.**
- IMAP was launched in September 2025 and is positioned at the S**un-Earth Lagrange Point 1 (L1),** giving it a continuous, unobstructed view of solar activity and the heliospheric boundary.

Objective

- To map the heliosphere's boundary i.e. the bubble created by the solar wind that shields the solar system from high-energy cosmic rays.
- To examine particle acceleration, as well as interactions between the solar wind and the interstellar medium.

Key Features

- Equipped with 10 scientific instruments capable of detecting neutral atoms, charged particles, magnetic fields, and interstellar dust.
- Provides real-time space weather data, improving the prediction of solar storms.
- Supports advancements in space weather forecasting, satellite protection, and future human space missions.

PHOSPHINE

Context: Astronomers using the James Webb Space Telescope (JWST) have detected phosphine (PH_3) in the atmosphere of the **brown dwarf Wolf 1130C,** sparking scientific interest due to the molecule's unusual formation pathways.

About Phosphine (PH_3 / Hydrogen Phosphide)

- Phosphine (PH_3) is a **colorless, flammable, and highly toxic gas** commonly known for its **garlic-like or rotting fish odor in impure forms.** It is only slightly soluble in water.
- **Formation: Produced naturally by anaerobic bacteria in oxygen-poor environments.** Industrially generated when white phosphorus or calcium phosphide reacts with water.
- **Occurrence:** It is present on **Earth** through biological processes. It is detected in the atmospheres of **Jupiter and Saturn,** where it forms through high-temperature chemical reactions, not biology.

- **Uses:**
  - Utilised in semiconductor manufacturing
  - As an ingredient in flame retardants
  - As a fumigant pesticide for protecting stored grains

VISIBLE EMISSION LINE CORONAGRAPH

Context: Recently, scientists at the Indian Institute of Astrophysics (IIA), in collaboration with NASA, used the Visible Emission Line Coronagraph (VELC) payload onboard Aditya-L1 to estimate key parameters of a coronal mass ejection (CME).

What is Visible Emission Line Coronagraph (VELC)?

- VELC is the **primary scientific payload of the Aditya-L1 Mission.** It has been **designed and built by the Indian Institute of Astrophysics (IIA)** at its CREST campus in Hosakote, Karnataka.
- Aditya-L1 is India's first solar mission, positioned about 1.5 million kilometres from Earth, allowing continuous observation of the Sun without obstruction.

Key Features

- An **internally occulted coronagraph**, which blocks the Sun's bright disk to clearly observe the faint outer atmosphere.
- Capable of simultaneous imaging, spectroscopy, and spectro-polarimetry, providing detailed physical information about solar plasma.

Objectives

- To observe the solar corona, the Sun's outer atmosphere.
- To study coronal temperature, plasma density, and velocity.
- To image the corona as close as 1.05 solar radii from the Sun's surface.
- To monitor coronal mass ejections (CMEs) and the solar wind, which are crucial for understanding space weather and its impact on Earth.

STARLINK SIGNS DEAL WITH MAHARASHTRA

Context: Maharashtra has become the first Indian state to collaborate with **Starlink Satellite Communications** to deliver satellite-based internet connectivity across remote and underserved regions.

About Satellite-based Internet

- It is a technology that delivers **broadband internet access using satellites in orbit around Earth,** rather than relying on traditional ground-based infrastructure like cables or cell towers.
- Satellite internet systems use a **network of satellites, ground stations, and user terminals.** Data travels from the user's terminal to a satellite in orbit, then to a ground station connected to the internet backbone, and back again.
- Historically dominated by Geostationary (GEO) satellites used for television broadcasting and limited data services, the sector is currently undergoing a paradigm shift toward Low Earth Orbit (LEO) mega-constellations.

GEO VS. LEO FOR INTERNET SERVICES

GEOSTATIONARY ORBIT (GEO)	PARAMETER	LOW EARTH ORBIT (LEO)
~35,786 km above the Earth.	ALTITUDE INDICATOR	~500 km and 2,000 km above the Earth.
Appears fixed over one point on Earth. One satellite covers about 33% of the planet.	ORBITAL CHARACTERISTICS	Satellites move rapidly and orbit every 90–120 minutes. Require large constellations for continuous coverage.
High latency (around 600 milliseconds or more) because signals must travel very long distances. 600ms+	LATENCY	20-50ms Very low latency (around 20–50 milliseconds), comparable to terrestrial broadband.
Used by traditional satellite internet providers such as Viasat and HughesNet, especially for rural or remote areas. Viasat HughesNet	USE CASES	Starlink OneWeb Used by next-generation satellite internet services such as SpaceX's Starlink, OneWeb, and Amazon's Project Kuiper.
• Wide coverage with a small number of satellites. • Stable and continuous connectivity over large regions. • Simpler ground tracking requirements.	KEY BENEFITS	• Low latency and high-speed connectivity. • Better performance for interactive applications. • Improved user experience similar to fibre-based internet.
• Very high latency. • Slower data speeds. • Less suitable for modern internet applications.	KEY CHALLENGES	• Requires deployment and maintenance of thousands of satellites. • Higher operational complexity and costs. • Frequent satellite replacement due to shorter orbital lifespan.

Latency refers to the time delay between sending a data packet over a network and receiving a response, measured in milliseconds (ms)

ESCAPADE MISSION

Context: Recently, Blue Origin successfully launched NASA's highly anticipated ESCAPEDE mission to Mars.

About ESCAPADE (Escape and Plasma Acceleration and Dynamics Explorers) Mission

- The ESCAPADE mission is a **NASA-led project involving two identical spacecraft, named Blue and Gold,** launched in 2025, **to investigate how the solar wind interacts with Mars' magnetic environment and how this interaction drives the planet's atmospheric escape.**
- It is a part of **NASA's SIMPLEx (Small Innovative Missions for Planetary Exploration) programme.**
- The mission is managed by the Space Sciences Laboratory at the University of California, Berkeley, with key partners Rocket Lab, NASA's Goddard Space Flight Center, Embry-Riddle Aeronautical University, Advanced Space LLC, and Blue Origin.
- The mission is launched on Blue Origin's New Glenn 2 Launch vehicle. ESCAPADE's twin orbiters will take simultaneous observations from different locations around Mars.

Launch Strategy

- ESCAPEDE employs a "launch-and-loiter" strategy, in which the spacecrafts are first placed into orbit near Earth's L2 region.
- They will loiter there until the favourable Earth–Mars alignment in late 2026, after which they will proceed to Mars.

Objectives

- To study Mars's hybrid magnetosphere and its response to space weather.
- To measure how the solar wind interacts with Mars's atmosphere and crust.
- To explain solar-wind-driven atmospheric escape and its implications for long-term habitability of the planet.

SENTINEL-6B SATELLITE

Context: Recently, the Copernicus Sentinel-6B satellite was launched from the Vandenberg Space Force Base in California.

About Copernicus Sentinel-6B

- Sentinel-6B is an **ocean-monitoring satellite** equipped with a highly accurate radar altimeter that measures the height of the ocean surface to within a centimetre.
- It is **part of the Copernicus Programme and the Jason satellite series.**
- **Joint Mission:** It is a collaborative mission involving NASA, NOAA, European Space Agency, EUMETSAT, the European Commission (funding), and CNES (technical support).
- **Role**
  - Provides high-precision sea-level altimetry with accuracy of about one inch over nearly 90% of the world's oceans.
  - Enhances weather, storm, and flood forecasting, and supports coastal protection and undersea infrastructure planning.
- **Key Features**
  - Travels at a speed of about 7.2 km per second, completing one orbit around the Earth in 112 minutes.
  - Has an expected mission life of about 5.5 years and carries six scientific instruments.
  - Operates alongside its twin satellite, Sentinel-6 Michael Freilich, which was launched in 2020.

YOUNG STELLAR OBJECTS

Context: Recently, researchers decoded the early lives of young stars, known as Young Stellar Objects (YSOs), using a decade of data from NASA's Wide-field Infrared Survey Explorer (WISE) and its extended mission NEOWISE.

What are Young Stellar Objects?

- Young Stellar Objects are **early-stage stars that have not yet entered the main sequence.** They are **still contracting under gravity and have not begun stable hydrogen fusion** at their cores.
- This phase occurs before a star enters the main sequence on the **Hertzsprung–Russell diagram**, which is a scientific chart used to show how stars differ in brightness and temperature across different stages of their evolution.

- YSOs are found in dense molecular clouds that are rich in gas and dust, which provide the raw material for star formation.
- They **form through the collapse of dense molecular clouds**, often triggered by external disturbances such as supernova shock waves, radiation pressure, or turbulence within the cloud.
- This class consists of two groups of objects: **protostars and pre-main-sequence stars.**
  - **Protostars:** Very young objects still heavily embedded in their natal envelopes, shining mainly from gravitational contraction and accretion rather than stable core fusion.
  - **Pre-main-sequence stars:** Objects where core temperature is rising and sometimes partial fusion has begun, but they have not yet settled on the main sequence
- **Stages:**
  - **Class 0 & I**: Thick dust; seen in Infrared/ Radio wavelengths.
  - **Class II & III:** Dust disperses; visible in optical wavelengths

Significance

- Understand how stars are born and evolve, including processes such as magnetic activity and stellar outflows.
- Studying planet formation and the early evolution of planetary systems, including conditions similar to the early Solar System.

VIKRAM-I ROCKET

Context: Recently, PM Modi unveiled Skyroot Aerospace's first orbital rocket, Vikram-I.

What is Vikram-I?



- Named after Dr. Vikram Sarabhai, the father of India's space programme, Vikram-I is **designed to** launch **multiple small satellites into orbit** in a single launch.
- It aims to serve the **commercial small-satellite segment** with **rapid, cost-effective access to space.**
- Vikram-I is a **four-stage rocket**, standing 20 meters tall with a diameter of 1.7 meters and generating **1,200 kN of thrust.**
- The rocket's design prioritises simplicity, reliability, and quick turnaround, enabling assembly and launch within 24 hours from any suitable site.
- Key innovations include 3D-printed engines reducing weight by 50 per cent and production time by 80 per cent.
- Its first **three solid-fuel stages** provide strong initial lift, while a **hypergolic liquid upper stage** enables precise orbital insertion and adjustments.
- **Capabilities of Vikram-I:** Payload capacity of up to 350 kg to Low Earth Orbit (LEO) and 260 kg to Sun-Synchronous Orbit (SSO), depending on mission inclination. For instance, it can place 290 kg into a 500 km SSO or 480 kg into a 500 km LEO at 45° inclination.

SOLARAS S-2

Context: Grahaa Space, a Bengaluru-based startup, has received authorisation from IN-SPACe for its first nano-satellite mission, Solaras S-2.

About Solaras S-2

- Solaras S-2 is a **nano satellite** developed primarily for technology demonstration purposes.
- It is **scheduled to be launched from the Alcântara Space Center in Brazil** aboard the Hanbit-Nano launch vehicle developed by South Korea's Innospace.
- The mission aims to
  - **qualify Grahaa Space's nano satellite bus and platform,**
  - assess system performance, and gather basic solar observation data.
- The satellite also features a **beacon that transmits on amateur frequencies and includes an FM repeater module.**

GSAT-7R SATELLITE (CMS 03)

Context: The ISRO has successfully launched the Indian Navy's advanced communication satellite, GSAT-7R (CMS-03), from the Satish Dhawan Space Centre at Sriharikota.

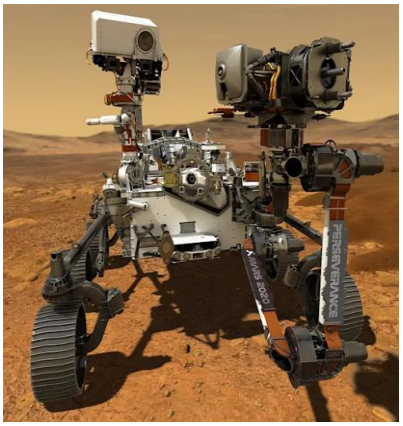
About CMS-03 / GSAT-7R

- GSAT-7R is a **multi-band military communication satellite developed by the Indian Space Research Organisation (ISRO) for the Indian Navy.**
- CMS-03 aims to **provide the Navy with secure telecom coverage across the Indian Ocean** region. It also feeds into ISRO's Gaganyaan preparations.
- It was successfully launched aboard the **LVM3-M5 rocket (also known as Bahubali)** from the Satish Dhawan Space Centre, Sriharikota.
- It is designed to **replace the aging GSAT-7 "Rukmini" satellite.**
- GSAT-7R is **India's heaviest communication satellite to date,** weighing about 4,400 kg.
- It features **advanced multi-band transponders (UHF, S-band, C-band, and Ku-band)** for secure voice, data, and video communication.

PERSEVERANCE ROVER

Context: In a major scientific advance, NASA's Perseverance rover has recently detected electrical activity in the Martian atmosphere for the first time.

About Perseverance Rover ("Percy")



- Perseverance is a **semi-autonomous, car-sized robotic explorer** and the central mission element of **NASA's Mars 2020 programme.**
- Built on the design of the Curiosity rover, Perseverance is the **first rover to land in a former Martian river delta.**
- It has also recorded and transmitted sounds from Mars and successfully produced oxygen on the planet using the **MOXIE** (Mars Oxygen In-Situ Resource Utilization Experiment) instrument.
- **Launch and landing:** Launched in 2020, it landed in 2021 at **Jezero Crater,** an ancient river delta on Mars.
- **Primary mission:** To search for signs of ancient microbial life and collect rock and soil samples for possible return to Earth in the future.

About Ingenuity Helicopter

- Ingenuity is a **small, autonomous helicopter that travelled to Mars attached beneath Perseverance.** It made history as **the first aircraft to achieve powered, controlled flight on another planet.**
- Its mission was a **technology demonstration** to test the feasibility of powered flight in the Martian atmosphere.

ALAKNANDA SPIRAL GALAXY

Context: Indian researchers from the National Centre for Radio Astrophysics (NCRA-TIFR), Pune have discovered a massive galaxy named **Alaknanda**, using data from NASA's James Webb Space Telescope (JWST).

About Alaknanda Galaxy

- Alaknanda is a massive spiral galaxy that existed when the universe was only 1.5 billion years old. This makes it one of the earliest to have been observed so far.
- Located about **12 billion light-years away** and displays a **textbook spiral structure**, the galaxy is **named after the Himalayan river Alaknanda**, drawing symbolic connection with the Hindi name for the Milky Way.
- It has two well-defined spiral arms wrapped around a bright central bulge and spans nearly 30,000 light-years in diameter.
- Alaknanda is also a highly active star-forming galaxy, producing new stars at a rate of nearly 60 solar masses per year.
- It appears remarkably similar to our own Milky Way, despite having formed when the universe was only about 10% of its present age.

- Contrary to scientific expectations that early galaxies were chaotic, clumpy, and turbulent, Alaknanda is a well-defined spiral galaxy with arms remarkably similar to the Milky Way. Its organized structure challenges current models of galaxy formation.

What is a Spiral Galaxy?



- Spiral galaxies are **rotating systems of stars and gas** with graceful **spiral arms** and are often composed of many hot, young stars.
- In these galaxies, **stars, gas, and dust are arranged in spiral arms that extend outward from the galactic centre.**
- Most spiral galaxies have a **central bulge surrounded by a flat, rotating stellar disk.** The central bulge contains older and dimmer stars and usually hosts a supermassive black hole.
- Nearly two-thirds of spiral galaxies also contain a bar-shaped structure across the centre — a feature seen in the Milky Way as well.
- From this rotating disk emerge the distinctive spiral arms that curve around the galaxy.
- These arms are rich in gas, dust, and young luminous stars, which burn brightly but have relatively short lifespans.

About NASA's James Webb Space Telescope (JWST)

- JWST is an **orbiting infrared observatory** and **most powerful observatory ever launched,** succeeding the Hubble Telescope with advanced infrared capabilities.
- **Launched on December 25, 2021**, it observes the universe's earliest galaxies, star formation, and exoplanet atmospheres.
- It does not orbit around the Earth like the Hubble Space Telescope, it orbits the Sun 1.5 million kilometers away from the Earth at what is called the second Lagrange point or L2.
- It was a joint effort by NASA, the European Space Agency (ESA), and the Canadian Space Agency (CSA).

AVISPRAY-10C

Context: AvironiX Drones, a Chennai-based deep-tech drone company, has launched it.

About AviSpray-10c

- It is an **ultra-compact agricultural spraying drone**. It is **backpack-sized** and about 53% smaller than conventional agri-drones, while covering around **5 acres per battery** with precision spraying.
- Built on a **hexacopter design,** it includes terrain-following radar and collision-avoidance features, making it suitable for Indian farming conditions such as heat, dust, and humidity.
- The drone has been **field-tested on over 6,000 acres,** including paddy and sugarcane farms, and offers lower capital and operating costs.

COSMIC FILAMENT

Context: Recently, researchers at the University of Oxford reported a cosmic filament about 50 million light-years long, containing at least 14 galaxies.

About Cosmic Filament

- Cosmic filaments represent the **largest known structures in the universe,** forming **thread-like networks of galaxies, gas, and dark matter** that create the backbone of the cosmic web. These vast filaments span hundreds of millions of light-years.
- They **form due to gravity pulling matter together,** especially where large sheets of matter intersect, and they connect galaxy clusters while surrounding vast empty regions called cosmic voids.
- These filaments **act like highways that guide the movement of gas and galaxies**, helping shape how galaxies grow and how new stars form.

GEMINID METEOR SHOWER

Context: The Geminid meteor shower peaked overnight December 13-14, 2025.

What is the Geminid Meteor Shower?

- Geminid meteor shower is one of the most reliable and intense annual meteor displays, peaking each mid-December. It originates from **debris left by the asteroid 3200 Phaethon, unlike most showers tied to comets.**

- It peaks during mid-December each year, and is considered to be one of the best and most reliable annual meteor showers. The radiant point lies in the constellation Gemini, visible globally after sunset.
- Geminids produce up to 120 meteors per hour at peak under ideal dark-sky conditions, appearing bright, slow-moving, and often yellowish.
- The radiant point lies in the constellation Gemini, visible globally after sunset.

ANTARIKSH PRAYOGSHALA (SPACE LABS)

Context: IN-SPACe recently rolled out a Request for Proposal (RfP) to establish Antariksh Prayogshala (Space Labs) at select academic institutions across India.

Antariksh Prayogshala (Space Labs):

- It is a first-of-its-kind initiative aimed at creating state-of-the-art space laboratories within Indian academic institutions.
- **Objective**: To set up space laboratories in academic institutions for hands-on space technology training.
- **Coverage**: Up to 7 institutions, one per geographic zone (phased selection).
- **Users**: Students and Non-Governmental Entities (NGEs) in the zone.
- **Funding**: IN-SPACe support of up to 75%, capped at ₹5 crore per institution, linked to milestones.
- **Selection**: To be carried out in two stages—eligibility screening and Empowered Committee ranking.

About Indian National Space Promotion and Authorisation Centre (IN-SPACe)

- IN-SPACe is **India's single-window nodal agency** under the Department of Space to **promote private sector participation in space activities** formed in June 2020.
- It authorizes and supervises Non-Governmental Entities (NGEs) in building launch vehicles, satellites, and providing space-based services.
- It acts as an interface between ISRO and NGEs, and optimises the use of India's space resources.

MICROMETEOROIDS AND ORBITAL DEBRIS

Context: Recently, a piece of debris struck the Chinese crewed vehicle Shenzhou-20, causing a minor crack in the window of its return capsule. This incident has raised concerns about protecting astronauts from Micrometeoroids and Orbital Debris (MMOD) orbiting the Earth.

Micrometeoroids	Orbital Debris (Space Junk)
• Micrometeoroids are tiny **natural** particles of rock, metal, or other extraterrestrial material, typically smaller than 1 millimeter, that travel through space at high velocities. • **Size**: A few micrometres to ~2 mm. • **Origin**: Collisions in the asteroid belt; minor contribution from comets.	• **Human-made** objects in Earth's orbit that no longer serve any functional purpose. • **Origin**: Exploded rocket stages, defunct satellites, collisions, and ASAT (Anti-Satellite) tests. • **Impact**: Billions of hits on orbiting spacecraft annually. • **Concentration**: Mainly in Low Earth Orbit (LEO), around ~200–2,000 km altitude.

Kessler Syndrome

- The Kessler Syndrome is a phenomenon in which the amount of junk in orbit around Earth reaches a point where it just creates more and more space debris, causing big problems for satellites, astronauts and mission planners.
- It is named after former NASA scientist Donald Kessler, who laid out the idea in 1978.

MARS ATMOSPHERE AND VOLATILE EVOLUTION (MAVEN) MISSION

Context: NASA has lost contact with its MAVEN spacecraft, the Mars orbiter that has worked for more than a decade to study how the planet's atmosphere is escaping into space.

About Mars Atmosphere and Volatile Evolution (MAVEN) Mission

- The MAVEN mission **studies the Martian upper atmosphere** to understand how the planet lost much of its atmosphere over billions of years.
- It is the first mission devoted to understanding the Martian upper atmosphere.

- **Launched in 2013,** from Cape Canaveral, Florida, aboard an Atlas V rocket, MAVEN **entered Mars orbit in 2014.**
- **Instruments:** Solar wind–ionosphere instruments, an ultraviolet (UV) spectrometer, and a mass spectrometer.
- **Key finding:** Mars lost about 2/3 of its early atmosphere.

SUPERKILNOVA

Context: Astronomers observed superkilonova in the event AT2025ulz, announced by Caltech and LIGO/Virgo in late 2025, in the form of a gravitational wave signal.

What is a Superkilonova?

- Superkilnova refers to **a hypothetical type of cosmic explosion** combining traits of a **supernova** (the death of a massive star) and a **kilonova** (the merger of two neutron stars).
- Superkilonova is a situation where a supernova blows up a massive star into two neutron stars, which then merge to produce a kilonova.
- It can **create heavy elements such as gold and silver,** and also **emits gravitational waves.**
- **Process**: Supernova → two neutron stars form → merge.

Kilonova vs Supernova

- **Kilonova**: A kilonova is a rare, **extremely powerful explosion that occurs when two neutron stars collide, or when a neutron star merges with a black hole**. Neutron stars are ultra-dense remnants left behind after massive stars explode as supernovae.
- **Supernova**: A supernova is the **explosive death of a star,** releasing immense energy and light visible across vast cosmic distances. These events represent the **final stage of massive stars** or certain binary systems and help create many heavy elements found in the universe. For a short time, a supernova can outshine an entire galaxy.

RESPOND BASKET 2025

Context: ISRO recently released RESPOND Basket 2025.

- It is a set of research problem statements aligned with its ongoing and upcoming mission requirements, inviting academia and R&D institutions to contribute through targeted research.
- Launched on December 16, 2025, during **ISRO-Academia Day**.
- **Objective:** To align academic research and development with ISRO's present and future mission needs.
- **Focus Areas:** Quantum computing, Launch vehicles and advanced materials, Remote sensing, Advanced satellite communication systems, Mission Linkage
- The problem statements are linked to major upcoming missions such as: Bharatiya Antariksh Station, Chandrayaan-4, Gaganyaan, Venus Orbiter Mission, Human Moon Mission
- **Who Can Apply?:** Faculty members and scientists from recognized academic institutions and autonomous R&D organisations, submitted via the I-GRASP portal

BIOLOGY AND BIOTECH

METHANDIENONE LONG-TERM METABOLITE

Context: India has successfully developed the Methandienone Long-Term Metabolite (LTM) to strengthen anti-doping testing in sports.

What is Methandienone Long-Term Metabolite (LTM)?

- Methandienone LTM is a **rare, high-purity Reference Material (RM)** used **to detect the long-term presence of Methandienone,** an **anabolic steroid** banned by the World Anti-Doping Agency (WADA).
- Reference Materials are highly purified and scientifically characterised forms of drugs or metabolites. They are essential for accurate anti-doping tests and are used to detect more than 450 substances prohibited by WADA.
- It allows detection of Methandienone months or even years after use, improving the ability to catch doping violations.
- It helps increase positive detections, deter doping practices, and protect clean athletes.
- Such long-term metabolites are not commercially available globally

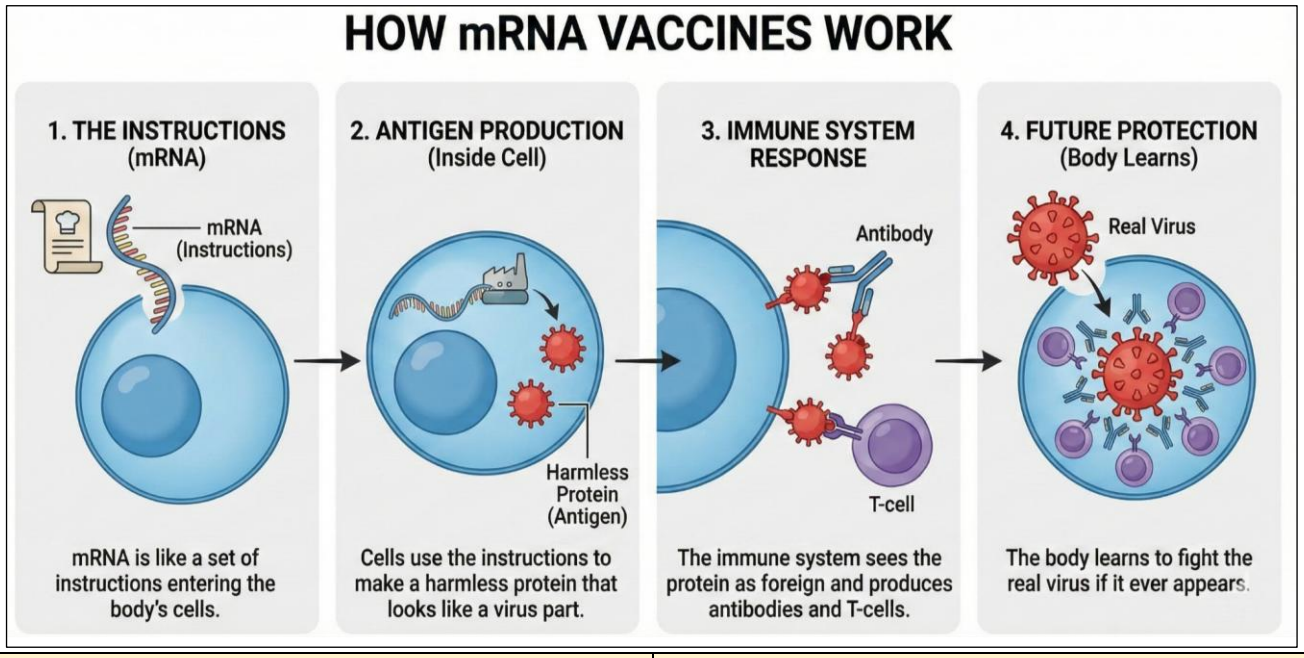
- **Developed By:** National Institute of Pharmaceutical Education and Research (NIPER), Guwahati, in collaboration with the National Dope Testing Laboratory (NDTL), New Delhi.
    - NDTL is India's only facility for human sports dope testing and is accredited by both the National Accreditation Board for Testing and Calibration Laboratories (NABL) and WADA (since 2008).

MRNA VACCINES

Context: Russia is developing Enteromix, an oncolytic vaccine, along with personalized mRNA vaccines for targeted cancer therapy.

What is an mRNA Vaccine?

- An mRNA vaccine is a type of vaccine that uses **a tiny piece of genetic material called messenger RNA (mRNA) to teach the body how to protect itself from a disease.**
- The vaccine **does not contain a live virus,** so it cannot cause the disease. The mRNA functions in the cytoplasm to direct protein synthesis and does not integrate into the cell's DNA (genome). After its job is done, the mRNA breaks down naturally inside the body.
- **Example**: COVID-19 mRNA vaccines directed cells to make the spike protein of SARS-CoV-2.



Advantages of mRNA Vaccines	Challenges of mRNA Vaccines
• **Rapid Development:** Can be created quickly once a pathogen's genetic sequence is known. • **Strong Immune Response:** Elicit both antibody and T-cell immunity. • **No Live Virus Needed:** Enhances safety by eliminating the risk of causing disease.	• **Storage Requirements:** Need ultra-cold temperatures, complicating distribution. • **Short-term Side Effects:** May cause fever, fatigue, and injection-site discomfort. • **Long-term Safety:** As a relatively new platform, long-term effects are still being studied.

Enteromix: an oncolytic vaccine

Enteromix is formulated using four non-pathogenic viruses capable of destroying malignant cells and stimulating antitumor immunity. Demonstrated 100% success in preclinical trials.

- **Oncolytic Vaccines:** These therapies use oncolytic viruses (OVs) that selectively kill cancer cells while also activating the body's anti-tumor immune response.
- **Personalized mRNA Vaccine:** Each vaccine is designed individually based on the genetic profile of a patient's tumor, enabling the immune system to specifically recognise and attack cancer cells.

P-47 PROTEIN

Context: Researchers at the S. N. Bose National Centre for Basic Sciences (SNBNCBS) have reported that the P-47 protein has an unexpected ability to function as a "mechanical chaperone."

- SNBNCBS is an autonomous institute under the Department of Science and Technology

What is P-47 Protein?

- P-47 is a **cofactor protein a**ssociated with p97, **a major regulator of protein movement and degradation in cells.**
- It has traditionally been known as a **helper involved in protein trafficking, degradation, and membrane fusion.**

About the Study

- The recent study shows that **P-47 acts as a mechanical chaperone, meaning it can directly stabilize proteins when they are under mechanical stress.**
- The protein enhances extraction of proteins from the endoplasmic reticulum (ER) into the cytoplasm. It helps reduce protein misfolding and improves protein translocation within the cell.
- This is the first single-molecule demonstration of a cofactor displaying autonomous, force-dependent, chaperone-like activity.
- The discovery identifies P-47 as a potential therapeutic target for cardiomyopathies, laminopathies, and neurodegenerative disorders associated with protein instability.

DUCHENNE MUSCULAR DYSTROPHY

Context: The Ministry of Social Justice and Empowerment observes World Duchenne Muscular Dystrophy Day every year on 7th September.

About Duchenne Muscular Dystrophy

- DMD is a rare genetic disorder inherited in an X-linked recessive pattern.
- It is caused by the absence of dystrophin, a protein that protects muscle fibres from breaking down. The lack of dystrophin leads to progressive muscle weakness and degeneration, with symptoms appearing in early childhood.
- **Discovery:** First described by French neurologist Guillaume Duchenne in the 1860s.
- **Who It Affects:** Affects mainly boys (1 in 3,500–5,000 births). Symptoms begin in early childhood. Girls are usually carriers.
- **Major Symptoms:** Muscle weakness in hips, thighs, shoulders; difficulty walking; calf enlargement; waddling gait; later involves heart and lungs.
- **Life Expectancy:** With modern care, patients may live into their 30s–40s.
- **Treatment:** Includes steroids, exon-skipping drugs, gene therapy, and multidisciplinary supportive care.

WHO MODEL LISTS OF ESSENTIAL MEDICINES

Context: The World Health Organization (WHO) has released updated editions of its Model Lists of Essential Medicines (EML), adding new treatments for several cancers, diabetes, and obesity.

About the WHO Model Lists of Essential Medicines

- The Model List serves as a **guide to the minimum medicine needs of every health system** and aims to ensure access to safe, effective, and affordable medicines.
- The list is **updated every two years by the WHO Expert Committee** on the Selection and Use of Essential Medicines.
- **Tanzania created the first national essential medicines list in 1970**. In response to a request from the World Health Assembly, **WHO published the first global Model List with 186 medicines in 1977.**
- More than 150 countries use the WHO Model List as the basis for their national essential medicines lists.

CLOPIDOGREL

Context: Doctors now believe that clopidogrel may be more effective than aspirin for the long-term prevention of heart attacks, particularly in high-risk individuals.

About Clopidogrel

- **Type:** Clopidogrel is an **antiplatelet drug** that **prevents the formation of blood clots.**
- **Uses:** It **helps prevent heart attacks and strokes**, treats peripheral artery disease, and prevents clot formation after certain medical procedures.

- **Administration:** It is taken orally, usually once daily, with or without food, and ideally at the same time each day.

SARCOIDOSIS

Context: A recently published peer-reviewed study provides an in-depth analysis of sarcoidosis, highlighting its variable course and the factors that influence disease severity.

What is Sarcoidosis?

- Sarcoidosis is an **non-communicable inflammatory disease** in which the **immune system overreacts and forms granulomas** (clumps of immune cells) in various organs.
- It most commonly affects the lungs and lymph nodes, but it can also affect the skin, eyes, and heart.
- **Cause:** The exact cause is unknown. It is likely triggered by a combination of genetic susceptibility and environmental factors, such as bacteria, dust, or chemical exposures.
- **Treatment:** There is no definitive cure for sarcoidosis. Many cases resolve on their own without medication. Severe or persistent disease may require immunosuppressive treatment, particularly corticosteroids.

CENTRE FOR CELLULAR AND MOLECULAR BIOLOGY (CCMB)

Context: Scientists at the CSIR–Centre for Cellular and Molecular Biology (CCMB) have discovered how white blood cells adapt their internal skeletons to combat pathogens.

About Centre for Cellular and Molecular Biology (CCMB)

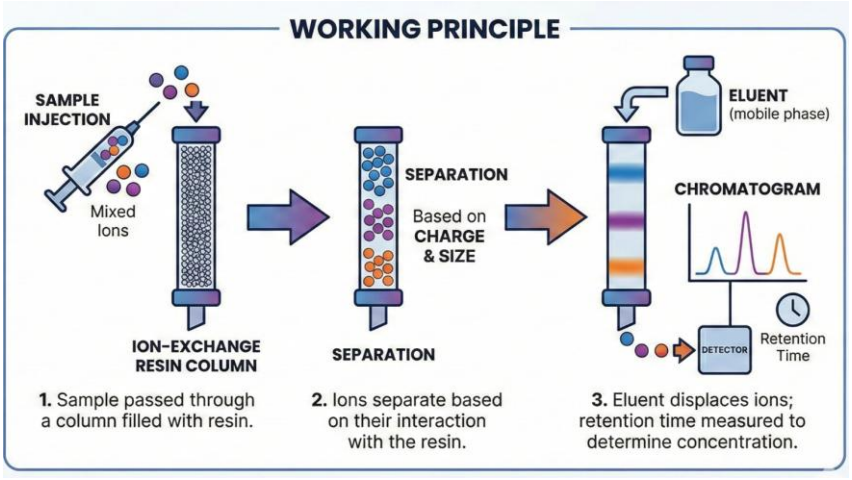
- **Established**: In 1977, Hyderabad; it **functions under the Council of Scientific and Industrial Research (CSIR)**, Ministry of Science & Technology.
- **History**: It began as a semi-autonomous centre and became a full-fledged national laboratory in 1981–82 under the leadership of Dr. P. M. Bhargava.
- **Objective**: It aims to conduct high-quality research and training in modern biology and to provide national-level facilities for advanced biological techniques.
- **Research Areas**: Its expertise spans genetics, biotechnology, immunology, molecular medicine, genomics, proteomics, and various cellular mechanisms.
- **Applications**: Its research contributes to medicine, disease management, agriculture, and environmental science.
- **Recognition**: It has been designated as a Centre of Excellence by the Global Molecular and Cell Biology Network (UNESCO).

ION CHROMATOGRAPHY

Context: Scientists have recently developed a method to perform ion chromatography directly in the field.

What is Ion Chromatography (IC)?

- Ion Chromatography, also known as ion exchange chromatography, is a powerful **analytical technique used to separate and quantify ions present in a sample.**
- The technique is highly **sensitive** and can detect ions at parts-per-billion (ppb) levels, including trace organic acids.
- IC is **widely used in water quality testing, food chemistry, protein isolation, and educational laboratory experiments.**
- It is also relatively easy to operate, making it suitable for both beginners and experienced analysts. The use of pre-packed columns and automated systems further simplifies the procedure.



- One major **drawback** is the **lack of universal detection**, meaning IC cannot provide structural information about the separated compounds. In addition, it has **limited capability to analyse non-ionic species** or molecules that do not interact effectively with ion-exchange resins.

Types of IC

- **Cation Exchange:** Used to detect positively charged ions such as Na^+, K^+, Ca^{2+}, and Mg^{2+}.
- **Anion Exchange:** Used to detect negatively charged ions such as F^-, Cl^-, NO_3^-, and SO_4^{2-}.

NIGHTMARE BACTERIA

Context: Scientists at the US Centers for Disease Control and Prevention (CDC) have reported that drug-resistant "nightmare bacteria," driven by the NDM gene, are spreading faster than ever in the United States.

What are Nightmare Bacteria?

- Nightmare bacteria are **carbapenem-resistant *Enterobacteriaceae* (CRE),** such as *E. coli* and *Klebsiella pneumoniae.*
- They are resistant to most available antibiotics, including carbapenems, which are typically reserved for severe or life-threatening infections.

Symptoms of Infection

- **Urinary Tract:** Burning sensation during urination, frequent urge to urinate, and cloudy urine.
- **Bloodstream:** High fever, rapid heartbeat, and low blood pressure.
- **Lungs (Pneumonia):** Cough, shortness of breath, and chest pain.

Causes of Rising Infections

- **Antibiotic Overuse:** Excessive or unnecessary use of antibiotics in humans and livestock accelerates resistance.
- **Post-Pandemic Vulnerability:** Prolonged hospital stays and heavy antibiotic use during and after COVID-19 have increased susceptibility.

Role of the NDM Gene

- The NDM (New Delhi Metallo-beta-lactamase-1) gene **enables bacteria to produce the NDM-1 enzym**e, which creates resistance to a broad range of beta-lactam antibiotics**,** including last-resort carbapenems.
- This makes infections extremely difficult to treat and contributes to rapid global spread.

AFLATOXIN

Context: Indian exporters are contesting Indonesia's delayed notification process regarding the detection of aflatoxins in groundnut shipments.



What are Aflatoxins?

- Aflatoxins are **toxic mycotoxins produced by the fungi *Aspergillus flavus* and *Aspergillus parasiticus.***
- **Sources:** They commonly contaminate **crops** such as groundnuts, maize, rice, tree nuts, spices, and cocoa, both before and after harvest.
- **Exposure:** Humans are exposed to aflatoxins by consuming contaminated food or animal products. Farmers and workers may also inhale contaminated dust during handling and processing.
- **Health Impacts:** Aflatoxins are known to be **genotoxic** and **carcinogenic**, posing serious risks to both human and animal health.

INFECTIOUS BOVINE RHINOTRACHEITIS

Context: Indian Immunologicals Limited (IIL) has recently launched Raksha-IBR, India's first indigenously developed glycoprotein E (gE)–deleted DIVA marker vaccine against infectious bovine rhinotracheitis.

About Infectious Bovine Rhinotracheitis (IBR)

- IBR is a highly contagious **viral disease affecting cattle,** caused by **bovine herpesvirus type 1 (BoHV-1).**
- It primarily causes **acute inflammation of the upper respiratory tract** but can also affect the reproductive system, leading to significant economic losses in cattle production.
- **Transmission:** The virus is transmitted mainly by direct contact and spreads rapidly among animals in close proximity.

- **Impacts**: It leads to respiratory and reproductive disease in cattle, causing infertility, abortions, and reduced milk yield.
- **Prevention**: There is no specific treatment for IBR.
    - The newly launched **Raksha-IBR vaccine is India's first gE-deleted DIVA (Differentiating Infected from Vaccinated Animals) vaccine**, which allows differentiation between infected and vaccinated animals.
    - It has been developed by IIL in collaboration with the National Dairy Development Board (NDDB), Anand, Gujarat.

NATIONAL BIOFOUNDRY NETWORK

Context: India launched its first National Biofoundry Network on 27 August 2025, coinciding with the first anniversary of the BioE3 Policy.

What is a Biofoundry?

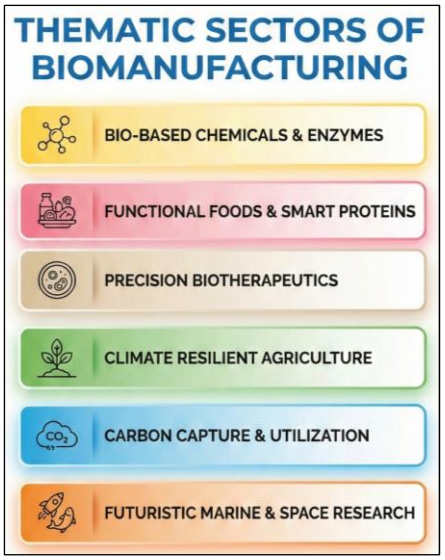
- An automated, high-technology facility that designs, builds, and optimises engineered organisms using tools such as DNA synthesis, gene editing, and high-throughput biomanufacturing platforms. Biofoundry is a place where biomanufacturing meets automation.

About the National Biofoundry Network

- The National Biofoundry Network is **India's first integrated platform for advanced biomanufacturing**, launched as part of the BioE3 (Biotechnology for Economy, Environment and Employment) Policy.
- This network comprises six premier institutions and **aims to accelerate biotech innovation by scaling up proof-of-concept projects into market-ready solutions**, bridging the gap between research labs and industry.
- The **Department of Biotechnology (DBT)**, under the Ministry of Science and Technology, is the nodal agency responsible for implementing the network.

About the BioE3 Policy (Biotechnology for Economy, Environment and Employment)

- The BioE3 Policy, approved in August 2024, is a framework to boost innovation in biotech for sustainable economic growth, focusing on **6 key sectors.**
- **Nodal Ministry:** Department of Biotechnology (DBT), under the Ministry of Science & Technology.
- **Vision:** To position India as a leader in sustainable, globally resilient biomanufacturing by advancing diverse bioeconomic solutions with minimal environmental and climate impact.
- **Goal:** To speed up the shift from innovation to technology by unifying fragmented biomanufacturing efforts and promoting sustainable, scalable options.
- **Objective:** To create a framework that supports adoption of advanced technologies, directs research toward transforming biomanufacturing for higher efficiency, sustainability, and quality, and accelerates the production of high-value bio-based products.
- In order to augment research and translation across these six verticals, **Bio-Enablers (Moolankur)** i.e. **Bio-Artificial Intelligence (AIs) Hubs** and **Biofoundry/Biomanufacturing Hubs** will be set up across the country.



SYPHILIS

Context: Recent U.S. government data show that while sexually transmitted disease rates among adults have declined, syphilis in newborns continues to rise.

What is Syphilis?

- Syphilis is a preventable and curable **bacterial sexually transmitted infection (STI)** caused by ***Treponema pallidum.***
- **Transmission:** Syphilis spreads through sexual contact, mother-to-child transmission during pregnancy, and, rarely, breastfeeding.
- **Symptoms (Stages)**

- **Primary Stage:** A painless sore on the genitals, rectum, or mouth, sometimes accompanied by swollen lymph nodes.
- **Secondary Stage:** A non-itchy rash on the hands and feet, fever, and general malaise.
- **Latent (Hidden) Stage:** No symptoms are present, but the bacteria remain in the body.
- **Tertiary Stage:** Severe damage to the brain, heart, and other organs; this stage can be life-threatening.

- **Impact in Pregnancy:** Untreated syphilis is a leading cause of stillbirth and neonatal death globally (second only to malaria in some regions).
- **Treatment:** Penicillin is the definitive cure for syphilis, and treatment is most effective in the early stages.

1ST EVER GENE EDITED (GE) RICE VARIETIES

Context: India has developed its first-ever gene-edited (GE) rice varieties—DRR Dhan 100 (Kamla) and Pusa DST Rice 1.

Gene-Edited Rice in India

- Developed by **ICAR** using the advanced **CRISPR-Cas9 gene-editing technique (specifically SDN-1 and SDN-2)**, these varieties are **derived from traditional strains Samba Mahsuri and MTU 1010**.
- Importantly, the process **did not involve the introduction of any foreign gene**, making these crops non-transgenic.
- They are also the **first GE food crops in India to be cleared for cultivation**.
- This progress follows India's regulatory relaxation in March 2022, which allowed the use of SDN-1 and SDN-2 techniques that do not insert external DNA. In contrast, SDN-3 involves adding foreign genes, which classifies the crop as transgenic (similar to genetically modified organisms).
- **DRR Dhan 100** shows a **19% higher yield due to more grains per plant** and matures 20 days earlier, which reduces water needs and lowers methane emissions.
- **Pusa DST Rice 1** demonstrates **greater tolerance to drought, salinity, and climate stress**, making it well-suited for changing environmental conditions.

Aspect	Genetically Modified (GM) Crops	Gene-Edited (GE) Crops
Technique	Genome modified using **recombinant DNA (r-DNA) techniques**	Genome edited using the CRISPR **system**.
Nature	• Involves **inserting genes from unrelated species** into host plants. • Always **transgenic**.	• May or may not involve foreign gene insertion. • Can be **non-transgenic** if no external DNA is added.
Regulation in India	• Strictly regulated under **Environment Protection Act (1986)**. • Requires approval of **GEAC (Genetic Engineering Appraisal Committee)**. • Rules apply broadly to r-DNA, gene editing, and gene drives without distinction.	• If no foreign gene is introduced (SDN-1 & SDN-2), regulation is **relaxed** under biosafety rules. • Still falls under Environment Protection Act but treated differently from transgenic GM crops.
Status in India	**Bt Cotton** is the only GM crop approved for commercial cultivation.	**DRR Dhan 100** and **Pusa DST Rice 1** are the first GE crops cleared for cultivation.

Aspect	r-DNA Technology	Gene Editing
Inception	Pioneered by **Herbert Boyer and Stanley Cohen** in 1970s	Developed by **Jennifer Doudna and Emmanuelle Charpentier** in 2012
Method	Insertion of **foreign DNA fragments** into the host genome. *Example: inserting Vitamin A gene from daffodil into rice (Golden Rice).*	Editing of **endogenous DNA sequences** (cut, insert, delete) without necessarily adding foreign DNA.

Precision	**Random integration** – less precise Cutting enzymes are non-specific and do not "read" the genome.	• **Targeted and site-specific** – enzymes like CRISPR can be programmed to edit a precise location in the genome. • Known as **Site-Directed Nuclease (SDN) techniques**.
Tools	**Restriction enzymes** and **ligases**.	**CRISPR-Cas9**, **TALENs**, **ZFNs (Zinc Finger Nucleases)**.
Appli-cations	Production of **insulin, growth hormones**, and early GM crops.	Treatment of **genetic disorders**, **precision agriculture**, and development of **climate-resilient crops**.

INDIA'S 1ST GENE-EDITED SHEEP

Context: India has achieved a landmark in livestock genetics with the creation of its first gene-edited sheep, a Kashmir Merino lamb.

- The breakthrough was made by researchers at Sher-e-Kashmir University of Agricultural Sciences and Technology (SKUAST), Srinagar, the same institute that produced **India's first cloned Pashmina goat, Noori, in 2012.**
- The gene editing enhanced the animal's muscle mass by about 30% through the disruption of the myostatin gene, which naturally regulates muscle growth. While this mutation is commonly found in certain European breeds such as the Texel, it is absent in Indian sheep.
- Importantly, since the process **did not involve the introduction of any foreign gene**, the resultant breed is classified as **non-transgenic.**

GENE THERAPY FOR HAEMOPHILIA

Context: India has successfully conducted its first human trial of gene therapy for haemophilia. Researchers from Christian Medical College (CMC), Vellore and inSTEM (Bengaluru) developed the **world's first lentivirus-based gene therapy for the haemophilia.**

About Haemophilia

- Haemophilia is a rare **inherited bleeding disorder** where the **blood does not clot properly due to a deficiency in certain clotting factors**. The disorder is typically inherited through an X chromosome mutation, which is why it is more common in males
- **Types**
  - **Hemophilia A:** This is the most common form. It occurs when the body has low levels of **clotting factor VIII**, leading to prolonged bleeding.
  - **Hemophilia B:** This type develops due to a deficiency of **clotting factor IX**, and its symptoms are similar to Hemophilia A.
  - **Hemophilia C:** Also called **factor XI** deficiency, this is the rarest form of hemophilia and generally causes milder bleeding problems compared to the other types.
- **Symptoms: spontaneous bleeding in joints, muscles, and soft tissues,** and becomes especially dangerous during internal bleeding, such as a brain hemorrhage.
- **Treatment:** Intravenous infusion of clotting factors, recombinant therapy, and gene therapy in advanced nations.
- **Emerging innovations:** CRISPR-based gene editing, long-acting clotting factors, and subcutaneous treatment options.

Gene Therapy for Haemophilia

- Blood clotting factors are proteins normally produced in the liver of a healthy individual.
- In gene therapy, a patient's **hematopoietic stem cells (blood-related stem cells)** are genetically engineered to produce white blood cells capable of producing clotting proteins.

WORLD'S 1ST GENE-EDITING THERAPY TO CURE CPS1 DEFICIENCY

Context: Researchers from Philadelphia (USA) have successfully conducted the world's first CRISPR-based gene-editing therapy to save a baby with the rare metabolic disorder CPS-1 deficiency.

CPS-1 Deficiency:

- **Carbamoyl Phosphate Synthetase I (CPS-1)** deficiency is a **rare autosomal recessive metabolic disorder of the urea cycle**, causing **hyperammonemia**.
- Deficiency leads to **toxic ammonia buildup,** which can cause coma, brain swelling, and permanent brain damage. CPS-1 deficiency has an estimated mortality of 50% in early infancy.
- **Treatment:** Protein-restricted diet, nitrogen-scavenging drugs (sodium benzoate, sodium phenylbutyrate), and in severe cases, liver transplantation.

GLOBAL ANIMAL HEALTH REPORT

Context: The World Organisation for Animal Health (WOAH) released its first comprehensive global report on animal health in the context of a changing environment.

Key Findings

- **Changing Disease Patterns:** Infectious animal diseases are spreading into new regions, with 47% having zoonotic potential (transmissible to humans). Example: Peste des Petits Ruminants (sheep and goats) has reappeared in Europe after being largely limited to developing nations.
- **Disease Intensity:** Outbreaks of African swine fever, avian influenza, and foot-and-mouth disease are becoming more frequent and severe, threatening food security, public health, and biodiversity.
- **Major Drivers:** Climate change and global trade expansion are accelerating the spread of transboundary animal diseases.
- **Antimicrobial Resistance (AMR):** By 2050, AMR could cause livestock losses endangering food security for 2 billion people and lead to an estimated US$100 trillion global economic loss.

About World Organisation for Animal Health (WOAH)

- **Founded**: Founded in 1924 as the Office International des Epizooties (OIE), in May 2003, it adopted the common name World Organisation for Animal Health (WOAH).
- **Mandate**: To promote global animal health, ensure transparent sharing of disease data, and contribute to a safer and more sustainable world.
- It is headquartered in **Paris** and comprises **183 member countries, including India.**
- WOAH is the **international standard-setting body for animal health recognized by the World Trade Organization (WTO).**
- It runs the **World Animal Health Information System (WAHIS)** to track disease outbreaks and publishes standards on animal health and welfare

TRACHOMA

Context: India received the **Certificate of Elimination of Trachoma as a Public Health Problem** from WHO, becoming the third Southeast Asian country to eliminate Trachoma, following Nepal and Myanmar.

About Trachoma

- Trachoma is a preventable **bacterial eye infection** caused by *Chlamydia trachomatis*, and is the leading infectious cause of blindness, especially in areas lacking clean water and sanitation.
- **Transmission:** Spread occurs through direct contact with eye or nose secretions, contaminated items, and flies. Children are the main carriers, helping sustain transmission within communities.
- **Symptoms:** Early signs include itching, irritation, and swelling of the eyelids. Repeated infections lead to scarring, trichiasis (inward-turning lashes), and corneal damage, eventually causing blindness.
- **Global Burden (2025):** Endemic in 32 countries, 103 million people at risk. 1.9 million visually impaired or blind
- **Most affected:** Africa, followed by parts of Asia and the Middle East
- **Prevention & Treatment:** Clean water, sanitation, and hygiene (WASH) improvements, Mass antibiotic distribution (mainly azithromycin), Surgery for advanced trichiasis cases

NIPAH VIRUS

Context: Recently, Kerala has reported two cases of the Nipah virus.

About Nipah Virus (NiV)

- Nipah virus (NiV) is a zoonotic virus primarily carried by fruit bats of the genus Pteropus (flying foxes).

- **Transmission**: The virus spreads from animals to humans (bats → pigs → humans), human-to-human, and via contaminated food (e.g., raw date palm juice) or contact with infected patients.
- **Symptoms**: Fever, headache, cough, sore throat, respiratory distress, and neurological symptoms such as encephalitis, seizures, and coma. Symptoms usually appear 4–14 days after exposure.
- **Treatment**: No specific drugs or vaccines exist; intensive supportive care is essential.
- **Outbreaks**: NiV was first identified in 1999 following a major outbreak in Malaysia and Singapore. Outbreaks occur almost yearly in parts of Asia, including Bangladesh, India, Malaysia, Singapore, and the Philippines.

NANOZYMES TO TREAT EXCESSIVE BLOOD CLOTTING

Context: Researchers at IISc Bengaluru have developed a **novel nanozyme made of vanadium pentoxide (V_2O_5) nanoparticles to combat excessive blood clotting (thrombosis).** This condition, linked to pulmonary thromboembolism (PTE), ischemic stroke, and complications from diseases like COVID-19, can trigger heart attacks or strokes.

About Nanozymes

- Nanoenzymes are **nano-biomaterial-based synthetic enzymes** 1–100 nm in size, with similar structures and functions, such as metal complexes, nucleic acids, glucose, and some other biomolecules.
- They are **artificial enzymes made from nanoparticles** that mimic the action of natural enzymes in the body.
- They regulate or trigger biological reactions, often targeting harmful molecules like reactive oxygen species (ROS).
- Nanozymes can neutralize oxidative stress, reduce abnormal blood clotting, and potentially treat conditions like thrombosis, ischemic stroke, or complications from COVID-19.

DNA FINGERPRINTING

Context: DNA profiling was conducted to identify the victims of the unfortunate Air India crash using the DNA fingerprinting technique.

About DNA Fingerprinting

- DNA fingerprinting is a technique used to identify an individual based on their unique genetic makeup. It focuses on specific variations in DNA that differ among individuals, even within the same species.
- One of the commonly used variations in DNA fingerprinting is called **VNTR (Variable Number of Tandem Repeats).**

Applications

- Forensic investigations (crime scene analysis)
- Establishing parentage (paternity/maternity tests)
- Identifying victims in natural disasters or accidents

DNA and the Genome:

- The genome is the complete set of DNA in an organism. DNA is made of four nucleotides- Adenine (A), Thymine (T), Guanine (G), Cytosine (C)- arranged in sequences like letters in a book.
    - The human genome has about 3 billion nucleotides. Humans share 99.9% of their DNA, so even the 0.1% differences are enough to distinguish individuals.

Types of DNA Variations:

- **Single Nucleotide Polymorphisms (SNPs)**: Changes in a single DNA base.
- **Sequence Variations**: Differences in short stretches of DNA.
- **Structural Variations:** Repeating sequences in DNA, such as VNTRs.

What are VNTRs (Variable Number of Tandem Repeats)?

- VNTRs are specific locations in a genome where a short nucleotide sequence is repeated multiple times in tandem, meaning the repeats are adjacent and oriented in the same direction.
- The number of repeats varies among unrelated individuals but is similar in relatives.
- VNTRs are typically found in non-coding regions of DNA, although they can also be in coding or regulatory regions.
- By counting these repeats on both chromosomes inherited from the mother and father, scientists create a unique DNA profile for an individual—this is their DNA fingerprint.
- VNTRs are analyzed through techniques like PCR (polymerase chain reaction) and gel electrophoresis, producing distinctive banding patterns that serve as genetic markers.

DRUG PATENTING IN INDIA

Context: The Delhi High Court has allowed Dr. Reddy Labs to manufacture and export but not sell patented drug Semaglutide in India.

What are Patents?

- Patents are a form of intellectual property rights (IPRs) that give inventors exclusive control over their inventions.
- For drugs, a patent grants exclusive rights to manufacture, use, sell, or export the medicine for a specified period.

Drug Patents in India

- Drug patents in India are governed by the **Indian Patents Act, 1970**. Until 2005, India allowed only **process patents**, which protected the method of manufacturing a drug rather than the drug itself.
- After 2005, following compliance with the **WTO's TRIPS agreement**, India adopted **product patents**, granting **20-year exclusive rights** over the active pharmaceutical ingredient (API) responsible for the drug's therapeutic effects, as per Section 48 of Indian Patents Act, 1970.
- During this period, patented drugs are often expensive to enable companies to **recover their research and development costs**.

Exceptions to Patent Monopoly

- **Experimental or Research Use:** Allows use of a patented invention for research, experiments, or clinical trials without permission
- **Use on Foreign Vessels, Aircraft, and Vehicles:** Patented inventions may be used without authorization on foreign ships, aircraft, or vehicles temporarily entering India
- **Use for Regulatory Approval (Bolar Provision):** Generic manufacturers can use patented drugs for tests and regulatory approvals before patent expiry, enabling immediate launch of affordable generics once the patent ends.
- **Exhaustion of Patent Rights and Parallel Imports:** Once a patented product is sold in India legally, resale or import of the product is allowed.
- **Compulsory Licensing:** Allows governments or authorized third parties to produce or sell patented drugs without the patent holder's consent, especially when the medicine is unaffordable or unavailable to the public, ensuring access to essential healthcare.

Evergreening and Section 3(d)

- **Evergreening**: Refers to the practice where pharmaceutical companies obtain new patents for minor modifications or new forms of existing drugs without significant therapeutic benefits, effectively extending their patent monopoly beyond the original patent term.
- **Section 3(d):** Prevents such misuse; patents are granted only if the modification shows significant therapeutic improvement.

SPOT-SCANNING PROTON ARC THERAPY (SPARC)

Context: A radiation technique developed in the US has improved precision in treating cancers.

About SPArc (Spot-scanning Proton Arc Therapy)

- SPArc is an **advanced form of proton therapy** that treats tumors with high precision, especially in complex areas like the skull, brainstem, and spinal cord.
- It improves upon traditional **Single Field Optimised Intensity Modulated Proton Therapy (SFO-IMPT)** by **enhancing dose conformity, plan robustness, and delivery efficiency.**
- SPArc **delivers proton beams spot-by-spot around the tumor,** dynamically adjusting both beam intensity and angle during treatment.

Types of SPArc

- **Step-and-shoot SPArc:** Beam angles and energy are pre-programmed; radiation is delivered one step at a time.
- **Dynamic SPArc:** Beam angles and energy are calculated in real-time during treatment, providing highest precision.

Comparison with Conventional Proton Therapy

- **SFO-IMPT:** Uses fixed proton beams with set energy and angles. Radiation cannot be adjusted mid-treatment, potentially affecting nearby healthy tissues.

- **SPArc:** Allows dynamic control of beam intensity and angle, reducing exposure to surrounding tissues.

KERALA'S RAPID DIAGNOSTIC TEST FOR BRAIN-EATING AMOEBA

Context: The Kerala State Public Health Lab has created a molecular diagnostic test to detect different strains of the deadly brain-eating amoeba, aiming to reduce meningoencephalitis mortality.

What is Amoebic Meningoencephalitis (Amoebic Brain Fever)?

- It is a rare but fatal brain disease within the Acute Encephalitis Syndrome (AES) spectrum, involving inflammation of the brain and its protective membranes (meninges).
- **Symptoms:** Initial symptoms resemble bacterial meningitis, such as severe headache, high fever, vomiting, stiff neck, confusion, seizures, and sensory changes. The disease progresses rapidly, often causing coma and death within days to two weeks.
- **Causes:** Caused by free-living amoebae (FLA) found in warm freshwater—lakes, ponds, rivers, soil and poorly maintained pools.
- **Transmission:** The amoeba enters through the nose during swimming, travels to the brain, and destroys brain tissue. Infection does not occur from drinking water and does not spread between people.
- **Key deadly varieties: Naegleria fowleri** (most common/fatal), Acanthamoeba spp., Vermamoeba vermiformis, Balamuthia mandrillaris.
- **Fatality:** Globally, mortality is around 97%. In Kerala, early treatment protocols and a One Health approach have reduced mortality to under 25%.

CANDIDA TROPICALIS

Context: Researchers have identified how Candida tropicalis (a fungus) develops resistance to antifungal drugs like fluconazole and voriconazole.

About Candida tropicalis

- Candida tropicalis is a **yeast specie**s in the Saccharomycetales order that causes bloodstream infections, particularly in tropical and subtropical regions. It can also infect animals, for example, causing fungal mastitis in dairy cows.
- Although it is less globally threatening than Candida auris, C. tropicalis is an **emerging concern in healthcare settings in countries such as India, China, and Thailand.**
- The widespread use of **azole fungicides** in agriculture has **contributed to its drug resistance.**
  - The fungus can alter its chromosome sets, gaining extra genes that enable multi-drug resistance, a process known as **ploidy plasticity.**
- Recognized as a global priority, **WHO's 2022 Fungal Priority Pathogens List** highlights C. tropicalis and calls for the development of new antifungal drugs and diagnostic tools.

HIV PREVENTION DRUG APPROVED

Context: The US Food and Drug Administration (FDA) has approved Lenacapavir, a new drug for HIV prevention.

About Lenacapavir

- Lenacapavir is an antiretroviral medicine used for HIV prevention as Pre-Exposure Prophylaxis (PrEP).
- PrEP is a preventive treatment for people who are HIV-negative but at risk of infection.
- WHO currently recommends oral PrEP, the dapivirine vaginal ring, and long-acting injectable cabotegravir (CAB-LA) as PrEP options.

About HIV (human immunodeficiency virus)

- HIV is a **retrovirus** that attacks the immune system, specifically targeting CD4 cells (T cells), which are crucial for fighting infections.
- **Transmission**: HIV spreads through body fluids such as blood, semen, vaginal fluids, and breast milk. It can also be transmitted from mother to child.
- **Treatment and Prevention:** There is no cure for HIV. HIV can be managed and prevented with antiretroviral therapy (ART). Without treatment, HIV can progress to Acquired Immunodeficiency Syndrome (AIDS).
- According to the HIV Estimations 2023 report, over 2.5 million people in India are living with HIV.

JAPONICA RICE

Context: Researchers at the National Institute of Plant Genome Research (NIPGR), Delhi, have successfully used CRISPR-Cas9 gene-editing technology to improve phosphate uptake and transport in japonica rice.

What is Japonica Rice?

- Japonica rice is one of the two main varieties of cultivated rice (Oryza sativa), the other being Indica rice. It is mostly grown in cooler regions such as Japan, Korea, China, Vietnam, and parts of Indonesia.

Key Characteristics

- **Origin**: Northern and eastern China.
- **Climate**: Thrives in temperate and subtropical climates.
- **Grain type**: Short and round grains.
- **Texture**: Becomes sticky, soft, and slightly chewy when cooked (unlike Indica rice, which is long-grained and fluffy.)
- **Amylose content:** Low (0–20%), which makes it more cohesive (clumps together easily).
- **Common uses**: Used in sushi, rice balls, and traditional East Asian dishes that require sticky rice.
- **Gluten-free:** Despite being called "glutinous rice" in some contexts, it does not contain gluten.

About CRISPR-Cas9 (Clustered Regularly Interspaced Short Palindromic Repeats)

- CRISPR-Cas9 is a modern gene-editing technology that allows scientists to precisely change the DNA of living organisms, including plants, animals, and humans.
- It works like a pair of molecular scissors that can cut DNA at a specific location, allowing researchers to add, remove, or modify genetic material.
- **CRISPR**: Refers to short, repeating DNA sequences found naturally in bacteria. These sequences help bacteria remember and defend against viruses.
- **Cas9**: A special enzyme (protein) that acts like scissors to cut DNA at a target site identified by CRISPR.
- **Guided action:** Scientists design a short piece of RNA (guide RNA) that directs Cas9 to the exact part of the DNA to be edited.
- **Result:** Once the DNA is cut, the cell's natural repair process can be used to insert or delete genes, leading to desired traits.

MICROCRYSTALLINE CELLULOSE (MCC)

Context: A lethal accident recently occurred at the pharmaceutical unit of Sigachi Industries in Hyderabad, which manufactures Microcrystalline Cellulose (MCC).

What is Microcrystalline Cellulose (MCC)?

- Microcrystalline Cellulose (MCC) is **a purified, partially depolymerized form of cellulose, obtained from refined wood pulp.**
- It appears as a white, free-flowing, odorless powder and is commonly used as a binding and stabilizing agent in the pharmaceutical and food industries.

Chemical & Physical Properties of MCC

- **Structure:** Crystalline form of cellulose composed of tightly packed microfibers held together by hydrogen bonds and polymer cross-links.
- **Plasticity and Binding:** When compressed, MCC deforms plastically, allowing particles to bond strongly with each other. This high plasticity gives MCC its exceptional tablet-binding properties, making it ideal for tablet formulation.
- **Digestive Nature:** MCC is not absorbed or digested in the human digestive system.
- **Non-toxic:** It is a naturally derived, fiber-rich and non-toxic substance that can be safely consumed.
- **Partially Depolymerized:** The breakdown of cellulose chains enhances its stability and usability in pharmaceutical applications.

Safety Status

- MCC is recognized as "**Generally Recognized as Safe (GRAS)"** by the Select Committee on GRAS Substances. It is safe for human consumption when used in normal quantities.
- However, excessive intake may cause a laxative effect due to its fiber content.

Applications of MCC

- **Pharmaceutical Industry:** Used as a binder, filler, and disintegrant in tablets and capsules.
- **Food Industry:** Acts as a stabilizer, anti-caking agent, and fat substitute in processed foods.

ENDOCRINE-DISRUPTING CHEMICALS (EDCS)

Context: Beyond choking oceans and clogging landfills, plastics are now infiltrating human bodies through microplastic particles and a cocktail of endocrine-disrupting chemicals (EDCs).

What is the Endocrine System?

- The endocrine system is a network of glands that produce hormones — the body's chemical messengers.
- These hormones regulate vital processes such as growth, development, metabolism, reproduction, and mood. Because hormones influence nearly every cell, organ, and function in the body, even a small disruption can lead to significant health issues.

What are Endocrine-Disrupting Chemicals (EDCs)?

- Endocrine-Disrupting Chemicals are natural or synthetic substances that interfere with the body's hormonal system. They can:
  - Mimic natural hormones and trigger false signals.
  - Block hormone receptors, preventing real hormones from acting.
  - Alter hormone production, transport, or breakdown.
- There are an estimated 85,000 man-made chemicals in the world, and at least 1,000 are classified as EDCs.
- **Common Examples:**
  - **Bisphenol A (BPA):** Used in plastics, food-can linings, and toys.
  - **Phthalates**: Found in cosmetics, toys, and packaging as plasticizers.
  - **PFAS (Per- and Polyfluoroalkyl Substances):** Present in non-stick cookware and waterproof fabrics.
- **Sources of EDCs:** Food and beverage packaging, Cosmetics and personal care products, Toys and plastic materials, Household dust, carpets, and furnishings, Pesticides and industrial waste, Air, water, and soil

Routes of Exposure	Health Effects of EDCs
They can enter the body through skin contact and accumulate over time. • **Inhalation**: Breathing in airborne particles or vapors • **Ingestion**: Consuming contaminated food or water. • **Dermal Contact**: Absorption through skin (e.g., cosmetics, creams). • **Prenatal Transmission**: Transfer from mother to fetus during pregnancy.	• **Reproductive problems:** Infertility, low sperm count, endometriosis. • **Early puberty and developmental abnormalities.** • **Hormone-related cancers:** Such as breast, prostate, or thyroid cancers. • **Metabolic disorders:** Obesity and diabetes. • **Thyroid dysfunction.** • **Neurological and learning difficulties.** • **Immune and respiratory disorders.**

DENGIALL

Context: India has achieved 50% enrollment in the phase III clinical trial of its first indigenous tetravalent dengue vaccine, DengiAll.

About DengiAll

- DengiAll is a single-dose, tetravalent (four-in-one) vaccine developed to protect against all four dengue virus serotypes (DENV-1 to DENV-4).
- The vaccine contains weakened forms of each virus, designed to safely trigger an immune response without causing disease.
- **Developed by**: Panacea Biotec, using a licensed vaccine strain from the U.S. National Institutes of Health (NIH).
- **Vaccine trial coordinated by:** Indian Council of Medical Research (ICMR).

About Dengue

- It is a mosquito-borne viral infection present primarily in tropical and subtropical regions worldwide, including much of Asia, India, Africa, and South America.

- Dengue is caused by the dengue virus (DENV), with four related serotypes (DENV-1 to DENV-4), all transmitted mainly by Aedes aegypti mosquitoes.
- Infection occurs through the bite of an infected mosquito, not via person-to-person contact except rare maternal transmission.
- **Symptoms:** Typical symptoms include high fever, severe headache, pain behind the eyes, muscle and joint pain, nausea, vomiting, rash, swollen lymph nodes, and sometimes mild bleeding.
- **Treatment:** There is no specific antiviral treatment for dengue.

TERBIUM (TB)

Context: Scientists from the Indian Institute of Science (IISc) have developed a simple glowing paper sensor that can help in the early detection of liver cancer. The sensor works based on the green glow emitted by a rare-earth metal called terbium (Tb).

About Terbium (Tb)

- **Classification**: A rare-earth metal belonging to the lanthanide series of the periodic table.
- **Occurrence:** Found in several rare-earth minerals but primarily extracted from bastnasite and laterite ion-exchange clays. It can also be obtained as a by-product of nuclear fission.

Properties of Terbium

- **Appearance:** A moderately hard, silvery-white metal that remains stable in air when pure.
- **Air Stability:** Forms a protective dark oxide layer (a mix of Tb_2O_3 and TbO_2) that prevents further oxidation, even at high temperatures.
- **Reactivity:** Reacts easily with dilute acids. Insoluble in hydrofluoric acid (HF) due to the formation of a protective TbF_3 (terbium fluoride) layer that stops further reaction.

Uses of Terbium

- **Green Phosphors:** Used in fluorescent lamps, computer monitors, and television screens (cathode-ray tubes).
- **Magnetostrictive Alloys:** Combined with dysprosium and iron to make flat-panel loudspeakers and actuators.
- **Doping Agent:** Used in solid-state electronic devices to enhance performance.
- **Laser Devices:** Terbium salts are key components in certain laser systems.

BHARAT INITIATIVE

Context: The Indian Institute of Science (IISc), Bengaluru has launched a large-scale research project titled **BHARAT (Biomarkers of Healthy Aging, Resilience, Adversity, and Transitions).**

About BHARAT Initiative

- This initiative **aims to understand the biological and environmental factors that influence aging in the Indian population.**

Objectives

- To map physiological, molecular, and environmental indicators that drive ageing among Indians.
- To establish a reference baseline for what constitutes normal ageing in the Indian context.
- To detect early warning signs of age-related health issues and diseases.

Core Components of the BHARAT Initiative

- **India's First Comprehensive Ageing Database**
  - Researchers are building a multi-parametric database that **integrates: Clinical assessments, Lifestyle and environmental data, Biomarker discovery**
  - The BHARAT Baseline will include genomic, proteomic, and metabolic indicators to define healthy ageing in Indians.
  - It also seeks to challenge Western medical benchmarks (like cholesterol, vitamin D, and B12 levels), which often misclassify Indian health profiles due to genetic and lifestyle differences.
- **AI and Machine Learning Integration**
  - Artificial Intelligence (AI) and Machine Learning (ML) will be used to: Integrate complex, multi-dimensional datasets; Predict the effectiveness of interventions; Detect subtle biological signals that may indicate early health risks.

What are Biomarkers?

- **Definition**: Biomarkers are measurable physical, chemical, or biological characteristics that indicate the state of health or disease in the body.
- **WHO Definition:** "Any measurement reflecting an interaction between a biological system and a potential hazard- **chemical, physical, or biological**. The response may be functional, physiological, biochemical, or molecular."
- **Importance**: Biomarkers are crucial for Diagnosing diseases, Prescribing accurate treatments, Developing new drugs
- Examples include proteins, genes, DNA, RNA, enzymes, and hormones.

AGRICULTURAL MONITORING AND EVENT DETECTION (AMED) API

Context: Google has launched the AMED API, an advanced AI-based tool that provides comprehensive **information on crops and field activities across India.**

About AMED API

- The AMED API is an AI-powered, open-source application programming interface developed by Google to strengthen India's agricultural sector by offering field-level crop data and monitoring tools.

Key Features

- **Crop Identification:** Detects crop type, crop season, and field size.
- **Historical Data:** Provides up to three years of past agricultural activity for each field.
- **Event Detection:** Monitors & identifies major agricultural events (such as sowing/harvesting) in near real-time.
- **Frequent Updates:** Data is refreshed every two weeks, ensuring accurate and up-to-date insights.
- **Built on ALU Foundation:** Expands on Google's earlier Agricultural Landscape Understanding (ALU) API, which mapped land use through satellite and AI technologies.

Benefits

- **Supports Precision Agriculture**: Enables farmers to manage crops based on real-time data about soil, water, climate, and crop growth, and to predict harvest volumes.
- **Boosts Productivity:** Facilitates better decision-making for improved yield and resource efficiency.
- **Enhances Climate Resilience:** Helps anticipate and adapt to climate-related challenges.
- **Ecosystem Empowerment:** Available to agritech startups and developers to create innovative, localized solutions that strengthen the agricultural ecosystem.

CYSTEINE

Context: Researchers found that removing just one amino acid -cysteine, from the diet of mice led to a rapid 30% loss in body weight within a week, highlighting its crucial role in metabolism.

What is Cysteine?

- Cysteine is a sulfur-containing, **non-essential amino acid** that plays a vital role in protein structure and oxidative metabolism. It is **abundant in beta-keratin**, a structural protein found in nails, skin, and hair.
- **Key Functions**
  - **Supports Collagen Production:** Improves skin elasticity and texture.
  - **Antioxidant Defense:** Helps form glutathione, a major antioxidant that protects cells from damage.
  - **Produces Taurine:** Essential for heart function and digestion.
  - **Detoxification & Immunity:** Aids in removing harmful substances and supports immune health.
- **Deficiency Signs:** Fatigue, weakness, slower growth in children, and a weakened immune system.
- **Dietary Sources:** Found in protein-rich foods such as meat, eggs, and dairy products.

Non-Essential Amino Acids

- "Non-essential" means the body can produce these amino acids even if they are not obtained from food.
- Examples include: alanine, arginine, asparagine, aspartic acid, cysteine, glutamic acid, glutamine, glycine, proline, serine, and tyrosine.

COARTEM BABY

Context: In a major milestone, Swiss authorities have approved Coartem Baby, the world's first malaria treatment specifically designed for babies and very young children.

What is Coartem Baby?

- Coartem Baby (also known as Riamet Baby) is the first approved malaria treatment for infants weighing under 4.5 kg.
- It is **developed by Novartis**, in collaboration with the Medicines for Malaria Venture (MMV) and supported by the governments of Britain, Switzerland, the Netherlands, along with the World Bank and the Rockefeller Foundation.
- Until now, no malaria medicine was approved for infants below 4.5 kg. Babies were often given modified adult formulations, increasing the risk of overdose and side effects.
- The medicine is easy to dissolve, even in breast milk, making it safe and convenient for newborns.

Key Facts about Malaria

- Malaria is a life-threatening disease caused by **Plasmodium parasites,** transmitted through **bites of infected female Anopheles mosquitoes.**
- It does not spread from person to person, but can spread through infected blood or contaminated needles.
- **Major species:** *Plasmodium falciparum* (most deadly); *Plasmodium vivax (*most widespread, especially in Asia)
- **Global burden:** Around 4 lakh (400,000) deaths occur every year due to malaria (WHO).
- **Regions most affected:** Nigeria, Congo, Tanzania, Mozambique, Niger, and Burkina Faso together account for over 50% of global malaria deaths.
- **India's progress**: India continues to face malaria cases but has made remarkable progress, malaria deaths have dropped from 1,151 (1995) to 83 (2022).

AdFalciVax: India's New Malaria Vaccine Candidate

- AdFalciVax is a **chimeric recombinant vaccine**. It uses different gene parts of the malaria parasite (Plasmodium) to create target proteins that trigger the body's immune response.
- It is being produced using Lactococcus lactis, a safe, food-grade bacterium often used in dairy fermentation.
- It specifically targets Plasmodium falciparum (the deadliest strain), though it is not effective against P. vivax, which is more common in India.

CHRONIC VENOUS INSUFFICIENCY (CVI)

Context: US President Donald Trump was diagnosed with Chronic Venous Insufficiency (CVI)

What is Chronic Venous Insufficiency (CVI)?

- CVI is a condition in which the **veins in the legs cannot efficiently return blood to the heart.** This happens when the valves inside the veins become weak or damaged, causing blood to pool in the lower legs.
- In healthy veins, small one-way valves ensure that blood flows upward toward the heart. In CVI these valves fail to close properly, allowing blood to flow backward and collect in the legs.

Symptoms of CVI	Risk Factors
• Pain or heaviness in the legs • Swelling (especially around the ankles) • Leg cramps or tiredness • Skin darkening or irritation • Varicose veins (swollen, twisted veins visible under the skin) • In severe cases, leg ulcers (open sores that heal slowly)	• **Overweight or obesity:** adds pressure on leg veins • **Pregnancy:** hormonal and circulatory changes increase risk • **Family history of vein problems** • **Past leg injuries, surgeries, or blood clots** • **Age:** Affects about 1 in 20 adults, and the risk rises with age

Treatment Options

- **Lifestyle and First-Line Care:** Regular exercise (walking or cycling); Elevating legs to reduce swelling; Maintaining healthy body weight
- **Medical Treatment:** Compression therapy to improve blood flow; Medications to strengthen vein walls and enhance circulation
- **Surgical Options (for severe cases):** Procedures to remove, close, or repair damaged veins, improving blood flow and relieving symptoms.

WHO LAUNCHES "3 BY 35" INITIATIVE

Context: WHO has launched the "3 by 35" initiative, which aims to increase the **prices of three major unhealthy products- tobacco, alcohol, and sugary drinks- by at least 50% through health taxes by the year 2035.**

What is a Health Tax?

- A health tax is a **levy imposed on products that are harmful to public health,** such as tobacco, alcohol, and sugar-sweetened beverages. The purpose of such taxes is not only **to discourage unhealthy habits** but also **to generate revenue for public health initiatives.**
- The WHO considers health taxation one of the most cost-effective policy tools for reducing the prevalence of non-communicable diseases (NCDs) like obesity, diabetes, and heart disease, while also supporting sustainable health financing for countries.

N-NITROSODIMETHYLAMINE (NDMA)

Context: DCGI has instructed all state drug regulators to ensure that pharmaceutical manufacturers monitor the presence of NDMA, a potentially cancer-causing chemical, in Ranitidine, a commonly used antacid.

About N-Nitrosodimethylamine (NDMA)

- NDMA is a **volatile organic compound (VOC)** known to form easily in the environment and is classified as a probable human carcinogen based on animal studies.
- NDMA can form when secondary or tertiary amines react with nitrite ions in acidic conditions.
- It may also develop inside the stomach from certain food or water chemicals and is produced as a byproduct of industrial processes and water chlorination.
- **Sources of Exposure:** People may be exposed to NDMA through contaminated food, water, or medicines. It is found in small amounts in cured meats, beer, fish, cheese, vegetables, and other processed foods. NDMA breaks down when exposed to sunlight, reducing its persistence in the environment.
- **Use:** In the past, NDMA was used in industries to manufacture rocket fuel, antioxidants, lubricant additives, and polymer softeners, though its use has largely been discontinued due to its toxic nature.

PHENOME INDIA NATIONAL BIOBANK

Context: A National Biobank has been inaugurated at the **CSIR–Institute of Genomics and Integrative Biology (IGIB)**, a major step toward creating **India's first large-scale longitudinal health database.**

About the National Biobank	About Phenome India Project
• Launched under Phenome India Project • Inspired by the UK Biobank, but adapted to reflect India's genetic and cultural diversity. • **Purpose:** ○ Support early disease diagnosis, improve targeted therapies ○ Aid research on complex diseases such as diabetes, cancer, cardiovascular disorders, and rare genetic conditions. ○ Generate high-resolution biological and lifestyle data to enable AI-based diagnostics and gene-guided treatments. • **Coverage:** The project aims to collect comprehensive genomic, lifestyle, and clinical data from 10,000 participants across India.	• Officially known as Phenome India–CSIR Health Cohort Knowledgebase (PI-CheCK) • **Launched by**: Council of Scientific and Industrial Research (CSIR) in 2023 • **Objective:** To conduct a long-term, data-rich study that tracks the health patterns and risk factors of individuals over several years**.**

What is a Phenome?

- The phenome represents the complete set of observable characteristics (known as phenotypes) in a living organism, from its cells to entire body systems.
- A phenotype includes visible traits such as appearance, development, and behavior, shaped by the organism's genetic makeup (genotype) and its environmental influences.

LYME DISEASE

Context: Popular singer Justin Timberlake recently disclosed that he has been diagnosed with Lyme disease, a tick-borne bacterial infection.

About Lyme Disease:

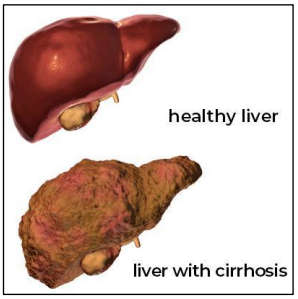
- Lyme disease is a bacterial infection caused by *Borrelia burgdorferi*, transmitted to humans through the bite of infected black-legged ticks, also known as deer ticks.
- It often begins with flu-like symptoms such as fever, fatigue, and muscle aches, and may later lead to joint pain, neurological complications, and skin rashes.
- The disease is treatable with antibiotics, particularly when diagnosed early.
- The transmission occurs when a tick that has fed on an infected animal (such as mice or deer) bites a human.
- The tick must remain attached to the skin for 36–48 hours for the bacteria to pass into the bloodstream.
- **Geographical Distribution:** Lyme disease is most prevalent in North America, Europe, and parts of Asia, but the tick species capable of transmitting it are also found in India, mainly in the Himalayan region where forested and grassy habitats are common.

LIVER CIRRHOSIS

Context: A team of scientists from the Institute of Liver and Biliary Sciences (ILBS), New Delhi, and the National Institute of Pharmaceutical Education and Research (NIPER), Guwahati, has identified a new therapeutic approach using Vascular Endothelial Growth Factor-C (VEGF-C) to treat liver cirrhosis.

- VEGF-C delivered through **nanocarriers improved lymphatic drainage** and **reduced ascites** and portal pressure in cirrhosis models, indicating a future therapeutic option.

What is Liver Cirrhosis?



- It is a late-stage condition in which the **liver becomes scarred due to long-term inflammation caused by alcohol misuse**, **hepatitis B/C, Non-Alcoholic Steatohepatitis (NASH)**, and certain autoimmune or genetic disorders.
- **Effects**: Scarring distorts blood and lymphatic vessels, leading to portal hypertension and **poor lymph drainage**, which cause complications like ascites (abdominal fluid buildup), jaundice, and bleeding.
- **Symptoms:** Often silent in early stages. Advanced disease causes fatigue, loss of appetite, and swelling in the legs, feet, or ankles.
- **Treatment:** Damage is irreversible, but progression can be slowed through alcohol abstinence, treatment for hepatitis, weight management, and medication for complications. Liver transplant remains the only definitive cure.

CLOVES SYNDROME

Context: Researchers believe that CLOVES Syndrome is caused by mutations in the PIK3CA gene, and fewer than 200 cases have been reported worldwide.

What is CLOVES Syndrome?

- A very rare genetic disorder characterized by **Congenital Lipomatous (fatty) Overgrowth, Vascular malformations, Epidermal nevi (skin lesions), and Spinal or skeletal anomalies.**

Cause:

- It results from mutations in the **PIK3CA gene,** which produces a protein that forms part of the PI3K enzyme, an important regulator of cell growth and division.
- When mutated, this enzyme can become overactive, leading to abnormal tissue growth; in some situations, similar mutations are also associated with cancer development.

Symptoms	Treatment
• Excess growth of fatty tissue • Vascular malformations (which may increase the risk of blood clots) • Large or wide hands and feet • Scoliosis or other spinal abnormalities • Skin bumps or lesions • Occasionally kidney or intestinal problems	• There is no cure. • Management includes medications to slow abnormal tissue growth, sclerotherapy or embolization for vascular issues, surgeries (such as debulking, orthopedic, or neurological procedures), and rehabilitation therapies.

HEPATITIS D

Context: Recently, the WHO **reclassified hepatitis D as carcinogenic**, highlighting the urgent need to prevent viral hepatitis, which is becoming a significant global public health challenge.

About Hepatitis D

- Hepatitis D is a **viral infection of the liver caused by the hepatitis D virus (HDV).** HDV is considered the **most severe form of viral hepatitis** because it leads to more rapid liver damage and a higher risk of complications such as liver cirrhosis, liver failure, and liver cancer compared to other hepatitis types.
- **Transmission:** Through **contact with infected blood or other body fluids**, similar to hepatitis B. It cannot infect a person unless they are already infected with hepatitis B, either simultaneously (coinfection) or after an existing hepatitis B infection (superinfection).
- **Symptoms:** May include fever, fatigue, nausea, vomiting, dark urine, pale stools, abdominal pain, and jaundice. Infection with HDV can worsen existing hepatitis B symptoms and often leads to more severe illness, with a higher risk of acute liver failure and chronic liver disease.
- **Treatment:** There is no vaccine for hepatitis D, but vaccination against hepatitis B provides protection against hepatitis D. Treatment options for hepatitis D are limited.

Type of Hepatitis	What Causes It?	How It Spreads	Chronic (Long-Term)	Vaccine
Hepatitis A (HAV)	A virus found mainly in contaminated food and water	Eating unclean food, drinking unsafe water, poor sanitation	**No**, usually lasts a few weeks	**Yes**
Hepatitis B (HBV)	A virus found in blood and body fluids	Unsafe injections, unprotected sex, childbirth from infected mother	**Yes**	**Yes**
Hepatitis C (HCV)	A virus mainly spread through blood	Sharing needles, unsafe blood transfusions	**Yes**	**No**
Hepatitis D (HDV)	A defective virus that needs Hepatitis B to survive	Only spreads in people already infected with HBV	**Yes**	**No (but HBV vaccine prevents)**
Hepatitis E (HEV)	A virus found in contaminated water	Drinking unclean water; poor sanitation	**No**, except in rare cases	**Yes**

CATCH GRANT PROGRAM

Context: IndiaAI Independent Business Division (IBD), in collaboration with the **National Cancer Grid (NCG)**, has announced the launch of the **Cancer AI & Technology Challenge (CATCH) Grant Program.**

- **Objective of the CATCH Grant:** To support the development and deployment of innovative Artificial Intelligence (AI) solutions that enhance cancer screening, diagnostics, treatment support, and healthcare operations across India.
- **Funding:** Up to ₹50 lakh per project, co-funded by IndiaAI and the National Cancer Grid (NCG). An additional ₹1 crore scale-up grant may be provided for successful pilot projects.
- **Deployment:** Focus on pilot implementations within NCG hospitals. Projects demonstrating strong results may be scaled nationally.
- **Focus Areas:** AI applications in screening, diagnostics, clinical decision support, patient engagement, operational efficiency, research, and data curation.
- **Eligibility:**
  - Startups, health-tech companies, academic institutions, and public or private hospitals
  - Joint applications from Clinical Leads (hospitals or clinicians) and Technical Leads (technology developers) are encouraged
  - Emphasis will be placed on responsible AI, clinical validation, and deployment readiness.

HUMAN AFRICAN TRYPANOSOMIASIS

Context: WHO certified Kenya as having eliminated human African trypanosomiasis (sleeping sickness).

What is it?	A **vector-borne parasitic disease** caused by *Trypanosoma brucei* (T.b.), transmitted by **tsetse flies**; **endemic to sub-Saharan Africa.** Mainly rural communities- farmers, hunters, herders are at risk.
Types	**1. T.b. gambiense:** West/Central Africa; chronic, slow-progressing; ~92% of cases. **2. T.b. rhodesiense:** East/Southern Africa; acute, rapidly progressing; ~8% of cases.
Symptoms	**Early:** fever, headache, joint pain. **Late:** confusion, behavioural changes, disturbed sleep. Can be **fatal if untreated**.
Treatment	Stage-specific drugs: **Pentamidine, Suramin, Eflornithine, NECT, Fexinidazole, Melarsoprol**.

PNEUMOCOCCAL DISEASE

Context: Drug firm Pfizer has recently introduced its next-generation 20-valent pneumococcal conjugate vaccine (PCV20) for adults in India, offering protection against 20 serotypes responsible for most pneumococcal diseases.

What is?	A group of illnesses caused by ***Streptococcus pneumoniae*** (pneumococcus), an encapsulated bacterium with ~90 serotypes.
Types of Disease	**Non-invasive:** otitis media, sinusitis, bronchitis. **Invasive:** pneumonia, meningitis, bacteremia, sepsis.
Transmission	Spread through respiratory droplets from infected individuals or healthy carriers.
High-Risk Groups	Children <2 years, adults >65 years, immunocompromised persons, those with chronic illnesses, smokers.
Global Burden	Causes nearly 1 million child deaths annually worldwide.
Treatment	Antibiotics, but antimicrobial resistance is rising quickly.
Prevention	Vaccination for children, elderly, and high-risk groups. Reinfections may still occur due to incomplete protection.

ESCHERICHIA COLI (E. COLI)

Context: Researchers have shown in a new study that genetically engineered E.coli bacteria can be converted into self-powered chemical sensors capable of interfacing directly with electronic systems.

What is E. coli?

- E. coli is a rod-shaped bacterium commonly found in the intestines of humans and animals. Most strains are harmless or even beneficial, but some, such as Shiga toxin-producing E. coli (STEC), can cause severe foodborne illness.
- **Transmission:** It spreads through contaminated food or water, or through contact with fecal matter from infected individuals or animals.
- **Treatment:** Most E. coli infections are self-limiting and resolve without medical treatment. Maintaining proper hydration is important throughout the illness.

LEWY BODY DEMENTIA (LBD)

Context: Jackie Bezos, mother of Jeff Bezos and early Amazon investor, passed away due to Lewy Body Dementia (LBD).

What is LBD?	A progressive brain disorder caused by abnormal protein deposits (alpha-synuclein / Lewy bodies) in nerve cells; second most common dementia after Alzheimer's.
Types	(i) Dementia with Lewy Bodies (DLB) (ii) Parkinson's Disease Dementia (PDD)
Risk Factors	Age > 60, more common in men, family history of LBD/Parkinson's disease.
Key Symptoms	• Cognitive decline (confusion, poor attention, memory loss) • Visual hallucinations • Parkinson-like features (rigidity, tremors, slowed movement) • Autonomic dysfunction (BP changes, dizziness, bladder/bowel issues)
Survival	5–7 years after diagnosis

Treatment	No cure. Symptom management with medications (cholinesterase inhibitors, Parkinson's drugs, antidepressants), physiotherapy, counseling, and supportive care.

BIOACTIVE PEPTIDES (BAPS)

Context: A study on population-specific responses to fermented foods shows that the health effects of the bioactive peptides they contain vary across groups and can help personalize nutrition for India's diverse population.

What are Bioactive Peptides (BAPs)?

- Bioactive peptides are short chains of amino acids, found naturally or released from larger parent proteins through enzymatic processes. They are usually inactive when part of a larger protein.
- **Function:** They provide beneficial physiological effects by influencing various systems of the body, including the digestive, immune, cardiovascular, nervous, and endocrine systems. Because of these roles, they are considered important health-promoting compounds.
- **Benefits:** BAPs act as a new generation of biologically active regulators. They can prevent oxidation and microbial spoilage in foods and support the treatment of several diseases and disorders.
- **Sources:** They are mainly derived from plant and animal sources—such as milk, cheese, fermented foods (pickles, vegetables), eggs, fish, meat, and soybean products. Some bioactive peptides can also be chemically synthesized.

Peptides vs. Proteins

Similarity	Difference
Both are chains of amino acids linked by peptide bonds.	Peptides are short (<100 amino acids) and less complex Proteins are longer (>100 amino acids) and have complex secondary, tertiary, and quaternary structures.

HUNTINGTON'S DISEASE

Context: Union and state governments have not yet included Huntington's disease under the National Policy for Rare Diseases, despite demands from patients and caregivers (2024).

What is Huntington's?	A rare inherited genetic disorder that causes progressive degeneration of brain cells, especially in regions responsible for movement, memory, and thinking.
Cause	Mutation in the **HTT** gene leads to production of abnormal huntingtin protein, which damages neurons in the **basal ganglia** (movement control) and **cortex** (thinking, memory).
Role of HTT Gene	Provides instructions for making the huntingtin protein, essential for normal nerve cell function, particularly in the brain.
Inheritance	Autosomal dominant; if one parent has Huntington's disease, each child has a **50% chance** of inheriting it.
Prevalence	Affects around **3–7 per 100,000** people, seen more commonly in individuals of European ancestry.
Symptoms	• Uncontrollable dance-like movements, abnormal posture, tremors • Cognitive decline, memory loss, poor judgment • Personality and behavioral changes • Symptoms worsen over time; death usually occurs **15–20 years** after onset
Treatment	No cure. Available medicines can only help manage symptoms.

RUBELLA

Context: WHO announced that Nepal has eliminated rubella as a public health problem.

What is Rubella?	A contagious viral infection caused by the rubella virus (RNA virus); also known as German measles or three-day measles. It is milder and less infectious than measles.
Transmission	• Spread through coughing, sneezing, contaminated surfaces, and from an infected pregnant woman to her fetus. • A person can spread the virus even without symptoms.

Symptoms	• Often mild or absent. • A red rash starting on the face/behind the ears and spreading across the body (appears 2–3 weeks after infection). • Dangerous during pregnancy, may cause fetal death or Congenital Rubella Syndrome (CRS), leading to hearing loss, eye or heart defects, and lifelong disabilities.
Prevention	Measles-Mumps-Rubella (MMR) vaccine provides safe, long-lasting protection.
Treatment	No specific cure; mild symptoms are treated with rest and fever-reducing medicines.

GLANDERS

Context: The Department of Animal Husbandry & Dairying (DAHD), under the Ministry of Fisheries, Animal Husbandry & Dairying, has issued the Revised National Action Plan on Glanders.

What is Glanders?

- Glanders is a contagious zoonotic disease affecting equines (horses, mules, and donkeys). It is caused by the bacterium Burkholderia mallei and is characterized by respiratory symptoms and skin lesions. The disease can spread to humans and other animals.
- **Transmission:**
  - Contaminated food or water containing nasal discharge from infected or carrier animals
  - Direct contact with secretions, equipment, or infected meat
  - Entry of the bacteria through skin abrasions
- **Human Risk:** Human infection is rare but can be fatal if untreated. Septicemia (blood poisoning) caused by B. mallei has a mortality rate of 40–95%.
- **Control Measures:** There is no vaccine or effective treatment for animals. Control relies on surveillance, culling of infected animals, quarantine, and strict disinfection.
- **Current Status:** Glanders is listed by the World Organisation for Animal Health (WOAH) and is notifiable under the Prevention and Control of Infectious and Contagious Diseases in Animals (PCICDA) Act, 2009. Although eliminated in many regions, it continues to persist in parts of Asia, Africa, the Middle East, and South America.

BLOOM SYNDROME

Context: Recently, a 12-year-old girl diagnosed with Bloom Syndrome underwent a bone marrow transplant using stem cells from her younger brother at a private hospital in Chennai.

What is Bloom Syndrome (BSyn)?

- Bloom Syndrome, also known as Bloom–Torre–Machacek syndrome, is a rare autosomal recessive genetic disorder caused by mutations in the BLM gene. This gene codes for a protein involved in maintaining DNA structure, and its mutation impairs DNA repair.
- An autosomal recessive disorder occurs when a child inherits two faulty copies of the BLM gene—one from each parent.
- The condition is seen most commonly in the Ashkenazi Jewish population.
- **Symptoms:** Poor growth, Sun-sensitive skin, Frequent infections, Endocrine problems, Infertility
- **Complication:** Extremely high cancer risk (150–300 times greater than average), often developing before age 40
- **Management:** There is no cure. Treatment focuses on supportive care such as sun protection, antibiotics, immune therapy, and regular cancer screening.

DIATOMS

Context: A team of Indian and international researchers has discovered a new species of diatom, named Climaconeis heteropolaris.

What are Diatoms?

- Diatoms are **photosynthetic, single-celled microscopic algae** and form a major group of phytoplankton.
- They have silica-based cell walls and constitute the foundation of aquatic food chains while producing a significant portion of Earth's oxygen.
- **Habitat:** They live in almost all aquatic environments. Diatoms may be free-floating (planktonic) or surface-attached (benthic/periphyton).

- **Unique Feature:** Although they lack leaves, stems, roots, and flowers, diatoms contain chlorophyll for photosynthesis. They are the only organisms with cell walls (called frustules) made of transparent opaline silica, often decorated with intricate patterns.
- **Functions:**
  - Form **base of aquatic food chains; serve as food for zooplankton, molluscs, and fish**
  - Carry out photosynthesis—produce oxygen and absorb CO_2
  - Contribute 20–50% of global oxygen production
  - Act as excellent **indicators of water** quality due to their sensitivity to chemical changes in water

HAND FOOT AND MOUTH DISEASE (HFMD)

Context: The national capital is witnessing a significant rise in Hand, Foot, and Mouth Disease (HFMD) cases, particularly among children.

What is Hand, Foot, and Mouth Disease (HFMD)?

- HFMD is a common, contagious viral illness, usually mild, that causes fever and a rash with small blisters on the hands, feet, and in or around the mouth, primarily affecting young children but also adults.
- HFMD is caused mainly by enteroviruses, especially Coxsackievirus A16
- **Transmission**: It is highly contagious and spreads rapidly in settings like daycares and schools. Adults generally have stronger immunity, but immunocompromised individuals remain vulnerable.
- **Symptoms**: Painful sores in the mouth, Rash on the hands and feet, Mild fever, Sore throat, Sometimes loss of appetite
- **Differentiation:** HFMD is not related to foot-and-mouth disease in animals; they are caused by completely different viruses.
- **Treatment & Recovery:** There is no specific antiviral treatment. Management is supportive i.e. rest, hydration, and fever medicines. The illness typically resolves within 7–10 days.

PRIMARY AMOEBIC MENINGOENCEPHALITIS (PAM)

Context: Two PAM cases reported in Kerala: one resulted in the death of a 9-year-old; another infected a 3-month-old.

What is PAM?	• A rare, often **fatal brain infection caused by the amoeba *Naegleria fowleri* ("brain-eating amoeba")**, which enters through the nose and destroys brain tissue.
Cause	• *Naegleria fowleri*, a free-living amoeba found in warm freshwater and soil; survives up to 46°C • Associated with poorly maintained or low-chlorine water sources.
Infection Route	• Amoeba enters through the nose during swimming or water activities. • Not spread by drinking water or person-to-person contact.
Symptoms	• **Early**: headache, fever, nausea, vomiting. • **Later**: confusion, seizures, hallucinations, coma, and death (usually within 1–18 days).
Treatment	• No proven cure. Doctors use drug combinations such as amphotericin B, azithromycin, and miltefosine. Survival is extremely rare.

SHRESTH INITIATIVE

Context: Recently, the union health secretary virtually launched the State Health Regulatory Excellence Index (SHRESTH).

About State Health Regulatory Excellence Index (SHRESTH)

- It is a first-of-its-kind national initiative to benchmark and strengthen state drug regulatory systems through a transparent, data-driven framework.
- The initiative, proposed by the **Central Drugs Standard Control Organization (CDSCO)** aims **to drive improvements in the performance of state drug regulatory authorities** across India.
- It will have **27 indices for Manufacturing States** across five key themes: Human Resources, Infrastructure, Licensing Activities, Surveillance Activities and Responsiveness and 23 indices for Primarily Distribution States.

RABIES

Context: The Supreme Court has asked the Delhi, Noida, Gurugram, Ghaziabad authorities, and civic bodies to relocate stray dogs to designated shelters due to increasing dog-bite cases.

What is Rabies?	• Rabies is a **viral disease** that can infect **any mammal**, not only dogs. • Dogs cause most human rabies cases, but many other animals can carry the virus.
Animals That Can Carry Rabies	• Possible carriers include: **cats, cattle, horses, goats, ferrets, bats, raccoons, skunks, foxes, coyotes, monkeys**. • **Birds, reptiles, amphibians, and fish** cannot contract or spread rabies. • Wild mammals (especially **bats, raccoons, and foxes**) are major transmitters. • Domestic pets can get infected by wild animals and then infect humans.
Fatality	• Rabies is almost **100% fatal once symptoms appear**. Survival is extremely rare.
Treatment	• Rabies can be prevented if **Post-Exposure Prophylaxis (PEP) (rabies vaccination)** is taken **immediately after exposure** and **before symptoms begin**. • Without PEP, rabies is **fatal**.

NEW WORLD SCREWWORM MYIASIS

Context: On August 24, the U.S. Department of Health and Human Services confirmed the first human case of infection caused by the New World screwworm, a flesh-eating parasite.

About Screwworms

- Screwworms are **a type of blue-grey blowfly** commonly found in South America and the Caribbean.
- Female screwworm flies are attracted to open wounds or natural entry points (such as the nasal cavity) in warm-blooded animals and, in rare cases, humans. A single female can lay up to 300 eggs at once, and as many as 3,000 eggs over her 10–30 day lifespan.
- The eggs hatch into larvae (maggots) that use sharp mouth hooks to burrow into and feed on living tissue, causing a serious infestation known as myiasis.
- They are called "screwworms" because of their screw-like, twisting movement as they penetrate flesh. Their scientific name, *Cochliomyia hominivorax*, translates to "man-eater."
- In humans, New World screwworm infestations are often extremely painful and can be **fatal if left untreated.**

SPARK-4.0 INITIATIVE

Context: The Central Council for Research in Ayurvedic Sciences (CCRAS) under the Ministry of Ayush has launched SPARK–4.0 (2025–26).

About SPARK-4.0 Initiative

- The **Studentship Program for Ayurveda Research Ken (SPARK)** is a program by the CCRAS for undergraduate Ayurveda students to promote research skills.
- **Objective of SPARK 4.0**
  - To nurture scientific curiosity, research aptitude, and analytical thinking in undergraduate Ayurveda students.
  - The programme provides hands-on experience in research methodology and encourages students to undertake short-term independent research projects.
- **Beneficiaries**
  - Undergraduate students enrolled in the Bachelor of Ayurvedic Medicine and Surgery (BAMS) programme at colleges recognised by the National Commission for Indian System of Medicine (NCISM).
  - Students from 1st to 4th year (before final examinations) are eligible.
  - Up to 300 studentships are available per year (subject to approval by the competent authority).
- **Details**
  - Each selected student receives ₹25,000 per month for two months (Total stipend: ₹50,000).
  - The stipend is released after successful completion of the research work and approval of the final report.
  - Research expenses are to be borne by the respective Institution/Medical College where the project is conducted.

- **Eligibility Restrictions**
  - Only Indian nationals studying in NCISM-recognised Ayurveda colleges may apply.
  - Interns, postgraduate students, and NRIs are ineligible.

FALSE SMUT DISEASE

Context: Continuous rainfall and flooding have triggered a severe outbreak of false smut disease in paddy crops across Punjab.

About False Smut Disease of Rice (Haldi Rog / Lakshmi Disease)



- False Smut Disease is a **fungal disease affecting rice crops**, caused by the pathogen *Ustilaginoidea virens*.
- Unlike true smut diseases, this fungus **does not replace the entire rice kernel with black spores**; instead, it **forms distinctive greenish-black, velvety spore balls** that emerge from individual grains, often during or after flowering.
- **Favourable Conditions:** Warm temperatures (25–35°C), High humidity (above 85%), Persistent rainfall, Excessive nitrogen fertiliser, Poor field drainage
- **Impact on Crop:** Leads to grain chalkiness, reduced grain weight, and poor seed germination. Causes yield losses of 7–25%, which may rise to 75% under severe infection.
- **Management Practices:**
  - Use clean, certified, and resistant seed varieties.
  - Maintain proper field sanitation.
  - Apply balanced fertilisers, avoiding excess nitrogen.
  - Follow AWD (Alternate Wetting and Drying) irrigation to minimise disease spread.
  - Spray recommended fungicides (such as propiconazole or tebuconazole) at the booting or early flowering stage for effective control.

TRICHLOROETHYLENE (TCE)

Context: Recent studies suggest that long-term outdoor exposure to trichloroethylene (TCE) may be associated with a higher risk of developing Parkinson's disease.

About Trichloroethylene (TCE)

- TCE is a **man-made, colorless, nonflammable liquid** with a **sweet, chloroform-like odor**, primarily used as an **industrial solvent for degreasing metal parts**. It **does not occur naturally** and is known for its **volatility**, meaning it **evaporates easily into the air.**
- **Uses:** Commonly used for **industrial degreasing, refrigerant production,** and present in products such as cleaners, aerosols, paint strippers, and some dry-cleaning agents.
- **Exposure Routes:** Found in air, soil, and groundwater near industrial sites. Enters the body mainly through inhalation, but also via contaminated water or food.
- **Health Effects:** Linked to kidney cancer, and possibly liver cancer and non-Hodgkin lymphoma; Associated with reproductive toxicity, immune system harm, and genetic damage. Trichloroethylene (TCE) is probably carcinogenic to humans (Group 2A) based on limited evidence in humans
- **Environmental Impact:** Highly persistent and mobile, making it a major contaminant of groundwater and even indoor air through vapour intrusion.
- **Regulation:** The U.S. Environmental Protection Agency (EPA) has imposed strict limits on its use. In India, TCE is regulated under the Environment (Protection) Act, 1986, and the Hazardous & Other Waste Rules. (India does not have a specific, outright ban on TCE)

Parkinson's is a progressive neurodegenerative disorder in which brain cells deteriorate, leading to tremors, stiffness, slowed movement, balance difficulties, and eventually problems with speech and daily functioning.

MONO ETHYLENE GLYCOL (MEG)

Context: The textile industry has urged the government not to impose an anti-dumping duty on Mono Ethylene Glycol (MEG), a key input for producing polyester fibre and filament.

About Mono Ethylene Glycol (MEG) — $C_2H_6O_2$ (Ethylene Glycol)

- MEG is a clear, colourless, odourless, syrup-like liquid with a mildly sweet taste.
- It is produced by reacting ethylene oxide with water and mixes easily with water and various organic compounds.
- **Key Uses:**
  - Serves as a primary **raw material for manufacturing polyester fibres, films, and PET (polyethylene terephthalate) plastics.**
  - Widely used in **antifreeze, coolants, de-icing solutions,** and other heat-transfer applications.
  - Functions as a **humectant** (moisture-retaining agent) and **solvent** in industries such as textiles, paper, adhesives, and paints.
  - It is also used in the **manufacture of tobacco products,** artificial smoke, and as a non-reacted component in adhesives and packaging
- **Hazards:** Toxic when ingested, and prolonged exposure can harm the central nervous system, heart, and kidneys.
- **Global Importance:** MEG is a critical commodity for the global polyester and PET sectors, with China being the world's largest consumer.

DIETHYLENE GLYCOL (DEG)

Context: At least 14 children in Madhya Pradesh died after consuming Coldrif syrup, which was found to be contaminated with diethylene glycol (DEG)—a highly toxic industrial chemical.

About Diethylene Glycol (DEG) — $C_4H_{10}O_3$ (Di glycol)

- DEG is an organic compound appearing as a colorless, odorless, and hygroscopic liquid with a sweet taste.
- It is widely used as a solvent and humectant in various industries, including textiles, resins, plastics, and as a component in antifreeze, brake fluids, and some personal care products.
- **Toxicity**: Once ingested, DEG is metabolised into harmful compounds that can cause severe kidney damage, anuria (inability to produce urine), and may be fatal. Analytical methods like **gas chromatography** and **thin-layer chromatography** are recommended for detecting DEG contamination in pharmaceuticals.
- **Symptoms of Poisoning**: Early signs include nausea, vomiting, abdominal pain, and lethargy. Symptoms rapidly progress to acute renal failure if untreated.

DEG (Diethylene Glycol) has a higher toxicity than MEG (Monoethylene Glycol). However, industrial exposure to MEG is generally more significant due to its widespread use in high-volume applications like antifreeze and polyester production.

ONLINE NATIONAL DRUGS LICENSING SYSTEM (ONDLS) PORTAL

Context: According to the Union Health Ministry, 18 State drug authorities have adopted the ONDLS, but none have fully met the required Corrective and Preventive Action (CAPA) standards.

About Online National Drugs Licensing System (ONDLS) Portal

- ONDLS is a **single-window, nationwide digital platform for processing all drug-related licences.**
- It has been **developed by the Centre for Development of Advanced Computing (C-DAC)** in collaboration with the **Central Drugs Standard Control Organisation (CDSCO)** and State/UT Drug Authorities.
- **Objective:** To create a uniform, transparent, and accountable drug licensing framework across India.
- **Functions:**
  - Processes applications for manufacturing licences, sales licences, and blood bank authorisations.
  - Issues key certificates such as: COPP (Certificate of Pharmaceutical Product), GMP and WHO-GMP certifications, Market Standing Certificates
  - Manages post-approval amendments, ensuring streamlined regulatory oversight.

About Schedule M

- Schedule M is a schedule to the Drugs and Cosmetics Rules, 1945, framed under the Drugs and Cosmetics Act, 1940.
- It prescribes mandatory GMP for manufacturers seeking or holding licences to produce drugs in India. It has two parts.

- Part I covers general GMP requirements for factory premises and materials; Part II covers specific requirements for different dosage forms and manufacturing operations.

CROHN'S DISEASE

Context: New studies indicate that diets rich in ultra-processed foods (UPFs) may aggravate gut inflammation and increase the likelihood of flare-ups in people with Crohn's disease.

About Crohn's Disease

- A **form of Chronic Inflammatory Bowel Disease (IBD)** that can affect any part of the digestive tract (from the mouth to the anus) though it most often involves the small intestine.
- **Pathology:** The inflammation typically penetrates deep into the intestinal wall, causing **abdominal pain, persistent diarrhoea, fatigue, and weight loss.**
- **Target Age Group:** Most frequently diagnosed in young adults, especially between 20 and 29 years.
- **Cause:** The exact cause remains unknown, but it is associated with **genetic predisposition,** abnormal immune responses, and disturbances in the gut microbiome.
- **Treatment:** There is **no permanent cure.** The condition is managed through medications, dietary adjustments, and therapeutic strategies aimed at achieving long-term remission.

ZOMBIE DEER DISEASE

Context: Health authorities in Florida have recently confirmed cases of Chronic Wasting Disease (CWD), often referred to as "Zombie Deer Disease."

About Chronic Wasting Disease or Zombie Deer Disease

- It is a fatal prion disorder that **affects deer, elk, moose, and reindeer.** It leads to **severe brain degeneration,** drastic weight loss, abnormal behaviour, excessive drooling, and ultimately death.
- **Cause:** It is caused by infectious proteins called **prions**, which lead to misfolding of normal brain proteins and result in severe brain damage.
    - Prions are highly resistant to traditional sterilization methods, including heat, radiation, and common disinfectants, making their decontamination challenging.
- **How it Spreads:** Through saliva, urine, faeces, blood, and contaminated soil, water, or vegetation. Transmission can also occur through scavengers and hunters who use deer-urine–based lures.
- **Human Risk: No confirmed cases in humans so far,** although scientists cannot completely rule out the possibility of cross-species transmission.
- **Symptoms in Animals:** Progressive wasting, unsteady gait or stumbling, drooping ears, drooling, and a generally listless appearance.
- **Treatment:** There is no known cure or vaccine; the disease is invariably fatal.

CALCIUM CARBIDE

Context: Over 60 people (mostly children) were hospitalised in Bhopal after suffering burns and injuries from improvised "calcium carbide guns" used during Diwali celebrations.

About Calcium Carbide (CaC_2)

- It is a chemical compound that has a hard, brittle, grayish-black solid with a distinct odor.
- **Preparation:** Produced by heating lime and coke at extremely high temperatures (2000–2100°C) in an electric arc furnace.
- **Major uses include:**
    - Production of acetylene gas for welding and cutting
    - Manufacturing of calcium cyanamide (a nitrogenous fertilizer)
    - As a reducing agent in metallurgy for extracting metals like chromium, manganese, and tungsten.
- **Illegal Application: Misused as an artificial fruit-ripening agent,** commonly sold as "masala," despite being unsafe.
- **Health Hazards:** Exposure or accidental ingestion may cause irritation, dizziness, and vomiting. Fruits ripened with carbide often retain arsenic and phosphorus residues, posing serious health risks.
- **Legal Status in India:** Banned for use in fruit ripening under the Prevention of Food Adulteration Rules, 1955, and the Food Safety and Standards (Prohibition and Restrictions on Sales) Regulations, 2011.

FIBROMYALGIA

- It is a long-term (chronic) health condition causing **widespread muscle pain, fatigue, sleep, and mood issues.**
- **Causes**: Unknown; linked to genetics, stress, trauma, and abnormal brain pain signals.
- **Risk:** Women, age > 40, family history, chronic illness.
- **Symptoms**: Body pain > 3 months, tiredness, poor sleep, "fibro fog," headaches, depression.
- **Diagnosis**: No specific test; based on symptoms.
- **Treatment**: Pain meds, exercise, cognitive behavioural therapy (CBT), stress control.

SINAPIC ACID

Context: Researchers at Nagaland University have identified sinapic acid as a promising agent that can significantly speed up wound healing in diabetic conditions.

About Sinapic Acid

- Sinapic acid is a **naturally occurring phenolic acid** and a derivative of cinnamic acid, found in various plant sources such as spices, citrus and berry fruits, vegetables, cereals, and oilseed crops.
- It belongs to the phenylpropanoid family and is known for its **antioxidant, anti-inflammatory, antimicrobial, anticancer, neuroprotective, and antiglycemic properties.**
- **Mechanism of Action:** Works by activating the SIRT1 pathway, which supports tissue repair, reduces inflammation, and enhances healing.
- **Significance:** Shows strong potential for treating diabetic wounds, especially foot ulcers, which often heal slowly due to impaired circulation and high blood sugar.
- **Related Disease Context:** Beneficial for patients with diabetes mellitus, a metabolic disorder characterised by chronically elevated blood glucose levels.

NAFITHROMYCIN

Context: India has introduced Nafithromycin, the country's first indigenously discovered antibiotic, marking a major advancement in domestic drug innovation.

About Nafithromycin (Miqnaf) (Launched in: 2024)

- Nafithromycin is India's first indigenous antibiotic, **developed to combat multidrug-resistant bacterial infections,** particularly **community-acquired bacterial pneumonia (CABP)** caused by pathogens like *Streptococcus pneumoniae.*
- It belongs to the **novel lactone ketolide class** and has shown ten times greater potency than existing antibiotics like azithromycin, with a three-day treatment regimen instead of the typical seven-day course. It is an oral antibiotic.
- **Developed by:** Wockhardt with support from the Biotechnology Industry Research Assistance Council (BIRAC).
- **Target Spectrum:** Effective against both typical and atypical bacterial strains, including those contributing to the growing challenge of Antimicrobial Resistance (AMR).
- **Safety Profile:** Shows excellent tolerance, produces minimal side effects, and carries no significant drug interactions.
- **Significance:** Represents the first new antibiotic in its class in more than three decades.

RHODAMINE B

Context: Scientists at the Raman Research Institute (RRI) have developed a low-cost and efficient detection method using the coffee-stain effect to identify harmful dyes such as Rhodamine B.

What is Rhodamine B?

- Rhodamine B is a **synthetic chemical dye of the xanthene group**, best known for its intense pink-red fluorescence in aqueous solution.
- **Uses:** Widely used in the **textile, paper, and leather industries;** Also employed in scientific research as a fluorescent tracer or marker.
- **Health Impact:** Considered toxic on prolonged exposure; Linked to DNA damage, increased cancer risk, oxidative stress, skin allergies, and pigmentation disorders.

CRYODIL

Context: Scientists at the National Institute of Animal Nutrition and Physiology (NIANP), Bengaluru, under the ICAR, have developed a ready-to-use, egg yolk-free solution – CRYODIL.

What is CRYODIL?

- CRYODIL is an egg yolk-free, ready-to-use semen extender specifically developed for cryopreservation of buffalo semen.
- CRYODIL has a relatively **long shelf life of about 18 month**s, which supports large-scale semen storage and distribution.
- It is reported to **maintain higher post-thaw progressive motility of buffalo sperm** compared to traditional egg-yolk-based extenders, which is crucial for fertility after insemination.
- Being egg yolk-free, CRYODIL reduces biosecurity and contamination risks associated with animal-origin components in conventional extenders.

MAHA MEDTECH MISSION

Context: The Anusandhan National Research Foundation (ANRF), in partnership with the Indian Council of Medical Research (ICMR) and the Gates Foundation, has launched the MAHA – Medical Technology Mission for a five-year period.

About Mission for Advancement in High-Impact Areas- Medical Technology (MAHA-Medtech)

- **Aim:** Promote indigenous medical technology innovation, reduce import dependence, and improve access to affordable, high-quality healthcare.
- **Funding Support:** ₹5–25 crore per project, extendable up to ₹50 crore in exceptional cases. Financial support available to academic institutions, startups, MSMEs, hospitals, and industry.
- **Focus Areas:** Medical devices and diagnostics; Implants and assistive technologies; AI/ML-based healthcare solutions and medical robotics
- **Priority Health Areas:** Tuberculosis, cancer, neonatal care, and primary healthcare.
- **Institutional Support Mechanisms**
  - **Patent Mitra:** Assistance for intellectual property protection and technology transfer.
  - **MedTech Mitra:** Regulatory guidance and approvals support.
  - **Clinical Trial Network:** Facilitates validation, testing, and generation of clinical evidence.
- **Nodal Ministry:** Ministry of Science and Technology

GLOBAL VIRUS NETWORK (GVN)

Context: The Global Virus Network (GVN) has expanded its international collaboration by adding three new Centers of Excellence in the Americas.

About Global Virus Network (GVN)

- GVN is an international coalition of leading medical virologists that works to understand, prevent, and respond to viral threats to human health, with a special focus on pandemic preparedness.
- It is a non-profit global organization, co-founded in 2011 by Robert Gallo, William Hall, and the late Reinhard Kurth.
- GVN supports collaborative research, scientific training, and advocacy to strengthen the detection, control, and management of viral diseases.
- It brings together Centers of Excellence in virology from across the world, creating a united platform for knowledge sharing and coordinated action against emerging and existing viral threats.
- **Mission:** To strengthen global scientific research and response to viral causes of human disease, and to enhance preparedness for future viral pandemics.
- **Vision:** To build a world that is capable of preventing, containing, and controlling viral epidemics and pandemics through the collaboration of a global network of expert virus laboratories.
- **Nature:** A non-profit, voluntary consortium of leading virology laboratories and scientists.
- **Headquarters:** Baltimore, United States
- **Key Focus Areas**
  - Scientific research support and collaboration

- Public awareness and education on viral threats
- Policy advocacy to inform evidence-based global health responses

ORAL CHOLERA VACCINE -SHANCHOL

Context: The oral cholera vaccine Shanchol has received World Health Organization (WHO) prequalification.

About Shanchol

- Shanchol is an oral cholera vaccine developed to protect **against cholera caused by Vibrio cholerae O1 and O139 strains.**
- The vaccine is suitable for individuals aged 1 year and above, and it induces local immunity in the gastrointestinal tract by stimulating IgA antibody responses.
- Shancho is a ready-to-use, killed bivalent (O1 and O139) whole-cell oral cholera vaccine. It is administered in two doses, given 14 days apart, for individuals aged 1 year and above.
- The vaccine does not require buffer or additional water during administration
- It is currently licensed in India and 17 other countries in Asia, Africa and Latin America.

About Cholera

- Cholera is a **highly infectious disease** caused by the **bacterium *Vibrio cholerae***, which **spreads through contaminated food or water**.
- It leads to **severe, watery diarrhea** that can cause **rapid dehydration** and, if untreated, can be fatal within hours.
- Treatment focuses on **rehydration**, often using **oral rehydration solutions** or **intravenous fluids,** and sometimes **antibiotics** for severe cases.
- The WHO estimates that 3-5 million cases and 100,000–130,000 deaths occur per year globally, predominantly in Asia and Africa.

BIOMEDICAL RESEARCH CAREER PROGRAMME (BRCP) PHASE 3

Context: The Union Cabinet has approved the continuation of the Biomedical Research Career Programme (BRCP) Phase III to strengthen India's biomedical research ecosystem.

About Biomedical Research Career Programme (BRCP) Phase 3

- The Biomedical Research Career Programme (BRCP) Phase 3 is a flagship initiative launched by the **Department of Biotechnology (DBT),** in partnership with the **Wellcome Trust, UK, through the India Alliance.**
- The programme was approved by the Union Cabinet in September 2025, with implementation set for 2025–26 to 2030–31, and funding provisions extended up to 2037–38.
- **Objective:** To nurture world-class biomedical researchers and promote interdisciplinary innovation, aligned with the vision of Viksit Bharat. It will also strengthen systems supporting high-quality research, and reduce regional disparities in scientific capacity, to create world-class biomedical research capacity with global impact.
- **Key Components**
  - **Fellowships:** Early and Intermediate career stages across basic, clinical, and public health research.
  - **Collaborative Grants:** Career Development and Catalytic Grants.
  - **Research Support:** Mentorship, networking, and institutional partnerships.
- **Expected Outcomes:**
  - Training of over 2,000 students and postdoctoral fellows
  - Production of high-impact publications, patentable discoveries, and increased participation of women researchers by 10-15%.
  - Around 30% of collaborative programmes are expected to progress to technology readiness level (TRL) 4
  - Activities will also expand into Tier-2 and Tier-3 institutions.

About Biomedical Research Career Programme (BRCP)

- BRCP is a flagship Indo-UK initiative launched in 2008-09 to bolster India's biomedical research ecosystem.
- BRCP operates via the DBT/Wellcome Trust India Alliance, a special purpose vehicle, with joint implementation by India's Department of Biotechnology (DBT) and the Wellcome Trust, UK.
- Phase I ran from 2008-09 for ten years, Phase II extended from 2018-19, and Phase III spans 2025-26 to 2030-31 with support until 2037-38.

LEPROSY

Context: Recently, the Maharashtra government has officially declared leprosy a notifiable disease.

About Leprosy (also known as Hansen's Disease)

- Leprosy is a chronic infectious disease caused by the bacteria Mycobacterium leprae and *Mycobacterium lepromatosis.* It primarily affects the skin, peripheral nerves, eyes, and other organs. Leprosy is classified as a Neglected Tropical Disease (NTD).
- National Leprosy Eradication Programme (NLEP) was initiated in 1983 to eliminate leprosy as a public health problem (defined as less than 1 case per 10,000). It was achieved at the national level in December 2005.
- In May 2025, the Union Government announced the classification of leprosy as a 'notifiable disease' across the whole country.
- **Transmission:** Spread through droplets from the nose or mouth of untreated patients; requires prolonged close contact. It is not transmitted through casual contact, and infectivity stops once treatment begins.
- **Symptoms:** Characterised by a long incubation period (3–5 years), persistent skin lesions, and loss of sensation, which can lead to repeated injuries.
- **Treatment:** Completely curable with Multi-Drug Therapy (MDT), which includes dapsone, rifampicin, and clofazimine.

ENCEPHALOMYOCARDITIS VIRUS

Context: Recently, an autopsy conducted by the Indian Veterinary Research Institute revealed that the lone African elephant at the National Zoological Park died due to infection by the rare rodent-borne encephalomyocarditis virus (EMCV).

About Encephalomyocarditis Virus (EMCV)

- EMCV is a **small, non-enveloped, positive-sense single-stranded RNA virus** belonging to the Picornaviridae family and the Cardiovirus genus.
- It is known to **cause myocarditis, encephalitis**, reproductive disorders, and neurological diseases in a wide range of mammalian species, including pigs, rodents, non-human primates, and occasionally humans.
- EMCV is a **zoonotic virus,** though human infections are rare and usually asymptomatic.
- **Transmission**: Spread through food or water contaminated with rodent urine or faeces, highlighting the role of rodents as natural reservoirs.
- **Hosts**: Includes pigs, non-human primates, elephants, zoo animals, and various wildlife species.
- **Treatment**: No specific antiviral treatment; management is limited to supportive care.

MELATONIN

Context: Recently, doctors have raised concerns over the widespread use of melatonin supplements by people without medical supervision, highlighting potential health risks.

What is Melatonin?

- Melatonin is a **natural hormone produced by the pineal gland that regulates the body's sleep–wake cycle (circadian rhythm).**
- Synthetic melatonin, also called exogenous melatonin, is widely available as over-the-counter (OTC) supplements, which are often misused or self-prescribed.

Functions and Working

- Darkness stimulates the pineal gland to release melatonin, which acts on the brain to slow body activity and induce sleep.
- Light suppresses melatonin production, helping promote alertness and wakefulness.
- Melatonin plays a role in regulating the sleep–wake cycle, body temperature, mood, and hormonal rhythms.
- It also supports brain health, helps in menstrual regulation, and has antioxidant properties.

Key Concerns

- Easy availability has led to self-medication and overuse, increasing the risk of dependency-like behaviour.
- Excessive or unsupervised use may cause hormonal imbalance, mood disturbances, and disruption of the circadian rhythm.
- It can also mask underlying conditions such as anxiety or depression, delaying proper diagnosis and treatment.

BATTEN DISEASE

Context: Researchers have recently found that male and female brains respond differently as Batten disease progresses and have identified a disease model that could help transform future treatment approaches.

What is Batten Disease?

- Batten disease is a group of genetic conditions that cause waste material to build up in your child's brain cells. It affects the structure and function of cells (neurodegeneration) and ultimately causes their death. Batten disease is fatal.
- **Cause**: Caused by mutations in CLN genes (CLN1–CLN14); the most common form involves CLN3.
- **Onset**: Usually begins in infancy or childhood, though adult-onset cases are rare.
- **Symptoms**: Include early loss of vision, seizures, developmental regression, and gradual loss of motor and language skills.
- **Course**: The disease progresses to complete blindness, followed by the inability to walk, talk, or swallow.
- **Treatment**: There is no cure; management is symptomatic, such as anti-seizure medications and physiotherapy.

RICIN

Context: The Gujarat Anti-Terrorist Squad recently busted a suspected terror module by arresting a person posing as a "doctor," who was allegedly preparing the deadly poison ricin.

About Ricin

- **Nature**: Ricin is a highly toxic poison derived from castor beans.
- **Forms**: It can exist as a powder, mist, pellet, or be dissolved in liquid.
- **Properties**: Though chemically stable under normal conditions, it becomes inactivated at temperatures above 80°C.
- **Exposure Routes:** Can enter the body through inhalation, ingestion, or injection.
- **Mechanism of Action:** Ricin blocks protein synthesis, leading to cell death and eventually organ failure.
- **Lethal Dose:** Approximately 5–10 micrograms per kilogram of body weight.
- **Concern:** Considered a potential biological weapon; accidental exposures are rare.
- **Treatment:** There is no specific antidote; management is limited to supportive care.
- Ricin is listed in Schedule 1, of Chemical Weapons Convention (CWC) Annex on Chemicals, as listed by the Organisation for the Prohibition of Chemical Weapons (OPCW).

AFRICAN SWINE FEVER

Context: The Assam Government has recently banned the inter-district movement of live pigs to curb the spread of African swine fever in the state.

What is African Swine Fever?

- African Swine Fever (ASF) is a highly contagious and deadly viral disease that affects domestic and wild pigs, with mortality rates as high as 100% in acute cases.
- The virus does not infect humans, but it can cause significant economic and social disruption due to the loss of livestock and restrictions on pork trade.
- **Spread**: The virus is highly resistant in the environment, meaning that it can survive on clothes, vehicles, equipment, and pork products, enabling rapid local and cross-border spread.
- **Impact**: Causes severe economic losses to farmers and the piggery sector. Leads to pork shortages and disruptions in trade and livelihoods.
- **Treatment**: There is no vaccine or specific treatment available for African swine fever.
- **Control Measures:** Strict biosecurity practices at farms and during transport. Restrictions on pork imports and pig movement. Culling of infected and exposed pigs to prevent further spread.

PHARMACOGENOMICS

Context: Pharmacogenomics represents a shift in drug therapy from a one-size-fits-all approach to precision medicine, by tailoring treatments according to an individual's genetic profile.

What is Pharmacogenomics?

- It is the study of how an individual's genetic makeup influences the body's response to medicines.

- This field combines **pharmacology (the science of drugs)** and **genomics (the study of genes and their functions)** to move beyond a "one-size-fits-all" approach to medicine.
- It is a key component of genomic medicine and precision (personalised) healthcare.

Major Uses

- **Oncology**: Selection of cancer drugs based on tumour and patient genetics.
- **Cardiology**: Gene-guided dosing of blood thinners to reduce adverse effects.
- **Psychiatry**: Choosing antidepressants with better effectiveness and fewer side effects.
- **Infectious Diseases:** Predicting patient response to antiviral medicines.

Significance

- **Improved safety and effectiveness: E**nhances drug safety, increases treatment success, and helps lower healthcare costs.
- **Targeted drug development:** Supports the design of medicines that act on specific gene variants responsible for disease.

INDIAN PHARMACOPOEIA COMMISSION (IPC)

Context: The Indian Pharmacopoeia Commission has signed three Memoranda of Understanding (MoUs) with the Nagaland Government.

- Pharmacopoeias are official compendia that lay down quality standards for drugs that are imported, manufactured, sold, stocked, or distributed in India.

About the Indian Pharmacopoeia Commission

- An **autonomous body** under the Ministry of Health, responsible for setting drug quality standards in India
- Set up in 2011 at Ghaziabad (UP), funded by Central Government, it is registered under Societies Registration Act, 1860
- Publishes the Indian Pharmacopoeia (IP), which prescribes official drug monographs and quality specifications.
- Publishes the National Formulary of India, promoting the rational use of generic medicines.
- Lays down standards for the identity, purity, and strength of human and veterinary drugs.
- Supplies Indian Pharmacopoeia Reference Substances (IPRS) for drug identification and purity testing.
- **Composition:** The Secretary, Ministry of Health and Family Welfare, serves as the Chairperson of the Commission, while the Chairman of the Scientific Body functions as the Co-Chairperson.
    - The Secretary-cum-Scientific Director acts as the Chief Scientific and Executive Officer of the Commission.

AURAMINE O

Context: India continues to witness repeated cases of food adulteration, particularly through the use of non-permitted **synthetic dyes.** One of the most persistent among these is auramine O.

What is Auramine O?

- It is a **bright yellow synthetic industrial dye used in textiles, leather, paper, inks, and microbiological staining**. It is **banned for food use in India**, the EU, and the USA. It is classified as a **non-permitted colour under FSSAI norms.**
- It is repeatedly detected in sweets and snacks, especially in the unorganised sector and during festive seasons.
- It is cheap, easily available, and mimics the colour of saffron or turmeric. Weak enforcement further encourages its misuse.

Health impacts:

- **Toxic**, causing liver and kidney damage and enlargement of the spleen
- **Mutagenic** (causes mutations in an organism's DNA)
- Classified by IARC (International Agency for Research on Cancer) as a **possible carcinogen** (Group 2B)

UNESCO- GLOBAL ETHICS FRAMEWORK ON NEUROTECHNOLOGY

Context: UNESCO has recently issued world's first global normative framework on the ethics of neurotechnology.

What is Neurotechnology?

- Neurotechnology refers to any technology that provides greater insight into brain or nervous system activity or affects brain or nervous system function. Examples include AI-driven **brain–computer interfaces (BCIs), Neuralink,** and neuroimaging tools.

- These technologies are used for tumour detection, stroke prediction, enhancement of human abilities, and support for persons with disabilities.

UNESCO Framework on the Ethics of Neurotechnology

- UNESCO has adopted the first global normative framework on the ethics of neurotechnology, which came into force on November 12, 2025.
- This framework sets out essential safeguards to ensure that advances in neurotechnology respect human rights, mental privacy, and personal dignity while enabling responsible innovation.
- **Objective:** To balance innovation with human rights by protecting the human brain and brain-related data from misuse.

Key Principles	Implementation
• Respect for human dignity and rights • No harm, beneficence, and proportionality • Mental privacy, autonomy, and freedom of thought • Protection of neural data • Non-discrimination, transparency, and accountability	• Promotion of responsible research and innovation (RRI) • Balancing open science with intellectual property rights • Encouraging ethics-by-design in the private sector

NATIONAL ACTION PLAN ON ANTIMICROBIAL RESISTANCE 2.0

Context: The Ministry of Health and Family Welfare launched the second version of the National Action Plan on Antimicrobial Resistance (2025–29).

About National Action Plan on Antimicrobial Resistance 2.0

- The NAP-AMR 2.0, launched in November 2025, is India's updated and more robust strategy to combat antimicrobial resistance (AMR) over the period 2025–2029.
- This plan builds on the lessons from the first NAP-AMR (2017–2021) and introduces stronger governance, accountability, and multi-sectoral coordination to address AMR as a One Health issue.

Key Features

- Follows a "**whole-of-government" approach** with sustained funding within each participating sector and department.
- Introduces an **Enforceable Accountability Model,** under which more than 20 ministries and departments have prepared specific, time-bound, and budget-linked action plans.
- For the first time, NAP-AMR 2.0 **mandates systematic surveillance of antibiotic residues and resistant pathogens in the environment.**
- Establishes **Joint Working Groups** and a **National AMR Steering and Monitoring Committee** to resolve inter-sectoral issues and ensure strategic coordination.
- Emphasises data sharing, genomic surveillance, prescription audits, and Antimicrobial Stewardship Programmes (AMSP) in hospitals to support rational antibiotic use.

Antimicrobial Resistance (AMR)

- AMR is the **ability of microorganisms** such as bacteria, viruses, fungi, and parasites to change and **become resistant to medicines used to treat infections**.
- When resistance develops, antibiotics, antivirals, antifungals, and antiparasitic drugs become less effective or may stop working. This makes infections harder to treat and increases the risk of disease spread, severe illness, disability, and death.
- **AMR can occur naturally** over time through genetic changes. However, it is increasing faster due to the misuse and overuse of antimicrobials.
- Examples include **using antibiotics for viral infections in humans**, **routine preventive use in healthy animals and crops**, and **poor livestock and agricultural practices**. These behaviours contribute to the spread of resistant infections in both humans and animals.
- The WHO identifies AMR as one of the top ten global public health threats.

ALPRAZOLAM

Context: Recently, the Directorate of Revenue Intelligence (DRI) uncovered a clandestine factory manufacturing alprazolam in Valsad under Operation White Cauldron.

What is Alprazolam?

- Alprazolam is a medication primarily used to treat anxiety disorders and panic disorder, including sudden, unexpected attacks of fear and worry about these attacks.
- It belongs to the class of benzodiazepine tranquillizers and acts as a central nervous system (CNS) depressant.
- It works by enhancing the effects of a neurotransmitter called GABA in the brain, which helps reduce abnormal excitement and calm the nervous system.
- Alprazolam is a psychotropic substance regulated under the Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985.

MELANIN

Context: Melanin reflects how human ancestors adapted to survive intense ultraviolet (UV) radiation from the Sun thousands of years ago, helping protect the body from harmful exposure.

What is Melanin?

- Melanin is a **natural pigment produced inside melanosomes** within specialised skin cells called **melanocytes**.
- It is found in varying amounts in human and animal skin, hair, and eyes, and **determines an individual's skin tone, hair colour, and eye colour.**
- Higher melanin levels act as a natural sunscreen, absorbing more UV radiation and reducing the amount that penetrates the skin to synthesize vitamin D.

Types of Melanin

- **Eumelanin**: A brown–black pigment found in the skin, hair, and eyes; it provides strong protection against UV radiation.
- **Pheomelanin**: A red–yellow pigment, commonly seen in people with red hair and lighter skin.
- **Neuromelanin**: A pigment found in the brain, formed from the oxidation of dopamine and noradrenaline, chemicals involved in the body's fight-or-flight response.

Functions of Melanin

- **UV Protection**: Absorbs and reduces damage from ultraviolet radiation.
- **Camouflage**: Provides a survival advantage in animals by aiding concealment.
- **Thermoregulation**: Helps regulate body heat by influencing absorption of sunlight.

Related Conditions

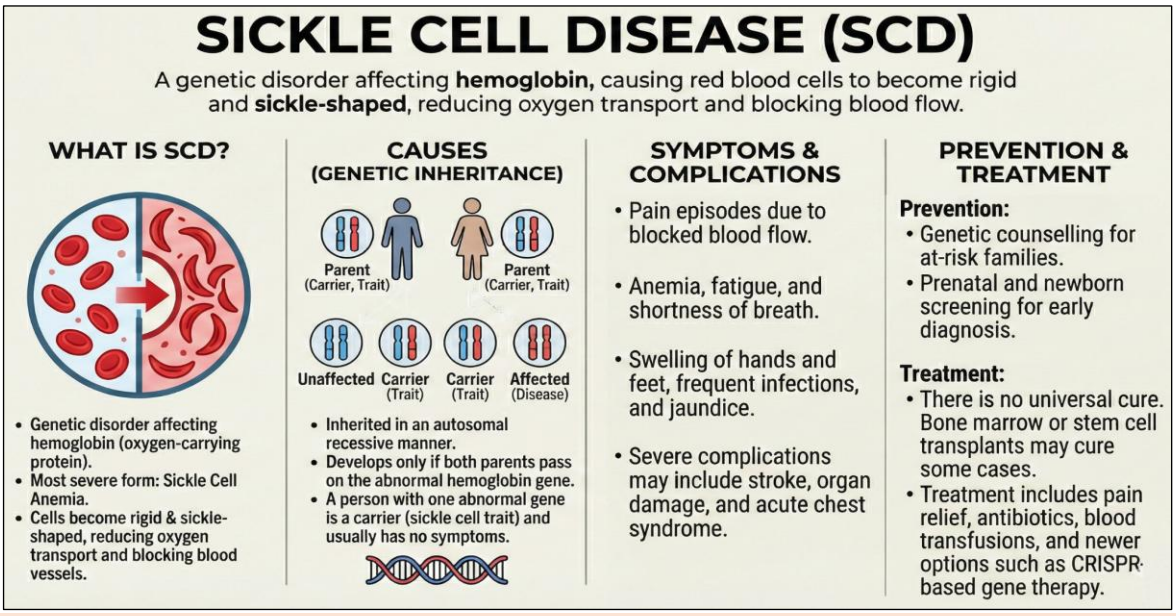
- **Vitiligo**: Loss of melanocytes, leading to white patches on the skin.
- **Albinism**: A genetic condition marked by little or no melanin production.
- **Hyperpigmentation**: Excess production of melanin, causing darker patches of skin.

BIRSA-101

Context: BIRSA 101, India's first indigenously developed CRISPR-based gene therapy for treating Sickle Cell Disease (SCD), was recently launched. Named in honor of Bhagwan Birsa Munda, a revered tribal freedom fighter, the launch coincided with his 150th birth anniversary.

About BIRSA 101

- It is India's first indigenous gene therapy using CRISPR-Cas9 technology. designed specifically to treat Sickle Cell Disease. It is more affordable compared to similar global CRISPR therapies.
- BIRSA 101 uses CRISPR-Cas9 gene editing to correct the mutation responsible for Sickle Cell Disease.
- The therapy is developed as a **one-time treatment** rather than lifelong medical therapy.
- The therapy **edits and corrects the defective HBB gene** that causes abnormal red blood cell formation. It is **administered as a single infusion.**
- After treatment, the body is expected to begin producing healthy, normal-shaped red blood cells instead of sickle-shaped cells.
- The therapy was **developed by the CSIR-Institute of Genomics and Integrative Biology (CSIR-IGIB)** in Delhi and is set to be manufactured at scale by the Serum Institute of India.

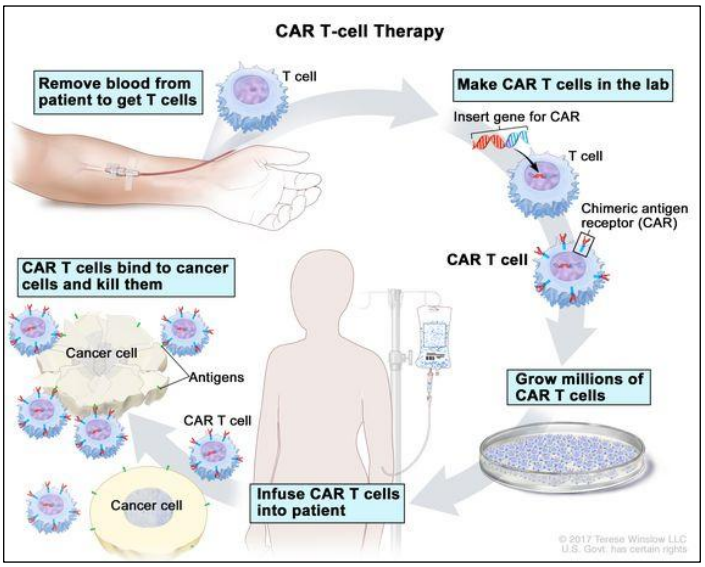


NEXCAR19

Context: Recently, PM Modi gifted NexCAR19, the world's first humanised CAR-T therapy, to the Nation.

About NexCAR19

- NexCAR19 is India's first indigenously developed **CAR-T cell therapy.**
- It is designed to treat relapsed or refractory B-cell cancers such as Diffuse Large B-cell Lymphoma (DLBCL) and B-cell Acute Lymphoblastic Leukemia (B-ALL) in patients who have not responded to standard treatments.
- It was developed by **ImmunoACT** (under IIT Bombay) in collaboration with **Tata Memorial Centre.** It was supported by the **Department of Biotechnology** and **Biotechnology Industry Research Assistance Council (BIRAC).**
- It was approved by India's Central Drugs Standard Control Organization in October 2023.



How NexCAR19 Works

- NexCAR19 modifies a patient's own T-cells to express Chimeric Antigen Receptors (CARs) that specifically target the CD19 protein found on cancerous B-cells.
- The process involves isolating T-cells, genetically engineering them, expanding their numbers, and reinfusing them into the patient for targeted cancer destruction.

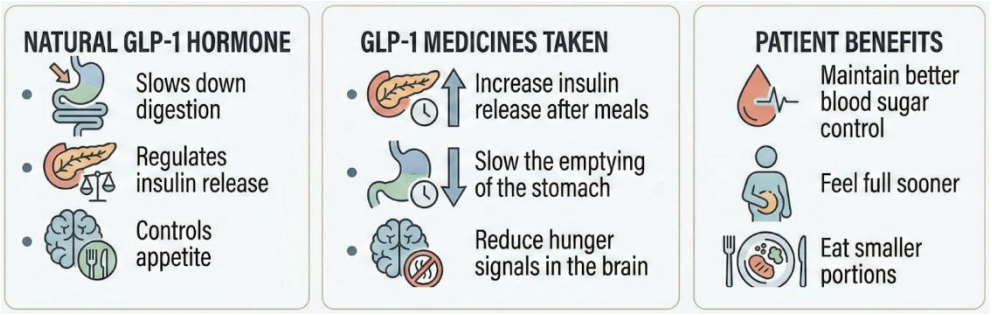
About CAR-T cell therapy

- It is a type of immunotherapy used to treat certain cancers, especially blood cancers like leukemia and lymphoma.
- It involves genetically modifying a patient's own T cells to recognize and attack cancer cells more effectively.
- It can lead to long-term remission or even cure in some patients with otherwise untreatable cancers.
- Side effects include cytokine release syndrome (CRS), neurotoxicity, and infections due to weakened immunity.

GLP1 MEDICINES

Context: In 2025, India saw a major shift in obesity and diabetes management with the arrival of GLP-1 receptor agonists (GLP-1 medicines) like Ozempic (semaglutide).

What Are GLP-1 Medicines?



- GLP-1 agonists are a class of medications that mainly help manage blood sugar (glucose) levels in people with **Type 2 diabetes**. Some GLP-1 agonists can also help treat obesity.
- GLP-1 receptor agonists **imitate the action of a natural hormone in the body called glucagon-like peptide-1 (GLP-1).**
- GLP-1 agonists are most often injectable medication.
- **Examples of GLP-1 Drugs**
  - **Semaglutide**: Ozempic (diabetes), Rybelsus (oral, diabetes), Wegovy (weight loss).
  - **Liraglutide**: Victoza (diabetes), Saxenda (weight loss).
  - **Tirzepatide**: Mounjaro (diabetes), Zepbound (weight loss).

About GLP-1(glucagon-like peptide-1)

- GLP-1 acts as an incretin hormone in the gut and bloodstream, and it is also produced in the brain where it functions as a neuropeptide/neurotransmitter.
- It is released from intestinal L-cells after meals and plays a key role in post-meal metabolism. It **enhances glucose-dependent insulin secretion** and **suppresses glucagon**, improving glycaemic control.

NOROVIRUS

Context: Cases of norovirus have been rising in the United States.

About Norovirus

- Norovirus (commonly known as the "winter vomiting disease,") is a **group of viruses that cause severe vomiting and diarrhea and is highly contagious.**
- Norovirus outbreaks occur most often between November and April in countries above the equator and between April and September in countries below the equator. There's usually no specific season for outbreaks in areas on the equator.
- The **first known norovirus outbreak occurred in Norwalk, USA, in 1968.**
- **Symptoms:** Norovirus causes **gastroenteritis**, commonly miscalled as the **"stomach flu"** (However, norovirus illness is not related to the flu. The flu is caused by the influenza virus). The infection leads to inflammation of the stomach and intestines, resulting in vomiting, diarrhea, nausea, and stomach cramps.
- **Transmission:** It spreads primarily through the fecal-oral route, via contaminated food, water, or direct person-to-person contact.
- **Treatment:** There is no specific treatment available; management focuses on hydration and symptom relief. Most people with norovirus illness get better within 1 to 3 days.

CENTRE FOR CHRONIC DISEASE CONTROL (CCDC)

Context: Recently, CCDC received recognition as a Collaborating Centre of Excellence (CoE) from the Indian Council of Medical Research.

- Established in 2000, CCDC is an **independent, not-for-profit biomedical research organization based in New Delhi.** It is registered as a society (under Societies Registration Act, 1860).
- **Objective**: To **reduce the burden of chronic diseases in India** and other low- and middle-income countries through surveillance, capacity building, and translational research in cardio-metabolic diseases.
- **Focus**: **Chronic non-communicable diseases (NCDs)**, especially cardio-metabolic diseases; nutrition research.

- CCDC is recognized as a **Scientific and Industrial Research Organization (SIRO)** by the DSIR, Ministry of Science and Technology.
- It is registered under the Foreign Contribution (Regulation) Act, 1976, allowing it to receive and transfer foreign funds with Government approval.

Chronic Diseases

- Chronic diseases are long-term health conditions that develop slowly and usually last for many years. They often need regular treatment and lifestyle management rather than a quick cure.]
- Examples: Diabetes, High blood pressure (Hypertension), Asthma

BLUETONGUE VIRUS (BTV)

Context: More suspected cases of BTV have recently been detected in Northern Ireland.

About Bluetongue Virus (BTV):

- BTV causes **bluetongue**, a severe **haemorrhagic disease** that mainly **affects domestic and wild ruminants (including cattle, deer and goats), especially sheep.**
- **Transmission:** It is an infectious but non-contagious illness, spread through the bites of Culicoides midges, with occasional mother-to-fetus transmission.
- **Found worldwide except Antarctica**, it does not infect humans, and meat and milk remain safe.
- In sheep, it can cause fever, facial and tongue swelling, nasal discharge, lameness, and a bluish tongue, leading to high losses in livestock productivity and trade.
- There is no specific treatment, but vaccines are available for some strains.

FLUORIDE

Context: Recently, an NGO assessed that, in Odisha's Mayurbhanj, excess fluoride in drinking water is causing widespread fluorosis in several villages.

What is Fluoride?

- Fluoride is a **naturally occurring mineral** commonly found in rocks and soil. It **dissolves into groundwater,** especially in areas with fluoride-rich geological formations.
- The **Bureau of Indian Standards (BIS)** prescribes the acceptable limit of fluoride in drinking water as 1.0 mg/L, and the maximum permissible limit in the absence of an alternative source is 1.5 mg/L.
- **Role**: Trace nutrient essential for teeth and bone strength (~99% of body fluoride is found in bones and teeth) **Low levels of fluoride can help prevent dental caries (tooth decay)**.
- **Excessive fluoride intake can lead to** serious health problems like **Dental fluorosis**, Skeletal fluorosis, etc.
- Rajasthan reports the highest fluoride level, along with Telangana, Western Andhra Pradesh, Eastern Karnataka.

Other Groundwater Contaminants in India

- **Arsenic Contamination:** Found in West Bengal, Bihar, Jharkhand, Uttar Pradesh, covering 90% of arsenic contamination cases in India.
- **Uranium Contamination**: Found in 12 states, including Punjab.
- **Iron Contamination:** Severe in states like Rajasthan, Jharkhand, and Assam.
- Other contaminants, such as antimony, cadmium, copper, and barium, also pose risks, leading to toxicity, hypertension, and liver and kidney damage.

HEMORRHAGIC SEPTICEMIA (HS)

Context: Ten blackbucks have died in the Jamshedpur Zoological Park (Jharkhand) due to suspected hemorrhagic septicemia.

- **Hemorrhagic septicemia** is an **acute, highly fatal bacterial disease** that **mainly affects cattle and buffaloes**, with younger animals being more vulnerable.
- **Cause**: It is caused by **Pasteurella multocida** *(a Gram-negative bacterium)*, commonly the serotypes B:2 in Asia and E:2 in Africa.
- **Transmission:** The disease spreads through inhalation or ingestion when animals come in contact with infected animals or consume contaminated feed and water, especially in humid and waterlogged conditions. No documented human infections exist from HS.

- **Symptoms:** high fever, dullness, excessive salivation, and rapid swelling of the throat and brisket.
- **Control:** Vaccination, and early treatment with intravenous antibiotics. In India, it's a notifiable disease under Prevention and Control of Infectious and Contagious Diseases in Animals Act, 2009

NITROFURANS

Context: Recently, FSSAI launched an egg safety drive after 'nitrofurans presence' triggers uproar.

- Nitrofurans are **synthetic, broad-spectrum antimicrobial drugs** that contain a **furan ring and a nitro group.** Common nitrofuran compounds include furazolidone, furaltadone, nitrofurazone, and nitrofurantoin.
- They mainly **act by stopping bacteria from multiplying (bacteriostatic),** though **at higher doses they can kill bacteria (bactericidal)**, and they work against both Gram-positive and Gram-negative bacteria, as well as some protozoa.
- **Earlier, nitrofurans were used in livestock and aquaculture,** while nitrofurantoin is still used in humans to treat urinary tract infections (UTIs).
- However, due to their toxic and potentially cancer-causing nature, **nitrofurans are banned for use in food-producing animals**.

GLOWCAS9 PROTEIN

Context: Recently, scientists from Bose Institute (Kolkata) have created GlowCas9 which can track gene editing.

- GlowCas9 is a **bioluminescent CRISPR-Cas9 protein** which **enables real-time visualization of gene editing in living cells**.
- Cas9 is fused with a split nano-luciferase enzyme; when Cas9 folds and becomes functionally active inside the cell, the luciferase fragments rejoin and emit light, signalling active gene editing.
- GlowCas9 exhibits high thermal stability, maintaining structure and activity at elevated temperatures unlike standard Cas9, which supports its use in gene therapy delivery.
- This stability, combined with its glow, allows non-invasive tracking in cells, tissues, and plant leaves.

AUTOPHAGY

Context: Researchers have uncovered a surprising player in the autophagy process, which can pave the way for developing therapies for diseases such as Alzheimer's, Parkinson's, and cancer.

What is meant by Autophagy?

- Autophagy, meaning "self-eating," is an intracellular degradation process that allows cells to recycle damaged intracellular components to generate energy and provide building blocks to create new cellular structures.
- It is a **cellular self-cleaning and recycling mechanism** that removes damaged organelles, proteins, and pathogens.
- Its core function is **to break down cellular waste and reuse components** to maintain cellular homeostasis.

Significance

- **Prevents waste accumulation** (crucial in long-lived cells like neurons).
- **Protects against infections** (destroys intracellular bacteria and viruses).
- **Supports cell survival** during stress, ageing, and nutrient scarcity.

Autophagy–Disease Linkages

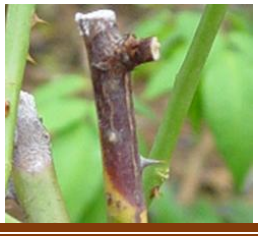
- **Cancer:** Acts as a **tumour suppressor in early stages** (by maintaining genome integrity and cellular homeostasis); later, **some cancers hijack autophagy** for survival and growth.
- **Neurodegenerative diseases:** Disrupted autophagy leads to the accumulation of damaged proteins in Alzheimer's and Huntington's.

DIEBACK DISEASE

Context: Withering of neem trees prompted the Mulugu-based Forest College & Research Institute (FCRI) to launch a comprehensive scientific investigation into the devastating "dieback disease."

What is Dieback Disease?

- It is a plant disease that **causes the progressive drying of twigs and branches,** starting from the tips.
- **Pathogen:** A fungal disease caused mainly by Phomopsis azadirachtae.
- **First reported in India in the 1990s**, near Dehradun (Uttarakhand).



- **Symptoms**: Tip-to-base browning, wilting, twig death, and loss of fruits/seeds.
- **Spread & conditions:** Spreads through soil, water, and root contact; worsens in warm and moist (rainy) conditions.
- **Impact:** Severe infections can lead to near-total fruit loss and large-scale tree mortality.

CANDIDA AURIS

Context: Scientists recently discovered a genetic process that could unlock new ways to treat the mysterious and deadly Candida auris.

What is Candida auris (C. auris)?

- It is an **emerging multidrug-resistant fungal pathogen**, first identified in 2009 in Japan. This pathogen has now been isolated in over 60 countries across 6 continents
- **Spread:** Mainly healthcare-associated, through contaminated surfaces and person-to-person contact.
- **Risk:** Hospitalised patients, those with comorbidities, and individuals using invasive medical devices.
- **Disease:** Can begin as colonisation and progress to invasive infections (especially bloodstream infections), often causing persistent fever.
- **Mortality:** Around 30–60%.
- **Treatment:** Echinocandins are commonly used; resistant strains may require combination therapy.

BUCCAL MUCOSA CANCER (BMC)

Context: Alcohol consumption, even in small amounts, significantly increases the risk of buccal mucosa cancer (BMC), according to a recent study.

What is Buccal Mucosa Cancer (BMC)?

- BMC is a type of **oral cancer originating in the inner lining of the cheeks,** known as the buccal mucosa. It predominantly **affects squamous cells** and is particularly prevalent in India due to **tobacco** and **betel nut chewing habits.**
- **Type**: Mostly **Squamous Cell Carcinoma (SCC).** It is the most common oral cancer in the Indian subcontinent.
- **Risk factors**: Tobacco (smoked and smokeless) and alcohol (even low intake increases risk).
- **Symptoms**: A non-healing ulcer, lump, cheek pain, and difficulty chewing.
- **Treatment**: Surgery with or without radiotherapy and chemotherapy (based on stage).
- **Prognosis**: Early detection is crucial; oral cavity cancers have about 60–70% five-year survival.

INFORMATION TECHNOLOGY

INDIA SEMICONDUCTOR MISSION

Context: The Union Cabinet approved a joint venture between HCL and Foxconn to set up a chip assembly and packaging unit in Uttar Pradesh, the sixth project under the India Semiconductor Mission.

About Semiconductors

- Semiconductors are materials used to make tiny electronic parts called chips or integrated circuits. These chips are made up of very small electronic components such as transistors, diodes, capacitors, and resistors, all connected together in a compact design.
- Semiconductors exhibit variable conductivity influenced by temperature, light, and impurities, distinguishing them from metals whose conductivity decreases with heat.
- Common semiconductor materials include elemental **silicon**, which dominates microchip and solar cell manufacturing, and germanium used in transistors and infrared detectors.
- Compound semiconductors like gallium arsenide (GaAs) and gallium nitride (GaN) are employed in high-speed electronics, optoelectronics, and power devices due to superior performance.

India Semiconductor Mission

- Launched in 2021 with a financial outlay of ₹76,000 crore (~$10 billion), the ISM is a **flagship initiative aimed at building a robust semiconductor and display ecosystem and positioning India as a global hub for electronics manufacturing and design.**
- **ISM acts as the nodal agency for the smooth implementation of semiconductor and display schemes**, driving India's integration into the global semiconductor supply chain.

- As of 2025, 10 semiconductor projects across six states (Gujarat, Assam, Uttar Pradesh, Punjab, Odisha, and Andhra Pradesh) have been approved, with investments totaling ₹1.60 lakh crore.
- ISM is led by global semiconductor experts, **coordinated by the Ministry of Electronics and Information Technology (MeitY),** and operates as an **independent division of Digital India Corporation.**
- It **also hosts the SEMICON India programme**, bringing together industry, academia, and government to foster innovation and collaboration in the semiconductor ecosystem.

REPAIRABILITY INDEX FOR SMARTPHONES, TABLETS

Context: The Department of Consumer Affairs has developed a **Repairability Index (RI) framework** for smartphones and tablets, requiring manufacturers to declare a repairability score indicating how easily devices can be repaired.

What is Repairability Index (RI)?

- The RI assesses how easily a device can be repaired by consumers or third-party shops, helping buyers make informed choices.
- **Key Parameters**
  - **Repair information:** Access to manuals, Do It Yourself guides, and diagnostics
  - **Spare parts**: Availability of original parts.
  - **Affordable tools:** Safe and accessible tools, including software.
  - **Modular design:** Parts can be repaired without affecting others.
  - **Economic feasibility:** Repairs should be cost-effective.

Right to Repair in India

- The Right to Repair is a **key pillar of the circular economy** and aligns with **SDG 12** (Responsible Consumption and Production) as well as the **LiFE Movement** (Lifestyle for the Environment).
- In 2022, the government launched the **Right to Repair Portal** in four sectors: automobiles, mobiles & electronics, consumer durables, and farming equipment.
- An **overarching Right to Repair legislation is under consideration**.

DRONE-BASED QUANTUM KEY DISTRIBUTION (QKD) SYSTEM

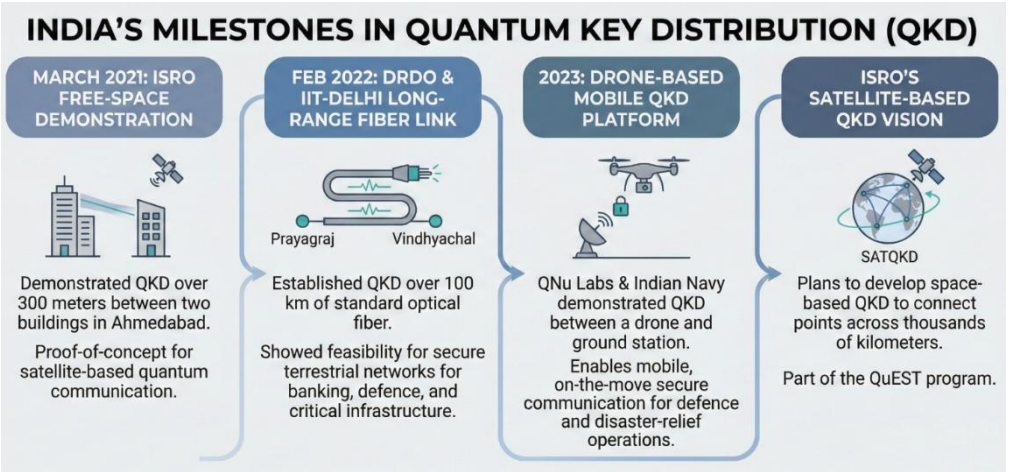
Context: India is advancing its quantum communication network by developing a drone-based QKD system. C-DOT and Synergy Quantum India Pvt. Ltd. have signed an MoU for this.

What is Quantum Key Distribution (QKD)?

- QKD is a **cutting-edge technology that uses principles of quantum mechanics to ensure ultra-secure communication.** It works by sharing encryption keys between two parties, which cannot be intercepted or duplicated due to the quantum properties of particles like photons.
- The **drone-based QKD system is designed for on-demand secure communication** during emergencies, disasters, battlefield operations, and mobile command centers.
- A practical limitation is **decoherence**, where **interaction with the environment can disturb quantum states,** reducing transmission distance and revealing potential tampering.

Quantum Mechanical Principles Behind QKD

- **Heisenberg's Uncertainty Principle:** Measuring a quantum system (e.g., photon polarization) disturbs its state, allowing detection of any eavesdropping.
- **Quantum Superposition:** Particles exist in multiple states until



measured. This ensures that the key remains probabilistically secure, as measurement forces the particle into one state.

- **No-Cloning Theorem:** Quantum states cannot be copied without altering them, preventing duplication of the key by an eavesdropper.

Feature	Conventional Encryption	Quantum Key Distribution (QKD)
Basis	Uses mathematical algorithms.	Uses quantum mechanics
Vulnerability	Can be broken by quantum computing.	Immune to quantum attacks.
Key Generation	Random keys generated by software/hardware.	Keys derived from quantum properties of photons.
Key Transfer	Keys transmitted and can be intercepted.	Keys shared via quantum states, making interception impossible.
Eavesdropping Detection	Not possible.	In-built, disturbance of quantum states reveals interception.
Limitations	Future advances in computing may weaken or break existing encryption methods	Distance limitations (e.g., ~100–200 km over optical fiber).
Examples	WhatsApp, Aadhaar, UPI encryption.	Drone-based QKD for defense use.

BHARAT FORECASTING SYSTEM

Context: India recently launched the Bharat Forecasting System, the world's highest-resolution weather forecasting model.

About Bharat Forecasting System (BFS)

- The BFS is **India's first indigenously developed**, high-resolution weather forecasting model.
- It is designed to provide **accurate, localized weather predictions at a block/panchayat level for the next two hours,** known as **nowcasts**, as well as **forecasts of extreme weather event**s like cyclones, heavy rainfall, heat and cold waves, floods, and thunderstorms.
- It is powered by the Arka high-performance computing (HPC) facility at the Indian Institute of Tropical Meteorology (IITM), Pune.
- **World's highest resolution**: **6×6 km grid** (down from 12×12 km)
- **Enhanced extreme weather forecasting**: heat/cold waves, cyclones, heavy rainfall, floods, thunderstorms, and lightning.
- **Regional coverage:** Entire tropical belt from 30°S to 30°N, including Africa, Southeast Asia, and South Asia

Characteristic	Arka	Arunika
Processing Speed	11.77 petaflops	8.24 petaflops
Storage Capacity	33 petabytes	24 petabytes
Location	IITM, Pune	National Centre for Medium Range Weather Forecasting
Application	Powers BFS, high-resolution block-level nowcasts	Medium-range forecasting, oceanic research, atmospheric modeling

About Supercomputer Arka:

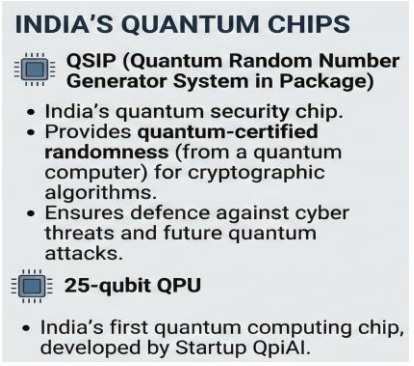
- Launched in September 2024 alongside Arunika, both dedicated to weather forecasting.
- Supports BFS by powering high-resolution numerical weather prediction (NWP) models integrated with 39 Doppler weather radars nationwide.
- Aims to foster a weather-aware society and improve earth-ocean sciences for fisheries, marine biodiversity, and deep-sea exploration.

INDIA'S 1ST QUANTUM TECHNOLOGY PARK IN AMRAVATI

Context: Under the National Quantum Mission, Andhra Pradesh is establishing India's first Quantum Technology Valley Park in Amaravati, in partnership with IBM, TCS, and L&T.

About Quantum Technology Valley Park

- It will be built on the foundation of the largest quantum computer in India, a 156-qubit Heron quantum processor of IBM Quantum System-2.



- TCS and IBM will develop quantum algorithms for life sciences, energy efficiency, materials science, eco-friendly manufacturing, cryptography, and supply chains.
- The park will also enable quantum-powered public services, including GST optimization, real-time census modeling, and India's first quantum governance framework.

SATELLITE INTERNET SERVICES

Context: Indian telecom giants Airtel and Jio have signed agreements with SpaceX to introduce Starlink's satellite internet services in India

What is Satellite Internet?

- Satellite internet (or satellite broadband) is a wireless internet service delivered through communication satellites orbiting the Earth.
- Unlike traditional fiber, cable, or DSL networks, it does not depend on ground-based infrastructure to transmit data.

Components:

- **Space Segment:** Consists of a network of satellites that receive, amplify, and transmit data signals. Satellites are positioned in different orbits (Low, Medium, or Geostationary Earth Orbit) depending on coverage needs.
- **Ground Segment:** Includes gateway stations and control networks that connect satellites to terrestrial communication systems.
- **User Segment**: Comprises user terminals or antennas that receive and send data signals.

Advantages of Satellite Internet:	**Disadvantages of Satellite Internet:**
• Wide Availability • High Speed Compared to Dial-Up • Disaster Resilience • No Need for Physical Infrastructure • Supports Remote Work and IoT	• Latency Issues • Weather Sensitivity • Higher Costs • Data Caps and Throttling • Signal Obstruction

Comparison of Satellite Orbits for Internet Services

Parameter	Geostationary Orbit (GEO)	Medium Earth Orbit (MEO)	Low Earth Orbit (LEO)
Altitude from Earth	~35,786 km	~2,000–20,000 km	~160–2,000 km
Latency	High	Low	Very low
Deployment Cost	Very high	Moderate to high	Relatively low
Earth Coverage	Very large (3 satellites cover the globe)	Large (≈6 satellites needed)	Small (thousands needed)
Antenna Movement	Stationary antennas	Slow tracking (~1 hour)	Fast tracking (~10 minutes)
Key Applications	Weather monitoring, broadcast TV, imagery, low-speed data transmission	Navigation (GPS, Galileo), defense, communication services	Remote sensing, human spaceflight, high-speed data communication

Project	Status	Planned Satellites	Satellites in Orbit
Project Kuiper (Amazon)	Full-scale deployment started April 2025	3,236	156
Starlink (SpaceX)	Operational with over 8,000 satellites	12,000	8811
OneWeb (Eutelsat)	Operational with 600+ satellites	6,372	600
Qianfan Constellation (China)	Initial deployment, behind schedule	15,000	90

DRUM WEB APP

Context: IIT Kharagpur researchers have developed DRUM (Dynamic Route Planning for Urban Mobility), an app like Google Maps that suggests least polluted and most energy-efficient routes.

More about DRUM (Dynamic Route Planning for Urban Mobility)

- **Offers five route options:** shortest, fastest, least air pollution (LEAP), least energy consumption (LECR), and a combined "suggested route."
- **Technical Setup:** Uses GraphHopper for route generation and Mapbox for real-time traffic updates.
- **Data Sources:** Pollution data from CPCB and World Air Quality Index (AQI).
- DRUM 2.0 will integrate machine learning models (LSTM, Prophet) to predict air quality, traffic, and energy use for smarter routing and departure suggestions.

SAHAV DIGITAL OCEAN DATA PORTAL

Context: At the Third UN Ocean Conference (UNOC3) in Nice, France, India launched SAHAV, a GIS-based, open-source digital tool to support Marine Spatial Planning (MSP).

About SAHAV:

- SAHAV is a joint initiative of India and Norway. Its name is derived from Sagar (ocean in Hindi) and Hav (ocean in Norwegian).
- It is open source and freely available through the Digital Public Goods Alliance registry.
- SAHAV is a GIS-based decision support system that empowers policymakers, researchers, and coastal communities by providing real-time spatial data for informed planning and improved marine resilience.
- It offers real-time information on physical, chemical, biological, and geological parameters of oceans and coastal areas.
- The platform integrates land, sea, ecological, and human activity data into a single system to support science-based ocean governance and management.

Location Intelligence in SAHAV:

- **Land Use:** District/village boundaries, coastal infrastructure, urban footprints
- **Water Resources:** Tanks, canals, surface water affecting coastal dynamics
- **Environment:** Water quality, marine pollution, precipitation, humidity, seabed features
- **Ecology:** Mangroves, coral reefs, biodiversity hotspots, sandy areas, fishing zones
- **Oceanography:** EEZ boundaries, 12/24 nautical miles, bathymetry (sea floor depth/topography)
- **Human Activities:** Ports, coastal protection, ocean instruments, navigation routes

ADVANCED LIQUID COOLING SYSTEMS FOR DATA CENTRES

Context: Studies show advanced liquid cooling technologies are key for the IT industry to meet climate goals.

About Advanced Liquid Cooling Technologies

- Advanced Liquid Cooling Technologies are modern cooling methods used in data centres and high-performance computers to manage the large amounts of heat generated by processors, GPUs, and other electronic components.
- Traditional air-cooling systems (fans blowing air) are often not efficient enough for today's high-density, high-power computing, such as AI, cloud servers, or GPU-heavy systems.
- Liquid cooling uses fluids, like water-based coolants or special oils, to transfer heat away from components much more efficiently.

Key Types:

1. Direct-to-Chip (Cold-Plate) Cooling:

- Chips are placed on cold plates that have tiny channels carrying coolant.
- Heat is absorbed at the source and carried to an external heat sink.
- **Advantage**: Highly efficient, reduces power use.
- **Disadvantage**: More expensive than air-cooling.

2. Immersion Cooling:

- Entire server components are submerged in a special dielectric liquid that does not conduct electricity but absorbs heat.

- Heat is then circulated away safely.
- **Advantage**: Uniform cooling, silent, low risk of overheating.

CELL BROADCASTING SYSTEM

Context: The Department of Telecommunications (DoT) and the National Disaster Management Authority (NDMA) are testing a new Cell Broadcast (CB) System **to deliver real-time disaster alerts across India, thereby strengthening the country's emergency communication network.**

What is the Cell Broadcasting System (CBS)?

- The CBS is a technology used by mobile network operators to simultaneously send short text messages to multiple mobile phone users in a specific geographic area.
- Unlike regular SMS, which is point-to-point, **cell broadcast is a one-to-many, geo-targeted, and geo-fenced messaging service targeting all handsets connected to certain network cells.**
- It is widely used for public warning systems to send real-time disaster alerts such as earthquakes, tsunamis, floods, and industrial hazards.
- The system has been developed by the Centre for Development of Telematics (C-DOT).

Key Features of C-DOT's Cell Broadcast System

- **Indigenous Design:** Fully developed in India, promoting the Aatmanirbhar Bharat mission.
- **Geo-Targeting:** Sends alerts only to affected areas, avoiding message overload.
- **Multilingual Support:** Delivers alerts in multiple Indian languages to ensure accessibility.
- **Speed and Scale:** Capable of reaching millions of mobile devices within seconds.
- **Technology Compatibility:** Works seamlessly across 2G, 3G, 4G, and 5G networks.
- **Low Latency:** Ensures instant delivery even in highly congested networks.
- **Customisable**: Can be adapted by each Telecom Service Provider (TSP) and equipment vendor.
- **Secure and Compliant:** Adheres to CERT-IN, InfoSec, and HTTPS security standards.
- **Advanced Analytics:** Equipped with cell broadcast analytics and a feedback mechanism to monitor alert performance and coverage.

Coordination with SACHET

- This new CB system complements the already operational **Integrated Alert System (SACHET)**, also developed by C-DOT.
- SACHET is based on the Common Alerting Protocol (CAP), recommended by the International Telecommunication Union (ITU).

QUANTUM NOISE

Context: Researchers at the Raman Research Institute (RRI) have discovered that "quantum noise," long considered harmful to quantum systems, can actually be beneficial in certain situations.

What is Quantum Noise?

- Quantum noise refers to the **unwanted and unavoidable disturbances that affect quantum systems, leading to errors in quantum computations.**
- Unlike classical noise, which simply adds random disturbances to signals, quantum noise arises from the fundamental principles of quantum mechanics.
- As a result, it often has more complex and unpredictable effects.

Causes of Quantum Noise

- **Heisenberg's Uncertainty Principle:** At the quantum level, certain pairs of physical properties (like a wave's amplitude and phase) cannot be measured exactly at the same time. This inherent limit causes tiny fluctuations even under ideal conditions—such as at absolute zero temperature with perfect detectors.
- **Discrete Nature of Energy:** Energy in quantum systems (like light or radio waves) exists in small packets called quanta or photons. When we measure or amplify these signals, random variations naturally occur because of their probabilistic nature.
- **Environmental Interactions:** Quantum systems are extremely sensitive. Factors like thermal fluctuations, electromagnetic interference, imperfections in quantum gates, and coupling with the environment can all introduce noise.

Types of Quantum Noise

- **Phase Noise:** Alters the relative phase between the basic states of a qubit, disturbing quantum interference patterns.
- **Amplitude Noise:** Changes the probability of finding a qubit in a particular state, causing distortions in measurement outcomes.

Why Quantum Noise Matters

- **Decoherence:** Quantum noise leads to decoherence, a process where qubits lose their unique quantum features such as superposition and entanglement.
- **Loss of Quantum Information:** Even tiny amounts of noise can introduce large errors, making quantum computations unreliable or unstable.

INDIA'S "BATTERY PASSPORT" SYSTEM

Context: India is set to roll out a Battery Passport system to provide electric vehicle (EV) owners with detailed digital information about the batteries in use.

What is the Battery Passport?

- The Battery Passport is a digital record system that stores essential information about each EV battery.
- It will include its source, composition, performance, lifecycle, and supply chain details, all encoded in a QR code printed on the battery.

Objectives

- **Enhance Safety:** Prevents mixing of battery cells from different production batches, a known cause of previous fire incidents.
- **Improve Quality:** Enables standardization and uniform quality checks across manufacturers.

Key Features & Benefits

- **Unique Digital Identity:** Each battery will have a unique ID (similar to an Aadhaar number) containing its complete digital data.
- **QR Code Integration:** A QR code printed on the battery allows instant access to battery details, supporting the upcoming Battery Swapping Policy and enabling efficient monitoring.
- **Digital Traceability:** Promotes transparency, accountability, and standardization throughout the battery's supply chain and lifecycle.
- **Manufacturing Integrity:** Ensures all cells within a battery are from the same manufacturing year, improving both safety and performance.
- **Export Boost:** Aligns Indian manufacturing with international standards, attracting global EV producers and enhancing export potential through government incentives.
- **Consumer Confidence:** Since batteries constitute about 40% of an EV's total cost, reliable lifecycle and performance data help consumers make informed decisions, enhancing trust, safety, and overall quality.

BLUETOOTH MESH NETWORKING

Context: Twitter Co-Founder Jack Dorsey has introduced **BitChat**, a new peer-to-peer (P2P) messaging app that works without a central server or mobile network. It uses Bluetooth Low Energy (BLE) Mesh Networking to connect nearby devices.

About Bluetooth Mesh Networking

- Bluetooth Mesh Networking is a **communication system that connects several Bluetooth-enabled devices directly to one another, forming a large interconnected group known as a mesh network.**
- Unlike traditional systems that rely on a central server or internet connection**, it allows devices to share data across multiple points in a networ**k. Each connected device, called a node, acts as both a sender and a relay, passing messages along to others in range.
- For example, if three phones—A, B, and C—are in a room, A can send a message to C through B, even if A and C are not directly connected.
- **Benefits**: It enhances **privacy** since messages are stored only on users' devices and are end-to-end encrypted. It **does not require registration or internet connectivity,** enabling secure and anonymous communication. Additionally, it **consumes little powe**r due to Bluetooth Low Energy technology.

- **Limitations:** Slower message delivery (high latency), complex network management, and low data transfer speed, making it more suitable for short text messages rather than large media files.

AI ALLIANCE NETWORK (AIANET)

Context: Digital India Foundation (DIF) has raised security concerns over Pakistan's AI Technology Centre's bid for membership of AIANET, citing risks related to military use and weaponization of AI.

About AI ALLIANCE NETWORK (AIANET)

- AIANET is an informal voluntary multinational coalition of AI research institutions and entities committed to ethical, transparent, and peaceful development of artificial intelligence.
- AIANET aims to unite AI research bodies from BRICS nations and aligned democracies to collaborate on civilian AI research, safeguard against dual-use risks, and establish global standards for responsible AI innovation.
- The network presently includes **28 member organisations (including 2 organisations from India)** and is **administered by the AI Alliance based in Russia.**

GPS INTERFERENCE

Context: On June 20, an Air India Express flight from Delhi to Jammu was forced to return to Delhi Airport after being diverted mid-air due to suspected GPS interference.

- **GPS Interference** occurs when Global Positioning System signals are intentionally or unintentionally disrupted. It usually happens through jamming or spoofing, both of which affect the accuracy of navigation systems.

Related Terms

- **GPS Jamming** happens when a jammer emits powerful radio waves on the same frequencies used by GPS satellites, blocking or overpowering weaker satellite signals. This prevents GPS receivers from accurately determining their location or time.
- **GPS Spoofing** involves sending fake signals that imitate genuine satellite transmissions. Instead of cutting off communication like jamming, spoofing misleads GPS receivers into showing false positions or timings.

HAM RADIO COMMUNICATION

Context: On July 4, Indian astronaut Shubhanshu Shukla spoke with students across the country through ham radio from the International Space Station (ISS).

What is Ham radio?

- Ham radio, or amateur radio, is a licensed communication service that uses radio waves to establish contact between operators.
- Any individual above the age of 12 can become a ham operator in India after qualifying in Amateur Station Operators Certificate examination, from the Ministry of Electronics & IT.
- The first use of amateur radio for space communication dates back to 1983, when it was employed aboard a space shuttle to link astronauts with people on Earth.
- The ISS is equipped with its own ham radio system called Amateur Radio on the International Space Station (ARISS), which regularly facilitates live sessions between astronauts and students worldwide.
- Ham radios function using radio waves, which are the longest in the electromagnetic spectrum. Their existence was first demonstrated by **Heinrich Hertz** in the late 1880s, laying the foundation for modern wireless communications.

DARK WEB

Context: A 35-year-old mechanical engineer from Muvattupuzha, Kerala, was recently arrested for selling narcotics through the dark web, highlighting the misuse of online anonymity tools.

About the Dark Web

- The dark web is a concealed part of the internet that cannot be accessed through normal search engines or browsers. It requires specialised software, most notably the Tor browser, to enter.
- Unlike regular browsers such as Google Chrome, Firefox, which can track users through IP addresses, the dark web hides user identities, offering a high degree of privacy and anonymity.
- The concept of a hidden, encrypted internet network began in the 1990s, when the U.S. Naval Research Laboratory developed **The Onion Routing (Tor) project** to secure online communications.

- Tor works by routing internet traffic through multiple randomly selected servers (nodes) worldwide, encrypting data at every step. This layered encryption makes it extremely difficult to trace user activity.
- **How It Works:** Websites on the dark web use ".onion" domains, which are not indexed by normal search engines. Tor does not search for these sites automatically; users must manually locate the addresses of dark web pages to access them.
- **Significance:** Although often linked with **illegal trade** (such as drugs, weapons, and stolen data) the dark web also supports **legitimate activities.** Whistleblowers, journalists, and human rights activists use it as a secure platform to share information and communicate safely, especially in repressive political environments.

AI MODEL FOR TRANSLITERATING

Context: The Indian Institute of Technology (IIT) Roorkee has created the world's first Artificial Intelligence framework capable of transliterating the historic Modi script into Devanagari.

About the Model

- The system, named "**MoScNet**", is built on a **Vision-Language Model (VLM) architecture,** enabling it to read and convert old handwritten Modi script texts into modern Devanagari.
- This innovation is expected to play a crucial role in digitising ancient documents under national initiatives such as Digital India and Bhashini.
- By integrating AI with linguistic heritage, the framework supports long-term conservation and accessibility of historical records.

About the Modi Script:

- The Modi script was used for writing Marathi for nearly 700 years, from the 13th century onwards.
- It remained in use even during the British colonial period and was taught in schools after Independence until it was gradually replaced by Devanagari in the 1950s.

CHARGE-COUPLED DEVICE

Context: A charge-coupled device (CCD) is an important electronic component whose invention marked a major technological milestone and transformed many scientific and commercial fields.

What is a Charge-Coupled Device (CCD)?

- It is an electronic sensor that **captures images by turning light into electrical signals**. It is made up of thousands or millions of tiny squares called pixels, each of which senses light.
- When light falls on these pixels, they produce electric charges. These charges are then passed along the device until they reach a readout system that converts them into a digital image.
- **Inventors:** Willard Boyle and George Smith (1969). They originally developed the concept for memory devices by storing and transferring electric charge in capacitors ("charge coupling").
- **Applications:**
  - **Consumer electronics:** digital cameras, webcams, CCTV
  - **Medical imaging:** X-rays, CT scans, endoscopy
  - **Scientific research:** microscopes, spectrometers, particle detectors
  - **Astronomy:** detecting faint celestial objects, mapping galaxies, and discovering exoplanets

INDIA SEMICONDUCTOR MISSION (ISM)

Context: The government has approved four additional semiconductor manufacturing projects in Odisha, Punjab, and Andhra Pradesh under the India Semiconductor Mission (ISM).

About India Semiconductor Mission (ISM)

- The ISM is an initiative launched in **December 2021** under the **Ministry of Electronics and Information Technology**, aimed at building a robust semiconductor and display ecosystem in India and positioning the country as a global hub for electronics manufacturing and design.
- **Objectives of ISM**
  - Establish sustainable semiconductor manufacturing and design ecosystems
  - Develop a trusted semiconductor supply chain (raw materials, equipment, gases, chemicals)
  - Support startups with Electronic Design Automation (EDA) tools and foundry services
  - Promote indigenous Intellectual Property (IP) creation and facilitate Transfer of Technology (ToT)

- Encourage R&D and create Centres of Excellence (CoEs)
- Build national and global collaborations for research, innovation, and skill development

- **ISM Schemes**
  - **Semiconductor Fabs Scheme:** 50% fiscal support for semiconductor wafer fabrication units in India
  - **Display Fabs Scheme:** 50% financial assistance for AMOLED/LCD display fabrication units
  - **Compound Semiconductors & ATMP/OSAT Scheme**: 50% support for units producing compound semiconductors, silicon photonics, MEMS/sensors, and discrete semiconductors, including ATMP (Assembly, Testing, Marking & Packaging) and OSAT (Outsourced Semiconductor Assembly and Test)
  - **Design Linked Incentive (DLI):** ₹1,000 crore scheme to support semiconductor design startups/MSMEs with R&D reimbursement, design tools, and incentives up to ₹15 crore per company

Recent Developments under ISM

- Investments by Micron, Tata, Foxconn–HCL, CG Power, and Kaynes in Gujarat, Assam, Uttar Pradesh, Odisha, and Punjab
- India's first indigenous semiconductor chip production expected to begin in 2025
- **SEMICON India**: A flagship event under ISM conducted annually with SEMI (Semiconductor Equipment and Materials International) since 2022, promotes investment, global collaboration, research, and skill development
- The 4th edition is scheduled for September 2025 in New Delhi.

EU AI CODE OF PRACTICE ON GENERAL-PURPOSE (GPAI)

Context: Twenty-six major technology firms like Amazon, Google, and Microsoft, have voluntarily endorsed the European Commission's AI Code of Practice for General-Purpose AI (GPAI).

About EU AI Code of Practice for General-Purpose AI (GPAI)

- The EU AI Code of Practice for General-Purpose AI (GPAI) is a **voluntary compliance tool** published on July 10, 2025, **to help providers of GPAI models meet the obligations set out in the EU AI Act,** especially regarding **safety, transparency, and copyright.**
- The code is designed to be a **practical guide for companies that develop large language models and other foundation models** widely used in various applications.

About the EU AI Act

- The EU AI Act is recognised as the **world's first comprehensive legal framework dedicated to regulating artificial intelligence.**
- It follows **a risk-based approach,** meaning AI systems are regulated according to the level of risk they present—ranging from minimal to unacceptable.
- The law strengthens accountability requirements for AI developers and places obligations on companies that deploy or integrate generative AI within their supply chains or through third-party services.
- **Similar to the influence of the General Data Protection Regulation (GDPR)**, the Act is expected to shape international norms and promote responsible AI practices globally.

BRAIN-COMPUTER INTERFACE (BCI)

Context: Stanford scientists have created password-protected mind reading Brain-Computer Interface (BCI).

About Brain–Computer Interface (BCI)

- A Brain–Computer Interface (BCI) is a system that **detects brain signals, interprets them, and converts them into commands that control an external device.**
- BCIs do not read thoughts. Instead, they allow a person to **operate devices using brain activity rather than muscle movements.**

How a BCI Works

- The computer analyses the user's brain signals and identifies the intended action. It then sends this command to an output device (such as a cursor, robotic arm, or keyboard).
- Feedback is essential, it helps users learn how to adjust their brain signals for better control.
- With training, users produce specific patterns of brain activity that the system can decode and translate into actions.

- BCIs bypass the body's usual communication pathways (such as nerves and muscles) and rely directly on signals from the central nervous system (CNS).

Types of BCIs		
Invasive BCIs (Brain Implants)	**Non-invasive BCIs (Surface Detectors)**	**Partially Invasive BCIs (Dura Mater Implants)**
• Surgically implanted into the brain's grey matter. • Provide high-quality, precise signals. • Example: Neuralink implant.	• Use external electrodes placed on the scalp to pick up brain activity. • Less risky but produce lower-resolution signals. • Examples: EEG (Electroencephalography), fMRI (Functional MRI).	• Placed under the skull but outside the grey matter. • Offer better signal quality than non-invasive methods without penetrating brain tissue. • Example: ECoG (Electrocorticography), where electrodes rest on the brain's surface.

What is a Neuron?

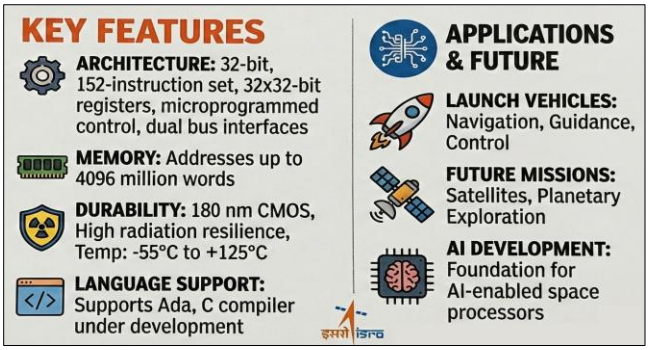
- A neuron, or nerve cell, is the basic functional unit of the brain and nervous system.
- Neurons receive sensory information, send motor commands to muscles, and transmit electrical signals across the body.
- The human brain contains roughly 100 billion neurons, and their combined activity shapes behaviour, memory, and identity.
- Neurons work together with glial cells, which support and protect them and may even outnumber neurons.
- **Structure of a Neuron**
  - **Dendrites:** Branch-like structures that receive signals from other neurons.
  - **Axon:** A long fibre that carries electrical impulses to other neurons or muscles.
  - **Soma (Cell Body):** Contains the nucleus and DNA; produces proteins needed for neuron function.

VIKRAM 3201

Context: India unveiled its **first fully indigenous 32-bit microprocesso**r, the Vikram 3201, at the Semicon India 2025 conference.

About Vikram 3201

- The processor has been **designed by the Vikram Sarabhai Space Centre (VSSC)** and fabricated at the **Semi-Conductor Laboratory (SCL) in Chandigarh.**
- It is an **upgraded version of the Vikram 1601**, a 16-bit processor that has been used in ISRO's launch vehicles since 2009.



AI FOR VIKSIT BHARAT AND FRONTIER TECH REPOSITORY

Context: NITI Aayog has launched AI for Viksit Bharat Roadmap and the NITI Frontier Tech Repository under its Frontier Tech Hub.

AI for Viksit Bharat Roadmap	• A clear, **sector-focused action plan** for economic transformation • The roadmap provides a **practical strategy to convert AI's** potential into real outcomes. It focuses on two major pathways: ○ Accelerating AI adoption across industries to improve productivity and efficiency. ○ Transforming research and development through generative AI, enabling India to leapfrog into innovation-led growth.
NITI Frontier Tech Repository	• **Inspiring states and districts to scale frontier technologies** • The Repository features over 200 impact stories from across India in four key sectors: **Agriculture, Healthcare, Education, and National Security.** • It **shows how states, startups, and district administrations are using technology to improve livelihoods and deliver public services.**

	• The platform encourages innovators, officials, and citizens to study real-world use cases and adopt them in their own regions.

About NITI Frontier Tech Hub:

- The Frontier Tech Hub is an **action-focused platform driving the vision of Viksit Bharat.**
- Working with experts from government, industry, and academia, it is designing a 10-year roadmap across 20+ sectors to harness frontier technologies for transformative growth.
- By mobilizing stakeholders nationwide, the Hub aims to build a prosperous, resilient, and technologically advanced India by 2047.

GRAPHITE SPYWARE

Context: The Trump administration has unfrozen a stalled Biden-era contract with Paragon Solutions, an Israeli company that develops Graphite spyware.

What is Graphite Spyware?

- Graphite is a **zero-click, state-grade spyware** capable of fully hijacking a smartphone.
- It can bypass encryption and covertly monitor a user's activities without requiring any action from the target. It conducts zero-click attacks, meaning it infects devices without the user tapping or opening anything.
- It provides access to photos, contacts, call logs, and GPS location. It can read encrypted chats, including messages on WhatsApp and Signal.
- It can activate the phone's microphone and camera, effectively turning the device into a listening and surveillance tool.

HEALTHAI GLOBAL REGULATORY NETWORK

Context: India has joined the Health AI Global Regulatory Network (GRN) to strengthen oversight and governance of artificial intelligence in healthcare.

What is the HealthAI Global Regulatory Network (GRN)?

- HealthAI Global Regulatory Network (GRN) is a global network of health regulators dedicated to the safe and effective use of artificial intelligence (AI) in healthcare.
    - HealthAI is **a Geneva-based, independent nonprofit organisation** that promotes equitable access to AI-powered health innovations.
    - It works with governments, international organisations, and global health leaders to strengthen AI governance and regulation, ensuring that AI technologies transform healthcare safely and inclusively.
- GRN members receive exclusive access to the **Global Public Repository of AI-related Registered Solutions for Health**, a platform where regulatory authorities can showcase AI health solutions registered in their countries.
- The **Indian Council of Medical Research – National Institute for Research in Digital Health and Data Science (ICMR-NIRDHDS)** and **IndiaAI** will collaborate with the HealthAI network.
    - IndiaAI, implemented by the Ministry of Electronics and Information Technology (MeitY) through the Digital India Corporation, is India's flagship initiative to build a comprehensive and inclusive AI ecosystem and position India as a global leader in AI innovation.

INTERNATIONAL ELECTROTECHNICAL COMMISSION

Context: India hosted the 89th General Meeting (GM) of the International Electrotechnical Commission (IEC) at Bharat Mandapam, New Delhi.

- This is the fourth time India has hosted the IEC General Meeting, the previous occasions being 1960, 1997, and 2013.

About the International Electrotechnical Commission (IEC)

- IEC is a global, not-for-profit membership organization comprising more than 170 countries, and it coordinates the work of around 20,000 experts worldwide.
- It is the world's leading organization responsible for the development and publication of international standards for electrical, electronic, and related technologies, collectively referred to as "electrotechnology."
- The mission of the IEC is to promote the global adoption of IEC International Standards and Conformity Assessment systems to ensure the safety, efficiency, reliability, and interoperability of electrical, electronic,

and information technologies, thereby supporting international trade, expanding access to electricity, and contributing to a more sustainable world.

- The IEC works closely with the International Organization for Standardization (ISO) and the International Telecommunication Union (ITU).
- There are 89 IEC Member Nations with one National Committee per country. Additional 85+ countries participate in the Affiliate Country Programme, which helps developing nations engage with IEC standards at no cost. **India has been a Full Member since 1929.**

AGRIENICS PROGRAMME

Context: The Ministry of Electronics and Information Technology (MeitY) has announced the transfer of several technologies developed under the AgriEnIcs Programme.

About the AgriEnIcs Programme

- It is a national initiative launched by the Ministry of Electronics and Information Technology (**MeitY**), aimed at **integrating advanced electronics, IT, and digital technologies into agriculture and environmental management.**
- **Objective:** To design and deploy electronics and ICT-based solutions for agriculture and environmental management.
- The programme is being implemented by the Centre for Development of Advanced Computing (C-DAC), Kolkata, as the nodal agency.

Key Technologies Developed

- **Go-P**: A device for monitoring cattle health, enabling early detection of abnormalities.
- **MAST-D:** A diagnostic device for detecting mastitis in dairy cattle.
- **Grain-Ex:** AI-driven quality analysis tool for pulses.
- **CT-Vieu:** Designed for chilli quality assessment.
- **RIGE-Sense:** Evaluates rice quality using advanced imaging and sensors.
- **Odour Monitoring System:** A real-time gas-sensor device that monitors odour emissions at municipal solid waste sites, industrial waste-processing units, and landfills.

INDIAN RADIO SOFTWARE ARCHITECTURE STANDARD

Context: The Defence Research and Development Organisation (**DRDO**), in partnership with the **Integrated Defence Staff and the Tri-Services**, has released IRSA Standard 1.0.

About Indian Radio Software Architecture (IRSA) Standard 1.0

- IRSA is India's first national standard for Software-Defined Radios (SDRs). It is designed to ensure interoperability, waveform portability, and greater self-reliance in military communication systems.
- **Software-Defined Radios (SDRs):** Unlike traditional radios, SDRs perform signal processing and modulation through software rather than dedicated hardware. This makes them highly versatile and adaptable to modern communication needs.

Key Features of IRSA

- Built on the global **Software Communications Architecture (SCA) 4.1,** enabling a uniform and standardised SDR software framework.
- Specifies common APIs, execution environments, and communication mechanisms such as CORBA (Common Object Request Broker Architecture) and MHAL (Modem Hardware Abstraction Layer).
- Introduces Radio Profiles for different SDR categories and new indices like Waveform Portability and Platform Hospitality, which help assess compatibility and ease of integration.
- Supports a secure, scalable, and indigenous SDR ecosystem, strengthening India's defence communication capabilities.

INSECURE DIRECT OBJECT REFERENCE (IDOR)

Context: A major data breach was averted after the Indian government patched a serious security vulnerability, an Insecure Direct Object Reference (IDOR), in the income tax e-filing portal.

What is an Insecure Direct Object Reference (IDOR)?

- An IDOR occurs **when a website exposes internal identifiers** (such as user IDs, database keys, or file paths) **without proper access control, allowing unauthorized access to sensitive information.**
- **Cause:** Weak or missing validation and authorisation checks on user inputs.
- **Effect:** Attackers can alter these identifiers to access or manipulate another user's data.
- **Example:** Changing a URL parameter like user_id=101 to user_id=102 to see someone else's account information.
- **Prevention:** Enforce strict server-side access controls, Validate every request, And avoid exposing sensitive internal identifiers directly.

INTRUSION DETECTION SYSTEM

Context: The Northeast Frontier Railway (NFR) has completed trial runs of its Intrusion Detection System (IDS) across four major railway sections, for improving wildlife safety.

- These pilot installations cover 64.03km of elephant corridors so far. It will cover about 147km by April 2026.

About the Intrusion Detection System

- **Objective**: To prevent collisions between trains and wildlife (especially elephants) while ensuring smooth railway operations in forested and elephant-rich regions.
- **Technology Used:** A sensor- and AI-enabled system that employs optical-fibre cables to sense ground vibrations caused by elephants moving near or onto railway tracks.
- **Function**: When abnormal vibrations are detected, the system sends real-time alerts to loco pilots, station masters, and railway control rooms, allowing trains to slow down or stop as needed.

SKILLING FOR AI READINESS (SOAR) PROGRAMME

Context: India has launched SOAR Program to prepare the next generation for an AI-driven future.

About Skilling for AI Readiness (SOAR) Programme

- The SOAR Programme is an initiative launched by the **Ministry of Skill Development and Entrepreneurship (MSDE)** in July 2025**.**
- The initiative, which coincides with the ten-year milestone of the Skill India Mission, aims to **integrate artificial intelligence learning into India's school education and training ecosystem,** preparing both students and teachers for a rapidly evolving digital world.
- SOAR **aims to integrate AI education into school curricula and vocational training, targeting students from Class 6 to Class 12 and educators across India.**
- The program is designed to foster AI literacy, bridge the urban-rural digital divide, and prepare India's youth for AI-driven careers and innovation.
- **Training Modules**
  - **For Students:** Three tailored modules of 15 hours each, covering AI fundamentals, machine learning basics, and digital responsibility.
  - **For Teachers:** One 45-hour module focusing on AI concepts, data literacy, and ethical technology use.
- **Budget 2025-26:** ₹500 crore allocation for establishing a Centre of Excellence in AI for Education.

SCHEME FOR INNOVATION AND TECHNOLOGY ASSOCIATION WITH AADHAAR (SITAA)

Context: The Unique Identification Authority of India (UIDAI) has launched the SITAA programme to accelerate innovation in the digital identity space.

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

- The initiative aims to strengthen India's ID Tech ecosystem by enabling startups, academia, and industry to work closely with UIDAI. Through SITAA, UIDAI seeks to drive innovation, promote indigenization, and co-develop advanced and future-ready identity technologies.
- MeitY Startup Hub (MSH) and NASSCOM have signed MoU with UIDAI and would act as strategic partners for furtherance of SITAA objectives.

About UIDAI

- Unique Identification Authority of India, is a **statutory authority** under the Ministry of Electronics and Information Technology.
- It issues the **12-digit Aadhaar number to residents**, linking it to biometric and demographic data for

identity verification.

- UIDAI was initially **set up in January 2009** under the Planning Commission and became a **statutory body via the Aadhaar Act, 2016**, effective July 12, 2016.
- Under the Aadhaar Act 2016, UIDAI is responsible for
  - Aadhaar enrolment and authentication, including operation and management of all stages of Aadhaar life cycle,
  - Developing the policy, procedure, and system for issuing Aadhaar numbers to individuals
  - Perform authentication and the security of identity information and authentication records of individuals.

NETWORK SURVEY VEHICLE (NSV)

Context: National Highways Authority of India (NHAI) plans to deploy NSVs across 23 states to evaluate 20,933 km of National Highways for detailed road inventory creation and pavement condition assessment.

About Network Survey Vehicles (NSVs).

- NSVs are specialized vehicles deployed by the NHAI to collect detailed data on road inventory and pavement conditions across National Highways.
- These vehicles use advanced sensors like 3D lasers, GPS, high-resolution cameras, and inertial measurement units to detect defects such as cracks, potholes, and ruts automatically.

Key Features of NSVs

- Fitted with **advanced equipment such as laser scanners, GPS, Inertial Measurement Units (IMU),** Distance Measuring Instruments (DMI), and high-resolution cameras supported by image-processing software.
- Capable of **identifying road defects** including cracks, potholes, rutting, edge failures, and faded lane markings.
- Records **critical road attributes** such as carriageway type, pavement width, terrain, surrounding land use, and utility infrastructure.
- Surveys are **conducted before project initiation** and subsequently every six months to track changes in road condition.
- Collected data is uploaded to NHAI's AI-enabled "**Data Lake**", allowing advanced analysis and generation of actionable maintenance insights.

YUVA AI FOR ALL

Context: The Ministry of Electronics and Information Technology (MeitY), under the IndiaAI Mission, has launched 'YUVA AI for ALL'.

About YUVA AI for ALL

- It is a 4.5-hour free **online learning programme designed to make artificial intelligence (AI) accessible and understandable to every Indian**, with a special focus on students.
- The initiative forms **part of the IndiaAI Mission** and seeks to reduce digital inequality, promote the responsible use of modern technologies, and prepare India's youth and workforce for a technology-driven future.
- The course is structured into six short modules and aims to empower one crore citizens with foundational AI skills, while encouraging ethical, responsible, and inclusive adoption of AI.
- The programme is available on major learning platforms such as FutureSkills Prime, iGOT Karmayogi, and several well-known ed-tech platforms.

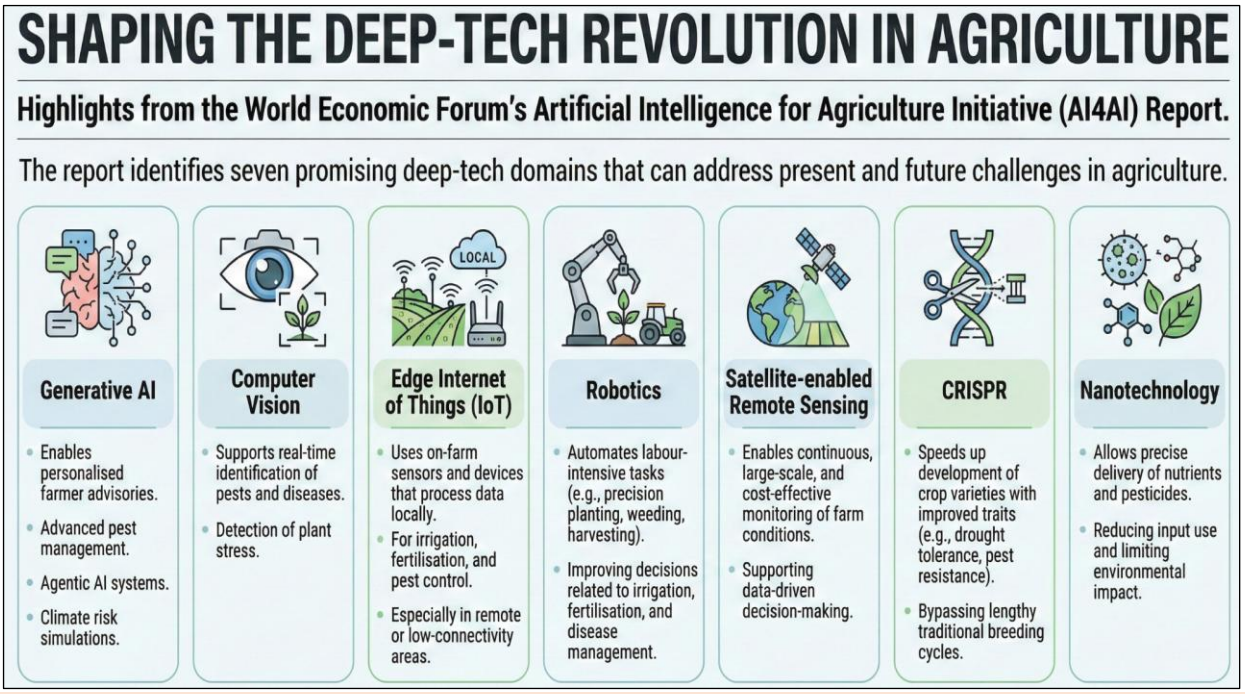
ARTIFICIAL INTELLIGENCE FOR AGRICULTURE INITIATIVE (AI4AI)

Context: The World Economic Forum's Artificial Intelligence for Agriculture Initiative (AI4AI) has released a report titled Shaping the Deep-Tech Revolution in Agriculture.

About Artificial Intelligence for Agriculture Initiative (AI4AI)

- The AI4AI initiative was **launched in August 2020** by the **World Economic Forum's Centre for the Fourth Industrial Revolution (C4IR) India,** in active collaboration with the Government of Telangana.
- The initiative was supported by the Ministry of Agriculture, NITI Aayog, and the Ministry of Electronics and Information Technology (MeitY).
- It **works across multiple regions** to help stakeholders use emerging technologies to make agriculture more inclusive, sustainable, and efficient.

- By 2030, AI4AI aims to equip 10 million farmers, including 30% women, with emerging agri-tech solutions.



PROJECT SUNCATCHER

Context: Recently, Google announced a new research initiative called Project Suncatcher

What is Project Suncatcher?

- It is Google's "moonshot" initiative **to develop AI data centres in space, powered by solar-energy satellites equipped with Tensor Processing Units (TPUs).**
- **Objective:** To address the high energy consumption and water usage associated with Earth-based data centres.

Key Features

- Use of space-based solar panels capable of generating up to eight times more power, supported by near-continuous exposure to sunlight.
- Deployment of clusters of satellites in Low Earth Orbit (LEO), interconnected through ultra-high-speed optical links, tested at speeds of up to 1.6 terabits per second (Tbps).
- TPUs have been tested to withstand radiation exposure equivalent to five years in space.
- Plans to launch two prototype satellites in partnership with Planet Labs by early 2027 to evaluate hardware durability and performance in space conditions.

Key Challenges

- Managing thermal control in space, ensuring radiation reliability, maintaining terabit-scale communications, achieving precise station-keeping, and reducing launch costs.

About Tensor Processing Unit (TPU)

- A TPU is a **specialized application-specific integrated circuit (ASIC)** developed by **Google** specifically **to accelerate machine learning (ML) workloads**.
- Unlike general-purpose CPUs or versatile GPUs, **TPUs are engineered from the ground up for** the heavy matrix multiplication and convolution operations **used in neural networks.**

DRISHTI SYSTEM

Context: Indian Railways is planning to install a new AI-based Locking Monitoring System called DRISHTI.

What is DRISHTI?

- The DRISHTI System is an **AI-based freight wagon locking monitoring system** developed by the Northeast Frontier Railway (**NFR**) in collaboration with the Indian Institute of Technology Guwahati Technology Innovation and Development Foundation (**IITG TIDF**).

- It is designed to detect unlocked, tampered, or faulty doors on freight wagons in real time during transit, thereby enhancing the safety, security, and efficiency of rail freight operations.
- **Objective**
  - To enhance safety and security of freight movement.
  - To automatically detect unlocked or tampered wagon doors.
  - To reduce dependence on manual inspections, which are time-consuming and impractical for long freight rakes.
- **Working:** The system uses AI-enabled cameras and sensors to continuously monitor wagon doors, detecting door position changes and signs of tampering in real time while the train is in motion.

CYBER SECURITY INNOVATION CHALLENGE (CSIC) 1.0

Context: The Ministry of Electronics and Information Technology (MeitY) launched the Cyber Security Innovation Challenge (CSIC) 1.0 under its Information Security Education and Awareness (ISEA) Project.

About Cyber Security Innovation Challenge (CSIC) 1.0

- The Cyber Security Innovation Challenge (CSIC) 1.0 is designed **to accelerate indigenous, research-driven cybersecurity solutions from India's academic ecosystem** by engaging students and researchers in real-world problem solving.
- **Objective:** To develop skilled students and professionals, promote indigenous solutions, and support self-reliant cybersecurity technologies.
- **Collaboration:** A joint initiative of MeitY, CERT-In, NSCS, C-DAC, DSCI, and IITs/NITs, aimed at shifting India's cyber defence approach from reactive to proactive.
- **Structure:**
  - A five-stage challenge that takes ideas to a Minimum Viable Product (MVP), supported by industry and expert mentorship.
  - Covers ten key domains, including network security, mobile security, hardware and software security, cryptography, fintech security, and cyber forensics.

About Information Security Education and Awareness (ISEA) Project

- ISEA is a MeitY initiative **to build skilled manpower in information security and promote cyber hygiene awareness.** It seeks to create a safe, trusted, and secure cyberspace.
- It is implemented through 50 premier institutions, including IITs, NITs, IIITs, and C-DAC, with C-DAC Hyderabad and DSCI as nodal agencies.
- Recently approved ISEA Phase-III (October 2023) seeks to develop 2.25 lakh trained individuals in cybersecurity over five years.

About Data Security Council of India (DSCI)

- DSCI is a **not-for-profit body set up by NASSCOM to promote data protection and cybersecurity best practices in India.**
- It works with government, law enforcement, industry, and regulators on standards, policy advocacy, capacity building, and awareness in cybersecurity and privacy.

SANCHAR SATHI APP

Context: The Department of Telecommunications (DoT) reversed the mandatory pre-installation directive of Sanchar Sathi App amid privacy concerns and rising voluntary adoption.

About Sanchar Sathi App

- Sanchar Sathi App is a citizen-centric mobile app and web portal launched by India's DoT **to enhance telecom security and protect users from fraud.** It **empowers subscribers to manage connections, report scams,** and secure devices through simple features.
- Available on Android and iOS, it is available in Hindi and 21 other regional languages and has seen over 1.4 crore downloads.
- Users can report suspected fraud calls, SMS, or WhatsApp messages via the **Chakshu tool,** pulling directly from phone logs for easy submission.
- The app allows blocking lost or stolen phones using IMEI to prevent misuse across networks, checking active connections linked to one's name, and verifying device genuineness.

DHRUV64

Context: Recently, India unveiled DHRUV64, its first fully indigenously developed 1.0 GHz, 64-bit dual-core microprocessor.

About DHRUV64

- DHRUV64 is a **dual-core, 64-bit microprocessor developed by the Centre for Development of Advanced Computing (C-DAC)** under the **Microprocessor Development Programme (MDP)** of the Ministry of Electronics and Information Technology.
  - A microprocessor is the "brain" of an electronic device. It is a small chip that takes instructions, processes information, and controls what the device should do next.
- It operates at around **1.0 GHz** and is **designed to support efficient multitasking**. This development is significant as it strengthens India's self-reliance in semiconductors and reduces dependence on imported chips.
- DHRUV64 can be used in areas such as 5G, automotive systems, industrial automation, consumer electronics, and the Internet of Things (IoT).
- Before **DHRUV64**, India had already developed indigenous microprocessors such as
  - **SHAKTI** (2018, IIT Madras) for strategic, space, and defence use
  - **AJIT** (2018, IIT Bombay) for industry and robotics
  - **VIKRAM** (2025, ISRO–SCL) for space missions
  - **THEJAS64** (2025, C-DAC) for industrial automation.

EKAM AI AND SAMBHAV

Context: Recently, the Indian Army showcased homegrown technologies Ekam AI and the SAMBHAV project during the Vijay Diwas celebrations.

About Ekam AI	About SAMBHAV
• Ekam AI is a fully indigenous and secure artificial intelligence platform designed for use in sensitive environments. • It supports AI-based data analysis, document management, and decision-making assistance. • Ekam AI works without foreign software or dependence on external cloud services, and it can be used by personnel across ranks without requiring specialised technical skills.	• SAMBHAV is a portable, satellite-enabled communication system that can be deployed quickly to provide mobile connectivity in remote areas or during disasters. • It is significant for improving secure communication, protecting data, and supporting digital sovereignty.

AGENTIC AI

Context: Satya Nadella, CEO of Microsoft, recently observed that India is witnessing strong momentum in the deployment of AI and agentic AI applications.

What is Agentic AI?

- It refers to AI systems with agency—the ability to autonomously set goals, plan, decide, and act with minimal human intervention.

Key Components	Generative AI vs Agentic AI
• **Perception:** Collects data from the environment/systems. • **Reasoning:** Interprets context using LLMs. • **Planning:** Sets goals and decomposes tasks. • **Action:** Executes tasks and calls tools/APIs. • **Reflection:** Learns from outcomes and adapts.	• **Generative AI:** Creates content (text, code, images). • **Agentic AI:** Uses such outputs for goal-oriented action by planning, invoking tools, and executing tasks.

GHOST PAIRING

Context: Recently, Indian Computer Emergency Response Team (CERT-In) issued an advisory about an active threat campaign targeting WhatsApp users through a new technique- Ghost Pairing.

What is Ghost Pairing?

- It is a **WhatsApp account takeover technique** that **abuses the device-linking (pairing) feature**, allowing attackers to link their own device to a victim's account without requiring a password or SIM swap.

- The attack typically begins with a **phishing message** such as "check this photo," which redirects the victim to a **fake webpage.** When the victim enters their phone number and WhatsApp pairing code, the attacker completes the device-linking process and gains silent, unauthorised access to the account.
- It can give attackers **full access to chats and media, enabling impersonation,** while the victim may remain unaware.

AILA (ARTIFICIALLY INTELLIGENT LAB ASSISTANT)

Context: IIT Delhi researchers, with European collaborators, recently developed an AI agent AILA.

What is an Artificially Intelligent Lab Assistant (AILA)?

- It is an **autonomous AI agent** that can **perform real laboratory experiments end-to-end.**
- **Key feature:** It can directly operate instruments such as the **Atomic Force Microscope (AFM)**, one of the most delicate and complex tools used to study materials at the nanoscale.
- **Impact:** It reduces AFM optimisation time from about ~24 hours to nearly 7–10 minutes.
- **Significance**: It enables fully automated experimentation, including coding, data collection, analysis, and decision-making.

QUANTUM ECHOES

Context: Google has achieved a breakthrough with Quantum Echoes experiment on its 65-qubit Willow processor.

What is meant by Quantum Echoes?

- It is an experiment that **tracks how quantum information spreads (scrambles)** and then partly refocuses within an entangled network of qubits.
- It signals a shift from only pursuing quantum speed (like the 2019 Sycamore experiment) to studying how information evolves inside entangled quantum systems.
- **How was it done?:** It measured **out-of-time-order correlators (OTOC)**, which are small "echo-like" signals that show how a small disturbance moves through connected qubits.
- **Significance:**
  - Helps reveal quantum chaos and how information flows in quantum systems.
  - Useful for advancing research in fundamental physics and materials science.

What is Q-day?

- Q-day means the day a **cryptographically relevant quantum computer becomes powerful enough to break widely used public-key encryption.**
- It would not instantly expose everything, but it creates a serious risk called "harvest now, decrypt later". Attackers can collect encrypted data today, and decrypt it in future once strong quantum machines exist.

MISCELLANEOUS

LIQUID CARBON

Context: For the first time, scientists have successfully studied the structure of liquid carbon using in situ X-ray diffraction, offering new insights into this elusive state of matter.

About Liquid Carbon:

- Liquid carbon is carbon in a liquid state, which is not naturally stable under normal atmospheric temperature and pressure, requiring extreme conditions to exist even briefly.
- Until now, very little was understood about carbon in its liquid form, as it is extremely difficult to recreate and study in laboratory conditions.
- At normal atmospheric pressure, carbon does not melt—it sublimates directly into gas.
- Liquid carbon only forms at extreme conditions, around 4500°C (over 4000 K) and extremely high pressures (approximately 1 million atmospheres or about 100 GPa).
- Liquid carbon **likely exists in the interior of planets**, within planetary cores and ice giants like Uranus and Neptune, where such high pressure and temperature prevail.
- Understanding liquid carbon can contribute to advancements in high-energy technologies, including nuclear fusion research and planetary science.

METRE CONVENTION

Context: The Department of Consumer Affairs celebrated World Metrology Day 2025, marking 150 years of the Metre Convention.

The Metre Convention (1875)

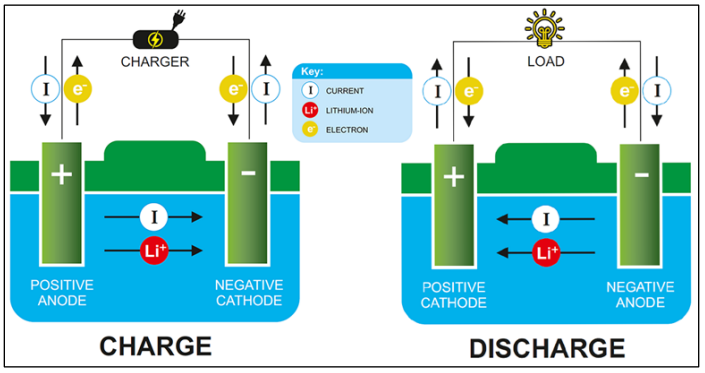
- It is an **international treaty** signed on May 20, 1875, in Paris by representatives of 17 nations. It established a permanent **framework for international cooperation in the field of measurement,** leading to the creation of the **International Bureau of Weights and Measures (BIPM)**.
- The Convention **aims to unify and improve the metric system**, which includes defining and standardizing units of measurement globally.
- It also created governing bodies: the General Conference on Weights and Measures (**CGPM**) and the International Committee for Weights and Measures (**CIPM**), which oversee and coordinate metrology internationally.
- The Convention initially focused on length and mass but was extended in 1921 to cover all physical measurements, leading to the establishment of the **International System of Units (SI)** in 1960.
- **The BIPM headquarters is in Sèvres, France**, and it holds the international prototypes for measurement standards.
- As of 16 October 2024, the CGPM had 64 members (India is a member) and 37 associates.

SODIUM ION BATTERIES

Context: A research team at the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) has developed a super-fast charging **sodium-ion battery (SIB)**, that can **charge up to 80% in just six minutes and last over 3000 charge cycles.**

Working Principle of a Battery

- Rechargeable batteries operate through **reversible chemical reactions**, splitting electrons and ions at the anode and recombining them at the cathode.
- **Discharge cycle:** Electrons move from anode to cathode via an external circuit, powering devices.
- **Charge cycle:** External energy pushes electrons from cathode to anode.



Key Components for Electron and Ion Movement:

- **Anode and charge carrier:** An electrode with lower electrochemical potential that releases electrons to the external circuit and ions (such as lithium or sodium ions) into the electrolyte during discharge.
- **Electrolyte**: Medium that allows ions to move between electrodes while forcing electrons through the external circuit.
- **Cathode**: Material that stabilizes upon gaining electrons (e.g., metal oxides of iron, manganese, cobalt, nickel), enabling recombination. The stability of cathode determines the battery's cycle life.

Parameter	Lithium-Ion Batteries	Sodium-Ion Batteries
Charge Carriers	Lithium ions (Li^+) (small, light)	Sodium ions (Na^+) (larger, heavier)
Anode	Graphite – stable and chemically compatible with Li	Hard carbon – accommodates larger Na^+ ions
Cathode	Lithium metal oxides (e.g., $LiCoO_2$, NMC) Uses cobalt and nickel	Sodium-metal oxides (e.g., sodium-manganese oxides) Cobalt/nickel-free
Electrolyte	Liquid electrolytes with lithium salts	Liquid electrolytes with sodium salts
Energy Density	High (~150–250 Wh/kg)	Moderate (~100–160 Wh/kg)

Cost	High (due to lithium, cobalt, and refining costs)	Low (sodium is abundant; cathode avoids Co/Ni)
Longevity	Up to 2000–3000 cycles	Over 3000 cycles in recent designs
Charge Time	Can charge relatively fast.	Generally charge and discharge more slowly than lithium-ion batteries, but recent advances charge faster
Raw Materials	Lithium, cobalt, nickel, graphite (mostly imported)	Sodium, iron, manganese, hard carbon (mostly domestic)

NEW SOLAR CELL TECHNOLOGY

Context: The Maharashtra government and ART-PV India Pvt Ltd, a start-up from IIT Bombay's SINE, are developing a new solar cell technology expected to boost efficiency by 25–30% and reduce solar power costs to around ₹1 per kWh, compared with ₹2.5-4 per kWh now.

- They have engineered a **semi-transparent perovskite solar cell (PSC) layered over a silicon-based solar cel**l, forming a 4-terminal (4T) tandem structure.
  - Perovskites are metal-halide compounds used as the active layer in solar cells. The general chemical formula of a perovskite compound is ABX_3, where 'A' and 'B' are cations, and 'X' is anion.
  - A thin perovskite layer absorbs light, excites electrons, and generates electric power.
- The bottom cell uses silicon, while the top cell features a locally developed halide perovskite, allowing high light absorption and efficient energy conversion.
- To overcome stability issues (heat, light, electrical stress), the 4T design lets both layers operate independently under varying conditions.

INDIGENOUS POLAR RESEARCH VESSEL (PRV)

Context: India's Garden Reach Shipbuilders and Engineers Limited (GRSE) and Norway's Kongsberg Oslo signed an MoU for India to build its first Polar Research Vessel (PRV) indigenously.

About Polar Research Vehicle (PRV):

- It is a **specialized vessel designed for research in the polar regions**, both Arctic and Antarctic. It is equipped with advanced scientific instruments for ocean exploration and marine ecosystem studies.

Significance for India:

- **Indigenous Scientific Capability:** Will support the National Centre for Polar and Ocean Research (NCPOR), Goa, for polar research activities.
- **Support Existing Missions:** Enhances India's operations in Antarctica (Maitri [1989], Bharati [2011]) and the Arctic (Himadri [2008]).
- **Alignment with Maritime Vision:** Complements initiatives such as:
  - **SAGAR (Security and Growth for All in the Region):** Leverages India's coastline, location, and maritime heritage.
  - **MAHASAGAR (Mutual and Holistic Advancement for Security Across the Regions):** Promotes holistic maritime engagement.
  - **Sagarmala 2.0:** Under the Ministry of Ports, Shipping, and Waterways; key pillar of **Maritime Amrit Kaal Vision 2047 (MAKV),** aiming to place India among the top five shipbuilding nations by 2047.

NATURAL HYDROGEN: WHITE HYDROGEN

Context: Researchers in many parts of the world are probing the feasibility of exploring natural hydrogen sources in the subsurface of earth's crust.

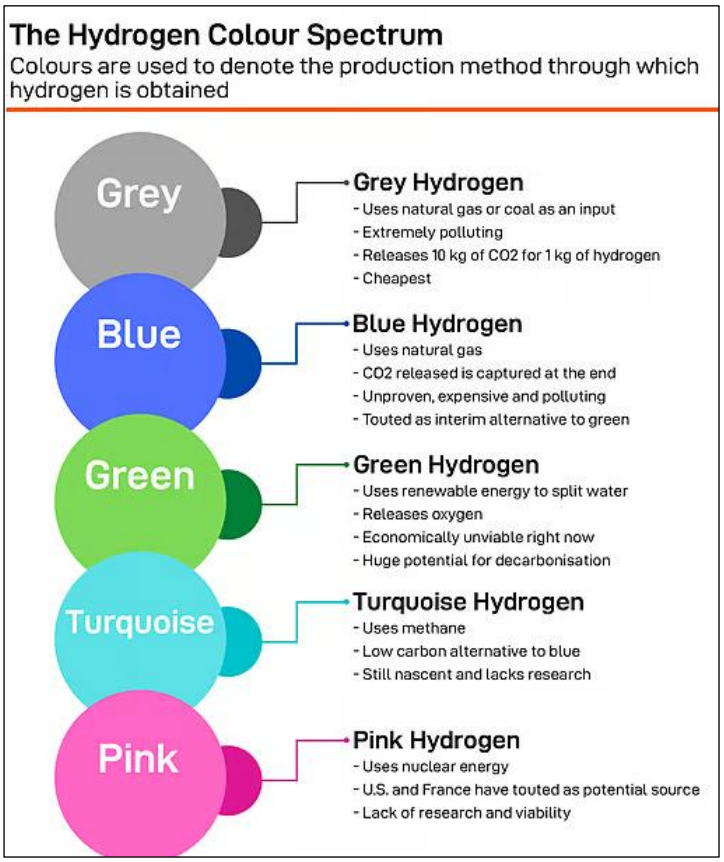
What is Natural Hydrogen (White Hydrogen, H_2)?

- White hydrogen, also called natural hydrogen or golden or geological hydrogen, is **molecular hydrogen (H_2) formed naturally in the Earth's subsurface** through **geological and biological processes.**
- Unlike green hydrogen (from renewable energy), grey hydrogen (from fossil fuels), or blue hydrogen (from fossil fuels with carbon capture); **white hydrogen is extracted directly from underground reservoirs and emits no CO_2 when used.**
- It requires **minimal processing**, making it a promising alternative for sustainable energy.

How is White Hydrogen Formed?

White hydrogen is produced by abiotic (non-living) and biotic (microbial) processes deep in the Earth's crust:

- **Serpentinization:** A chemical reaction between water and iron-rich rocks (ultramafic rocks like olivine) produces hydrogen and magnetite. Common in tectonically active areas, such as mid-ocean ridges.
- **Radiolysis of Water:** Natural radioactivity underground splits water molecules into hydrogen and oxygen.
- **Fermentation:** Certain microorganisms break down organic matter without oxygen (anaerobic process), releasing hydrogen.
- **Mantle Degassing:** Hydrogen escapes from the Earth's mantle in tectonically active regions, contributing to near-surface hydrogen deposits. Hydrogen trapped underground before reaching the atmosphere is called white hydrogen.



Global Discoveries

- Around 2020, natural hydrogen began to receive serious scientific attention worldwide. Before this period, most observations were scattered and not studied in a systematic manner.
- A key role was played by **Viacheslav Zgonnik,** who brought earlier Russian scientific studies to global attention through translations. More importantly, his own research showed that hydrogen can be naturally produced and continuously replenished inside the Earth, increasing its value as a long-term energy source.
- Significant reservoirs have been found in France (Lorraine Basin), Mali, Australia, the USA, Russia, and Colombia.
- Estimates suggest tens of billions of tons exist globally.
- A 2023 discovery in France revealed one of the largest known reservoirs, potentially worth $92 billion.

SCIENCE AND TECHNOLOGY (S&T) CLUSTERS INITIATIVES

Context: S&T Clusters Annual Report 2024–2025 highlighted various initiatives launched under the programme, including Kalaanubhav.in, an AR/VR-enabled artisan marketplace.

About the S&T Clusters Initiative

- Launched in 2020 based on the recommendations of the Prime Minister's Science, Technology, and Innovation Advisory Council (PM-STIAC).
- **Objective:** To bring together stakeholders, like academic institutions, R&D organisations, industry, local governments, to deliver demand-driven solutions through innovative ideas.
- **Approach:** Operates through a consortium-based approach. Focuses on science- and technology-based regional problem-solving.
- **Implementing Authority:** Office of the Principal Scientific Adviser (PSA functions under the Cabinet Secretary.)

ALTERMAGNETS

Context: Scientists have identified a new electrical and thermal transport phenomenon in a high-quality, single-crystalline sample of the altermagnet chromium antimonide (CrSb).

What are Altermagnets?

- Altermagnets are a recently discovered class of magnetic materials that combine the best features of both ferromagnets and antiferromagnets.

- **Ferromagnets (e.g., fridge magnets):** All atomic spins align in the same direction, producing a net magnetization.
- **Antiferromagnets:** Atomic spins align in opposite directions, canceling each other and leading to no net magnetization.

- In altermagnets, spins also alternate as in antiferromagnets, resulting in **zero overall magnetization.**
- However, due to their unique crystal symmetry, their electronic band structure shows spin splitting (a property typical of ferromagnets).
- This gives rise to **spin-dependent electronic behavior** (electrons behave differently depending on their spin) **even without external magnetism.**
- Such dual properties make altermagnets highly promising for **spintronics, an advanced technology that uses electron spin,** in addition to charge, to store and process information.

Scientific Background

- Between 2019–2022, theoretical studies predicted over 200 potential altermagnetic materials.
- The first experimental evidence came in 2023, when scientists confirmed altermagnetism in **manganese telluride (MnTe)** using X-ray photoemission spectroscopy.
- **Chromium antimonide (CrSb)** is now considered a standout altermagnet

Spin polarization refers to the tendency of electrons to align their spins in a specific direction. In altermagnets, this occurs in both real space (atomic structure) and momentum space (motion and energy of electrons).

Key Characteristics of Altermagnets

- **No stray magnetic fields:** Allows dense packing in memory devices.
- **Strong spin polarization:** Despite zero macroscopic magnetism, electrons exhibit a distinct alignment of spins.

Future Applications

- **Spintronics:** Development of high-density memory and logic devices.
- **Ultrafast photonics:** Use in terahertz (THz) oscillators for next-generation communication systems.
- **Quantum computing:** Potential for stable and fast quantum information processing.
- **Multiferroics and superconductivity:** Could enable unconventional electronic pairings and novel material properties.

ANTIMATTER

Context: Recently, an international team of scientists reported, for the first time, that matter and antimatter versions of baryons decay at different rates.

What is Antimatter?

- Antimatter is the mirror counterpart of ordinary matter, with the same mass but opposite electric charge.
- These opposite forms are collectively known as antiparticles.
- When combined, antiparticles can form anti-atoms, and in theory, even antimatter galaxies.

Formation and Structure of Antimatter

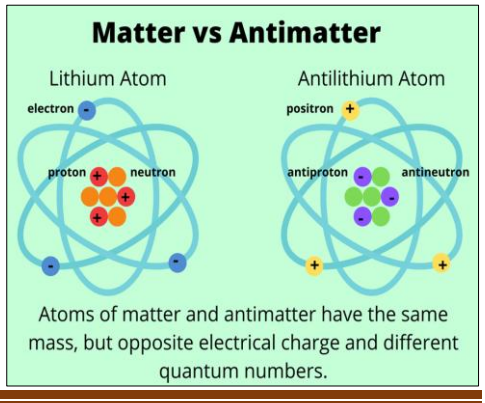
- Every known particle in the Standard Model has a corresponding antiparticle.
- For example, baryons (like protons and neutrons) are made of quarks, while antiprotons and antineutrons are made of antiquarks.
- When antiparticles come together, they can form anti-atoms, just as normal atoms are formed by particles of matter.

Where is Antimatter Found?

- **Naturally:** In cosmic ray collisions and certain types of radioactive decay (such as emission of positrons).
- **Artificially:** In particle accelerators (e.g., CERN's Large Hadron Collider). In laboratory experiments, where scientists have even created anti-helium nuclei.

Annihilation: Why is Antimatter Rare?

- When matter and antimatter meet, they annihilate each other—disappearing in a burst of energy (usually gamma rays).



- According to the Big Bang theory, both should have been produced in equal amounts. However, for reasons still not fully understood, there was a tiny excess of matter (about one extra particle per billion matter–antimatter pairs).
- That small imbalance is why our universe exists today. Understanding why this happened remains one of the biggest mysteries in modern physics.

BLACK HOLE MERGER

Context: An international network of gravitational wave observatories has detected the merger of two exceptionally massive black holes, the largest ever recorded.

- Two black holes, one 140 times and the other 100 times the mass of the Sun, merged to form a new black hole around 225 solar masses.
- The event, named GW231123, occurred billions of years ago but was recently detected through gravitational waves.
- The discovery was made by the **LVK network**, comprising: **L**IGO (United States), **V**irgo (Italy), **K**AGRA (Japan).

About Black Hole

- A black hole is a **cosmic object with an extremely strong gravitational pull from which nothing, not even light, can escape.**
- Black holes usually form when a massive star collapses after a supernova explosion. Smaller stars may form neutron stars, while larger ones collapse into black holes.
- This **event horizon** marks the point beyond which the escape velocity exceeds the speed of light, making it impossible for any matter or radiation to escape. They are invisible but can be detected by observing the motion of nearby stars and gas.
- **Types of Black Holes:**
  - **Stellar Black Holes:** formed by collapsing massive stars.
  - **Intermediate Black Holes:** formed by mergers of smaller black holes.
  - **Supermassive Black Holes:** found at the centers of galaxies.
  - **Primordial Black Holes (PBH):** hypothetical, formed soon after the Big Bang. *No confirmed detection of PBHs yet.*

What is Black hole Merger?

- A black hole merger occurs **when two black holes orbit each other and gradually spiral inward due to the emission of gravitational waves** i.e. the ripples in the fabric of space-time produced by their intense acceleration. Eventually, these black holes collide and **merge into a single, larger black hole.**
- This merger **increases both the mass and the event horizon size (diameter) of the resulting black hole**, although some mass is radiated away as energy in the form of gravitational waves during the process.

Gravitational Wave Detection Observatories around the world		
LIGO	United States	Has two 4 km long arms; among the world's most sensitive gravitational wave detectors.
Virgo	Italy, near Pisa	Operates with 3 km long arms; part of an international collaboration involving multiple European countries.
GEO600	Germany, near Hanover	Features 600 m long arms; jointly operated by German and UK research institutions.
KAGRA	Japan, Kamioka mine	Built underground with 3 km arms; uses cryogenic mirrors to minimize noise and improve sensitivity.
LIGO-India (IndIGO)	India, Hingoli Maharashtra (planned)	Expected to become operational in the 2020s–2030s; will expand the global network for better triangulation of gravitational wave signals.

1ST PRIVATE TEST FACILITY FOR HEAVY WATER UPGRADE

Context: India has, for the first time, partnered with private industry to handle a critical process i.e. testing and upgradation of "depleted heavy water", that was earlier managed solely by government.

About the Initiative:

- TEMA India, a Mumbai-based engineering firm, has been authorised to test equipment used for the upgrading of depleted heavy water, a key component in India's Pressurised Heavy Water Reactors (PHWRs).
- The task was previously carried out exclusively by the Bhabha Atomic Research Centre (BARC).
- A new test facility has been inaugurated at Achchad in Palghar district (Maharashtra), where TEMA India will manufacture, assemble, and test equipment such as distillation columns before they are deployed at nuclear reactor sites.

About Heavy Water (D_2O):

- Heavy water is a form of regular water (H_2O) in which hydrogen atoms are replaced by deuterium, a heavier isotope of hydrogen.
- It serves as both a **coolant and a neutron moderator,** helping slow down fast neutrons to sustain the nuclear fission chain reaction.
- For reactors to function efficiently, heavy water must be 99.9% pure. Over time, it becomes mixed with light water, requiring upgradation through distillation to restore its purity.

IONIC LIQUIDS

Context: Scientists have found that life can exist on rocky super-Earths with volcanic activity and minimal water, thanks to the presence of ionic liquids.

What are Ionic Liquids (ILs)?

- Ionic liquids are **salts that remain in liquid form below 100°C,** often even at room temperature. Unlike ordinary liquids made of neutral molecules, ILs are composed entirely of charged particles- cations and anions.
- **Examples**: Choline acetate, Tetrabutylammonium nitrite.
- **Properties of Ionic Liquids:**Non-volatile, Non-flammable, Stable at high temperatures; Tunable (can be hydrophilic or hydrophobic), Good electrical conductors (electrolytes)
- **Advantages of Ionic Liquids:** Environment-friendly ("green"), Recyclable, Safer than many organic solvents, Can dissolve a wide range of compounds
- **Uses of Ionic Liquids:** Green chemistry, Catalysis, Electrochemistry, Extraction processes, Biotechnology, Materials science

SAKURA SCIENCE PROGRAMME

Context: A group of thirty-four students from government schools in India are set to visit Japan under the Sakura Science Programme 2025.

About Sakura Science Programme (SSP)

- SSP is a prestigious Japan-Asia Youth Exchange Program in Science launched globally in 2014 and implemented by the Japan Science and Technology Agency (JST).
- India has been a participant since 2016.
- **Opportunities**: Short-term visits to Japan; Exposure to cutting-edge science & technology;
- For the upcoming Sakura Programme 2025, JST has invited participants from six other countries Egypt, Ghana, Kenya, Nigeria, South Africa and Zambia.

ISOBUTANOL

Context: The Automotive Research Association of India (ARAI) is exploring the feasibility of blending **10% isobutanol with diesel** to support cleaner and more efficient fuel options.

About Isobutanol (Isobutyl Alcohol $C_4H_{10}O$)

- Isobutanol is **one of the four isomers of butanol.** It is a **clear, colorless liquid** that is moderately soluble in water. It is **highly flammable**, with a flash point near room temperature, and its vapours are heavier than air.
- It can cause skin irritation, severe eye damage, and respiratory problems if inhaled. It is also toxic when ingested.
- **Industrial and Commercial Applications**
    - **Solvent:** It is widely used in paints, coatings, inks, pharmaceuticals, pesticides, and in the preparation of flavours and fragrances.
    - **Food Additive:** It occurs naturally in certain foods and alcoholic beverages.

Biofuel Potential of Isobutanol

- **Bio-isobutanol, produced from biomass through fermentation**, is considered a promising advanced biofuel.
- It has a **higher energy density than ethanol,** causes **less corrosion**, and is more **compatible** with existing fuel transport and storage systems.
- It also offers **a high octane rating**, making it suitable for cleaner combustion.

INTERNATIONAL EARTH SCIENCES OLYMPIAD

Context: The student winners representing India at the 18th International Earth Science Olympiad (IESO-2025) held in Jining, China, were felicitated by the Government.

About International Earth Science Olympiad (IESO)

- An **annual global competition** for secondary school students (Class IX–XII).
- **Aim:** To promote interest in Earth system sciences through teamwork and problem-solving on climate change, natural disasters, and environmental issues.
- India has participated in the Olympiad since 2007 and hosted the 10th edition in Mysore in 2013.
- Students are selected through the **Indian National Earth Science Olympiad (INESO)**, which is organised by the Geological Society of India with support from the Ministry of Earth Sciences (MoES).
- The competition covers key subjects such as geology, meteorology, oceanography, and environmental sciences.
- The MoES supports INESO under the **REACHOUT scheme**, now integrated into the **PRITHVI programme**, to strengthen Earth science education, build scientific temper, and prepare young students to address environmental and climate-related challenges.

PRITHvi VIgyan (PRITHVI) Scheme

- The PRITHvi VIgyan (PRITHVI) Scheme is an overarching program launched by the **Ministry of Earth Sciences (MoES)** for the period 2021–2026.
- It integrates five major sub-schemes to address all aspects of Earth System Sciences, including atmosphere, hydrosphere, geosphere, cryosphere, and biosphere.

Key Components

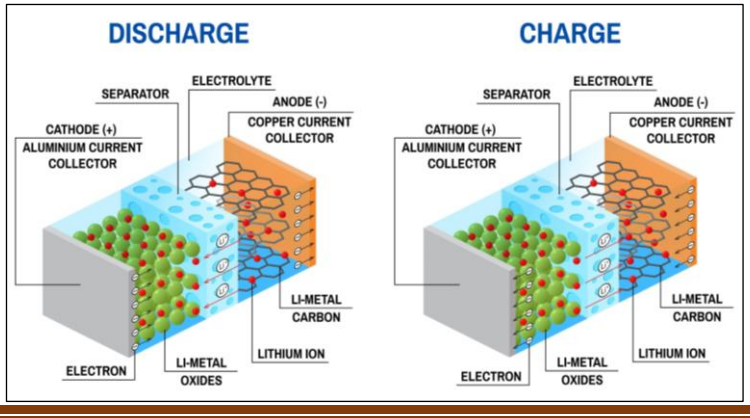
- **ACROSS:** Atmosphere and Climate Research-Modelling Observing Systems & Services
- **O-SMART:** Ocean Services, Modelling Application, Resources and Technology
- **PACER:** Polar Science and Cryosphere Research
- **SAGE:** Seismology and Geosciences
- **REACHOUT:** Earth System Science Outreach

LITHIUM-ION (LI-ION) BATTERY

Context: India has inaugurated its largest Li-ion battery manufacturing plant in Haryana.

About Lithium-ion Batteries

- A lithium-ion battery is a rechargeable energy storage device in which lithium ions move between the **negative electrode (graphite)** and the **positive electrode (lithium transition metal oxides)** through a non-aqueous electrolyte during charging and discharging.
- Lithium-ion batteries operate by moving lithium ions between the anode and cathode through an electrolyte during charging and discharging. When charging, lithium ions move from the cathode to the anode; during discharge, the process reverses, generating electrical energy.
- **Key Components**
  - **Anode**: Typically made of graphite.
  - **Cathode:** Made from lithium metal oxides (e.g., lithium cobalt oxide, lithium iron phosphate).
  - **Electrolyte:** A lithium salt in an organic solvent.



- **Separator:** Prevents short circuits by keeping the anode and cathode apart.

Benefits of Lithium-ion Batteries	Disadvantages
• High energy density, storing 75–200 Wh/kg for compact and long-lasting use. • Lightweight with relatively lower toxicity due to lithium and carbon electrodes. • Strong performance with good cycle stability, high efficiency, low self-discharge, and no major memory effect.	• Sensitive to overcharging and deep discharging, which can cause safety hazards like fires. • Degradation over time, especially at high temperatures or with frequent deep cycles. • Relatively high cost compared to some alternatives.
Applications: Consumer electronics (smartphones, laptops, tablets); Electric vehicles (EVs).; Renewable energy storage (solar, wind).	

WORLD'S LARGEST NEUTRINO DETECTOR ACTIVATED

Context: The Jiangmen Underground Neutrino Observatory (JUNO) in China has become the world's largest operational neutrino detector.

About Jiangmen Underground Neutrino Observatory (JUNO)

- **Built 700 meters underground** to shield it from interfering particles such as muons.
- JUNO **aims to answer two fundamental questions in neutrino science**:
  - **determining the mass hierarchy among the three neutrino types** - electron, muon, and tau—
  - **precisely measuring their oscillation frequency,** or how often they shift from one type to another.

About Neutrinos

- Neutrinos are **subatomic particles** that are **electrically neutral**, have **very little mass,** and **interact extremely weakly with matter**, making them difficult to detect.
- They are often referred to as "**ghost particles**" because they can pass through normal matter without any noticeable effect.
- Neutrinos are elementary particles and belong to the **lepton** family, meaning they do not participate in the strong interaction. They **interact only through the weak force and gravity.**
- Neutrinos have half-integer spin (½), classifying them as **fermions.** There are three known types or "flavors" of neutrinos: **electron neutrino, muon neutrino,** and **tau neutrino.**
- They are the most abundant particles with mass in the universe, second only to photons in overall abundance.
- They are **not affected by magnetic fields.** They travel in straight paths from their source and move at nearly the speed of light.

Other Neutrino Observatories

- **IceCube Neutrino Observatory (Antarctica):** Located at the Amundsen–Scott South Pole Station, it is a cubic-kilometer neutrino telescope that detects high-energy neutrinos.
- **Super-Kamiokande (Super-K), Japan:** Located 1,000m underground, it uses 50,000 tons of ultra-pure water to study neutrinos from cosmic, atmospheric, and solar sources.
- **Sudbury Neutrino Observatory, Canada:** Situated over 2 km underground, it made landmark contributions to understanding solar neutrinos and neutrino oscillations.
- **Daya Bay Reactor Neutrino Experiment, China:** A reactor-based experiment that measures neutrinos emitted from nuclear power plants.
- **Laboratori Nazionali del Gran Sasso, Italy:** One of the world's largest underground labs, hosting multiple neutrino experiments shielded from cosmic radiation.
- **MINOS Experiment, USA:** Based in the Soudan Underground Mine in Minnesota, MINOS investigates long-baseline neutrino oscillations.

SJ-100

Context: Hindustan Aeronautics Limited (HAL) and Russia's United Aircraft Corporation (UAC) have signed a Memorandum of Understanding to collaborate on the production of the SJ-100 civil commuter aircraft.

About the SJ-100 (Sukhoi Superjet 100)

- The SJ-100 is a Russian regional jet developed by Sukhoi Civil Aircraft, now part of the United Aircraft Corporation (UAC) and rebranded as Yakovlev SJ-100 in 2023.

- It is a **twin-engine**, **narrow-body aircraft** designed for **short-haul passenger transport.**
- **Capacity & Range**: Seats up to 103 passengers with a range of about 3,530 km.
- **Key Features:**
  - Designed for lower operating costs and offers a customisable cabin layout suited to regional airline needs.
  - It has a fly-by-wire system, autoland capability (CAT IIIA), and advanced navigation features.

INDIGENOUS PRODUCTION OF HIGH-RRR NIOBIUM

Context: India has recently achieved a breakthrough in the indigenous production of high-RRR (Residual Resistivity Ratio) niobium.

- The Nuclear Fuel Complex (NFC) in Hyderabad has developed the technology to produce high-RRR niobium ingots and sheets.

About High-RRR (Residual Resistivity Ratio) Niobium

- High-RRR niobium is an **extremely pure form of the metal niobium,** specially made for use in superconducting technologies.
- It is characterized by an RRR value typically greater than 300. (Higher RRR = fewer impurities)
- **At very low temperatures, pure niobium becomes a superconductor,** allowing electricity to flow with zero resistance. Impurities disturb electron flow and reduce superconducting performance.
- High-RRR niobium carries very high currents, produces strong and stable magnetic fields, and minimizes energy loss and heat generation
- **Applications**
  - Superconducting radio-frequency (SRF) cavities in particle accelerators
  - Nuclear research reactors and accelerator-driven systems
  - Advanced scientific facilities (synchrotrons, neutron sources)

RESEARCH DEVELOPMENT AND INNOVATION SCHEME

Context: The Executive Council of the Anusandhan National Research Foundation (ANRF) has approved the creation of a Special Purpose Fund (SPF) under the Research, Development and Innovation (RDI) Scheme.

About the Research, Development and Innovation (RDI) Scheme

- The RDI Scheme is a new ₹1 lakh crore Government of India initiative to catalyse private-sector investment in high-impact R&D and deep-tech, implemented through long-term, low or zero-interest finance.
- The **Department of Science and Technology (DST) is the nodal ministry** for the scheme, while the **Anusandhan National Research Foundation (ANRF), chaired by the Prime Minister, acts as the main implementing/fund-holding body.**
- **Key Objectives**
  - Provide low- or zero-interest financing to encourage private-sector R&D in sunrise and strategic sectors.
  - Support projects with high Technology Readiness Levels (TRLs).
  - Facilitate the acquisition of critical technologies.
  - Establish a Deep-Tech Fund of Funds to strengthen India's innovation financing ecosystem.
- **Funding Structure:** The **Special Purpose Fund (SPF) will serve as the custodian of the overall corpus.** It will channel capital to **second-level fund managers**, including:Alternative Investment Funds (AIFs), Development Finance Institutions (DFIs), NBFCs. These entities will provide concessional loans or equity support to eligible projects and startups.

PLUTONIUM

Context: Russia moved to withdraw from plutonium agreement with the United States.

About Plutonium Management and Disposition Agreement (PMDA)

- The PMDA, signed in 2000, committed both the United States and Russia to dispose of at least 34 tonnes of weapons-grade plutonium each, which would have been enough for as many as 17,000 nuclear warheads. It came into force in 2011.

About Plutonium

- Plutonium is a radioactive chemical element with the symbol Pu and atomic number 94. It is a silvery-gray actinide metal that tarnishes in air and is primarily known for its use in nuclear reactors and nuclear weapons.

- **Formation**: Produced in nuclear reactors as a by-product when Uranium-238 captures neutrons.
- **Role in Energy:** Supplies about **one-third of nuclear power in many reactors**; can be recycled as MOX (Mixed Oxide) fuel. It is also used as a power source for space missions, such as the Mars Curiosity Rover.
- **Key Isotopes:**
  - **Pu-239:** Fissile; used in nuclear reactors and weapons.
  - **Pu-238:** Non-fissile; powers spacecraft via radioisotope generators.
  - **Pu-240:** Non-fissile; high spontaneous fission makes it unsuitable for weapons.
- **Grades:**
  - **Reactor-grade**: From spent fuel, mainly for energy.
  - **Weapons-grade:** Rich in Pu-239, used for nuclear arms.
- **Advanced Reactors**: Fast Neutron Reactors (FNRs) use plutonium efficiently and are part of Generation-IV designs.
- **Global Stock**: Around 260 tonnes of civilian plutonium worldwide.
- **Health Risk:** Highly toxic, especially if inhaled.

IMPACT RISE INITIATIVE

Context: IIT Kharagpur has launched **Impact RISE-** an initiative centred on **Research, Innovation, Skilling, and Entrepreneurship.**

About Impact RISE

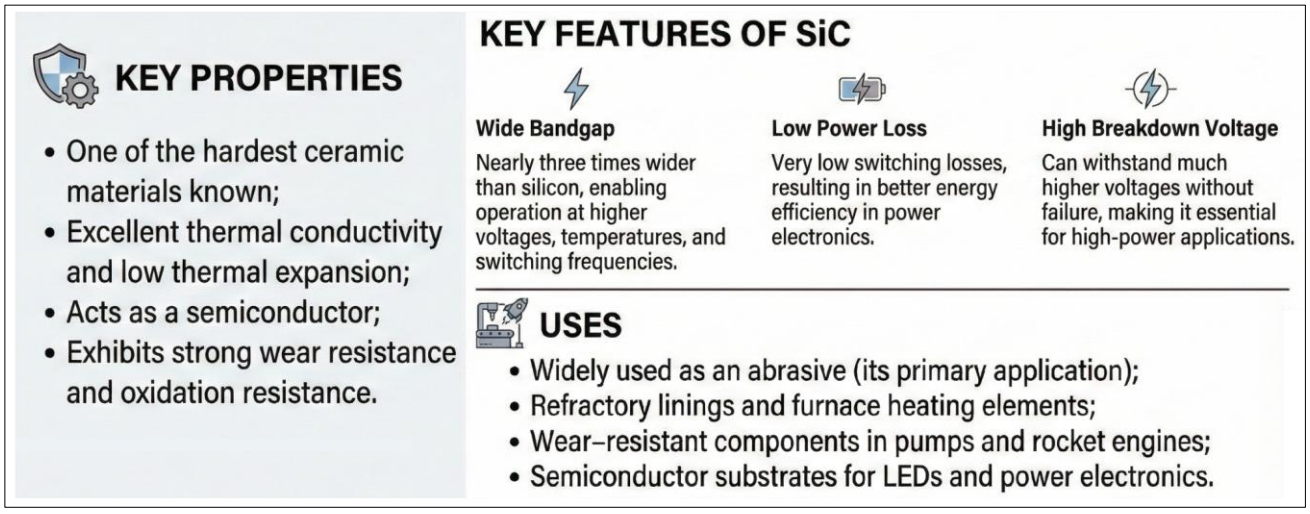
- Impact RISE is an initiative with a focus on promoting sustainable technological and management practices for societal transformation.
- The initiative aims to move beyond academic publications by developing solutions in laboratories, piloting them on campus, and scaling sustainable technologies and impact models globally.
- Impact RISE is structured around four core pillars: **research, innovation, skilling, and entrepreneurship.**
- The initiative will be implemented through targeted missions focusing on:
  - **Climate resilience in the Sundarbans**
  - Application of IIT Kharagpur's **AI-based health diagnostics**
  - **Women's health,** with emphasis on low-cost screening devices for anaemia and oral cancer
  - **Provision of safe drinking water** through the use of arsenic filters and smart soil scanners.

SILICON CARBIDE

Context: Recently, the Chief Minister of Odisha performed the groundbreaking ceremony for India's first end-to-end silicon carbide semiconductor production plant, marking a major step in advanced semiconductor manufacturing.

About Silicon Carbide (SiC)

- Silicon carbide is a synthetically produced crystalline compound of silicon and carbon and is the most widely used non-oxide ceramic. It was discovered in 1891 by E. G. Acheson.



VAIBHAV FELLOWSHIP PROGRAMME

Context: Recently, the Union Minister of State for Science and Technology interacted with **VAIshvik Bhartiya Vaigyanik (VAIBHAV)** Fellows from across the world.

What is the VAIBHAV Fellowship Programme?

- The VAIBHAV Fellowship Programme **enables scientists from the Indian diaspora to collaborate with Indian higher educational institutions (HEIs)** and public research institutions.
- Selected fellows can work with a host Indian institution for up to two months each year, spread over a period of three years.
- **Aim:** To strengthen India's research ecosystem and enhance global–Indian research linkages.
- **Funding:** Fellowship grant (Rs. 4 Lakhs per month), international and domestic travel, accommodation and contingencies. The financial support (up to ₹5 Lakhs per year for 3 years) will be given to the host institution to facilitate the VAIBHAV fellow for research work as per DST norms.
- **Eligibility:** Applicants must hold a PhD, M.D., or M.S. degree and be affiliated with institutions ranked among the top 500 in QS rankings.
- **Nodal Ministry:** Department of Science and Technology, under the Ministry of Science and Technology.

VANADIUM

Context: Recently, the Union Minister for Power inaugurated India's first MWh-scale Vanadium Redox Flow Battery (VRFB) system at NTPC's NETRA facility in Greater Noida.

About Vanadium (V; Atomic Number 23)

- **Properties**: A silver-grey metallic element that is ductile and malleable, harder than most metals, and highly resistant to corrosion by alkalis and acids.
- **Occurrence**: The 22nd most abundant element, found in over 60 minerals such as vanadinite, carnotite, and roscoelite; it is also present in coal and petroleum.
- **Uses**:
  - Steel alloying to enhance strength and corrosion resistance;
  - Vanadium Flow Batteries (VFBs) for large-scale renewable energy storage;
  - Catalysts, notably in sulphuric acid production;
  - Nuclear applications, including materials used in reactors.

BATTERIES	LITHIUM-ION (Li-ion)	VANADIUM REDOX FLOW (VRFB)
Energy Storage Mechanism	• Solid-state intercalation (ions move between electrodes)	• Liquid-phase redox reactions in electrolyte tanks
Energy Density	• High (≈ 150–250 Wh/kg); compact and lightweight	• Low (≈ 10–30 Wh/kg); requires large tanks
Cycle Life	• Moderate (≈ 1,000–3,000 cycles)	• Very high (≈ 15,000–20,000+ cycles)
Scalability	• Energy and power scale together	• Energy (tank size) and power (stack size) scale independently
Safety	• Flammable electrolyte; risk of thermal runaway	• Non-flammable; very low fire risk
Response Time	• Milliseconds	• Milliseconds to seconds
Round-Trip Efficiency	• High (≈ 85–95%)	• Moderate (≈ 70–80%)
Operating Lifespan	• ~7–10 years	• ~20–25 years
Capital Cost (CAPEX)	• Lower upfront cost	• Higher upfront cost
Best Cost Range	• Short-duration storage (< 4 hours)	• Long-duration storage (> 6–10 hours)
Typical Applications	• EVs, electronics, short-term grid support	• Renewable energy storage, microgrids, utility-scale backup

RUTAG INITIATIVE

Context: Recently, the Principal Scientific Adviser (PSA) to the Government of India chaired the second annual review meeting of the Rural Technology Action Group (RuTAG) 2.0 initiative.

About the Rural Technology Action Group (RuTAG) Initiative

- RuTAG is an initiative conceptualized by the Office of the Principal Scientific Advisor (PSA) to the Government of India in 2003-04 to facilitate science and technology interventions for rural development.

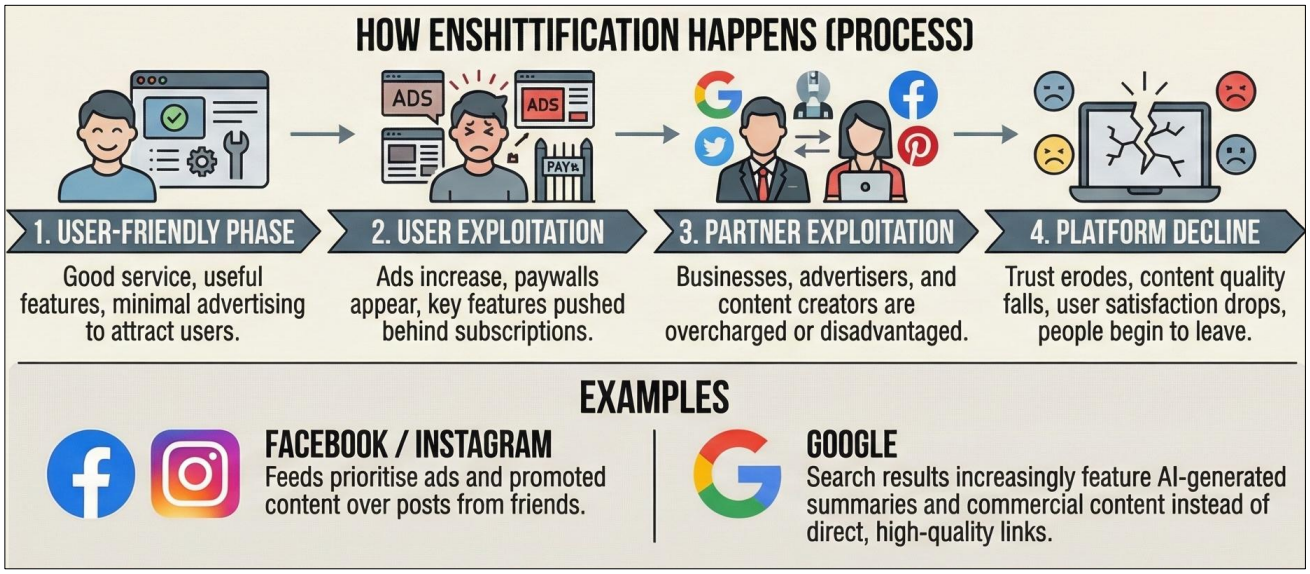
- It is a **mechanism to deliver higher-level science and technology (S&T) interventions in rural areas**, with a focus on demand-driven and grassroots-based technological solutions.
- **Objectives**
  - To upgrade traditional rural practices by integrating them with institutional technologies.
  - To identify rural technology needs through engagement with NGOs, self-help groups (SHGs), and start-ups.
  - To develop demand-based technologies, validate prototypes, and ensure scalable commercialisation.

About RuTAG 2.0 (2023)

- RuTAG 2.0 places **greater emphasis on commercialisation, wider dissemination, and field deployment of technologies with measurable rural impact.**
- It also promotes stronger collaboration among RuTAG centres and a wider range of stakeholders.

ENSHITTIFICATION

- Enshittification is a term coined in 2022 by Cory Doctorow to describe how digital platforms gradually worsen over time, as business decisions prioritise profit over user experience.
- Enshittification is seen as a form of rent-seeking, where platforms extract maximum value from users and businesses, often leading to cognitive and moral harm for users due to information overload and reduced trust



AMMONIUM NITRATE

Context: Ammonium nitrate (NH_4NO_3), one of the substances linked to the recent Delhi explosion, has also been used in deadly blasts in Mumbai in the past, after being mixed with other materials.

About Ammonium Nitrate (AN)

- Ammonium nitrate is a **white crystalline salt formed from ammonia and nitric acid.** It is produced in large quantities and is mainly used as a high-nitrogen fertiliser and as an oxidising agent in explosives.
- **Properties**: It melts at about 170°C, is highly soluble in water, and on heating decomposes into nitrous oxide (N_2O), commonly known as laughing gas.
- **Explosiveness**: Ammonium nitrate is **not explosive by itself**; it requires a fuel and a detonator. It is a key component of slurry and mining explosives.
- **Regulation in India:** Ammonium nitrate containing more than 45% concentration is classified as an explosive. A District Magistrate may permit storage up to 30 metric tonnes, while larger quantities require a licence from the Petroleum and Explosives Safety Organization (PESO).

INDIA INTERNATIONAL SCIENCE FESTIVAL 2025

Context: The 11th edition of the India International Science Festival (IISF) is being held in Panchkula, Haryana.

- **Organized by:** Ministry of Earth Sciences
- **Coordinated by:** Indian Institute of Tropical Meteorology, Pune
- **Theme**: "Vigyan Se Samruddhi: for Aatmanirbhar Bharat"

- **Focus Areas:** Science, Technology and Ecology of North-West India and the Himalayan Region; Science for Society and Education; Atmanirbhar Bharat through Science and Technology; Biotechnology and Bio-economy; Integration of Traditional Knowledge with Modern Science

About India International Science Festival

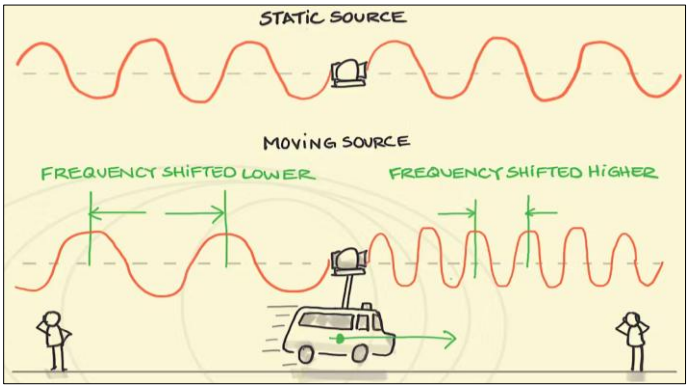
- IISF is an annual initiative of Ministry of Science and Technology and Ministry of Earth Science of Government of India in association with Vijnana Bharati.
- Launched in **2015**, IISF aims to **increase public engagement with science** and encourage collaboration among scientists in India and across the world.

DOPPLER WEATHER RADAR

Context: Recently, the Minister of State for Earth Sciences informed that India currently has 47 Doppler Weather Radars (DWRs) to monitor weather patterns and improve forecasts.

What is Doppler Weather Radar (DWR)?

- A DWR is a specialised radar that **uses the Doppler effect to measure the movement and speed of rain, clouds, and other particles in the atmosphere,** giving information on both the location and motion of weather systems.
- It works by **sending out radio waves that bounce off raindrops or clouds and return to the radar.** The time taken shows the distance, while the change in frequency of the returning signal indicates the speed and direction of movement.
- IMD commonly **uses radar bands such as S-band** (long range, ~400–500 km), **C-band** (medium range, ~250 km), and **X-band** (short range, ~100 km).
- DWRs **help in tracking weather systems** and cloud bands, estimating rainfall, and issuing early warnings for storms, hail, heavy rain, and lightning.

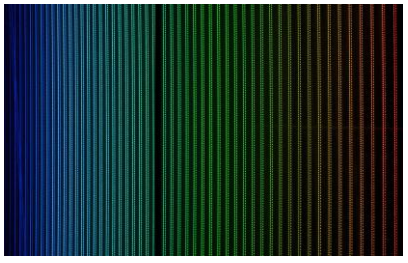


What is the Doppler Effect?

- The Doppler effect describes the **change in the frequency or wavelength of a wave observed** when the **source and the observer are in relative motion.**
- Waves emitted by a source moving toward a stationary observer appear compressed, resulting in a higher observed frequency (a higher pitch in the case of sound). Conversely, waves from a source moving away appear stretched, leading to a lower observed frequency.
- During approach, each successive wave cycle reaches the observer sooner, reducing the time between crests and shortening the wavelength. During recession, wave cycles arrive later, increasing the time between crests and lengthening the wavelength.

FREQUENCY COMBS

Context: Frequency combs are an important modern tool used to calibrate atomic clocks and have several other applications.



About Frequency Combs

- A frequency comb is a **laser source whose spectrum consists of thousands of equally spaced, phase-coherent frequencies**, resembling the teeth of a comb. It bridges radio and optical frequencies with extreme precision.
- **Uses:** Atomic clock calibration, Precision spectroscopy, Exoplanet detection, Measuring gravitational effects on light

CULTURE

FAIRS AND FESTIVALS

Festival	Region	Description
Kheer Bhawani Mela	Ganderbal district, Jammu & Kashmir	• Celebrated by Kashmiri Pandits at the Kheer Bhawani Temple, dedicated to Goddess Ragnya Devi (Durga's incarnation) on Jyeshtha Ashtami in Kashmir. • The Kheer Bhawani temple, believed to have been built by Maharaja Pratap Singh in 1912, is an archaeologically significant site. • The temple stands over a spring said to change colour. • Pilgrims offer *kheer* (rice pudding) to the goddess. • It is the second-largest Hindu gathering in Kashmir after Amarnath Yatra. • The festival is a symbol of communal harmony and brotherhood, reflecting the rich pluralistic ethos that has defined Jammu and Kashmir for centuries.
Bonalu Festival	Hyderabad, Secunderabad, and parts of Telangana	• A traditional festival dedicated to Goddess Mahakali, celebrated in the month of Ashada (June–July). • Devotees offer *Bonam* (meal of rice, curd, jaggery, neem leaves). • Includes rituals like *rangam* (future forecasting). Declared a state festival in 2014.
Poson Poya	Sri Lanka (Mihintale, Anuradhapura)	• Marks the arrival of Buddhism in Sri Lanka in the 3rd century BCE. • Celebrated on the June full moon, it commemorates Arahat Mahinda's (son of Emperor Ashoka) first sermon to King Devanampiyatissa at Mihintale. • Major celebrations occur at Mihintale and other Buddhist sites.
Ambubachi Mela	Kamakhya Temple, Guwahati, Assam	• A Tantric fertility festival held in June (Ashadha month) celebrating Goddess Kamakhya's annual menstruation, symbolizing fertility and regeneration. • The temple remains closed for three days, and devotees receive blessed cloth pieces as protective tokens. • Known as the "Mahakumbh of the East."

SARASWATI PUSHKARALU

Context: The 12-day **Saraswati Pushkaralu festival** was held at **Triveni Sangamam in Kaleshwaram, Telangana.**

- This festival **occurs once every 12 years,** when Jupiter (Brihaspati) enters the Gemini (Mithuna) zodiac sign. It **honours the sacred River Saraswati,** revered as the goddess of knowledge and wisdom.
- Saraswati is believed to flow unseen, as an underground stream called **Antarvahini**.
- **Kaleshwaram is the only place in South India where three rivers meet, allowing all three river festivals—Godavari, Pranahita, and Saraswati** — to be celebrated in their respective cycles.
- The last Godavari Pushkaralu was in 2015 and the Pranahita Pushkaralu in 2022.

About Kaleshwaram

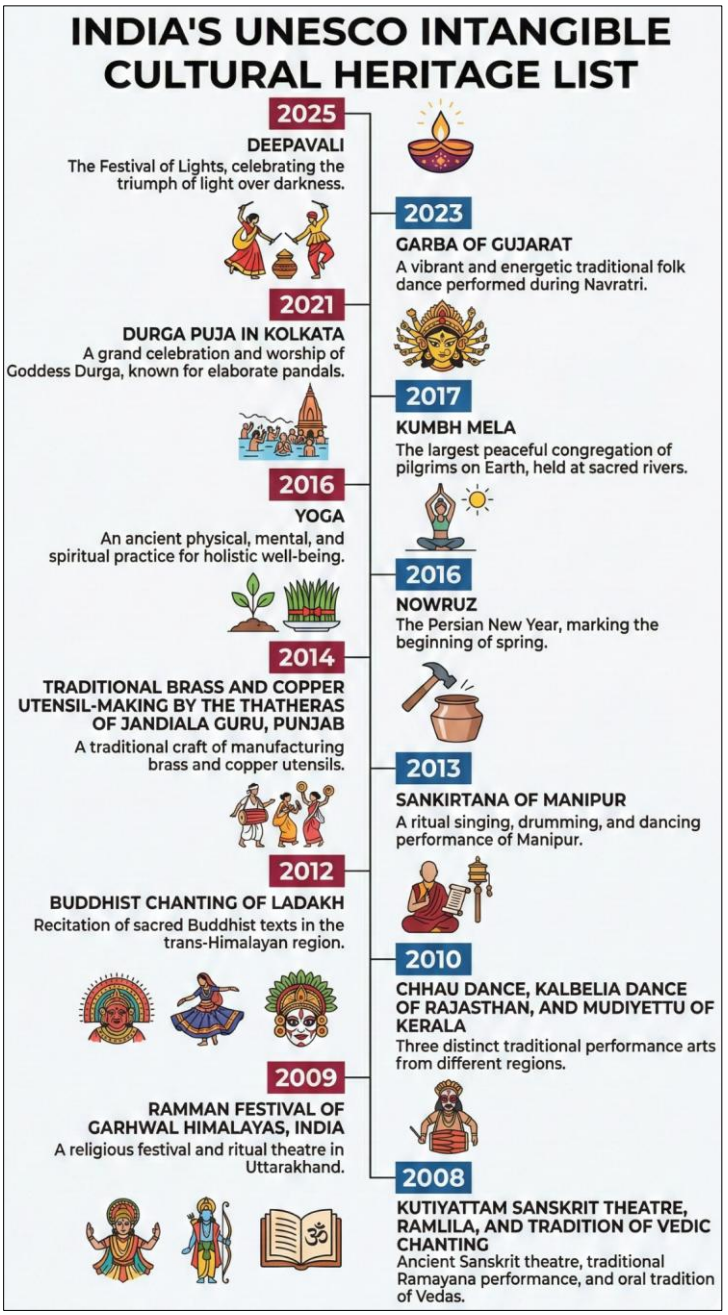
- The Kaleshwaram temple complex is known for the **Sri Kaleshwara Mukteshwara Swamy shrine**, dedicated to Lord Shiva.
- It is **unique for housing two Shiva Lingas** - Lord Kaleshwara (Yama) and Lord Mukteshwara (Shiva) - **on a single pedestal.**
- The temple is **one of three sacred Shiva temples in the regio**n, called Trilinga Desham, alongside Draksharamam and Srisailam.

DEEPAVALI IN LIST OF THE INTANGIBLE CULTURAL HERITAGE OF HUMANITY

Context: Deepavali has been officially included in UNESCO's Representative List of the Intangible Cultural Heritage of Humanity under the category of **Social practices, rituals and festive events**.

About Deepavali (Diwali)

- Deepavali is a **festival of lights** celebrated across India to mark the **end of the harvest season** and the beginning of a new year and new season. It is **observed according to the lunar calendar** and usually falls in October or November, lasting for several days.
- The festival symbolizes the **victory of light over darkness and good over evil**. People clean and decorate their homes, light lamps and candles, burst fireworks, and offer prayers for prosperity, happiness, and new beginnings.



About UNESCO's List of the Intangible Cultural Heritage of Humanity

- UNESCO's List of the Intangible Cultural Heritage of Humanity **safeguards non-physical cultural expressions like traditions, rituals, and knowledge passed down through generations.**
- Established in 2008 under the **2003 Convention for the Safeguarding of the Intangible Cultural Heritage,** it promotes global awareness and protection of these practices.
- This list is published by the **Intergovernmental Committee** for the Safeguarding of Intangible Cultural Heritage, the members of which are elected by State Parties meeting in a General Assembly.
- The list comprises three main categories:
  - Representative List of the Intangible Cultural Heritage of Humanity (showcasing vibrant traditions)
  - List of Intangible Cultural Heritage in Need of Urgent Safeguarding (for endangered elements)
  - Register of Good Safeguarding Practices.
- The Committee meets annually to evaluate nominations proposed by States Parties to the 2003 Convention and decide whether or not to inscribe those cultural practices and expressions of intangible heritage on the Convention's Lists.
- As of recent updates, over 849 elements corresponding to 5 regions and 157 countries feature on these lists. **India has sixteen cultural elements** in the List of the **Intangible Cultural Heritage of Humanity** and **no elements in the list of** Intangible Cultural Heritage in **Need of Urgent Safeguarding.**

SHIRUI LILY FESTIVAL

Context: The Shirui Lily festival has returned to Manipur after a two-year pause due to conflict in the state.

- Organised by the Manipur government's Department of Tourism, the festival was first held in 2017 and is named after the **Shirui Lily, the state flower**.
- It coincides with the flower's blooming season and is held in **Ukhrul district, home to the Tangkhul Naga community.**
- The festival promotes eco-tourism and raises awareness about the rare flower.
- The **Shirui Lily is a pinkish-white flower found only in the upper Shirui Hill range**. Locals call it '**Kashsong Timrawon**' after Timrawon, the daughter of the mythical goddess Philava who protects the hills.



BUDDHA PURNIMA

Context: Buddha Purnima, or Vesak, was celebrated on 12 May to mark the birth, enlightenment, and death of Gautama Buddha.

- It **falls on the full moon of Vaisakh** (usually in May in the Gregorian calendar) and was declared an **International Day of Observance** by the UN in 1999.
- Gautama Buddha was born as Siddhartha Gautama in Lumbini, Nepal, to King Suddhodana and Queen Maya Devi of the Shakya clan. Raised in luxury, he married Princess Yashodhara at 16 and had a son, Rahul. Seeking the cause of suffering, he left his princely life to become a wandering ascetic.
- At 35, meditating under the Bodhi tree in Bodh Gaya, he attained **enlightenment** (Nirvana) and became the **Buddha, the "Awakened One."**
- He gave his first sermon at **Sarnath**, teaching the **Four Noble Truths and the Noble Eightfold Path**. He also established the **Sangha**, a community of monks.
- Buddha passed away at 80 in Kushinagar, an event called **Mahaparinirvana**.
- A sizable fair is held at Sarnath to commemorate the occasion, and the Lord Buddha's artefacts are brought out to be displayed on caparisoned elephants.

DHIRIO

Context: The legislators in the Goa Legislative Assembly have demanded the legalisation of bullfighting, locally known as Dhirio.

About Dhirio

- Dhirio (also called Dhiri) is a **traditional form of bullfighting practiced in Goa**. Unlike Spanish bullfighting, **dhirio does not involve a matador or the ritual killing of the animal.** The contest ends when one bull is pushed out of the arena or retreats.
- The sport is regarded as an important part of Goan cultural heritage, historically associated with agrarian festivals and church feasts.
- Although officially banned since a 1997 High Court ruling, the practice continues in some parts of Goa, particularly in rural and coastal villages.
- The tradition of dhirio traces its origins to the Portuguese colonial period.

Other Bull-Related Traditions in India

- **Jallikattu (Tamil Nadu):** A well-known **bull-taming sport** with deep cultural and historical significance. Conducted during **Mattu Pongal,** it is viewed as a symbol of courage, honour, and community identity.
- **Bullock Cart Racing (Tamil Nadu and Karnataka):** A traditional sport in which **teams race carts pulled by bulls.** It is commonly organised during agricultural festivals and village celebrations.
- **Kambala (Karnataka):** Although not a form of bullfighting, Kambala is a popular **buffalo racing festival** held in the coastal districts of Karnataka. It is closely connected to agrarian traditions and the worship of local deities.

ROSH HASHANAH

Context: PM Modi extended greetings to Jewish community on the occasion of Rosh Hashanah.

- Rosh Hashanah is the **Jewish New Year festival** and marks the **beginning of the High Holy Days,** also known as the "**Ten Days of Repentance**." These ten days **culminate in Yom Kippur, the Day of Atonement.**
- Spiritually, it is a **period of reflection, repentance, and renewal.** According to Jewish tradition, on Rosh Hashanah, God opens the "Book of Life," in which each person's deeds of the past year are recorded, and divine judgments are made for the coming year.

LANGKHUN FESTIVAL

Context: The Tiwa tribesmen recently celebrated the Langkhun festival in Umsowai village in the **Karbi Anglong district of Assam.**

- **Langkhun is an annual harvest festival** celebrated to offer gratitude to **Ramsa Devta**. It reflects the agrarian lifestyle of the Tiwa community and their close connection with nature.
- The festival involves bamboo worship over four days and is usually **celebrated between October and December.**

About Tiwa Tribe

- The Tiwas, also known as **Lalung**, are a Tibeto-Burmese ethnic group **living mainly in Assam, Meghalaya, and Arunachal Pradesh.** The community is broadly divided into Hill Tiwas and Plains Tiwas.
- **Hill Tiwas live in the hilly regions of Assam and Meghalaya** and maintain traditional governance systems with close-knit village councils.
- **Plains Tiwas are more integrated with Assamese culture** and language.
- Despite these differences, both groups share a common ethnic identity.
- The **founder of the Tiwa community** is believed to be **Pha Poroi "Indrosing Dewri",** who played a major role in shaping Tiwa society. He also composed the **Tiwa national anthem, "O Angé Tiwa Tosima".**
- The Tiwa tribe follows a **matrilineal system**, where lineage is traced through the mother's line, and a unique marriage practice called "**Kobea Liwa**" is observed.

BATHUKAMMA FESTIVAL

Context: The Telangana government–organised Bathukamma celebrations have created two new Guinness World Records.

- The first record was set for the **largest Bathukamma floral installation,** made using about seven tonnes of flowers, measuring 63.11 feet in height and 11 feet in width.
- The second record was for a **highly synchronised Bathukamma dance performance by 1,354 women.**



About Bathukamma

- Bathukamma is a **traditional floral festival celebrated mainly by women in Telangana and parts of Andhra Pradesh.**
- It is observed for **nine days** as per the Satavahana calendar, usually during September–October.
- The term "**Bathukamma**" in Telugu means "***Mother Goddess come alive."***
- The Bathukamma is a beautiful flower stack, made with seasonal flowers (many having medicinal value) arranged in seven concentric layers resembling a temple gopuram.
- Historically, Bathukamma meant "festival of life" and was celebrated to thank Goddess Parvati for her blessings for the crop harvest and income she helped generate this (current) year and again ask her blessing for the next year.
- The festival symbolises the harmonious relationship between humans, nature, earth, and water.
- Bathukamma is followed by Boddemma, which is a 7-day festival. During the celebrations, women also prepare **Boddemma**, **a clay form of Gauri (Mother Durga),** which is immersed in water bodies along with Bathukamma.

MERA HOU CHONGBA FESTIVAL

Context: In Manipur, the Mera Hou Chongba festival is being celebrated.

About Mera Hou Chongba Festival

- Mera refers to the Meitei ***lunar month of Mera***, while **Hou Chongba** means ***coming together or unity.*** Together, the term signifies a **festival of unity celebrated in the month of Mera.**
- **Time of Celebration:** Observed annually on the 15th lunar day of the Mera month as per the Meitei calendar.

- **Key Ritual:** The ceremonial march is led by Manipur's titular king (current king: **Maharaja Sanajaoba Leishemba).** It begins at the Manipur Royal Palace (Sana Konung) and proceeds to the historic **Kangla Fort in Imphal,** with participation from tribal village chiefs. Traditional rituals, including Mera Men Tongba, Yenkhong Tamba, exchange of gifts among the tribal village chiefs and valley people, are held.
- **Significance**: It is the only festival in Manipur that brings together all indigenous communities, including Meiteis, Kukis, and Nagas, highlighting social harmony and shared cultural heritage, symbolising hill–valley unity.

GURU CHARAN YATRA

Context: PM Modi urged devotees to have darshan of the Jore Sahib during this yatra, which began on 23 October and travelled from New Delhi to Patna Sahib Gurudwara in Bihar.

About Guru Charan Yatra

- The Guru Charan Yatra is **a religious procession associated with the sacred relic known as the 'Jore Sahib'.**
- The **Jore Sahib, meaning holy or sacred shoes**, are a pair of footwear **believed to have belonged to Guru Gobind Singh**, the tenth and last human Guru of Sikhism, and his wife Mata Sahib Kaur.
- These footwears are regarded as sacred relics because they are personal belongings once used by revered Sikh spiritual figures.
- The relics include footwear of different sizes, reflecting those worn by Guru Gobind Singh (Dasam Pita) and Mata Sahib Kaur, and are deeply respected within the Sikh tradition.
- **Guru Gobind Singh is remembered for founding the Khalsa Panth,** the community of the pure, which strengthened Sikh identity and values.
- Before his death, he declared the Guru Granth Sahib as the eternal Guru, ending the line of human Gurus in Sikhism.

RAULANE FESTIVAL

- Raulane is an **ancient traditional festival celebrated after Holi for several days in the hill region of Kinnaur district (Himachal Pradesh).**
- The festival **honours celestial fairies** known as ***Saunis***, who are believed to protect villagers and their homes during the harsh winter months.
- **With the arrival of spring, villagers organise Raulane as a ritual farewell to the Saunis**, expressing gratitude for their protection.
- During the festival, **two men symbolically marry and act as vessels for the Saunis**, representing a divine couple - the Raula (groom) and the Raulane (bride).
- They wear heavy woollen robes, ornaments, and distinctive face masks, and perform a slow, meditative dance at the Nagin Narayan Temple.

HORNBILL FESTIVAL

Context: The 26th edition of Nagaland's Hornbill Festival kicked off from December 1 to 10 2025.

About Hornbill Festival

- Hornbill Festival is an **annual cultural extravaganza held in Nagaland**, showcasing the state's diverse ethnic tribes. Known as the "**Festival of Festivals,**" it unites all tribes (over 17 Naga tribes) through traditional performances, crafts, and cuisine.
- It was first organized in the year 2000 to promote inter-tribal interaction and preserve Nagaland's heritage, blending the traditional with the contemporary in a harmonious display of unity. It is organised every year in the first week of December.
- **Organised by:** It is organized by the State Tourism and Art & Culture Departments of the Government of Nagaland.
- It is celebrated at Naga Heritage Village, Kisama which is about 12 km from Kohima in Nagaland. It was named after the Hornbill bird given its association with the socio-cultural life of the Nagas.



- ***Theme of 2025 Festival:*** *Cultural Connect*
- This year, the United Kingdom, Ireland, France, Austria, Malta and Switzerland have joined as country partners, while Arunachal Pradesh comes on board as the state partner.

BISON HORN MARIA DANCE

Context: The traditional Bison Horn Maria dance was recently performed during a festival at Judiya Para in Bastar, Chhattisgarh.

About Bison Horn Maria Dance



- It is a **vibrant tribal folk dance** of the **Dandami Madia (also spelled Maria) tribe of Chattisgarh**. It identifies itself with the broader Gond tradition.
- The dance is performed by both men and women. Men wear a horn-shaped headgear made from bamboo, decorated with bison (gaur) horns, feathers, and bright cloth strips.
- Women wear bright handwoven saris, heavy silver and brass ornaments, and headgear.
- The dance gets its name from the **bison horns (gaur horns) worn by the performers.**
- It imitates the movements of a wild bison, symbolising strength, energy, and the tribe's close relationship with forest life and hunting traditions.
- It is mainly **performed during major community** occasions such as: **Madia Festival, Bastar Dussehra, Weddings, Harvest rituals**
- During the performance, ritual chants often invoke local deities such as Budhadev and Danteshwari Mai.

ARCHITECTURE AND SCULPTURES

KARTARPUR CORRIDOR CLOSED

Context: The Kartarpur Corridor at Dera Baba Nanak in Punjab's Gurdaspur district was recently closed after Operation Sindoor.

- The **corridor connects Gurdwara Darbar Sahib** (final resting place of Guru Nanak) **in Pakistan, to Dera Baba Nanak** (one of the most sacred places of the Sikhs) **in India**.
- Guru Nanak, the first Sikh guru, founded Kartarpur on the right bank of the Ravi River and established the first Sikh commune there.
- The Gurdwara was built in 1522, and Guru Nanak lived there for 18 years until his death. During Partition, the Radcliffe Line divided the region, giving the right bank, including Kartarpur, to Pakistan, and the left bank, including Gurdaspur, to India.
- Earlier, Indian pilgrims had to travel 125 km via Lahore to reach Kartarpur. To simplify access, India and Pakistan signed the **Kartarpur Corridor agreement in 2019**, allowing Indian pilgrims of all faiths to travel visa-free through the 4.5-km passage year-round.

KARNI MATA TEMPLE

Location	Bikaner district, Rajasthan
Deity	Dedicated to Karni Mata, believed to be an incarnation of Goddess Durga
Established By	Rao Jaitasi, to commemorate the victory of the Bikaner king over Mughal ruler Kumaran
Religious Affiliation	Belongs to the Shakta Sampradaya (worshippers of the Divine Mother)
Unique Features	• Home to thousands of freely roaming rats (kabbas), revered as sacred • Devotees offer food to the rats as part of religious rituals • Despite the large rat population, no plague or disease outbreak has ever occurred

MARATHA MILITARY LANDSCAPES OF INDIA

- UNESCO has granted World Heritage status to a set of 12 historic Maratha forts spread across **Maharashtra and Tamil Nadu.** The decision was taken at the 47th Session of the World Heritage Committee.
- It is the 44th Indian property to receive this recognition. **India ranks 6th globally and 2nd in Asia Pacific Region for the most number of World Heritage Sites.**

About Maratha Military Landscapes of India



- Spanning from the 17th to 19th centuries CE, these sites are together called the Maratha Military Landscapes of India.
- The forts are spread across diverse terrains, including the Sahyadri mountain ranges, Konkan Coast, Deccan Plateau, and Eastern Ghats, reflecting the Maratha rulers' ability to adapt to varied physiographic conditions.
- The selected sites, include **Salher, Shivneri, Lohgad, Khanderi, Raigad, Rajgad, Pratapgad, Suvarnadurg, Panhala, Vijaydurg, and Sindhudurg in Maharashtra, along with Gingee Fort in Tamil Nadu.**

CHOLA GANGAM LAKE

Context: In honour of the birth anniversary of the Tamil king Rajendra Chola I, the Tamil Nadu Chief Minister announced the development of the historic 'Chola Gangam' lake.

About Chola Gangam Lake

- **Location:** Near Gangaikonda Cholapuram in Ariyalur District, Tamil Nadu; locally known as Ponneri Lake.
- **Built by King Rajendra Chola I** to commemorate his northern campaign, as recorded in the Tiruvalangadu Copper Plates. According to the Plates, the tank symbolised a "**liquid pillar of victory**," created using water brought from the Ganga.
- A canal, near the Kollidam River, was engineered to supply water to the lake.
- The reservoir depends mainly on rainwater and once irrigated about 1,564 acres of land, serving also as a key drinking water source for Gangaikonda Cholapuram.
- Its elliptical bunds, strengthened with laterite stones, were designed to withstand heavy water pressure. Sophisticated sluices and sediment traps allowed controlled water release while directing nutrient-rich silt into surrounding fields, improving soil fertility.
- The system was maintained through ***kudimaramathu*** (community-based maintenance), funded by a local tax known as ***eri-ayam***.

NATIONAL MARITIME HERITAGE COMPLEX

Context: The Chief of the Naval Staff visited the National Maritime Heritage Complex (NMHC) at Lothal, Gujarat.

About National Maritime Heritage Complex

- The NMHC is being developed under the Sagarmala Programme by the Ministry of Ports, Shipping, and Waterways, with support from the Gujarat Government and the Indian Navy.
- NMHC is to be the first of its kind in the country, dedicated to the legacy of maritime heritage of India.
- Built at a cost of ₹3,500 crore, it seeks to showcase India's rich maritime heritage and promote Lothal as a world-class international tourist destination.
- A Lothal mini-recreation will use immersive technology to depict Harappan architecture and lifestyle.



- It was one of the southernmost sites of the Indus Valley civilization, located in the Bhāl region of what is now the state of Gujarat.
- It is known for the **discovery of the oldest man-made dockyard**, connecting the city to an ancient course of the Sabarmati river.
- The meaning of Lothal (a combination of Loth & (s) thal) in Gujarati is "the mound of the dead".
  - Incidentally, the name of the city of Mohenjo-daro (also part of the Indus Valley Civilisation, now in Pakistan) means the same in Sindhi.
- Believed to have been built in **2,200 BC,** Lothal was a thriving trade centre in ancient times, with its trade of beads, gems and ornaments reaching West Asia and Africa.
- Lothal was nominated in 2014 as a UNESCO World Heritage Site, and its application is pending on the tentative list of UNESCO.
- In the region, it can be compared with other Indus port towns of Balakot (Pakistan), Khirasa (in Gujarat's Kutch) and Kuntasi (in Rajkot).

- The complex will include four theme parks: **a Memorial Theme Park, a Maritime and Navy Theme Park, a Climate Theme Park, and an Adventure and Amusement Theme Park**.
- It will house the **world's tallest lighthouse museum** and **14 galleries** tracing India's maritime history from the Harappan era to the present.
- A coastal states pavilion will display the maritime traditions of India's states and Union Territories.

MUSEUM OF ROYAL KINGDOMS OF INDIA

The PM laid the foundation stone for the Museum of Royal Kingdoms of India at the Statue of Unity in Gujarat.

About Museum of Royal Kingdoms of India (MORKI)

- MORKI is a major **new museum project located in Ekta Nagar (Kevadiya), Gujarat, near the Statue of Unity.**
- The museum aims to revisit the period during which India transitioned from nearly 550 princely states into a single republic.
- It is being **developed by the Directorate of Archaeology and Museums**, Government of Gujarat, as part of the Sardar Patel Area Development Plan.

Objectives:

- Preserve and display India's royal and princely heritage.
- Educate the public about the integration of princely states and their contributions to nation-building.
- Offer interactive, experiential, and digital learning opportunities, especially for youth.
- Serve as a research and learning center for India's regal and democratic heritage.
- Promote national unity, cultural pride, and democratic values.

HOLY CITY STATUS GIVEN TO THREE CITIES IN PUNJAB

Context: The Punjab government has notified holy city status to **Anandpur Sahib, Talwandi Sabo, and the Amritsar Walled City.** These three cities are home to three of **the five 'Takhts'.**

Key provisions of the resolution:

- Prohibits the sale and consumption of liquor, meat, tobacco, and other intoxicants within these holy city limits.
- Mandates formation of an interfaith committee involving representatives of all religious institutions in these cities.
- Commits the state government to improving development, cleanliness, security, and the promotion of religious tourism.

The Five Takhts:

In Sikhism, a Takht (throne) represents both spiritual and temporal authority. The Panj Takht are central institutions that guide religious practice, address community matters, and preserve Sikh historical traditions, closely associated with the Sikh Gurus.

- **Akal Takht Sahib (Amritsar, Punjab):** Established by Guru Hargobind in 1609, it is the highest seat of Sikh temporal authority and is located opposite the Golden Temple. It is where major decisions on Sikh religious and political matters are made.
- **Takht Sri Keshgarh Sahib (Anandpur Sahib, Punjab):** The birthplace of the Khalsa, established by Guru Gobind Singh in 1699, marking the creation of the Sikh brotherhood.
- **Takht Sri Damdama Sahib (Talwandi Sabo, Punjab):** Where Guru Gobind Singh compiled the final edition of the Guru Granth Sahib. It was officially recognized as a Takht in 1966.
- **Takht Sri Patna Sahib (Patna, Bihar):** The birthplace of Guru Gobind Singh, the tenth Sikh Guru. It is a major pilgrimage site for Sikhs.
- **Takht Sri Hazur Sahib (Nanded, Maharashtra):** The site where Guru Gobind Singh breathed his last and passed the Guruship to the Guru Granth Sahib. It is a place of great spiritual importance.

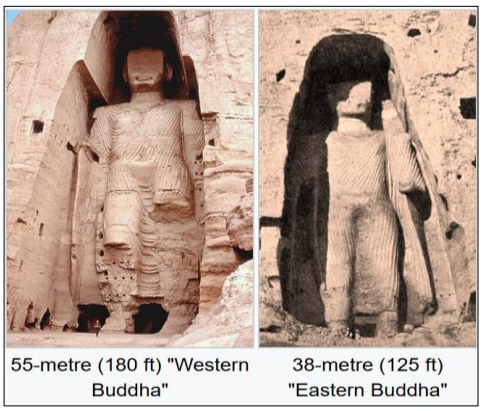
BAMIYAN BUDDHAS

Context: Afghanistan's Taliban government has announced initiatives to protect the country's Buddhist heritage sites and artefacts.

About Bamiyan Buddhas

- The Bamiyan Buddhas were **two colossal standing Buddha statues** carved into the cliffs of the **Bamiyan Valley in central Afghanistan, dating back to the 6th century CE.**

- The larger statue on the western side, known as **Salsal**, stood at 55 meters (about 175 feet), and the smaller on eastern side, called **Shah Mama**, was 38 meters (about 120 feet) tall.
- These statues were among the tallest standing Buddha carvings in the world and **represented the Buddha Vairocana and Sakyamuni**, respectively.
- The statues and surrounding caves featured Buddhist art with influences from India, the Sasanian Empire, and Byzantine traditions.
- The Bamiyan Buddhas were destroyed in 2001 by the Taliban. Today, only the empty niches remain, but the **site is recognized as a UNESCO World Heritage Site** for its cultural landscape and archaeological importance.



IMPORTANT PERSONALITIES

AHILYABAI HOLKAR

Context: The Ministry of Culture, in collaboration with the Madhya Pradesh government, recently commemorated the 300th birth anniversary of Lokmata Ahilyabai Holkar.

About Lokmata Ahilyabai Holkar (1725*1793)

- Born on 31 May 1725 in Chondi, Maharashtra, she came from a humble background. Malhar Rao Holkar, impressed by her, married her to his son Khanderao in 1733.
- After the deaths of her husband, father-in-law, and son Male Rao, she took over Malwa in 1767 and became the ruler of Indore. **Known as the Philosopher Queen,** she passed away on 13 August 1795.
- Ahilyabai established the **Maheshwar textile industry,** built temples, ghats, wells, and pilgrimage centers, and **renovated the Kashi Vishwanath Temple in 1780**, where her statue now stands.
- She constructed roads and rest houses, **restored temples at Haridwar, Kashi, Somnath, and Rameshwaram**, and built the **Old Somnath Temple in Gujarat**, called the **Ahilyabai Temple.**
- Beyond religion, she supported farmers, promoted trade, founded schools and gurukuls, and formed a women's army trained in warfare, self-defense, and administration.



SUSHRUTA AND CHARAKA

Context: The VP of India unveiled statues of Sushruta and Charaka in Goa, emphasizing their enduring contributions to the development of ancient Indian medicine and the inspiration their lives continue to offer.

Sushruta: The Father of Surgery

- Sushruta lived around 600 BCE in Kashi (Varanasi) and was a disciple of Dievodasa, from the school (Gurukul) of Dhanwantri.
- He authored the **Sushruta Samhita**, one of the three foundational texts of Ayurveda. The text provides detailed surgical methods and descriptions of over 120 surgical instruments.
- It classifies surgeries into categories like excision, puncturing, exploration, extraction, and suturing.
- Sushruta pioneered rhinoplasty (nose reconstruction), ear and lip repair, and skin grafting.
- He promoted the study of human anatomy through cadaveric dissection.
- The Samhita also outlined early principles of medical ethics and professional conduct.

Charaka: The Father of Medicine

- Charaka lived between the 2nd century BCE and 2nd century CE and served as the royal physician to King Kanishka.
- He revised the Agnivesha Samhita into the **Charaka Samhita,** dividing it into eight sections (Ashtanga Sthanas).
- The text discusses health, disease prevention, diagnosis, pharmacology, anatomy, and genetics.

- It introduced the **Tridosha theory (Vata, Pitta, and Kapha)** as the foundation of human health. The origin of "tridosha" can also be traced back to vedas.
- Charaka emphasized holistic healing through balanced diet, lifestyle, and mental well-being.
- His work remains a key reference for Ayurvedic medicine and ethics.

BIRSA MUNDA

Context: The Prime Minister paid tributes to legendary tribal leader Birsa Munda on his 125th death anniversary, also known as Balidan Diwas (Marty's Day) on 9th June.



About Birsa Munda (15 November 1875 – 9 June 1900)

- Birsa Munda was an iconic tribal freedom fighter, religious leader, and folk hero. He belonged to the Munda tribe of the Chotanagpur plateau (now largely in Jharkhand).
- His brief yet impactful life has made him a legendary figure in India's struggle against British colonial rule, especially for the rights and dignity of indigenous people.

Early Life and Background

- Born in Ulihatu village, present-day Khunti district, Jharkhand, to a poor Munda family.
- He received his early education in Salga under Jaipal Nag's guidance, later joining a German Mission School after converting to Christianity on his teacher's advice.
- Disillusioned by missionary activities aimed at conversions, Birsa left school and returned to his roots, founding his **own spiritual faith** known as **'Birsait'** and he was called Bhagwan by his followers.

Socio-Political Context

- The late 19th century saw the tribal communities (especially Mundas) lose their lands to zamindars and "dikus" (outsiders) due to the British-imposed zamindari system, which replaced the indigenous **khuntkatti** system of collective landownership.
- Widespread exploitation, forced labor (begar), indebtedness, and an assault on tribal customs ignited deep unrest among the people.

The Ulgulan Movement

- Birsa Munda spearheaded the Ulgulan ("The Great Tumult") movement (1899–1900), rallying tribals against British authorities, oppressive landlords, and missionary influences.
- He advocated for the restoration of tribal land rights and social reforms. He urged people to give up superstitions, idolize one God, give up alcohol consumption and abandon animal sacrifice.
- His leadership united not just Mundas but also other tribes such as Oraons and Kharias.

Impact and Legacy

- Birsa Munda's rebellion led to the **passage of the Chotanagpur Tenancy Act of 1908,** protecting tribal land rights by **prohibiting transfer of land from tribals to non-tribals.**
- Revered as **'Dharti Aba' (Father of the Earth)**, he was seen as a divine and prophetic figure by his followers.
- He was captured by the British and died in Ranchi Jail under mysterious circumstances at the young age of 24.
- The Ranchi jail where Birsa Munda died has since been converted into the Birsa Munda Smriti Sangrahalaya.
- His birth anniversary, November 15, is observed as 'Janjatiya Gaurav Diwas' (Tribal Pride Day) and also marks Jharkhand Foundation Day.

BUDDHU NONIA

Context: The government paid tribute to freedom fighter Buddhu Nonia on the centenary of his martyrdom and acknowledged the Nonia community's contribution to the Nonia Rebellion.

Nonia Rebellion

- The Nonia Rebellion comprised a series of uprisings by the Nonia community in Bihar between 1778 and 1800 against the exploitative rule of the East India Company (EIC).
- Traditionally engaged in the production of saltpetre—a key ingredient in gunpowder—the Nonias faced severe exploitation as the EIC monopolized the trade.
- Economic hardship and injustice led them to organize and revolt against British control.

- The rebellion was concentrated in the Saran, Vaishali, and Purnia districts, where saltpetre production was widespread.

Buddhu Nonia

- Born in Begusarai, Bihar, Buddhu Nonia belonged to the Nonia community.
- During Gandhi's Salt Satyagraha (1930), he participated in making and distributing salt, openly defying the British salt tax.
- He was arrested and martyred by being thrown into a boiling salt cauldron by the British.

CENTENARY OF A HISTORIC CONVERSATION

Context: PM Modi inaugurated the centenary celebrations of the historic meeting between Sree Narayana Guru and Mahatma Gandhi, held on March 12, 1925, at Sivagiri Mutt, Kerala.

- The conversation addressed major social issues of the time, including the Vaikom Satyagraha, religious conversions, non-violence, abolition of untouchability, and the upliftment of marginalized communities.
- The 1925 meeting is regarded as a moment of moral and philosophical convergence and a milestone in India's social reform movement.

About Sree Narayana Guru (1856–1928)



- Sree Narayana Guru was a renowned social reformer, philosopher, spiritual leader, and poet from Kerala. He led a reform movement against the caste system to promote spiritual enlightenment and social equality.
- His guiding principle—"One caste, one religion, one God for man"—became the cornerstone of his teachings.
- Emphasised education as a means of empowerment, especially for marginalised groups.
- In 1888, he consecrated a Shiva temple at Aruvippuram, breaking traditional Brahmanical norms and asserting that spiritual liberation was not limited to upper castes.
- In 1903, with Padmanabhan Palpu, he helped establish the **Sree Narayana Dharma Paripalana (SNDP) Yogam,** which aimed to uplift the Ezhava community through education and social reform.
- He organised India's first All India Industrial and Agricultural Exhibition in Kollam (1905). He also guided the formation of the **Travancore Labour Association** in 1922, Kerala's first organised labour union.
- He authored 45 works in Malayalam, Sanskrit, and Tamil, including Atmopadesa Satakam (a 100-verse spiritual poem) and Daiva Dasakam (a universal ten-verse prayer).
- He translated key texts such as **Thirukkural, Ishavasya Upanishad, and Ozhivil Odukkam.**

About Vaikom Satyagraha (1924–1925)

- Vaikom Satyagraha was a non-violent movement demanding public access for lower castes to the roads around the Vaikom Temple in Travancore.
- At the time, lower castes were barred not only from temple entry but even from walking on nearby roads.
- Led by T. K. Madhavan, K. Kelappan, and K. P. Kesava Menon, the movement sought equal access to public spaces, regardless of caste.
- **Mahatma Gandhi visited Vaikom in 1925, lending support and helping mediate with the authorities.**
- The agitation succeeded in opening three of the four surrounding roads to all castes in 1925.
- Full temple entry for all castes was granted later in 1936, following the Temple Entry Proclamation by the Travancore King.

SYAMA PRASAD MOOKERJEE

Context: Prime Minister recently paid tributes to Dr. Syama Prasad Mookerjee on his birth anniversary.

About Syama Prasad Mookerjee

- Born on 6 July 1901 in Calcutta (now Kolkata), Mookerjee was an eminent politician, barrister, and academician who made significant contributions to India's political and educational spheres.

- In 1934, he became the youngest Vice-Chancellor of Calcutta University at the age of 33, earning recognition for his commitment to education and reform.

Political Career before Independence

- Dr. Mookerjee began his political career in 1929, when he joined the Bengal Legislative Council as a Congress candidate representing Calcutta University.
- Later, in 1937, he was re-elected as an independent member and became the Leader of the Opposition when the Krishak Praja Party and Muslim League formed the government in Bengal.
- In 1939, he joined the All-India Hindu Mahasabha, led by V.D. Savarkar, and later formed a coalition government in Bengal with Fazlul Haque of the Krishak Praja Party, serving as Finance Minister.

Stance during the Freedom Movement

- The Hindu Mahasabha, under Mookerjee's influence, boycotted the Quit India Movement (1942) launched by the Indian National Congress.
- Though he supported India's unity, once partition became inevitable, Mookerjee advocated for the division of Bengal, demanding a separate West Bengal for Hindu Bengalis.

Formation of Bharatiya Jana Sangh

- After independence, Mookerjee founded the Bharatiya Jana Sangh (BJS) in 1951 and became its first president. The Jana Sangh later merged with other non-Congress parties to form the Janata Party, which eventually evolved into the present-day Bharatiya Janata Party.

Opposition to Article 370

- Dr. Mookerjee was a strong opponent of Article 370, which granted special autonomous status to Jammu and Kashmir. He popularized the slogan: "Ek desh mein do nishan, do pradhan, do vidhan nahi chalega" (One nation cannot have two emblems, two prime ministers, and two constitutions).
- To protest against this provision, he travelled to Jammu and Kashmir, where he was arrested for unauthorized entry. He died in custody on June 23, 1953, at the age of 51.

ALLURI SITARAM RAJU

Context: The 128th birth anniversary of Alluri Sitarama Raju was celebrated recently to honour one of India's most revered freedom fighters and tribal leaders.

About Alluri Sitarama Raju

- Alluri Sitarama Raju was an Indian revolutionary who became a monk at the age of 18 and later led the **Rampa Rebellion of 1922** against British rule.
- The uprising was a tribal revolt in the **Godavari Agency region** (present-day Andhra Pradesh) **in response to the 1882 Madras Forest Act,** which severely restricted tribal communities' access to forests, limiting their movement and preventing them from practicing podu (shifting) cultivation, their traditional agricultural method.
- Raju mobilised the tribal population, inspiring them to fight against the British administration. His leadership earned him the title "***Manyam Veerudu*****",** meaning **"Hero of the Forests."**
- In 1924, Alluri Sitarama Raju was captured by the British and executed publicly, marking the end of the armed rebellion.
- His sacrifice remains a powerful symbol of resistance, courage, and the struggle for India's independence.



1,000 YEARS OF RAJENDRA CHOLA'S MARITIME EXPEDITION TO SOUTH-EAST ASIA

Context: The Ministry of Culture celebrated the birth anniversary of the Chola emperor Rajendra Chola I through the **Aadi Thiruvathirai Festival** held at Gangaikonda Cholapuram, Tamil Nadu. This special celebration also marked 1,000 years of Rajendra Chola's historic maritime expedition to Southeast Asia.

About Rajendra Chola I (1014–1044 CE)

- Rajendra Chola I was one of the most powerful and visionary rulers in Indian history. Under his reign, the Chola Empire expanded its influence across South and Southeast Asia, establishing India as a major naval power.
- After his successful northern campaign, where his army marched to the Ganga River and **defeated the Pala dynasty of Bengal, he established Gangaikonda Cholapuram** as his new capital.

- In celebration of this victory, he assumed the title "**Gangaikonda Chola"** (the Chola who conquered the Ganga).
- He constructed a large water tank called **Cholagangam**, symbolically referred to as a "liquid pillar of victory" (Ganga-jalamayam jayasthambham).

Aadi Thiruvathirai Festival

- The term 'Aadi' refers to a Tamil month (mid-July to mid-August), while 'Thiruvathirai' is a nakshatra (star constellation) associated with Lord Shiva and believed to be Rajendra Chola's birth star.
- The festival celebrates the rich Tamil Shaiva Bhakti tradition, which was deeply patronized by the Chola rulers and immortalized by the 63 Nayanmars, the saint-poets of Tamil Shaivism.
- The event highlights the **philosophical depth of Shaiva Siddhanta**, the role of the Tamil language in spreading its teachings, and the spiritual and cultural unity of Tamil civilization.

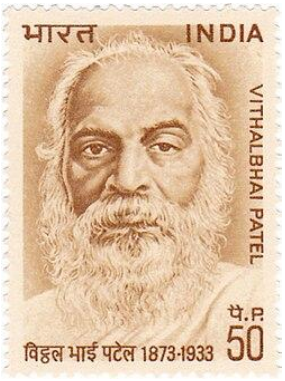
The Kudavolai System

- During the festival, the Prime Minister drew attention to the Chola Empire's early democratic traditions, particularly the Kudavolai system, or **"ballot pot election".**
- This ancient method of voting was used to elect local administrative members, reflecting the Cholas' emphasis on participatory governance and transparency in public affairs.

VITHALBHAI PATEL

Context: The All India Speakers' Conference was held at the Delhi Assembly to mark the 100th anniversary of Vithalbhai Patel becoming the **first elected Indian President (Speaker) of the Central Legislative Assembly,** the legislative body that functioned as Parliament under British.

About Vithalbhai Patel (1873–1933)



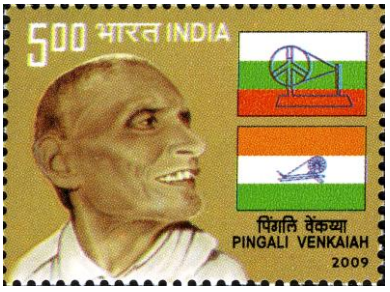
- Vithalbhai was a prominent freedom fighter, legislator, and political leader, known for his pioneering contributions to India's parliamentary system. He was the **elder brother of Sardar Vallabhbhai Patel.**
- He entered public life early, winning election to the Bombay Legislative Council in 1912, and later to the Imperial Legislative Council in 1918.
- In 1924, he was elected to the Central Legislative Assembly from Bombay city and, in 1925, became its first Indian President (Speaker).
- Vithalbhai Patel, along with senior Congress leaders, opposed Mahatma Gandhi's decision to suspend the Non-Cooperation Movement following the Chauri Chaura incident.
- These leaders (including Motilal Nehru and Chittaranjan Das) **went on to form the Swaraj Party in 1923** to pursue constitutional and legislative methods of opposing colonial rule.
- Vithalbhai also **established an independent Parliament Secretariat**, ensuring that its staff reported solely to the President of the Assembly.

PINGALI VENKAYYA

Context: The Prime Minister paid tribute to Shri Pingali Venkayya on his birth anniversary.

About Pingali Venkayya

- Born on 2 August 1876, Pingali Venkayya was a freedom fighter and the **designer of India's National Flag**. He also worked as a teacher, author, agriculturist, and linguist.
- He served in the British Army and was deployed to South Africa during the Second Boer War (1899–1902).
- During the war, when Indian soldiers were required to salute the Union Jack (the British national flag), Venkayya realised the need for a distinct national flag for Indians.
- In 1916, he **published a book titled Bharatha Deshaniki Oka Jatiya Patakam (A National Flag for India).**
- The flag draft he presented to Mahatma Gandhi had two colour bands, red and green, representing India's two major communities, Hindus and Muslims.



- Gandhi recommended adding a white band to represent peace and harmony among all communities, along with a spinning wheel (charkha) to symbolise the nation's economic progress.

National Flag of India

- The present tricolour was **adopted by the Constituent Assembly on 22 July 1947.**
- The National Flag is rectangular and consists of **three horizontal stripes—saffron, white, and green.** At the centre of the white band is the **Ashoka Chakra**, depicted in navy blue. It is a hollow wheel with 24 spokes radiating from the centre.
- The Chakra represents the Dharma Chakra, or the "wheel of the law," found in the Sarnath Lion Capital of Emperor Ashoka (3rd century BCE). It signifies that movement leads to life and stagnation leads to decline.
- The dimensions of the flag follow a 2:3 ratio, meaning the length must be 1.5 times the width.

350TH MARTYRDOM DAY OF GURU TEGH BAHADUR

Context: Indian Railways is commemorating the 350th Martyrdom Day of Guru Tegh Bahadur Ji to raise awareness among the younger generation about his teachings and supreme sacrifice.

About Guru Tegh Bahadur Ji (the ninth Sikh Guru)

- Guru Tegh Bahadur was born in Amritsar in 1621 to **Mata Nanki and Guru Hargobind, the sixth Sikh Guru**.
  - **Guru Hargobind** raised Sikh army and **introduced the concept of saint-soldier.**



- In his childhood, **Guru Tegh Bahadur was called Tyag Mal** because of his ascetic temperament. He spent his early years in Amritsar under Bhai Gurdas, who taught him Gurmukhi, Hindi, Sanskrit, and Indian religious philosophy.
- Baba Budha trained him in swordsmanship, archery, and horse-riding.
- He married Mata Gujri at Kartarpur in 1632, after which he moved to Bakala, near Amritsar.
- Guru Tegh Bahadur travelled extensively to spread the teachings of Guru Nanak. He contributed several hymns to the Guru Granth Sahib, including many Saloks (couplets).
- He is revered as the "**Saviour Guru" and "Srisht-di-Chadar"** because he **stood firmly against religious persecution under Mughal rule**.
- Some scholars preferred calling Guru Teghbahadar Sahib "Dharam ki Chadar," while many scholars in the twentieth century referred to him as "Hind Ki Chadar."
- During the reign of Aurangzeb, many were forced to convert to Islam, and Guru Tegh Bahadur resisted these oppressive measures to defend freedom of faith.
- **Guru Tegh Bahadur was executed in Delhi in 1675 on the orders of Aurangzeb.** His martyrdom is commemorated as **Shaheedi Divas every year on 24 November.**

DADABHAI NAOROJI

Context: The 200th anniversary of Dadabhai Naoroji, fondly remembered as the **Grand Old Man of India**, was recently observed.



About Dadabhai Naoroji (1825–1917)

- Dadabhai Naoroji was a pioneering **nationalist leader, social reformer, and intellectua**l whose ideas laid the foundation for India's freedom struggle.
- He became the **first Indian professor at Elphinstone College**, and established institutions such as the Zoroastrian Trust Funds of Europe.
- He was among the founders of the Indian National Congress and served as its president three times - in 1886, 1893, and 1906.
- In 1867, he **founded the East India Association**, which brought together Indians and sympathetic British supporters to advocate for Indian political rights.

- He became the **first Indian elected to the British House of Commons in 1892**, where he exposed the economic exploitation of India through his famous **Drain Theory,** later elaborated in his book **Poverty and Un-British Rule in India (1901).**
- As **Congress President in 1906, he asserted Swaraj as the ultimate goal of the Indian national movement.**
- Naoroji founded the **Rahnumai Mazdayasan Sabha (1851)** to reform Parsi society and started the **Rast Goftar** *(The Truth Teller)* newspaper to promote social and religious reforms.
- As a social reformer, he promoted women's education, simplified Parsi social customs, and championed equality in everyday life. He also supported greater Indian access to the Civil Services and other professions.

PERUMBIDUGU MUTHARAIYAR II

Context: A commemorative postage stamp in honour of King Perumbidugu Mutharaiyar II was released by the Vice President.

About Perumbidugu Mutharaiyar II (705 AD–745 AD)



- Also known as **Suvaran Maran**, was a ruler of the **Mutharaiyar lineage, who served as feudatories (subordinate rulers) under the Pallavas**.
- Suvaran Maran was also known as Shatrubhayankar. He seems to have patronised Shaivya and other scholars, as a Jain monk Vimalachandra is mentioned as visiting his court to debate them.
- As Pallava power weakened, several such local chiefs gained greater authority and prominence, and many came to be treated as independent rulers.
- He is believed to have fought bravely in several battles **alongside the Pallava king Nandivarman**, and is remembered as a capable administrator.
- Suvaran Maran ruled from Tiruchirappalli for nearly four decades and that his reign was marked by administrative stability, territorial expansion, cultural patronage, and military prowess
- The Mutharaiyars controlled regions such as **Thanjavur, Pudukkottai, Perambalur, Tiruchirappalli**, and other areas near the Cauvery river.
- The Mutharaiyars ruled for a long period, almost from the time of Parameśvaravarman I of the Pallava dynasty.
- The Pallava period witnessed a revival of Hinduism during a time when Jainism and Buddhism were influential. As Pallava feudatories, the **Mutharaiyars became well known as temple builders,** with temples like Vijayalaya Choleswaram temple, Sattan Pazhiyili's cave temple.

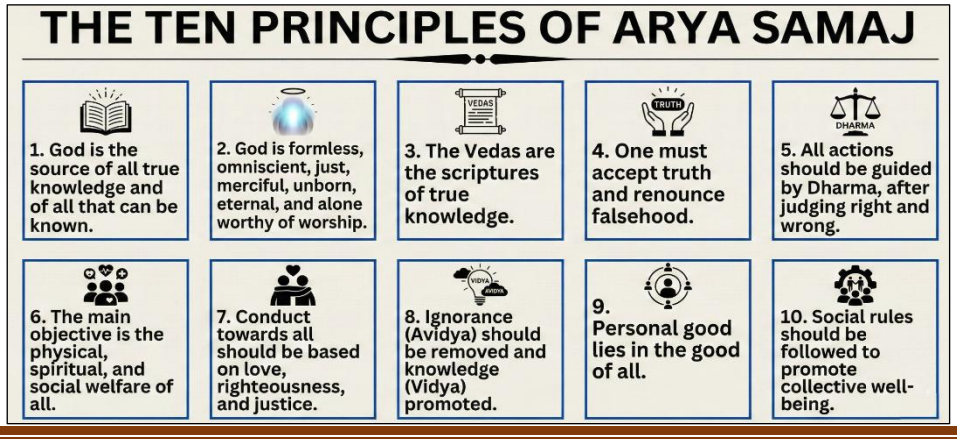
MISCELLANEOUS

150 YEARS OF ARYA SAMAJ

Context: PM Modi addressed the International Arya Mahasammelan 2025, a key event of the **Jyāna Jyoti Festival** marking the **200th birth anniversary of Swami Dayanand Saraswati** and **150 years of the Arya Samaj.**

About Arya Samaj

- The Arya Samaj is a **socio-cultural organisation founded in 1875** in **Bombay** by **Swami Dayanand Saraswati**. It is not a separate religion, but a **monotheistic reform movement within Hinduism.**



- It **rejected excessive ritualism, superstition, and rigid social dogma**s, and sought to unite Hindu society on the basis of Vedic teachings.
- Its guiding motto is "***Krinvanto Vishwam Aryam"*** (let us make the world a noble place to live in). The movement is guided by ten fundamental principles.

Contributions of Arya Samaj

- Promoted women's rights through support for widow remarriage, opposition to child marriage and Sati, and advocacy of female education.
- Spread modern and Vedic education through the **Dayanand Anglo-Vedic (DAV) schools and colleges.**
- The Samaj led initiatives like the **Shuddhi movement** to bring back those who had converted to other religions into Hinduism.
- Campaigned against caste discrimination and untouchability.
- Though primarily a socio-religious movement, it **influenced Indian nationalism.**
- Leaders such as **Lala Lajpat Rai** and **Swami Shraddhanand** were closely associated with it.



About Maharishi Dayanand Saraswati (1824–1883)

- Born on February 12, 1824, in Tankara, Gujarat, initially named Mool Shankar, he was steeped in religious traditions in his early childhood and studied Hindu scriptures intensively.
- He believed Hindu society had fragmented due to the corruption of Sanatan Dharma, particularly by sections of the priestly class seeking to preserve their dominance.
- His book ***Satyarth Prakash*** called for a return to pure Vedic principles. Even before founding Arya Samaj, he **established several Vedic schools and Gurukuls to democratise access to Vedic knowledge.**
- He founded the Arya Samaj on April 7, 1875, emphasizing a **return to the Vedas** as the true authority in Hindu religion and promoting the principles of truth, righteousness, and social reform.

Dayanand's Philosophy and Legacy

- He argued that **caste should be based on ability,** not birth. He **opposed untouchability,** which he saw as a result of long-standing social distortion.
- He was the first to use the term swaraj (self-rule) in 1875.
- Through Arya Samaj, he promoted social unity and **reconversion into the Hindu fold.**
- His legacy continues through Arya Samaj centres and DAV institutions across India.
- Sarvepalli Radhakrishnan described him as "a maker of modern India."

MUZIRIS HERITAGE PROJECT (MHP)

- Muziris Heritage Project is an initiative that aims restoration and preservation of numerous historical sites, including forts, palaces, synagogues, churches, mosques, and traditional markets across the Ernakulam and Thrissur districts.
- Launched in 2009, MHP is **one of India's largest conservation projects**, with collaboration between the state and central governments, and support from UNESCO, aimed at preserving a culture that is over 3,000 years old.
- **Muziris was an ancient port on the west coast of southern India** in the 1st century BCE.
- It was the **primary trading hub for the Chera kingdom**, connecting it to the Roman and Greek worlds, mainly through the **spice trade**. It was located near present-day Kodungallur in Kerala.

RAGHUJI BHOSALE I'S SWORD RECLAIMED

Context: The Maharashtra government recently reclaimed the iconic sword of Maratha warrior Raghuji Bhosale I at a Sotheby's auction in London for £38,100 (around Rs 43.49 lakh).

- The sword is a classic example of **Maratha 'firangi' weaponry,** with a straight European blade and a locally crafted Mulheri hilt.
- The blade bears the European maker's mark and a gold-inlaid Devanagari inscription reading **'Shrimant Raghoji Bhosale Senasaheb Subha Firang'.**

- It is historically significant, as most medieval Indian weapons lacked decoration or inscriptions, making this sword rare.



Raghuji Bhosale I (1695–1755)

- Raghuji founded the **Nagpur-based Bhosale dynasty** and was a key Maratha general under Chhatrapati Shahu Maharaj, who honoured him with the title '**Senasaheb Subha**'.
- He led campaigns in Bengal (1745, 1755), expanding Maratha rule into Bengal, Odisha, Chanda, Chhattisgarh, and Sambalpur.
- His victories in South India, defeating the Nawabs of Kurnool and Cuddapah, further strengthened Maratha dominance in the region.

KOLHAPURI CHAPPALS

Context: Italian luxury fashion brand Prada recently listed a pair of flat leather sandals priced at nearly ₹1 lakh on its website. These sandals closely resemble India's age-old Kolhapuri chappal.

About Kolhapuri Chappals



- **Origin and Craftsmanship:** Handcrafted unisex leather sandals traditionally made by artisans in **Kolhapur, Maharashtra**, believed to have originated centuries ago.
- **Distinctive Features:** Known for braided leather straps, intricate cutwork, and fine craftsmanship.
- **Traditional Process:** Made using vegetable-tanned leather and manual techniques passed down through generations.
- **Recognition:** Granted a Geographical Indication (GI) tag in 2019.

Under the Geographical Indications of Goods (Registration and Protection) Act, 1999, the term "Kolhapuri Chappal" is protected within India, restricting unauthorised commercial use. These protections do not extend beyond India's borders.

KUMBAKONAM VETRILAI AND THOVALAI MAANIKKA MAALAI

Context: Kumbakonam betel leaf and Thovalai maanikka maalai from **Tamil Nadu** received Geographical Indications (GI) tag for their unique cultural significance.

Kumbakonam Vetrilai	A betel (pan) leaf grown in Thanjavur's fertile Cauvery River basin. Known for high antioxidant and anti-inflammatory properties due to chavicol.
Thovalai Maanikka Maalai	A special garland made only in Thovalai. Flowers are carefully folded and arranged in geometric patterns to resemble gems, especially rubies.

PRIME MINISTERS MUSEUM AND LIBRARY SOCIETY

- The Prime Minister recently chaired the 47th Annual General Meeting of the **Prime Ministers Museum and Library (PMML) Society** in the **Teen Murti House** campus.
- **Teen Murti House was the official residence of the Commander-in-Chief in India.** It was designed by Robert Tor Russel and built in 1929-30 as part of Edwin Lutyens' imperial capital.
- **Post independence, it became the official residence of independent India's first PM Jawaharlal Nehru.**
- After his death in 1964, the government decided to dedicate it to Nehru and converted it into a museum and a library.
- **Formerly known as the Nehru Museum and Library Society,** PMML is an autonomous institution **under the Ministry of Culture.**

JODIDARAN

Context: The Sirmaur District of Himachal Pradesh recently witnessed the observance of an age-old local tradition known as 'Jodidaran'.

About Jodidaran

- Jodidaran is a traditional form of polyandrous marriage practiced among the Hatti tribe in the Trans-Giri region of Himachal Pradesh, **where a woman marries two or more brothers**.

- This practice helps prevent the division of ancestral land and strengthens family unity in hilly farming communities.
- This custom is practised by the **Hatti tribes,** who were granted **Scheduled Tribe (ST) status** by the Central Government in 2022.

About Hatti tribes

- The Hattis are a closely-knit community named after their **practice of selling homegrown produce, meat, wool, and other goods in small village markets called 'haats'.**
- They are governed by a traditional council called the **Khumbli**, which, much like the khaps of Haryana, handles community and social matters.

NATIONAL FLAG DAY

Context: National Flag Day (Tiranga Adoption Day) is observed in India every year on **July 22.**

- The day commemorates the adoption of the Indian National Flag by the Constituent Assembly on July 22, 1947, a few weeks before India gained independence.



About National Flag

- The design of the Indian flag evolved through several stages during the freedom struggle. The **earliest version was created in 1904 by Sister Nivedita, f**eaturing red and yellow colours symbolising strength and victory, with the words Vande Mataram written in Bengali.
- Over the years, the flag underwent many changes until the present tricolour design was officially adopted.
- The **modern Tiranga consists of three horizontal stripes,** saffron, white, and green, with the Ashoka Chakra in navy blue at the centre, replacing the earlier charkha symbol.

Each element of the flag carries deep symbolism:

- **Saffron (top band):** Represents courage, sacrifice, and the spirit of nationalism.
- **White (middle band):** Denotes truth, peace, and purity.
- **Green (bottom band):** Symbolises fertility, prosperity, and India's agricultural heritage, along with a commitment to environmental protection.
- **Ashoka Chakra (navy blue wheel):** Known as the wheel of law (Dharma Chakra), it signifies progress, movement, and the idea that a nation must constantly advance.

PIPRAHWA RELICS

Context: The Ministry of Culture announced the historic return of the sacred Piprahwa relics of Lord Buddha to their home in India.

About Piprahwa Relics

- **Discovery:** Unearthed in 1898 by British civil engineer William Claxton Peppé at Piprahwa, near Siddharthnagar in Uttar Pradesh.
- **Significance:** The relics are believed to contain the mortal remains of Lord Buddha, enshrined by his Sakya clan followers in the 3rd century BCE.
- **Composition:** Includes bone fragments, crystal and soapstone caskets, a sandstone coffer, gold ornaments, and gemstones.

- **Inscription**: A Brahmi script engraving on one casket identifies the relics as those of the Buddha, deposited by the Sakyas.

KAKORI TRAIN ROBBERY

Context: The Prime Minister recently paid tributes to the revolutionaries of the Kakori Train Robbery on the occasion of its 100th anniversary.

About Kakori Train Robbery

- The incident occurred on August 9, 1925, when members of the **Hindustan Republican Association (HRA)** attacked the **8-Down Train** on the Saharanpur–Lucknow line near Kakori railway station in Uttar Pradesh.
- The train was carrying **government treasury funds**, which the revolutionaries seized to support their armed struggle against British rule.
- In response, the British government launched a large-scale crackdown. Many participants were arrested, tried, and given harsh punishments.
- The robbery was led by Ram Prasad Bismil, Ashfaqullah Khan, Chandrashekhar Azad, Rajendra Lahiri, and other members of the HRA.

Kakori Conspiracy Case

- Bismil and some others were charged with various offences, including robbery and murder. Two of the accused – Ashfaqullah Khan and Sachindranath Bakshi were captured after the trial.
- The legal defence for the arrested revolutionaries was provided by Govind Ballabh Pant, Mohan Lal Saxena, Chandra Bhanu Gupta, Ajit Prasad Jain, Gopi Nath Srivastava, R. M. Bahadurji, B. K. Chaudhury, Nirmal Chandra Chaturvedi and Kripa Shankar Hajela.
- **Ram Prasad Bismil, Ashfaqulla Khan, Rajendra Lahiri,** and **Roshan Singh** were executed in 1927, while others received long prison sentences. Chandrashekhar Azad evaded capture and continued the struggle until his death in 1931.

NATIONAL HANDLOOM DAY

Context: The 11th National Handloom Day will be celebrated on 7 August 2025, with the theme "Weaving Innovation into Tradition."

About National Handloom Day

- National Handloom Day was first observed on August 7, 2015, inaugurated by PM Modi.
- The date was chosen to commemorate the Swadeshi Movement, which began on August 7, 1905.
- The movement was launched in response to Lord Curzon's decision to partition Bengal, announced on July 19, 1905. The partition created East Bengal and Assam (with a Muslim majority) and Western Bengal (with a Hindu majority).

Handloom Awards

- The Ministry of Textiles announced the conferment of the prestigious Sant Kabir Handloom Award and National Handloom Awards. These awards are part of the Handloom Marketing Assistance (HMA) component under the National Handloom Development Programme (NHDP).

Sant Kabir Handloom Award	• Recognizes outstanding handloom weavers who have significantly contributed to the sector's growth. • Eligible weavers may be recipients of national or state awards, national merit certificates, or recognized for extraordinary skills and contributions to promoting and preserving weaving traditions, community welfare, and sector development. Cash Prize: Rs. 3.5 lakh
National Handloom Awards	• These awards honour weavers who show exceptional skill, creativity, and dedication in their craft. • The objective is to encourage weavers to continue their high-quality work and to inspire others in the handloom sector. Cash Prize: Rs. 2.00 lakh

DARUMA DOLL

Context: During his visit to the Shorinzan Daruma-ji Temple in Kitakatsuragi, Japan, on August 29, 2025, Prime Minister Narendra Modi was presented with a traditional Daruma doll.

About Daruma Doll

- A Daruma doll is a **traditional Japanese round, hollow figurine modeled after Bodhidharma,** the founder of Zen Buddhism, and is widely regarded as a symbol of perseverance, resilience, and good luck.
- The doll is typically **red and limbless**, reflecting the legend that Bodhidharma meditated for nine years without moving, causing his limbs to atrophy.
- It is widely regarded as a symbol of perseverance, determination, and good luck, commonly used to set personal goals and track progress.
- The doll's rounded, weighted base allows it to upright itself when pushed over, symbolising the Japanese proverb "Nana korobi ya oki" *(fall seven times, get up eight)* which represents resilience.

About Bodhidharma

- Bodhidharma, an Indian monk from Kancheepuram, is known in Japan as Daruma Daishi. After travelling to China, he is believed to have meditated in a cave in Henan Province.
- The name "Daruma" is derived from the Sanskrit word "Dharma", though the term has no direct equivalent in Japanese or Chinese languages.
- The Shorinzan Daruma-ji Temple in Takasaki, Gunma, established in 1697, is widely regarded as the birthplace of the Daruma doll tradition.

NATIONAL ARCHIVES OF INDIA

Context: The 50th Golden Jubilee Meeting of the National Committee of Archivists (NCA) was recently organised by the National Archives of India (NAI).

About National Committee of Archivists (NCA)

- Established in 1953, the NCA serves as an all-India forum of professional archivists.
- Its first meeting was held in Hyderabad in 1954.
- The Committee is chaired by the Director General of Archives, NAI, and includes representatives from all State and UT archives.

National Archives of India (NAI)

- The NAI **functions under the Ministry of Culture** and serves as the repository of all non-current government records, making them available to administrators, researchers, and scholars.
- It was **originally established as the Imperial Record Department in 1891** in Calcutta, then the capital of British India. It is now located in **New Delhi.**
- **NAI preserves and manages only public, unclassified government records** and does not receive classified documents.
- Its holdings follow a continuous series starting from 1748 and include records in English, Arabic, Hindi, Persian, Sanskrit, and Urdu.
- It has expanded digital access through the **Abhilekh Patal portal,** which makes archival material available online.
- Under the **Public Records Act, 1993,** central ministries and departments must transfer records older than 25 years to the NAI, unless they contain classified information.

SELF-RESPECT MOVEMENT

Context: The year 2025 marks the 100th anniversary of the Self-Respect Movement.

About Self-Respect Movement

- The Self-Respect Movement was a major human rights and social reform movement launched in **Tamil Nadu** in **1925** by **E.V. Ramasamy (Periyar)**, along with S. Ramanathan.
- Its primary aim was **to secure equal rights and social justice for marginalized communities,** particularly the non-Brahmin sections of society, challenged by rigid caste hierarchies and deep social inequalities.

Key Emphases of the Movement

- **Abolition of caste discrimination and all forms of social inequality.**
- **Rationalism and critical thinking**, encouraging people to question religious orthodoxy, superstitions, and oppressive social customs.
- **Women's rights**, including support for widow remarriage, gender equality, and opposition to the dowry system.

- **Self-respect marriages**, performed without priests or religious rituals, symbolizing equality, dignity, and rationality.

VANDE MATARAM

Context: The Union Cabinet has announced a nationwide celebration of the 150th anniversary of the Vande Mataram.

About Vande Mataram

- Vande Mataram is the **national song of India** and a powerful symbol of patriotism and national unity.
- It was **written by Bankim Chandra Chatterjee**. It was first published in the literary journal ***Bangadarshan*** on 7 November 1875. Later, Bankim Chandra Chatterjee incorporated the hymn in his novel '***Anandamath***' (1882). It was set to music by Rabindranath Tagore.
- The song became a rallying cry during the Indian independence movement and was officially **adopted as the national song of the Republic of India on 24 January 1950,** holding equal honor with the national anthem.
- The song celebrates Mother India and seeks to inspire patriotism, courage, and national unity. Its emotional appeal made it a powerful symbol of the freedom movement.
- Notably, Vande Mataram was first sung publicly by Rabindranath Tagore in 1896 at a session of the Indian National Congress.

About Bankim Chandra Chatterjee (1838–1894)

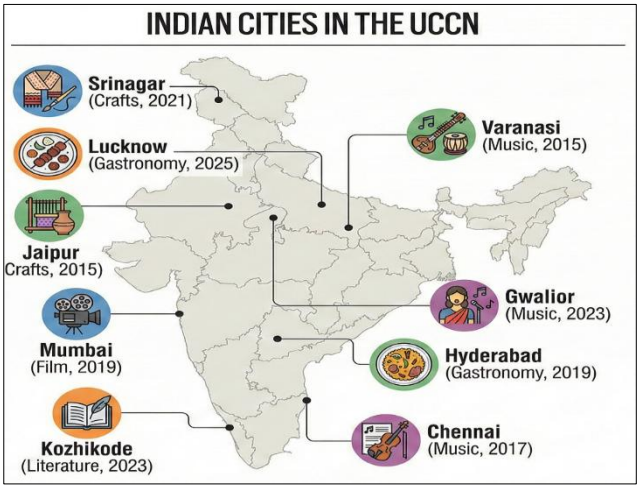


- Chatterjee was one of the most influential thinkers and writers of nineteenth-century Bengal.
- He occupies a central place in the intellectual and literary history of the period and played a crucial role in **shaping modern Bengali prose** as well as early nationalist ideas in India.
- As a novelist, poet, and essayist, Bankim addressed the social, cultural, and moral challenges of a society living under colonial rule. His major works: ***Durgeshnandini*** (1865), ***Kapalkundala*** (1866), ***Anandamath*** (1882), and ***Devi Chaudhurani*** (1884), reflect a search for cultural self-respect and collective identity.

LUCKNOW: THE CREATIVE CITY OF GASTRONOMY

Context: Lucknow was officially designated a UNESCO Creative City of Gastronomy. With this inclusion, the global network now consists of 408 cities from over 100 countries.

Why was Lucknow Recognised?



- Lucknow is globally known for its **Awadhi cuisine,** which reflects centuries-old culinary traditions.
- The city has preserved **traditional cooking methods while also encouraging innovation in food practices.**

About the UNESCO Creative Cities Network

- Launched in 2004, it promotes cities that use culture and creativity as tools for sustainable urban development.
- **Aim:** The network is aimed at leveraging the creative, social, and economic potential of cultural industries.
- **Categories in UCCN**: Crafts and Folk Art, Design, Film, Gastronomy, Literature, Media Arts, Music, *Architecture (added as a new theme in 2025).*

YUGE YUGEEN BHARAT NATIONAL MUSEUM

Context: The first gallery of the upcoming Yuge Yugeen Bharat National Museum is expected to open within one year.

About Yuge Yugeen Bharat National Museum

- Located in New Delhi, the museum will be the largest museum in the world.

- It will be **housed in the heritage North and South Block Secretariat buildings**, which are being repurposed under the Central Vista redevelopment project.
- The name "Yuge Yugeen Bharat", derived from Sanskrit, means "Everlasting India", highlighting the continuity of Indian civilization.
- The project is an Indo-French collaboration, with France Museums Development providing technical expertise in museum design and management. This initiative is part of the Central Vista Redevelopment Project.
- **Theme**: Traces 5,000 years of Indian civilisation, covering culture, ideas, knowledge systems, and heritage.
- The first gallery, titled "Time and Timelessness", will explore India's civilisational understanding of time, showcasing its cultural, philosophical, and scientific evolution.
- The museum will be organised into thematic zones presenting key historical events, personalities, ideas, and achievements that shaped India's past and continue to influence its present.

GYAN BHARATAM MISSION

Context: The Gyan Bharatam Conference, a landmark three-day international gathering from 11–13 September 2025 marked the formal launch of the Gyan Bharatam Mission.

About Gyan Bharatam Mission

- The Gyan Bharatam Mission is a **national initiative** to preserve, digitise, study, and share India's vast manuscript heritage.
- It aims to combine traditional knowledge with modern technology so that ancient texts remain accessible to scholars, students, and future generations.
- The initiative **has been launched by the Ministry of Culture** in 2025, as a Central Sector Scheme for the period 2024–31.
- **Targets**: Digitisation and cataloguing of over one crore manuscripts and creation of a National Digital Repository.
- **Technology Use:** Integration of Artificial Intelligence, Optical Character Recognition (OCR), and blockchain for smart access and transcription.
- **Infrastructure:** Establishment of new conservation laboratories for palm-leaf, birch-bark, and paper manuscripts.
- **Community Engagement:** Creation of a network of trained volunteers, called ***Pandulipi Mitras***, across about 100 districts.



Implementation Structure

- **Cluster Centres** will manage manuscript-related work for their own collections as well as for up to 20 designated partner centres.
- **Independent Centres** will handle activities limited to their own manuscript collections.

About Gyan-Setu

- Gyan-Setu is a **National AI Innovation Challenge** launched by the **Ministry of Culture** under the Gyan Bharatam Mission, as part of the Gyan Bharatam Conference on "Reclaiming India's Knowledge Legacy through Manuscript Heritage."
- With more than ten million manuscripts covering fields such as philosophy, medicine, governance, and the arts, the **initiative seeks to harness artificial intelligence** to make this knowledge heritage more accessible, understandable, and meaningful for the world.

SPORTS IN NEWS

ICC WOMEN'S CRICKET WORLD CUP

Context: In a historic achievement, the Indian Women's Cricket Team won their first-ever ODI World Cup title after defeating South Africa in the final

- This was the 13th edition of the Women's Cricket World Cup.
- The final took place at DY Patil Stadium in Navi Mumbai, India. **Shafali Verma earned Player of the Match** while **Deepti Sharma received Player of the Tournament.**
- India scored 298/7 in 50 overs (Shafali Verma 87; Ayabonga Khaka 3/58), while South Africa scored 246 all out in 45.3 overs (Laura Wolvaardt 101; Deepti Sharma 5/39).

About Women's Cricket World Cup

- The Women's Cricket World Cup is a **quadrennial event** (every four years) organized by the ICC, first held in 1973 in England.
- Australia holds the record for most titles (7), followed by England (4) and New Zealand (1).
- **Format:** One Day International (ODI) format, 50 overs per side

DOHA DIAMOND LEAGUE

Context: At the Doha leg of the Diamond League, Neeraj Chopra crossed the 90m mark with a 90.23m throw, finishing second in the league. He became only the third Asian and the 25th athlete in history to achieve this milestone.

- Germany's Julian Weber won the event with a 91.06m throw.
- Historically, the 90m barrier in men's javelin (800g) has been surpassed 129 times by 26 athletes (counting their best throw in each event).
- Remarkably, Jan Zelezny of Czechia, Chopra's coach and world record holder, accounts for 34 of these throws.

WORLD TEST CHAMPIONSHIP

Context: South Africa clinched its first ICC trophy in 27 years by defeating Australia by five wickets in the World Test Championship (WTC) final held at Lord's, London.

About the World Test Championship (WTC)

- The ICC WTC is a league-style tournament introduced by the International Cricket Council (ICC) to make Test cricket more competitive and engaging.
- It was **launched in 2019** to determine the world's best Test team over a fixed cycle of matches.
- The **competition includes the top nine Test-playing nations**, who play bilateral Test series (home and away) over a two-year cycle.
- Each team earns points for wins, ties, or draws based on the WTC points system (independently of the ICC Test rankings.)

FIDE WORLD RAPID TEAM CHAMPIONSHIP

Context: Team MGDI, featuring Indian Grandmaster Arjun Erigaisi as the star player and N. Srinath as the non-playing captain, won the FIDE World Rapid Team Championship 2025 held in London.

About the Championship

- **The FIDE World Rapid and Blitz Team Championships** is an international event open to any team that fulfills the official participation requirements set by FIDE (the International Chess Federation).
- Teams may consist of club players, members from different national federations, or independent chess players.
- Each team must include at least six and no more than nine players.
- The team composition must include: At least one female player, and At least one recreational player (defined as someone who has never achieved a FIDE Standard, Rapid, or Blitz rating of 2000 Elo points (or is unrated) as of March 2025.)
- **Prize Fund:** €500,000. (€310,000 is allocated to Rapid, €190,000 is allocated to Blitz.)

DURAND CUP TOURNAMENT

Context: The President of India recently unveiled the trophies of the Durand Cup Tournament, which include the Durand Cup, the President's Cup, and the Shimla Trophy.

About Durand Cup Tournament

- The Durand Cup is **Asia's oldest football tournament** and the fifth oldest national football competition in the world, first held in 1888 in Annadale, Shimla, Himachal Pradesh.
- The Durand Cup is named after its founder Sir Henry Mortimer Durand, who served as the Foreign Secretary of British India from 1884 to 1894.
- The tournament is organised by the Indian Army on behalf of the three Armed Services, under the aegis of the All India Football Federation (AIFF).
- After its inaugural edition in Shimla, the tournament was shifted to New Delhi in 1940, where it continued to be held until 2016. It is now a multi-city, multi-state event across eastern and northeastern India.
- A unique feature of the Durand Cup is that the winning team receives three trophies:
  - **Two rolling trophies:** The Durand Cup and The Shimla Trophy.
  - **One permanent trophy:** The President's Cup.

CHESS WORLD CUP

- India will host the FIDE Chess World Cup 2025, scheduled to take place in the month of November.
- The World Cup will feature 206 players competing in a knockout format.
- The top three finishers of the 2025 World Cup will earn direct qualification for the 2026 Candidates Tournament, which determines the challenger for the World Chess Championship.
- This is the second time India is hosting the World Cup, after hosting it at Hyderabad in 2002.
- The last major FIDE event in the country was the Chess Olympiad of 2022, held at Mamallapuram, near Chennai.

FIDE WOMEN'S WORLD CUP 2025

Context: India's Divya Deshmukh, aged 19, created history by winning the FIDE Women's World Cup 2025, defeating veteran Koneru Humpy (38) in the final through tiebreakers on 28th July.

About the Event:

- With this victory, Divya Deshmukh became the first Indian woman ever to win the FIDE Women's World Cup.
- She also earned the title of India's 88th Grandmaster and became the fourth Indian woman to achieve this distinction.
- The championship was held in Batumi, Georgia, from July 6 to 28, 2025.

About FIDE Women's World Cup

- It is a prestigious knockout chess tournament organized by FIDE (International Chess Federation) to determine top contenders for the Women's Candidates Tournament and advance the World Chess Championship cycle.

U17 WORLD WRESTLING CHAMPIONSHIPS 2025

Context: The U17 World Wrestling Championships 2025 took place at the Ano Liosia Olympic Hall in Athens, Greece, from July 28 to August 3, 2025.

Key Highlights:

- Hardeep Singh created history by becoming India's first-ever U17 World Champion in the 110 kg Greco-Roman category. In a thrilling final, he made a remarkable comeback from a 0–2 deficit to defeat Iran's Yazdan Delrouz 3–2.
- According to United World Wrestling (UWW), this is the **heaviest weight class in which India has ever won a gold medal at the U17 World Championships.**

57TH INTERNATIONAL CHEMISTRY OLYMPIAD (ICHO) 2025

Context: India's four-member student team delivered an outstanding performance at the 57th International Chemistry Olympiad (IChO) 2025, bringing home two gold and two silver medals.

About the International Chemistry Olympiad (IChO):

- The IChO is an annual academic competition for the world's most talented high school chemistry students. It began in 1968 and is one of the International Science Olympiads.
- The 2025 Olympiad was hosted in Dubai, United Arab Emirates, from July 5 to 14.

- It witnessed participation from 354 students across 90 countries and five observer nations.
- India achieved sixth position in the overall medal tally, sharing the spot with Ukraine, Uzbekistan, Kazakhstan, and Israel.

NEERAJ CHOPRA CLASSIC 2025

Context: India's Olympic champion Neeraj Chopra clinched victory at the inaugural Neeraj Chopra (NC) Classic 2025 with an impressive javelin throw of 86.18 metres.

About the Neeraj Chopra Classic:

- The NC Classic is India's first international javelin competition. It is recognized as a **World Athletics Gold-level event,** making it India's first international javelin meet of such a high category.
- The event was held at the Sree Kanteerava Stadium, Bengaluru, on 5th July 2025.
- Julius Yego (Kenya) secured the second position with a throw of 84.51 metres, while Rumesh Pathirage (Sri Lanka) finished third with 84.34 metres.

KHELO INDIA WATER SPORTS FESTIVAL

- The first-ever Khelo India Water Sports Festival (KIWSF) was held at Dal Lake in Jammu & Kashmir.
- More than 400 top athletes from 36 States and Union Territories competed for 24 gold medals across rowing, kayaking, and canoeing events.
- The festival was jointly organised by the Sports Authority of India (SAI) and the Jammu & Kashmir Sports Council.
- KIWSF is part of the broader Khelo India initiative, launched in 2017–18 to promote grassroots sports. In 2025, the Khelo India Beach Games were also held in Diu in May.
- The festival's **mascot** is the Himalayan Kingfisher, and its **logo** features a Shikara on Dal Lake.
- Madhya Pradesh (18) topped the Medal Tally, followed by Odisha (10) and Kerala (7).

BRONCO TEST

Context: The Board of Control for Cricket in India (BCCI) has introduced the Bronco fitness test for Indian players to ensure higher fitness standards.

- The Bronco test is a widely used aerobic fitness assessment, especially in sports such as rugby, football, and athletics, to evaluate an athlete's endurance, speed, and recovery capacity.
- The test requires continuous shuttle running: a 20-metre run, followed by a 40-metre run, and then a 60-metre run, which together make one set.
- Players must complete five such sets—a total of 1,200 metres—without any rest.

U20 WORLD WRESTLING CHAMPIONSHIPS 2025

Context: At the U20 World Wrestling Championships 2025 held in Samokov, Bulgaria from August 17 to 24, India registered its best-ever performance.

- Kajal Dochak, a 17-year-old wrestler from Haryana, won the women's 72 kg final with an 8–6 victory over China's Liu Yuqi, becoming India's second U20 World Champion of the week.
- Tapasya Gahlawat, aged 19, secured India's first gold medal of the tournament in the women's 57 kg category by defeating Norway's Felicitas Domajeva 5–2.
- The championship featured medal events across three disciplines — men's freestyle, Greco-Roman, and women's freestyle — each with 10 weight categories.

NATIONAL SPORTS DAY 2025

Context: National Sports Day is celebrated every year on August 29 to honour the **birth anniversary of Major Dhyan Chand**, one of the greatest field hockey players in history.

- The theme for 2025 is "Ek Ghanta, Khel ke Maidan Mein."
- National Sports Day was first observed in **2012** with the **objective of promoting sports culture in India and recognising the achievements and contributions of Indian athletes.**

About Major Dhyan Chand

- Born on 29 August 1905 in Allahabad (now Prayagraj), Dhyan Chand is celebrated as one of the greatest field hockey players in history.

- Known as "**The Wizard**" for his unmatched ball control and goal-scoring skill, he joined the British Indian Army in 1922, where his hockey career began.
- He **led India to three Olympic gold medals:** 1928 (Amsterdam), 1932 (Los Angeles), and 1936 (Berlin). He was the top scorer in 1928 with 14 goals. His performance in Berlin was so remarkable that he was reportedly offered a position in the German army, which he declined.
- Dhyan Chand is believed to have scored over 1,000 career goals and was **honoured with the Padma Bhushan in 1956.**

BADMINTON WORLD CHAMPIONSHIP 2025

- Paris, France hosted the World Championships for the first time since 2010, in August 2025.
- Shi Yuqi of China won his first-ever Men's Singles title, defeating Kunlavut Vitidsarn of Thailand in the final.
- In the Women's Singles, Akane Yamaguchi of Japan claimed the championship by defeating China's Chen Yufei.
- India's pair Satwiksairaj Rankireddy and Chirag Shetty secured a bronze medal in the Men's Doubles category.
- Over the years, 11 Indian shuttlers have won 15 medals at the BWF World Championships, with P.V. Sindhu being the only Indian to win gold, achieving the world title in 2019.

INDIA TO HOST 2030 COMMONWEALTH GAMES

Context: India will host the centenary edition of the 2030 Commonwealth Games (CWG), with Ahmedabad proposed as the host city. This will be India's second time hosting the event, following the 2010 CWG in New Delhi.

About the Commonwealth Games

- The Commonwealth Games are the **second-largest multi-sport event in the world, after the Olympics** and are organised every four years.
- They were **first held in 1930 in Hamilton, Canada,** as the "British Empire Games".
- As decolonisation progressed, the name evolved: British Empire and Commonwealth Games (1954), British Commonwealth Games (1970), and finally "Commonwealth Games" from 1978 onwards, reflecting a shift from empire to a voluntary association of nations.
- They are overseen by the **Commonwealth Games Federation, based in London,** which sets the sports programme and awards hosting rights.
- The Games **bring together athletes from 74 Commonwealth Games Associations,** which represent **56 Commonwealth member states** and several dependent territories.
- India first participated in 1934 and has since become one of the stronger nations in sports such as shooting, wrestling, boxing, and weightlifting.

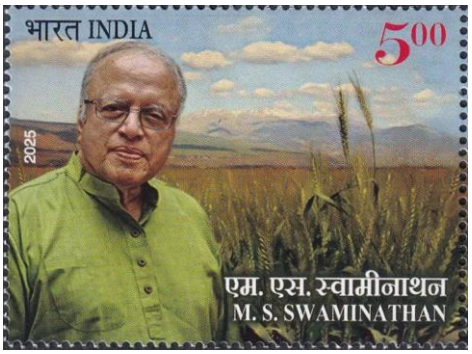
AWARDS & PERSONS IN NEWS

M.S. SWAMINATHAN CENTENARY CONFERENCE

Context: The M.S. Swaminathan Centenary International Conference was held in New Delhi.

- The conference was organised by the M.S. Swaminathan Research Foundation (MSSRF) in collaboration with the Ministry of Agriculture and Farmers Welfare, the Indian Council of Agricultural Research (ICAR), and the National Academy of Agricultural Sciences (NAAS).
- The theme of the conference, "Evergreen Revolution: The Pathway to Biohappiness," reflected Prof. M.S. Swaminathan's lifelong commitment to ensuring food security and improving the well-being of farmers.

About M.S. Swaminathan (1925–2023)



- M.S. Swaminathan was an eminent Indian geneticist, plant breeder, and humanitarian, widely recognized as the "**Father of the Green Revolution in India**" for his pivotal role in transforming Indian agriculture and ensuring food security.

Key Contributions

1. Architect of India's Green Revolution (1960s–70s)

- Played a central role in transforming India from a food-deficit nation to a food-secure one by promoting scientific crop breeding and modern agronomic practices.
- Alongside Norman Borlaug, helped develop wheat varieties with dwarfing genes, creating shorter and sturdier plants that significantly improved yields.
- Introduced semi-dwarf Mexican wheat varieties such as Sonora and Lerma Rojo 64, and promoted high-yielding Indica rice varieties across India.
- Contributed to the development of **Pusa Basmati (1989)**: the world's first semi-dwarf, high-yielding Basmati rice variety.

2. Global Influence

- Advocated for **climate-resilient crops** (drought- and salt-tolerant varieties) and **championed millets (Shree Anna)** long before global discussions on climate adaptation grew.
- Introduced the idea of "**biohappiness**"- the idea that human well-being increases when biodiversity is conserved and used sustainably for nutrition, health, and livelihood improvements.
- **Advocated for gender justice in agriculture**; introduced the Women Farmers' Entitlements Bill (2011) to secure women's rights over land, water, and farming resources.
- **Promoted the shift from food security to nutrition security,** addressing calorie hunger, protein hunger, and hidden hunger (micronutrient deficiencies).

3. Major National and International Honours:

- Padma Shri (1967), Padma Bhushan (1972), Padma Vibhushan (1987), **Bharat Ratna (2024)**
- Shanti Swarup Bhatnagar Award (1961), Lal Bahadur Shastri National Award (1999), Indira Gandhi Prize (2001)
- **World Food Prize (1987)** – first ever recipient
- Ramon Magsaysay Award (1971)
- Albert Einstein World Science Award (1986)
- Named "**Father of Economic Ecology**" by UNEP

4. National Leadership in Agricultural Policy

- Chaired the **National Commission on Farmers (2004–06)**, producing five landmark reports addressing farmer distress.
- One of the key **recommendations was fixing Minimum Support Price (MSP) at least 50%** above the weighted average cost of production.
- Founded the **National Academy of Agricultural Sciences (NAAS)** in 1990 to provide independent and science-based policy advice.

EQUATOR INITIATIVE AWARD 2025

Context: The Bibi Fatima Women's Self-Help Group from a village in Dharwad, Karnataka, has won the Equator Initiative Award presented by the United Nations Development Programme (UNDP).

- It is the only group from India among this year's 10 awardees.
- The SHG has made notable progress in promoting eco-friendly farming on rainfed lands, managing community seed banks, and strengthening food and nutrition security.
- The group has revived millet-based mixed cropping systems through natural farming methods across nearly 30 villages.

About the Equator Initiative Award

- Launched in 2002 by the UNDP, the Equator Initiative Award is often described as the **"Nobel Prize for Biodiversity Conservation."**
- The award honours nature-based solutions led by indigenous peoples and local communities that advance sustainable development and ecological resilience.
- The 2025 award theme focused on Women and Youth Leadership for Nature-Based Climate Action. Each winning group receives a cash prize of $10,000.

2025 RAMON MAGSAYSAY AWARD

Context: The 67th Ramon Magsaysay Award has recognised three major recipients this year:

- Foundation to Educate Girls Globally (India)
- Shaahina Ali (Maldives) for her contributions to environmental conservation
- Flaviano Antonio L. Villanueva (Philippines)

About Foundation to Educate Girls Globally (India)

- The Foundation to Educate Girls Globally, commonly known as Educate Girls, has become the first Indian organisation to receive the Ramon Magsaysay honour.

About Ramon Magsaysay Award

- Established in 1958, the Magsaysay Award is often referred to as **Asia's Nobel Prize.**
- It honours individuals and organisations across Asia for outstanding leadership, public service, and community impact.
- Awardees receive a certificate, cash ($50,000) and a medallion bearing the profile of Ramon Magsaysay.
- Previous Indian recipients of the award include: Vinoba Bhave, Arvind Kejriwal (former Delhi Chief Minister), Ravish Kumar (journalist), Bezwada Wilson (social activist), Sonam Wangchuk (environmentalist)

MAJOR DHYAN CHAND KHEL RATNA AWARD

Context: Satwiksairaj Rankireddy and Chirag Shetty were conferred the Major Dhyan Chand Khel Ratna Award. The badminton duo achieved the World No. 1 ranking in the Badminton World Federation (BWF) rankings in 2023.

Major Dhyan Chand Khel Ratna Award

- It is India's **highest sporting honour, awarded annually** by the Ministry of Youth Affairs and Sports for the **most outstanding performance by a sportsperson in the field of sports over the last four years**.
- The award committee evaluates performances in major events like the Olympic Games, Paralympic Games, Asian Games, and Commonwealth Games.
- **Established in 1991-92**, the award was originally named the Rajiv Gandhi Khel Ratna Award but was renamed in August 2021 in honour of Major Dhyan Chand
    - Major Dhyan Chand was a legendary Indian field hockey player known as the "Hockey Wizard" for his extraordinary skills and contributions to Indian hockey.
- No Award will be made for a second time to the same person. The award may be given posthumously if such an occasion arises.
- There will be only one award every year to be given to an individual sportsperson. This condition will be relaxed only in exceptional circumstances.

INTERNATIONAL BOOKER PRIZE 2025

Context: In a landmark moment for Indian literature, Banu Mushtaq's short story collection Heart Lamp won the International Booker Prize 2025.

Banu Mushtaq's Heart Lamp

- The stories reflect her work as a journalist and advocate, **focusing on women's rights and resistance to caste and religious injustice.** Her win follows **Geetanjali Shree's** 2022 Booker Prize for *Tomb of Sand.*
- Mushtaq is the second Kannada writer recently recognised by the prize, after UR Ananthamurthy in 2013, who was the first Kannada writer ever shortlisted.
- **Heart Lamp was originally published in Kannada** and translated into Urdu, Hindi, Tamil, and Malayalam.

The International Booker Prize

- It is hosted in the UK, **recognises fiction or short story collections translated into English** and published in the UK or Ireland. It awards £50,000 shared equally between author and translator.

WORLD FOOD PRIZE 2025

Context: Brazilian scientist Mariangela Hungria has won the 2025 World Food Prize for her pioneering work in **reducing chemical fertiliser use and developing biological seed and soil treatments** to boost crop yields and nutrition.

- She has created dozens of biological treatments that help crops absorb nutrients from soil bacteria, enhancing the productivity of wheat, maize, rice, beans, and especially soybeans.
- Over her career, Brazil's soybean production grew from 15 million tonnes in 1979 to 173 million tonnes in 2025. Hungria's work focuses on biological nitrogen fixation (BNF).

About World Food Prize

- **Established in 1986 by Nobel Peace Prize laureate Dr. Norman E. Borlaug,** it is often called the "**Nobel Prize for Food and Agriculture**."
- It honours individuals who have made significant contributions to improving food quality, quantity, or availability worldwide.
- **Administered by the World Food Prize Foundatio**n, the award includes a $500,000 prize and is presented annually in Des Moines, Iowa, during the Borlaug Dialogue, a global symposium on food security.
- The **first recipient was Dr. M.S. Swaminathan**, the father of India's Green Revolution, in **1987**.

SAROJ GHOSE

- Saroj Ghose, the father of India's science museum movement, passed away recently.
- He was the founding Director General of the **National Council of Science Museums (NCSM)** from 1979 to 1997.
- Headquartered in Kolkata, NCSM was formed in 1978 under the **Union Ministry of Culture.**
- Ghose is remembered as the architect of India's extensive network of science centres and museums, earning the title **Bhishma Pitamah of Indian Science Museums**.
- He developed a decentralised model of science museums, making science interactive and accessible to millions.
- He received the Padma Shri in 1989 and the **Padma Bhushan in 2007**, and served as president of the International Council of Museums in Paris.
- He played a key role in designing institutions such as Science City Kolkata, **National Science Centre New Delhi**, and Nehru Science Centre Mumbai, and contributed to projects like Kolkata's Town Hall Museum, Rashtrapati Bhawan Museum, Parliament Museum, and Gujarat Science City in Ahmedabad.

GALLANTRY AWARDS

In 2025, the President of India approved 93 gallantry awards on Republic Day.

- Gallantry Awards are among the highest national honors, instituted by the Government of India to acknowledge **exceptional bravery, valor, and self-sacrifice by members of the armed forces, central armed police forces, and occasionally civilians.**
- Recommendations are made by the Armed Forces, CAPFs, and Home Ministry.
- **Occasions of Announcement:** These awards are announced twice a year — on Republic Day (26 January) and Independence Day (15 August).
- **Classification:** Awards are categorized based on the circumstances of the act of bravery: in the face of the enemy (wartime) or other than in the face of the enemy (peacetime).

- **Wartime Gallantry Awards:** 1. Param Vir Chakra (PVC) 2. Maha Vir Chakra (MVC) 3. Vir Chakra
- **Peacetime Gallantry Awards:** 1. Ashoka Chakra 2. Kirti Chakra 3. Shaurya Chakra
- **Service-Specific Medals:** Additional honors include the Sena Medal (Army), Nao Sena Medal (Navy), and Vayu Sena Medal (Air Force), awarded for acts of courage in both combat and non-combat situations.

NATIONAL FLORENCE NIGHTINGALE AWARD 2025

- The President of India presented the National Florence Nightingale Awards 2025 to 15 nursing professionals for their exceptional service.
- The award was instituted in 1973 by the Ministry of Health and Family Welfare to honour the meritorious services of nursing professionals to society.
- It is conferred upon outstanding nursing personnel serving in Central and State/UT governments as well as voluntary organisations.
- Each award includes a certificate of merit, a cash prize of ₹1,00,000, and a medal.

PADMA AWARDS

- The President of India conferred the Padma Awards 2025 to 69 eminent personalities at Rashtrapati Bhavan.
- Of these, 3 received the Padma Vibhushan, 9 received the Padma Bhushan, and 57 received the Padma Shri.

About the Awards

- Instituted in 1954, the Padma Awards are among India's highest civilian honours, announced annually on the eve of Republic Day and conferred by the President later.
- The awards are given in three categories:
  - **Padma Vibhushan:** For exceptional and distinguished service (2nd highest civilian award after Bharat Ratna)
  - **Padma Bhushan:** For distinguished service of a high order
  - **Padma Shri:** For distinguished service in any field

Key Features

- The awards recognise achievements in a wide range of fields such as literature, education, arts, science, engineering, trade and industry, civil services, public affairs, sports, and medicine, among others, where public service is involved.
- The Padma Awards Committee, constituted annually by the Prime Minister, makes recommendations for the awards.
- The nomination process is open to the public, and even self-nominations are accepted.
- All persons, irrespective of race, occupation, position, or gender, are eligible. However, government servants, including those in PSUs, are generally not eligible, except for doctors and scientists.
- The awards may also be conferred on foreigners, NRIs, and Overseas Citizens of India (OCIs).
- The Padma Awards do not constitute a title and cannot be used as a prefix or suffix to the awardees' names.
- The total number of Awards which can be given in a year (excluding posthumous cases and Foreigners/NRIs/OCIs) is 120.

DADASAHEB PHALKE AWARD

Context: Legendary actor, director, and producer Mohanlal has been conferred the Dadasaheb Phalke Award for the year 2023.

- He has previously been honoured with the Padma Shri (2001) and the Padma Bhushan (2019).
- The following members were part of the Dadasaheb Phalke Award Selection Committee: Mithun Chakraborty, Shankar Mahadevan, Ashutosh Gowariker



About the Dadasaheb Phalke Award

- The Dadasaheb Phalke Award is **India's highest honour in the field of cinema.**
- It is presented **annually** at the **National Film Awards ceremony** by the **Directorate of Film Festivals,** an organisation under the **Ministry of Information and Broadcasting.**

- The award includes a Swarna Kamal (Golden Lotus) medallion, a shawl, and a cash prize.
- **Instituted in 1969,** it commemorates Dadasaheb Phalke's monumental contribution to Indian cinema. **The first recipient of the award was actress Devika Rani.**

About Dadasaheb Phalke

- Dhundiraj Govind Phalke is regarded as the **Father of Indian Cinema.**
- His debut film, **Raja Harishchandra (1913), was the first full-length Indian feature film,** marking the beginning of Indian cinema.

KALAIMAMANI AWARDS

Context: The Tamil Nadu government has announced the Kalaimamani Awards for the years 2021, 2022, and 2023.

About Kalaimamani Awards

- Kalaimamani literally means **"gem of art,"** and the award is **considered the highest civilian honour in Tamil Nadu for contributions to arts and culture.**
- The award celebrates **individual excellence** while also promoting and **preserving Tamil Nadu's diverse cultural traditions for future generations.**
- The awards are **conferred by the Tamil Nadu Iyal Isai Nataka Mandram** (literature, music, and theatre), a unit of the Directorate of Art and Culture, Government of Tamil Nadu.
- Award categories span a **wide range of art forms**, including vocal music, Thevaram recital, mridangam performance, harmonium, religious discourse, Bharatanatyam teaching, drama, folk singing, Valli Oyil Kummi, television acting, painting, and more. **Awardees receive a gold medal and a shield.**
- There are also special awards at the national level named Bharathi (literature), M.S. Subbulakshmi (music), and Balasaraswathi (dance), which carry cash prizes of Rs 1 lakh along with gold medals.

SCOPE EMINENCE AWARDS

Context: The President of India presented the SCOPE Eminence Awards for the year 2022–23 in New Delhi.

- These awards are instituted by the Standing Conference of Public Enterprises (SCOPE).
- The awards recognise and honour the significant contributions and achievements of Public Sector Enterprises (PSEs) as nation builders.

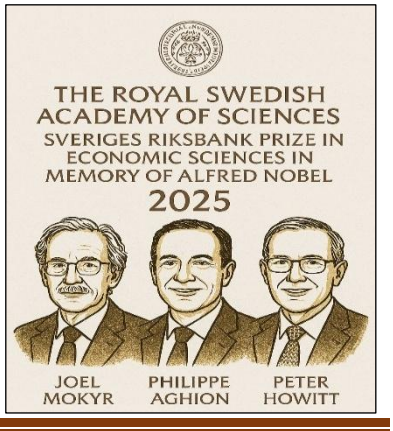
About SCOPE

- Established in 1973, SCOPE is the **apex body representing Public Sector Enterprises (PSEs) in India.**
- It aims **to promote competitiveness and excellence among PSEs** by improving their efficiency and operational capabilities through supportive policies and strategic initiatives.
- **SCOPE functions on four core pillars:** Policy Advocacy; Programs & Workshops; Capacity Building & Skill Development; Brand Building
- Internationally, SCOPE represents Indian public sector employers in major global bodies such as the International Labour Organization (ILO), the United Nations (UN), the Organisation for Economic Co-operation and Development (OECD), and the International Organization of Employers (IOE).

SVERIGES RIKSBANK PRIZE IN ECONOMIC SCIENCES

Context: The 2025 Sveriges Riksbank Prize **(Nobel Prize in Economics)** was **awarded to Joel Mokyr, Philippe Aghion, and Peter Howitt** for advancing our understanding of innovation-driven economic growth.

Joel Mokyr's Contribution



- Joel Mokyr's work focuses on **explaining how the world moved from centuries of slow progress to sustained economic growth over the past 200 years**.
- He introduced the idea of "**useful knowledge**" as the foundation of long-term growth, dividing it into two linked forms:
  - **Propositional Knowledge:** understanding why things work, based on scientific theories and observations.
  - **Prescriptive Knowledge:** knowing how to apply this understanding through practical methods, such as technical drawings, process manuals, or step-by-step instructions.

- He further emphasised that technological change alone is insufficient; societal openness to experimentation and reform, shaped by Enlightenment values, enabled the transition to sustained growth.
- Without a willingness to accept "creative destruction", societies cannot experience continuous advancement.
  - "Creative Destruction" was introduced by Joseph Schumpeter, referring to old methods being replaced by new ones,

Contributions of Philippe Aghion and Peter Howitt

- Aghion and Howitt explored the same question of innovation-led growth by developing a **modern mathematical model in 1992.**
- Their framework showed that **economic growth is driven by continuous creative destruction at the level of firms.**
- Firms innovate, secure temporary monopoly power through patents, and earn higher profits.
- New firms eventually create better technologies, replacing earlier leaders.
- This constant turnover, though disruptive in the short run, keeps the overall economy dynamic and productive.

About Sveriges Riksbank Prize in Economic Sciences

- The Prize, often called the Nobel Prize in Economics, is a prestigious award given for **outstanding contributions in the field of economic sciences.**
- It was established in **1968** by **Sweden's central bank, Sveriges Riksbank**, to commemorate its 300th anniversary and **in memory of Alfred Nobel, the founder of the Nobel Prizes.**
- Unlike the original Nobel Prizes, **this award was not part of Alfred Nobel's will** but is **administered by the Royal Swedish Academy of Sciences,** which also selects laureates for the Physics and Chemistry prizes.
- The laureates are chosen based on the same principles as the original Nobel Prizes, and the award ceremony is held annually on December 10, the anniversary of Alfred Nobel's death.
- The prize amount is equivalent to the Nobel Prizes, currently 11 million Swedish kronor, and is paid by Sveriges Riksbank.

NOBEL PRIZE IN PHYSIOLOGY OR MEDICINE 2025

Context: The Nobel Prize in Medicine 2025 was awarded jointly to Mary E. Brunkow, Fred Ramsdell, and Shimon Sakaguchi for their **groundbreaking discoveries concerning peripheral immune tolerance.**

About the Research

- Peripheral Immune Tolerance is the process by which the immune system avoids attacking the body's own cells. Their work identified Regulatory T cells (Tregs), which act as immune "guards" against self-damage.
- **Key Contributions**
  - **Shimon Sakaguchi (1995):** Identified Regulatory T cells (Tregs) as a distinct immune cell type responsible for maintaining self-tolerance.
  - **Mary Brunkow & Fred Ramsdell (2001):** Discovered the Foxp3 gene, essential for Treg function; mutations in Foxp3 cause severe autoimmune disease (IPEX).
  - **Shimon Sakaguchi (2003):** Established the central role of FOXP3 in Treg development and stability.
- **Significance**
  - Explained why autoimmune diseases do not develop in most people.
  - Laid the foundation for new therapies for autoimmune disorders, cancer immunotherapy, and improved organ transplantation outcomes.

NOBEL PRIZE IN PHYSICS 2025

Context: The 2025 Nobel Prize in Physics was awarded jointly to John Clarke, Michel H. Devoret, and John M. Martinis for their discovery of macroscopic quantum mechanical tunnelling and energy quantisation in an electric circuit.

Key Achievements

- Their research demonstrated that quantum phenomena—such as tunnelling and energy quantisation—can be observed in macroscopic systems, like superconducting circuits, rather than just at the microscopic level.
- This breakthrough has paved the way for practical quantum technologies, including quantum computers, quantum sensors, and quantum cryptography.

Key Concept: Josephson Junction

- A Josephson junction consists of two superconductors separated by a very thin insulating layer. It allows paired electrons (Cooper pairs) to tunnel through the barrier, a purely quantum effect.
- This device made it possible to observe and control quantum states in electrical circuits.

Significance

- Demonstrated that quantum laws apply at visible, human-made scales.
- Enabled precise control of macroscopic quantum states, laying the foundation for superconducting qubits.

Applications

- Quantum computers using superconducting qubits.
- Ultra-sensitive detectors and amplifiers.
- Quantum simulators and advanced quantum communication systems.

NOBEL PRIZE IN CHEMISTRY 2025

Context: The Nobel Prize in Chemistry 2025 was awarded jointly to Susumu Kitagawa, Richard Robson, and Omar M. Yaghi for their pioneering work on the development of metal–organic frameworks (MOFs).

About Metal–organic frameworks

- Metal–organic frameworks are a **new form of molecular architecture where metal ions are connected by organic molecules,** forming porous crystals with large internal cavities.
- These materials can be tailored to capture, store, or catalyze specific substances, offering solutions for global challenges such as climate change, water scarcity, and hazardous gas storage.
- MOFs can **harvest water from arid air, sequester carbon dioxide, and store gases efficiently.**
- Their **high surface area allows even a small amount of material to hold vast quantities of gas**, which has been compared to a "Harry Potter-like" molecular handbag.

Key Scientific Contributions

- **Richard Robson (1970s):** Introduced the idea of building porous crystals by connecting copper ions with organic linkers, laying the conceptual foundation of MOFs.
- **Susumu Kitagawa (1990s):** Developed flexible MOFs that can expand and contract, allowing them to absorb and release gases.
- **Omar Yaghi (2000s):** Created highly stable and tunable MOFs, making them suitable for practical use, including carbon dioxide capture, toxin filtration, and water extr action from air.

Applications: Carbon capture, water harvesting, pollution control, and drug delivery and environmental cleanup.

NOBEL PRIZE IN LITERATURE 2025

CThe Nobel Prize in Literature 2025 has been awarded to László Krasznahorkai, a renowned Hungarian writer.

About László Krasznahorkai

- Writing primarily in Hungarian, Krasznahorkai is celebrated for his intense, complex, and philosophical style, often examining the human condition amid social breakdown, chaos, and existential anxiety.
- He is the second author from Hungary to receive the honour, following Imre Kertész in 2002.
- His notable works include *Satantango (1985), The Melancholy of Resistance (1989), War and War (1999), and Baron Wenckheim's Homecoming (2016).*

About Nobel Prize in Literature

- The Nobel Prize in Literature is an **annual award** given by the Swedish Academy to an **author from any country who has produced "the most outstanding work in an idealistic direction,"** as defined by Alfred Nobel's will.
- The prize **recognizes an author's entire body of work** rather than a single piece.

NOBEL PEACE PRIZE 2025

Context: The Nobel Peace Prize 2025 was awarded to Maria Corina Machado, a prominent Venezuelan opposition leader, for her peaceful struggle to restore democracy and uphold human rights in Venezuela.

About Maria Corina Machado

- Machado is a Venezuelan opposition leader known for her role in defending democracy against authoritarian rule. Trained in engineering and finance, she founded initiatives supporting social welfare and free elections, including Súmate.

- Elected to the National Assembly in 2010, she was expelled by the regime in 2014. She leads the Vente Venezuela party and helped form the Soy Venezuela pro-democracy alliance.
- Blocked from contesting the 2024 presidential election, she supported opposition candidate Edmundo González Urrutia, whose campaign documented evidence of winning despite the regime claiming victory.

Nobel Peace Prize

- The Nobel Peace Prize is one of the most prestigious international awards, established by the will of **Swedish industrialist Alfred Nobel in 1895**.
- It is **awarded annually** to **individuals or organizations that have done the most or best work for fraternity between nations**, the abolition or reduction of standing armies, and the promotion of peace congresses.
- The Norwegian Nobel Committee, appointed by the Norwegian Parliament, selects the laureates each year.
- The **Nobel Peace Prize is presented in Oslo, Norway, on December 10** each year—the anniversary of Alfred Nobel's death. (It is the **only Nobel Prize decided by a committee outside Sweden)**
- Winners receive a diploma, a medal, and a monetary award, which has varied but is typically around 10 million SEK (about 1 million USD).

RASHTRIYA VIGYAN PURASKAR 2025

Context: The Union Government has announced the Rashtriya Vigyan Puraskar 2025, the highest national honour for exceptional contributions in science, technology, and technology-led innovation.

About Rashtriya Vigyan Puraskar

- Instituted in 2024, the awards replaced all earlier national science awards to create a unified recognition framework.
- **Objective:** To recognise the notable and inspiring contribution made by the scientists, technologists and innovators individually or in teams in various fields of science, technology and technology- led innovation.
- The awards were **instituted by the Ministry of Science and Technology** and honor scientists and innovators across **13 fields** such as Physics, Chemistry, Engineering, Agriculture, Environment, Atomic Energy, Space etc.
- The awards are **selected by a high-level committee chaired by the Principal Scientific Adviser**. Nominations are received from various institutions, and the final awardees are chosen by the Minister for Science and Technology.
- The award ceremony is held annually, on the National Technology Day (11th May), with recipients receiving a special medal and a certificate signed by the President of India.
- The awardees are presented a Sanad (certificate) signed by the President of India & a medallion. A commemorative brochure, containing the citation and photograph of the awardees is released on the day of the ceremony.

Award Category	Purpose	2025 Winners
Vigyan Ratna	Lifetime achievement in science and technology.	Awarded posthumously to Prof. Jayant Vishnu Narlikar (Physics).
Vigyan Shri	Distinguished contributions to science and technology.	Eight scientists were honoured.
Vigyan Yuva- Shanti Swarup Bhatnagar	Encourages outstanding young scientists (up to 45 years).	Fourteen scientists were awarded.
Vigyan Team	Recognises collaborative scientific work by teams.	Awarded to CSIR's Team Aroma Mission (Agricultural Science).

INDIA CONFERRED ISSA AWARD 2025

Context: India has been conferred with the Outstanding Achievement in Social Security Award 2025 by the International Social Security Association (ISSA)

- The triennial (once every three years) award recognises India's significant progress in strengthening social protection systems and its impact at the global level. India is the fifth country to receive this honour.

About International Social Security Association (ISSA)

- ISSA is the world's leading **international body for social security institutions, government departments, and agencies.**

- Established in **1927** under the auspices of the **International Labour Organization (ILO),** it works to promote excellence in social security administration and advance social justice and well-being.
- **Headquarters**: Geneva, Switzerland.
- **Membership**: Over 330 organisations across 160+ countries.

MY BHARAT-NATIONAL SERVICE SCHEME (NSS) AWARDS

Context: The President of India presented the MY Bharat–NSS Awards for 2022–23. These awards, given annually by the Department of Youth Affairs under the Ministry of Youth Affairs & Sports, honour exceptional NSS volunteers, Programme Officers, and Units

About the National Service Scheme (NSS)

- **Type:** Central Sector Scheme under the Ministry of Youth Affairs & Sports.
- **Motto**: "Not Me, But You" | **Symbol:** Konark Wheel (Odisha)
- **Launched**: 1969.
- **Purpose**: Provides opportunities to students of Classes 11–12, colleges, and universities to participate in community service and nation-building activities.
- **Objective:** To develop the personality and character of student youth through voluntary community service.
- **Areas of NSS Work:** Literacy and education, Health, family welfare, and nutrition, Environmental conservation, Women empowerment, Other forms of community development and social welfare

KENDRIYA GRIHMANTRI DAKSHATA PADAK (KGDP)

Context: The KGDP (*translated to Union Home Minister's Medal for Excellence*) was awarded to 1,466 personnel from various States, UTs, Central Armed Police Forces (CAPFs), and Central Police Organizations (CPOs) for the year 2025.

About the Kendriya Grihmantri Dakshata Padak (KGDP)

- It recognizes exceptional performance by members of Police Forces, Security and Intelligence Organizations, CAPFs, and Forensic Science institutions across India.
- The KGDP was **instituted by the Ministry of Home Affairs (MHA) in 2024**.
- The award replaces and consolidates several earlier honours into a single national award, including: Union Home Minister's Special Operation Medal, Medal for Excellence in Investigation, Asadharan Aasuchana Kushalata Padak, and Awards for Meritorious Service in Forensic Science.

Announcement and Decoration

- The awards are announced annually on 31 October, the birth anniversary of Sardar Vallabhbhai Patel.
- Awardees receive a medal and a certificate (scroll) signed by the Union Home Minister.
- The names of awardees are published in the Gazette of India, except in cases related to intelligence services.
- The medal may be withdrawn if the awardee is dismissed from service, faces a major penalty, or is convicted in a criminal case. The award may be restored if the grounds for withdrawal no longer exist.

Eligibility

- Open to all ranks of Police, CAPFs, CPOs, Security and Intelligence wings, and Forensic Scientists.
- No minimum service period is prescribed.
- The awardee must have no pending disciplinary or judicial proceedings and a clean service record for the past five years.

Selection Process

- Nominations are invited annually in June through the National Awards Portal. Scrutiny Committees at the State, UT, or organizational level examine nominations and forward recommendations to the MHA.
- An MHA Sub-Committee and an MHA-level Committee, chaired by the Union Home Secretary, review and recommend the final list.
- The awards are granted after approval by the Union Home Minister.

INDIRA GANDHI PEACE PRIZE 2024

Context: The Indira Gandhi Prize for Peace, Disarmament and Development for 2024 has been awarded to Michelle Bachelet, the first and only woman President of Chile and a former United Nations High Commissioner for Human Rights.

About Michelle Bachelet


Michelle Bachelet

- Bachelet played a key role in establishing Chile's National Institute for Human Rights and the Museum of Memory and Human Rights, and in setting up the Ministry of Women and Gender Equality.
- She has actively worked to advance LGBT rights and is also credited with major education and tax reforms in Chile.

About Indira Gandhi Peace Prize

- The Indira Gandhi Peace Prize, officially known as the **Indira Gandhi Prize for Peace, Disarmament and Development,** is an **annual award instituted in 1986** by the Indira Gandhi Memorial Trust in memory of former Prime Minister Indira Gandhi.
- The prize honors **individuals or organizations** for their **creative efforts in promoting international peace, development, disarmament,** and the use of scientific discoveries for the larger good of humanity.
- The award consists of a cash prize of 10 million Indian rupees (1 crore) and a citation.
- It is given to both national and international recipients, and to individuals as well as institutions, for outstanding contributions in peace, development, and a new international economic order.

BAL SAHITYA PURASKAR 2025

Context: Bal Sahitya Puraskar 2025 were presented by Madhav Kaushik, President of the Sahitya Akademi on 14 November (Children's Day).

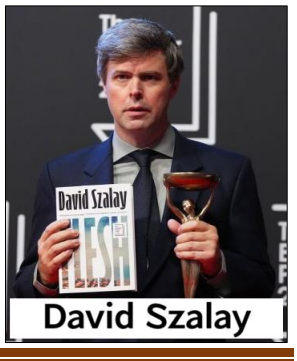
About Bal Sahitya Puraskar

- The Bal Sahitya Puraskar is a prestigious **annual** literary award presented by the Sahitya Akademi, India's National Academy of Letters.
- Instituted in **2010**, it recognises **outstanding contributions to children's literature in India's 24 officially recognised languages** (languages listed in the 8th Schedule of the Indian Constitution, as well as English and Rajasthani.)
- Eligible works include stories, novels, poems, plays, picture books, and literature rooted in India's cultural traditions and values.
- The Awards relate to books first published during the five years immediately preceding year of the Award (i.e. between 1 January 2019 and 31 December 2023).
- The awardees are presented with a cheque of Rs. 50,000/- and a bronze plaque in recognition of their work.

About Sahitya Akademi

- Established in 1954, Sahitya Akademi is the central institution for literary dialogue, publication, and promotion in India.
- It was registered as a society on 7 January 1956, under the Societies Registration Act, 1860.
- Headquartered in New Delhi, it functions as an autonomous body under the Ministry of Culture and undertakes literary activities in 24 Indian languages, including English.
- In addition to the Bal Sahitya Puraskar, the Akademi confers the following awards:
  - **Sahitya Akademi Award,**
  - **Yuva Puraskar** for young writers,
  - **Translation Prize** for literary translation,
  - **Bhasha Samman** for significant contributions to languages not formally recognised by the Akademi, and to classical and medieval literature.

BOOKER PRIZE 2025



David Szalay

Context: David Szalay has won the 2025 Booker Prize for his novel Flesh.

About Booker Prize 2025

- Founded in the UK in 1969, the Booker Prize is the world's most significant award for a single work of fiction.
- It was earlier known as the Booker Prize for Fiction (1969–2001) and the Man Booker Prize (2002–2019).
- **Established in the United Kingdom in 1969**, it initially recognised Commonwealth writers but is now **open to authors of any nationality.**

- The prize is awarded **annually** to the **best novel written in English and published in the United Kingdom or Ireland.**
- A companion award, the International Booker Prize, honours books translated into English and published in the UK or Ireland.
- The winner of the Booker Prize also receives £50,000, with £2,500 awarded to each of the other shortlisted authors.

PAULOS MAR GREGORIOS AWARD

Context: Dr. Tessy Thomas, celebrated as India's 'Missile Woman', was honored with the eighth Dr Paulos Mar Gregorios Award 2025.

About Dr. Tessy Thomas

- Dr Tessy Thomas is a renowned Indian aerospace scientist who played a key role in developing India's strategic missile programme.
- She is popularly known as "India's Missile Woman" because of her **leadership in the Agni series of ballistic missiles.**
- She served as Director General (Aeronautical Systems) at DRDO. **As Project Director of Agni-IV,** she helped strengthen India's long-range missile capability.
- She was **mentored by Dr APJ Abdul Kalam,** and worked with DRDO teams during several missile trials and launches.

About the Paulos Mar Gregorios Award

- The Paulos Mar Gregorios Award is a **biennial (once in every two years) international honor** instituted by the **Sophia Society of the Malankara (Indian) Orthodox Church.**
- It commemorates Dr. Paulos Mar Gregorios, the first Metropolitan of the Delhi Diocese, a renowned philosopher, theologian, and ecumenical leader who served as President of the World Council of Churches.
- The award recognises individuals who have made outstanding contributions to society, especially in fields linked to: knowledge and learning, human welfare, ethical leadership, and service to people.

UNEP CHAMPIONS OF THE EARTH AWARD – 2025

Context: Tamil Nadu IAS officer Supriya Sahu (Additional Chief Secretary) has been named a UNEP "Champion of the Earth" for 2025 under 'Inspiration and action' Category.

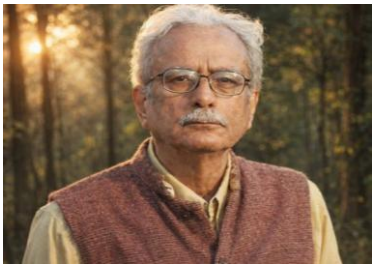
About UNEP Champions of the Earth Award

- **Established**: 2005 by the United Nations Environment Programme (UNEP).
- **Nature**: It is the UN's highest environmental honour.
- **Purpose**: **Each year**, UNEP recognises **individuals and organisations** developing innovative and sustainable solutions to address the triple planetary crisis—climate change, nature and biodiversity loss, and pollution and waste.
- **Categories under the award:** Policy leadership, Inspiration and action, Entrepreneurial vision, Science and innovation
- **Some Past Indian Laureates include:** Madhav Gadgil (2024), Narendra Modi (2018)

VINOD KUMAR SHUKLA

Context: Vinod Kumar Shukla, Jnanpith Award laureate recently passed away in December 2025.

About Vinod Kumar Shukla



- Vinod Kumar Shukla, born January 1, 1937, in Rajnandgaon, Chhattisgarh, was a renowned **Hindi writer and poet** celebrated for his magical realism-infused style.
- His notable novels include *Naukar ki Kameez (1979*), adapted into a film by Mani Kaul, and *Deewar Mein Ek Khirkee Rehti Thi (1999)*, which earned the **Sahitya Akademi Award.** He also penned poetry collections like *Lagbhag Jai Hind (1971)* and novels such as *Khilega To Dekhenge.*
- Shukla received **India's highest literary honor, the 59th Jnanpith Award 2024,** announced in March 2025, making him the **first from Chhattisgarh to win it**.

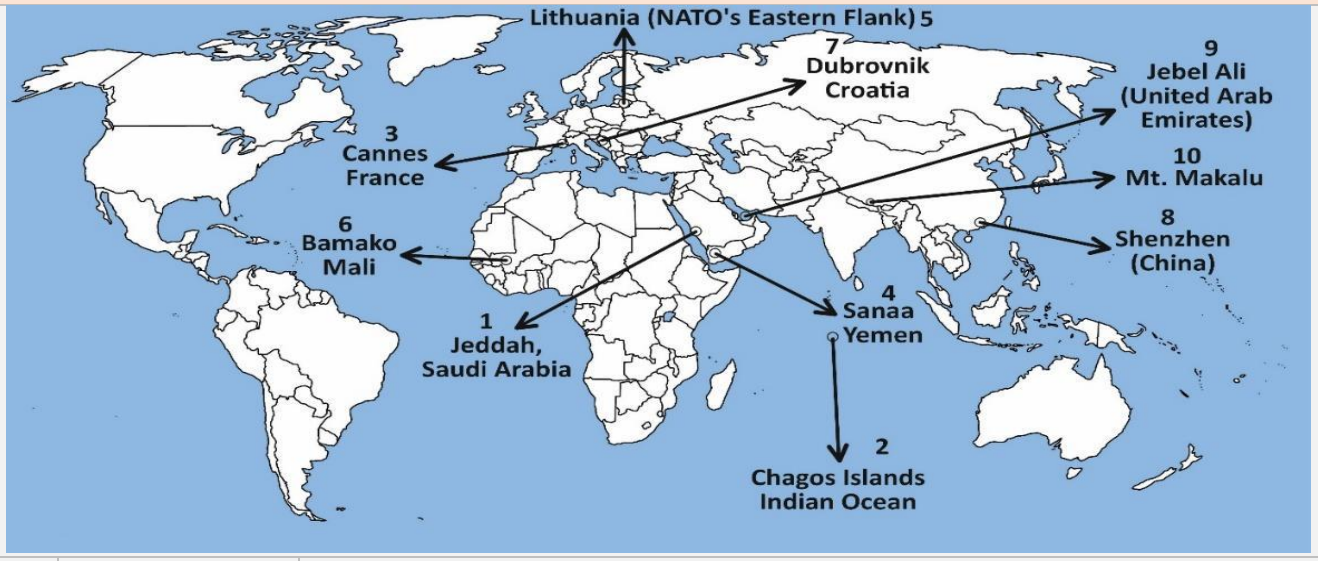
- Other accolades include the **PEN/Nabokov Award (2023), Shikhar Samman,** and **Rashtriya Hindi Gaurav Samman.**

About Jnanpith Award

- It is India's **highest literary honor, presented annually** to recognize outstanding contributions to literature by Indian authors. It is given **only to living Indian citizens.**
- **Instituted in 1961 by the Bharatiya Jnanpith organization**, it was first awarded in 1965 to Malayalam poet G. Sankara Kurup for his work Odakkuzhal.
- **Award Details:** Recipients receive a cash prize of ₹11 lakh, a citation, and a bronze replica of Saraswati, the goddess of knowledge.
- **Languages:** The award covers works in the **22 languages listed in the Eighth Schedule of the Indian Constitution and English**.
- **Selection Process**
    - Nominations come from literary experts, critics, universities, and associations, reviewed by language-specific advisory committees every three years.
    - The language of the previous winner is ineligible for the next two years to promote diversity.
    - The entire contributions of an author for Indian Literature are taken into account for the award.

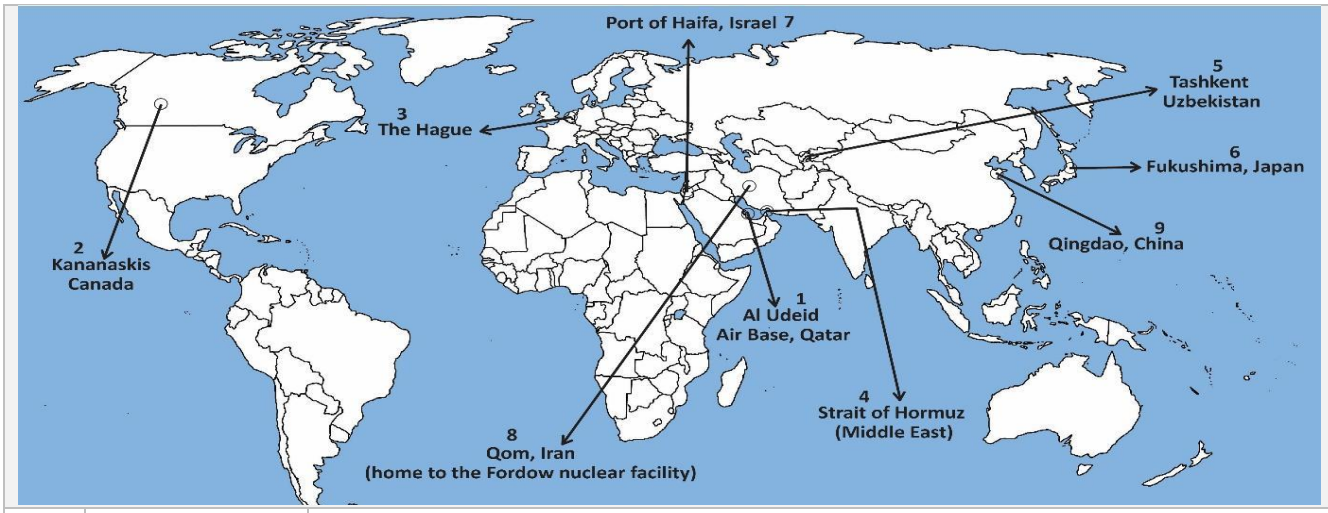
MAPS & PLACES IN NEWS

INTERNATIONAL PLACES IN NEWS



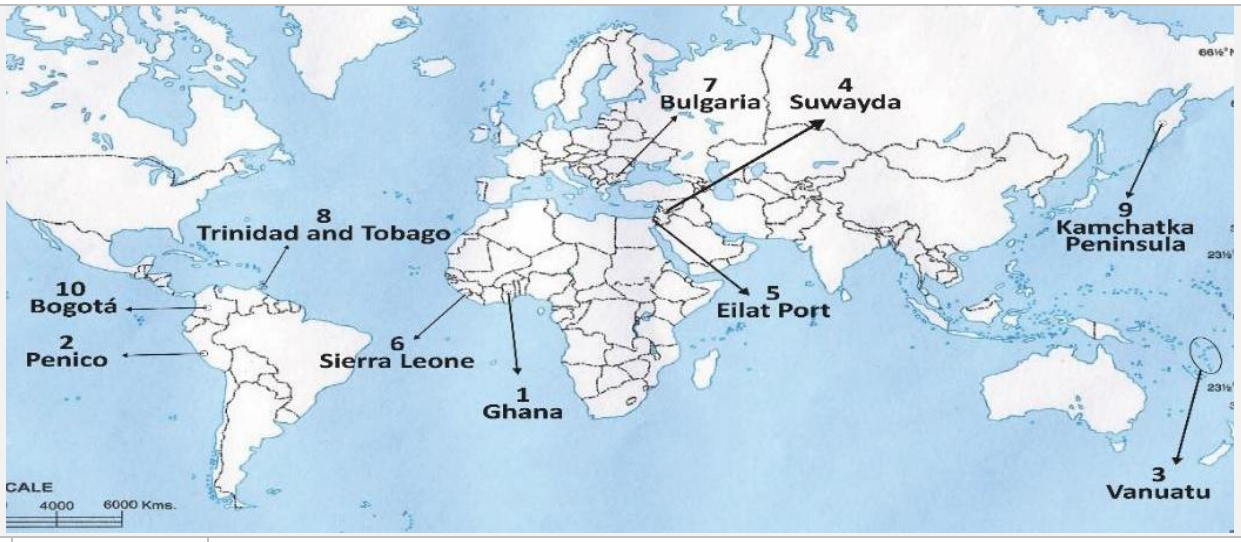
1	**Jeddah, Saudi Arabia**	• Hosted *Islamic Arts Biennale 2025*. • Second-largest Saudi city, Located on Red Sea coast • A Key gateway for Hajj & Umrah.
2	**Chagos Islands, Indian Ocean**	• Located in the central Indian Ocean, ~1,600 km south of India and 500 km south of the Maldives. • Comprises 60+ islands; Diego Garcia is the largest and most strategic.
3	**Cannes, France**	• Venue of the 78th Cannes Film Festival 2025 (May). • Located on the French Riviera, Mediterranean coast, southeastern France. • India frequently participates; was "Country of Honour" in 2022 at Cannes Film Market.
4	**Sanaa, Yemen**	• Israeli airstrikes hit Sana'a International Airport after Houthi attacks, damaging a Yemenia Airways plane. • Capital and largest city of Yemen; Old City is a UNESCO World Heritage Site. • Longstanding conflict zone, especially with Houthi insurgency.
5	**Lithuania (NATO)**	• Germany is establishing its 45th Tank Brigade in Lithuania, first permanent foreign deployment since WWII. • Brigade to be fully operational by 2027, strengthening NATO's eastern defenses.
6	**Bamako, Mali**	• Pro-democracy protests erupted against President Assimi Goïta's military regime after political parties were dissolved. • Located in southwestern Mali on the Niger River, surrounded by Manding Mountains.
7	**Dubrovnik, Croatia**	• Named a top travel destination for 2025 by Wanderlust Magazine *("Travel Green List").* • Situated on the Adriatic Sea, near Bosnia & Herzegovina and Montenegro. • UNESCO World Heritage Site (Old City, since 1979). • Famous as "King's Landing" in Game of Thrones, boosting film tourism.
8	**Shenzhen, China**	• Hit by new US semiconductor export curbs. • Located on the Pearl River Delta, near the South China Sea. • Known as "China's Silicon Valley" and a gateway via Hong Kong to global markets.

9	**Jebel Ali, UAE**	• Beneficiary of $200 billion U.S.–UAE deals (May 2025), including AI cooperation. • Strategically located at crossroads of Asia, Africa, Europe. • Close to the Strait of Hormuz, key chokepoint for oil trade. • Largest port in the Middle East; 9th busiest globally by cargo volume.
10	**Mt. Makalu**	• ITBP successfully scaled Mt. Makalu, world's 5th-highest peak. • Lies in the Mahalangur Himalayas, on **Nepal–Tibet (China) border.** • Region home to Sherpas, Rai, Tamang communities. • ITBP has climbed 6 of 14 eight-thousanders, including Everest, Kanchenjunga, Dhaulagiri, Lhotse, and Manaslu.



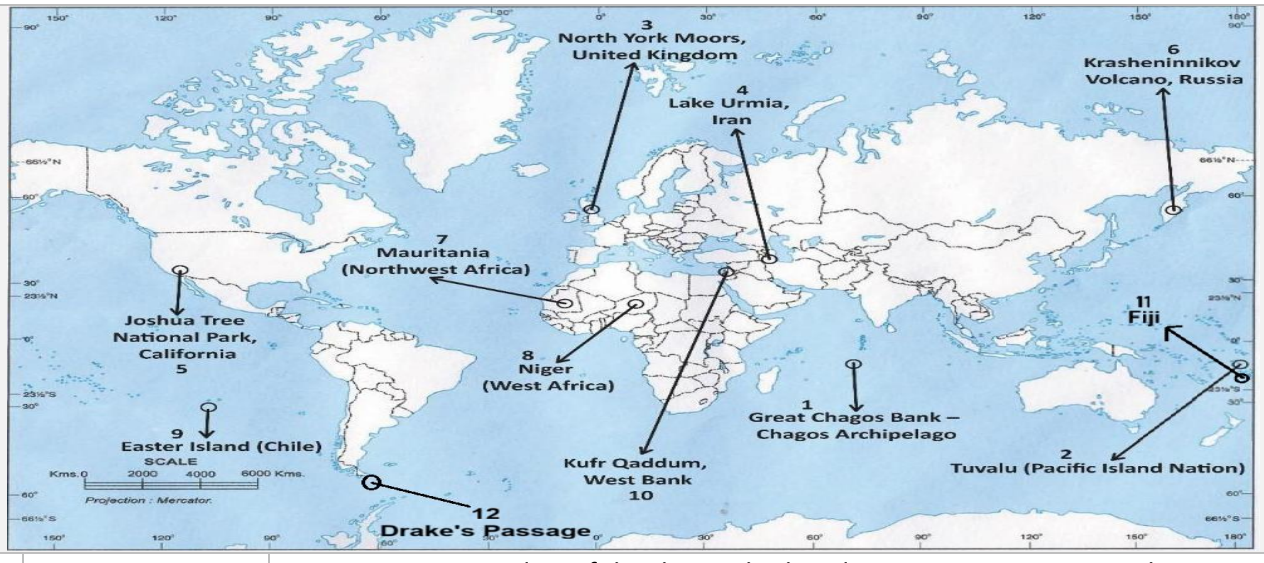
1	**Al Udeid Air Base, Qatar**	• Iran targeted U.S. military assets at Al Udeid in response to U.S. involvement in the Iran–Israel conflict. • It is the **largest U.S. base in the Middle East**, located **190 km south of Iran**. • Established in **1996**, it serves as the **forward HQ of U.S. Central Command** and hosts forces from the **U.S., U.K., and Qatar**.
2	**Kananaskis, Canada**	• Hosted the **51st G7 Summit**, the second in Kananaskis since 2002 and the seventh in Canada. • The area spans **~4,000 km²** along the **eastern Canadian Rockies**, near **Banff National Park**, featuring limestone peaks shaped during the **last Ice Age (~12,000 years ago)**.
3	**The Hague, Netherlands**	• Venue of the **NATO Summit 2025** at the World Forum—the first NATO summit ever hosted by the Netherlands. • Located in **South Holland**, The Hague is the **administrative and royal capital**, home to major global institutions like the **ICJ, ICC, PCA, and OPCW**, earning it the title *"International City of Peace and Justice."*
4	**Strait of Hormuz (Middle East)**	• Connects the **Persian Gulf** to the **Gulf of Oman and Arabian Sea**. • In North: **Iran**; In South: **Oman** and **UAE**. • Key nearby ports: **Fujairah (UAE)**, **Basra (Iraq)**, **Bandar Abbas (Iran)**. • Patrolled by the **U.S. Navy's Fifth Fleet** to secure trade routes.
5	**Tashkent, Uzbekistan**	• Hosted the **UzChess Cup Masters 2025**, where **R. Praggnanandhaa** won. • Located near the **Kazakhstan border** on the **Chirchiq River**, west of the **Tian Shan Mountains**. Also known for the **Tashkent Agreement (1966)** between India and Pakistan.
6	**Fukushima, Japan**	• Following the 2011 nuclear disaster, **China resumed partial seafood imports** from Japan.

		• Located in **northeastern Honshu (Tohoku region)**, Fukushima is known for its **samurai heritage, hot springs, and festivals**. • The 2011 incident was one of only **two Level 7 nuclear accidents** (with Chernobyl).
7	**Port of Haifa, Israel**	• Situated on the **Mediterranean coast**, it's Israel's **main deep-water port**, vital for trade with **Europe, North America, and Asia** via the **Suez Canal**. **Adani Ports (India)** holds a **70% stake**, linking it to the **India–Middle East–Europe Economic Corridor (IMEC)**.
8	**Qom, Iran (Fordow Facility)**	• Located **140 km south of Tehran**, near the **Qom River**. • The **Fordow Fuel Enrichment Plant**, about **30 km south**, is built **inside a mountain** for protection from airstrikes.
9	**Qingdao, China**	• Hosted the **22nd SCO Defence Ministers' Meeting**. A **major port on the Yellow Sea**, Qingdao faces **South Korea and Japan**. • Nicknamed *"Oriental Switzerland"* for its European-style architecture. Site of the **May Fourth Movement (1919)**; regained by China in 1922 and again after **World War II**.



1	**Ghana**	• The Prime Minister of India visited Ghana. • Located along the Gulf of Guinea and the Atlantic Ocean (south), Ghana shares borders with Côte d'Ivoire (west), Burkina Faso (north), and Togo (east).
2	**Peñico (Peru)**	• Archaeologists in Peru unearthed a 3,500-year-old ancient city named Peñico. • Developed between 1800–1500 BCE, it was contemporary to Egypt's Middle Kingdom, Sumeria, and the Indus Valley Civilization, but evolved independently, offering insights into early urban development.
3	**Vanuatu**	• The country is leading a global climate case backed by over 130 countries. • Located in the South Pacific Ocean, east of Australia and west of Fiji. • It is an archipelago of about 80 volcanic islands (65 inhabited). • **Capital: Port Vila** (Efate Island). Climate is tropical and disaster-prone (cyclones, earthquakes, volcanic eruptions).
4	**Suwayda (Syria)**	• Syria's Druze community in Suwayda faces ethnic cleansing by Bedouin militias following Assad's ouster. • **The region's demography:** ~90% Druze and one-third Bedouin (~250,000 people), marked by periods of coexistence and conflict.

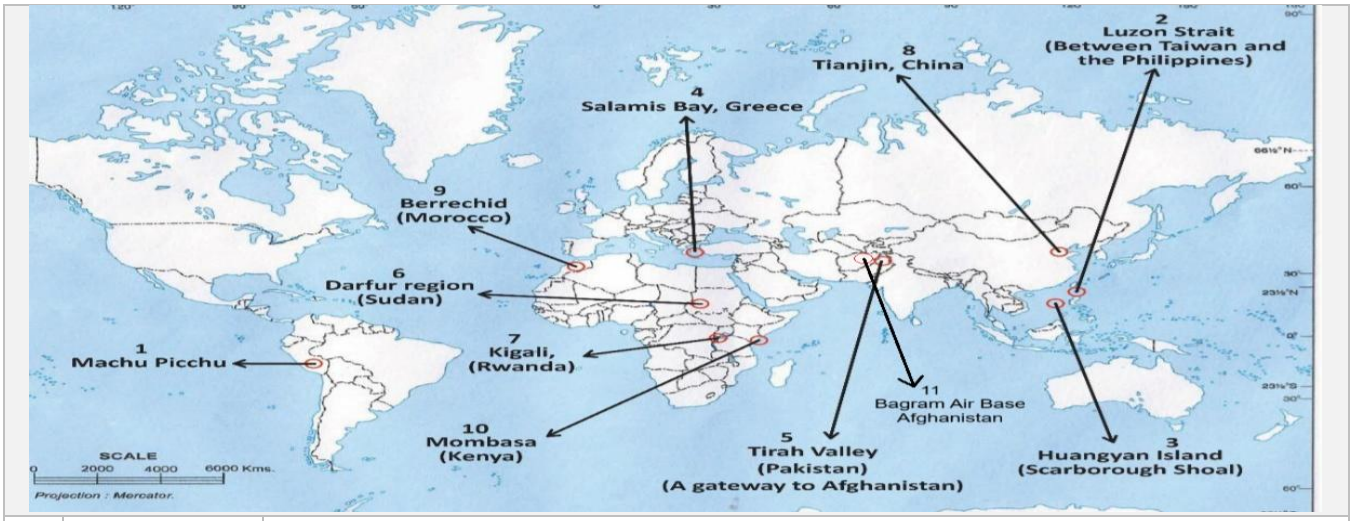
5	**Eilat Port (Israel)**	• Eilat Port, a Red Sea trade hub, faces closure due to financial losses from a Houthi naval blockade and rising debts. • The crisis has reduced Suez Canal revenues by 40% ($280 million/month) and Aqaba Port (Jordan) traffic by 25%, though Aqaba gained some diverted cargo.
6	**Sierra Leone**	• The **Gola–Tiwai complex** became **Sierra Leone's first UNESCO World Heritage Site.** • Located in West Africa, bordered by Guinea, Liberia, and the Atlantic Ocean. • **Economy:** Mining (iron ore, diamonds, titanium) contributes ~70% of exports. • The country faces a synthetic opioid "kush" crisis.
7	**Bulgaria**	• **Approved to adopt the euro on January 1, 2026**, becoming the 21st member of the Eurozone. • Joined Schengen Area for air/sea borders (March 2024) and land borders (January 2025). • Located in Southeast Europe (Balkan Peninsula), it borders Romania, Serbia, North Macedonia, Greece, Turkey, and the Black Sea
8	**Trinidad and Tobago**	• A twin-island republic off Venezuela's northeastern coast in the southern Caribbean. • **Capital**: Port of Spain; **Largest city:** San Fernando. • Its strategic proximity to South America makes it a major transshipment hub, though it also fuels drug trafficking.
9	**Kamchatka Peninsula (Russia)**	• An 8.8-magnitude earthquake triggered tsunami warnings across Russia, Japan, Hawaii, Peru, and Chile. • Located in Russia's Far East, Kamchatka is a 1,200 km volcanic peninsula on the Pacific Ring of Fire, between the Sea of Okhotsk (west) and the Pacific Ocean and Bering Sea (east).
10	**Bogotá (Colombia)**	• Hosted the Emergency Ministerial Conference of The Hague Group at San Carlos Palace, where 32 nations discussed Israel's actions in Gaza, termed "genocide." • **Geography**: Bogotá is Colombia's capital and largest city, situated on a high Andean plateau (2,640 m above sea level).



1	**Great Chagos Bank (Chagos Archipelago)**	• First-ever recording of the sliteye shark in deep-water seagrass meadows. • **Location:** Central Indian Ocean; part of the Chagos Archipelago, a British Indian Ocean Territory (BIOT). Lies south of Maldives and north of Mauritius. • **Physical Feature:** World's largest atoll structure (by total area). • **Political Status:** Administered by the UK since 1965; Mauritius claims sovereignty. In 2019, the ICJ stated the UK's administration was unlawful. In May 2025, the UK

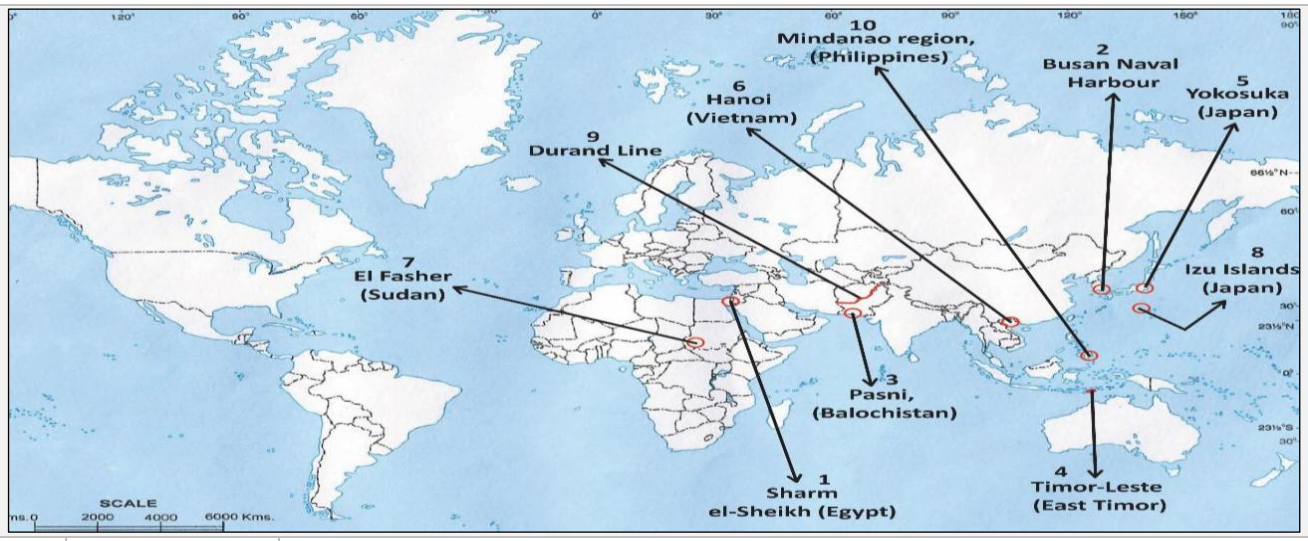
		and Mauritius agreed to transfer sovereignty to Mauritius, while the UK retains control of Diego Garcia's military base for a defined period.
2	**Tuvalu (Pacific Island Nation)**	• Australia launched a world-first "climate visa" programme; 80% of Tuvalu's population applied. • **Location:** Pacific Ocean, midway between Hawaii and Australia; consists of 9 islands. • Formerly known as the Ellice Islands. • Neighbours include Kiribati (north) and Fiji (south).
3	**North York Moors, United Kingdom**	• A wildfire burned 25 km² of moorland near Fylingdales, linked to rising temperatures. • **Location:** North Yorkshire, England, near the North Sea coast. • **Status:** National Park since 1952 (one of the UK's earliest).
4	**Lake Urmia, Iran**	• Severe drought led to major shrinkage, worsening Middle Eastern water scarcity. A symbol of Iran's environmental crisis. • **Type:** Salt lake (endorheic basin with no outlet). • **Hydrology:** Fed mainly by the Zarrineh Roud and Simineh Roud rivers; very high salinity.
5	**Joshua Tree National Park, California**	• California approved a protection plan for Joshua trees to address climate threats. • Named after the Joshua Tree (a desert-adapted plant of the agave family). Declared a National Park in 1994. • Located at the meeting point of the **Mojave Desert** (higher, with Joshua trees) and the **Colorado Desert** (lower, hotter, with cacti and creosote bush).
6	**Krasheninnikov Volcano, Russia**	• The volcano in Kamchatka erupted for the first time in over 500 years. • **Location:** Part of the Pacific "Ring of Fire". • **Type:** Compound stratovolcano with two overlapping cones inside a larger caldera.
7	**Mauritania (Northwest Africa)**	• A migrant boat tragedy off Mauritania's coast left at least 49 dead and ~100 missing. • **Location:** Borders the Atlantic Ocean (west), Western Sahara (NW), Algeria (NE), Mali (E & SE), Senegal (south). • **Geography:** Mostly Sahara Desert and Sahel; features sand dunes, plateaus, and mountains. • **Resources:** Rich in iron ore, gold, copper, gypsum, offshore oil & gas; major Atlantic fisheries.
8	**Niger (West Africa)**	• A large Martian meteorite found in Niger was auctioned in New York for $3.5 million, sparking ownership debates. • **Location:** Landlocked; borders Algeria & Libya (north), Chad (east), Nigeria (south), Benin & Burkina Faso (SW), Mali (west). • **River:** Niger River – key for agriculture and settlements. • **Economy:** Major global uranium exporter; crucial for France's nuclear energy sector.
9	**Easter Island (Chile)**	• Study warns that rising seas could threaten the island's iconic **moai** statues by 2080. • **Location:** Southeastern Pacific Ocean, west of Chile; locally called *Rapa Nui*. • **Famous For:** ~900 moai statues carved between the 13th–16th centuries; UNESCO World Heritage Site (Rapa Nui National Park).
10	**Kufr Qaddum, West Bank**	• Farmers, including those in Kufr Qaddum, faced restricted access to olive groves due to ongoing conflict. • **Location:** Palestinian village in northern West Bank, under Qalqilya Governorate.

		• **Historical Importance:** Roman and Byzantine-era remains, old olive presses, and ruins; long-standing reliance on olive cultivation.
11	**Fiji**	• Prime Minister of Fiji, Sitiveni Rabuka, paid an official visit to India. • Fiji is an island nation in the South Pacific, consisting of over 300 islands, around 100 of which are inhabited. • The capital is Suva, located on the largest island, Viti Levu. • Fijian, English, and Fiji Hindi are the principal languages.
12	**Drake's Passage**	• A 7.5 magnitude earthquake has struck the Drake Passage near Argentina and Chile. • Lies between Cape Horn and the South Shetland Islands. • Named after Sir Francis Drake, the English explorer. • Part of the Antarctic Circumpolar Current, with strong west-to-east water flow. • Known for rough seas and icy weather, making it one of the toughest sailing zones.



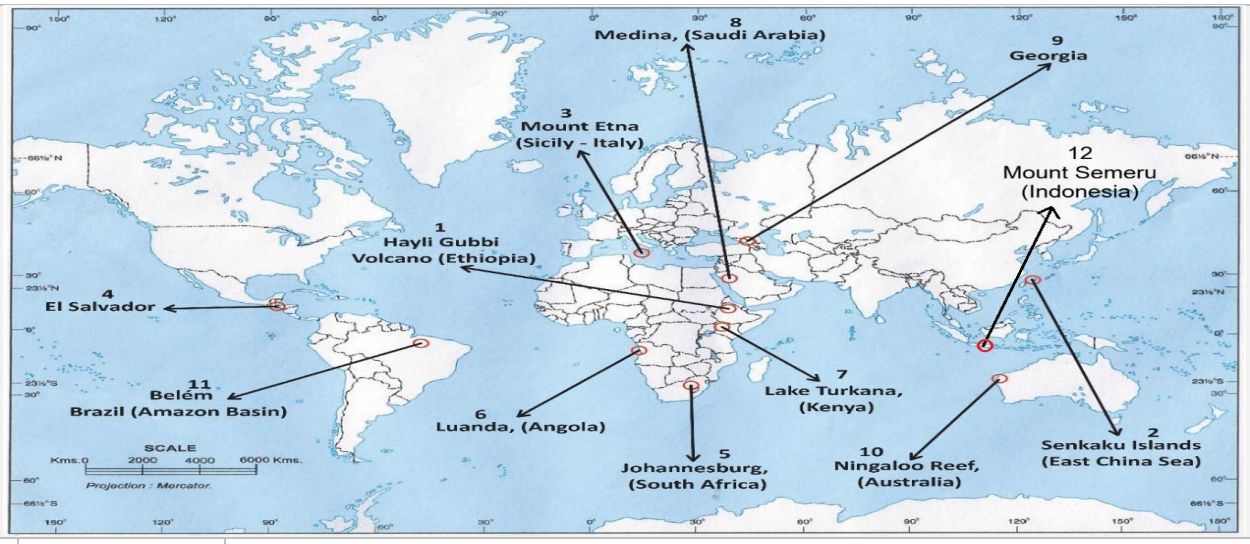
1	**Machu Picchu (Peru)**	• Peru evacuated around 1,600 tourists from the train station serving Machu Picchu. • Located in the Andes Mountains, this 15th-century Inca citadel is built with precise stone masonry and overlooks the Urubamba River. • It is a UNESCO World Heritage Site and one of the New Seven Wonders of the World.
2	**Luzon Strait (Between Taiwan & the Philippines)**	• Work and classes in the Philippines were halted as Super Typhoon Ragasa approached the Luzon Strait. The strait links the South China Sea with the Pacific Ocean and includes island groups such as Batanes and Babuyan. It lies along active tectonic zones, making it prone to earthquakes and intense typhoons.
3	**Huangyan Island / Scarborough Shoal (South China Sea)**	• China created a national nature reserve on Huangyan Island, a triangular reef mostly submerged at high tide. • Claimed by both China and the Philippines, it lies within the broader South China Sea disputes, including China's Nine-Dash Line claim. Only small rocks remain visible above water.
4	**Salamis Bay (Greece)**	• INS Trikand reached Salamis Bay, a natural harbor on Salamis Island near Athens. • Situated in the Saronic Gulf of the Aegean Sea, the area is historically significant for the 480 BCE Battle of Salamis, where Greek forces defeated the Persian navy.
5	**Tirah Valley (Pakistan)**	• A blast in the Tirah Valley of Khyber Pakhtunkhwa killed at least 23 people. • The valley lies in the Spin Ghar (Safed Koh) mountain range near the Afghanistan border. Its rugged terrain and deep gorges have long made it a natural corridor between Afghanistan and the Peshawar region.

6	**Darfur Region (Sudan)**	• A massive landslide in the Marra Mountains destroyed an entire village in Darfur. Located in western Sudan, Darfur borders Chad, Libya, and the Central African Republic. • The region has semi-arid to arid landscapes and is known for the Darfur conflict involving armed rebel groups since 2003.
7	**Kigali (Rwanda)**	• Kigali hosted the 2025 UCI Road World Championships, the first held in Africa. • Situated on Rwanda's central plateau near the Virunga Mountains, Kigali is known for its clean-city policies, high women's representation in Parliament, and leadership in climate action.
8	**Tianjin (China)**	• Tianjin hosted the 25th SCO Summit. Located at the Hai River's mouth on the Bohai Gulf, it borders Beijing and Hebei. • Tianjin Port is one of the world's top 10 busiest ports and the largest in northern China, serving as a key maritime gateway for Beijing.
9	**Berrechid (Morocco)**	• India inaugurated its first overseas defence manufacturing facility in Berrechid. The city lies on the fertile Chaouia Plain and forms part of the Casablanca–Settat economic corridor. • It is supported by tributaries of the Oum Er-Rbia River, making it an important agro-industrial zone.
10	**Mombasa (Kenya)**	• India's first naval training squadron made a port call at Mombasa under the "MAHASAGAR" initiative. • Mombasa is Kenya's major Indian Ocean port city, consisting of Mombasa Island and surrounding mainland areas. • It is known for its tropical climate, historic trade links, and the UNESCO-listed Fort Jesus in its Old Town.
11	**Bagram Air Base**	• The United States is reportedly in talks with Afghanistan to consider regaining control of the Bagram Air Base. • Located north of Kabul, Bagram is **Afghanistan's largest military air facility.** • Built by the Soviet Union in the 1950s, it later became a major battleground between the Taliban and the Northern Alliance. • After the 9/11 attacks, it served as the main centre for US military operations during the War on Terror until US and NATO forces withdrew in 2021.



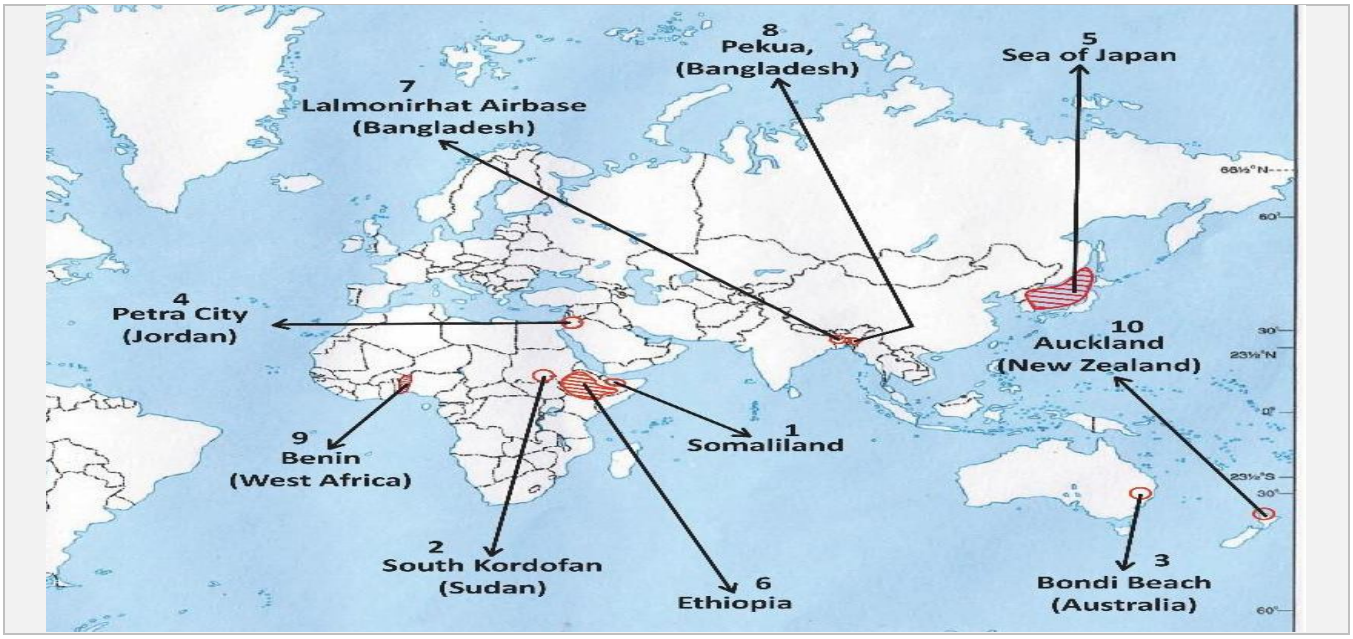
1	**Sharm el-Sheikh (Egypt)**	• Located at the southern tip of the Sinai Peninsula on the Red Sea, between the Gulf of Suez and the Gulf of Aqaba. • Hosted **UNFCCC COP27**, where the "Loss and Damage Fund" was established.

2	**Busan Naval Harbour (South Korea)**	• India and South Korea conducted their **first bilateral naval exercise** here. • Located on the southeastern Korean Peninsula, facing the Korea Strait; a natural deep-water harbour. • Secures vital Sea Lines of Communication (SLOCs) and deters North Korean threats.
3	**Pasni (Balochistan, Pakistan)**	• Pakistan proposed allowing the U.S. to build and operate a commercial deep-water port at Pasni for exporting critical minerals. • Located on the **Makran Coast,** west of Gwadar, features a natural deep-water bay (12–15 m). • It houses **PNS Makran**, Pakistan Navy's second-largest air station. • Site of the 2024 **China–Pakistan naval drill "Sea Guardian-3."**
4	**Timor-Leste (East Timor)**	• Became **ASEAN's 11th member** at the 47th Summit—the bloc's first expansion since the 1990s. • It occupies the eastern half of Timor Island in Southeast Asia. • Former Portuguese colony (1520–1975); occupied by Indonesia (1975–1999). • 1999 UN referendum led to independence. It is sovereign since 2002.
5	**Yokosuka (Japan)**	• INS Sahyadri participated in **JAIMEX-25** near Yokosuka. • Situated at the entrance of Tokyo Bay in Kanagawa Prefecture; deep-water harbour (8–20 m). • Hosts the **United States Navy's largest overseas base (CFA Yokosuka).**
6	**Hanoi (Vietnam)**	• Venue where **72 States** (as of Oct 2025) signed the first **UN Convention against Cybercrime**. • Located in the Red River Delta; formed by the Red River and Duong River system.
7	**El Fasher (Sudan)**	• Conflict has intensified between the Sudanese Armed Forces and the Rapid Support Forces. • **Capital of North Darfur;** located in southwestern Sudan. • Home to multi-ethnic communities including Fur, Zaghawa, Masalit, and Arab tribes.
8	**Izu Islands (Japan)**	• Hit by **Typhoon Halong**, causing record rainfall and mass evacuations. • Volcanic island chain south and east of the Izu Peninsula, extending into the Pacific Ocean. • Subtropical climate; located in the typhoon corridor • Warmed by the Kuroshio Current, supporting coral reefs.
9	**Durand Line (Pakistan–Afghanistan)**	• Fresh cross-border clashes reported along the 2,670-km porous border. • Established in 1893 through an agreement between Sir Mortimer Durand and Amir Abdur Rahman Khan. • Created as a buffer during the *Great Game*; divided Pashtun tribal regions (Afridi, Mohmand, Wazir, Shinwari). • Afghanistan does not recognise it; Pakistan treats it as the official border and has fenced 90% of it.
10	**Mindanao Region (Philippines)**	• A 7.4-magnitude offshore earthquake struck near southern Mindanao, triggering a tsunami warning. • Second-largest island after Luzon; part of the southern archipelago. • Biodiversity hotspot with UNESCO sites such as **Mt. Hamiguitan** (pygmy forest) and **Tubbataha Reefs** (shark sanctuary).



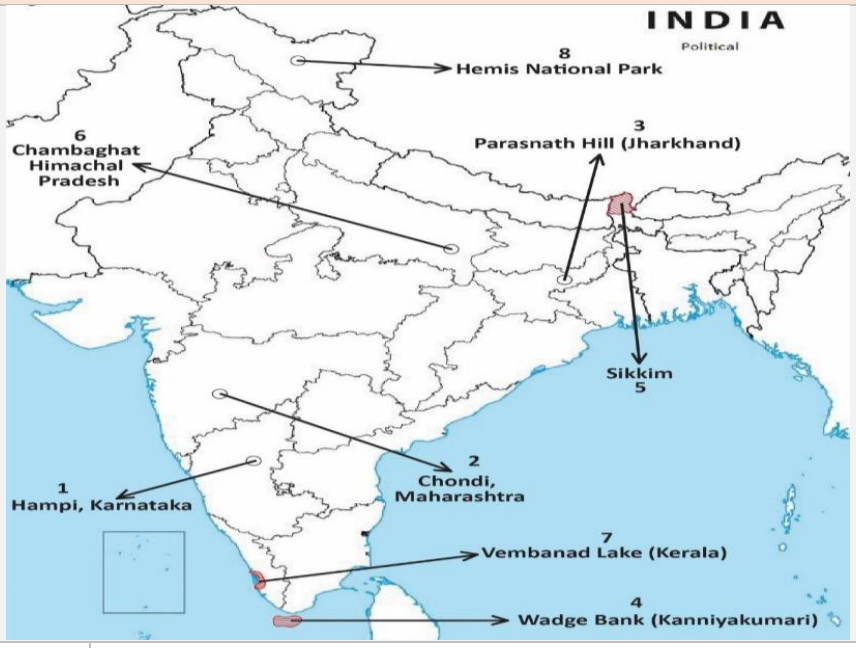
1	**Hayli Gubbi Volcano (Ethiopia)**	• Hayli Gubbi, a **shield volcano** in the Afar Region of northeastern Ethiopia, erupted after nearly 10,000 years. • Located in the Afar Depression at the Afar Triple Junction, where the Nubian, Somali, and Arabian tectonic plates diverge • The eruption released a massive ash cloud that drifted toward India, raising concerns about air quality and aviation safety.
2	**Senkaku Islands (East China Sea)**	• These Islands are a group of uninhabited islands in the East China Sea, administered by Japan but claimed by China and Taiwan. • They lie northeast of Taiwan and southwest of Japan's Ryukyu Islands.
3	**Mount Etna (Sicily, Italy)**	• Mount Etna is Europe's tallest and most active volcano, located on the island of Sicily. • It lies near a convergent plate boundary where the African Plate is moving beneath the Eurasian Plate. • Classified as a stratovolcano, Etna frequently comes into the news due to seismic activity and volcanic eruptions that affect nearby settlements.
4	**El Salvador**	• El Salvador, a Central American country bordering the Pacific Ocean, recently signed an agreement with the United States related to the deportation of criminals. • Known as the "Land of Volcanoes," it lies along a volcanic chain that offers geothermal energy potential. • In 2021, it became the first country to adopt Bitcoin as legal tender alongside the US dollar.
5	**Johannesburg (South Africa)**	• Johannesburg hosted the 2025 G20 Summit, marking the first time the summit was held in Africa. • Founded after the discovery of gold on the Witwatersrand, the city is known as "eGoli" or the City of Gold. • It lies on the Highveld plateau at over 1,750 metres and is notable for being a major global city without a river, lake, or coastline.
6	**Luanda (Angola)**	• Luanda, the capital of Angola, hosted the 7th European Union–African Union Summit. • The city is central to Angola's oil-based economy, as its port plays a key role in exporting crude oil. • Petroleum exports have historically contributed the majority of Angola's foreign earnings and government revenue.
7	**Lake Turkana (Kenya)**	• Lake Turkana, located in northern Kenya, lies within the Eastern branch of the East African Rift System, where the African continent is slowly splitting.

		• A recent scientific study found that declining water levels over the past 6,000 years have increased earthquake activity in the region. • It is the world's largest permanent desert lake and the largest alkaline lake.
8	**Medina (Saudi Arabia)**	• Medina, one of the holiest cities in Islam, was in the news following a tragic bus fire near the city that killed 45 Umrah pilgrims from Telangana. • Traditionally seen as a city of peace and reflection, Medina is known for its historic mosques, such as **Quba Mosque and Masjid al-Qiblatayn,** and for its fertile oasis agriculture, especially Ajwa dates.
9	**Georgia (Europe–Asia Border)**	• Georgia, located at the crossroads of Europe and Asia in the Transcaucasia region, recently strengthened cooperation with India in textiles and sericulture. • The country borders the Black Sea and is largely mountainous, with the Greater Caucasus range in the north. Its strategic location has made it an important cultural and economic bridge between regions.
10	**Ningaloo Reef (Australia)**	• Ningaloo Reef, a UNESCO-listed coral reef off Western Australia, suffered severe coral loss due to an intense marine heatwave. • Stretching over 300 km along the Indian Ocean coast, it is a fringing reef located very close to the mainland. • The warm Leeuwin Current supports rich biodiversity despite the area's dry coastal climate.
11	**Belém (Brazil, Amazon Basin)**	• Belém, the capital of Pará state in Brazil, hosted the 30th Conference of the Parties (COP30) to the UNFCCC. • Situated near the mouth of the Amazon River, the city is shaped by the Amazon Estuary. • The region is known for the Pororoca, a powerful tidal bore formed when Atlantic tides meet the river's massive flow.
12	**Mount Semeru (Indonesia)**	• Indonesian authorities rescued climbers who were stranded in the Ranu Kumbolo following an eruption of Mount Semeru. • Mount Semeru is the **highest volcano on the island of Java**, Indonesia, and located in East Java within the Bromo Tengger Semeru National Park. • It is an active **stratovolcano** situated in a subduction zone, making it one of Indonesia's most active volcanoes.

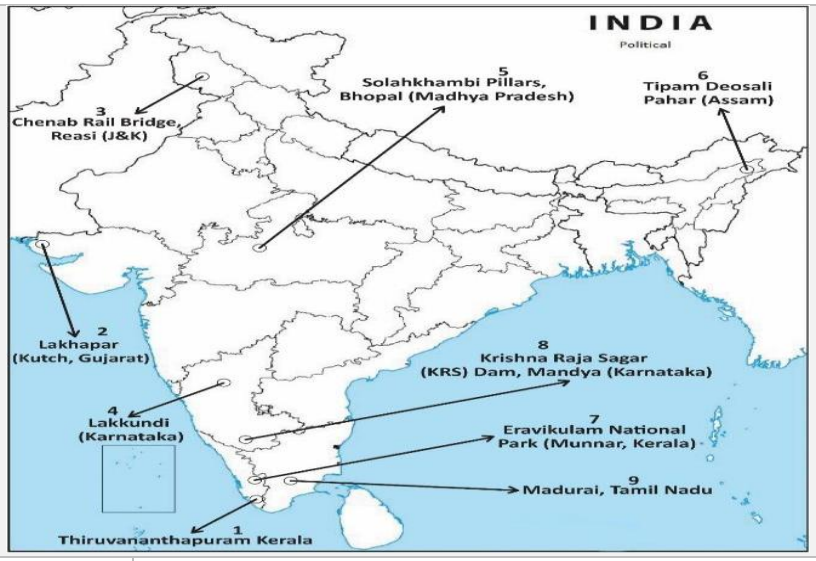


1	**Somaliland**	• First formally recognised by Israel on **26 December 2025**, triggering regional concerns on sovereignty and stability. • Located in the **Horn of Africa**, along the **Gulf of Aden**, bordering **Djibouti, Ethiopia, and Somalia (Puntland)**; capital is **Hargeisa**. • Originated as **British Somaliland**; merged with Italian Somaliland in 1960, but declared independence in **1991** after civil conflict. • Functions as a **de facto state** with its own currency and institutions. • **Strategic maritime importance** due to proximity to the **Bab-el-Mandeb Strait**, through which about **10–12% of global trade** passes.
2	**South Kordofan**	• The UN Security Council condemned **drone attacks on UN peacekeepers**. • It shares an **international border with South Sudan** and internal borders with North, West Kordofan and White Nile states. • Ethnically diverse region, home to **Nuba groups** and Arab pastoralist tribes like **Misseriya and Hawazma**.
3	**Bondi Beach**	• Site of a **terrorist attack** during **Hanukkah celebrations**. • Located **7 km east of Sydney** on the **Pacific coast**. • A **crescent-shaped embayed beach**, about **1 km long**, within a densely populated suburb. • Sea breezes help moderate temperatures and reduce **urban heat island effects**.
4	**Petra**	• India and Jordan agreed to **twin Petra with Ellora Caves**. • Known as the **"Rose-Red City"**, capital of the **Nabataean Kingdom**. • Located between the **Dead Sea and Gulf of Aqaba**, surrounded by mountains. • Architecture blends **Greek, Roman, and Nabataean** styles.
5	**Sea of Japan**	• U.S. **B-52 bombers** flew here with Japanese fighters after Chinese and Russian drills. • A **marginal sea of the western Pacific**, bordered by **Japan, Russia, and the Koreas**. • Major **security hotspot**, frequently used for missile tests and naval exercises.
6	**Ethiopia**	• Known as the **"Roof of Africa"** due to the **Ethiopian Highlands**. • The **Great Rift Valley** cuts diagonally across the country. • Contains **Ras Dashen** (highest peak) and the **Danakil Depression**, one of the **lowest and hottest places on Earth**.
7	**Lalmonirhat Airbase**	• China is constructing the **runway** of this Bangladesh Air Force base. • Located **12–15 km from the Indian border**, near **Cooch Behar (West Bengal)**. • Around **135 km from the Siliguri Corridor (Chicken's Neck)**. • Built by the British in **1931**; strategically important for monitoring plains and Himalayan frontiers.
8	**Pekua**	• China is building a **submarine base** capable of hosting **8 submarines**. • Coastal **Upazila in Cox's Bazar district**. • **BNS Pekua** is Bangladesh's first full-fledged submarine base. • Close to **Matarbari deep-sea port**, expected to be fully operational by **2026**.
9	**Benin**	• Recent events mark the **3rd coup attempt** and **first failed coup** in the Sahel this year. • **Atakora Mountains** dominate the northwest. • Since 2020, Africa has seen **17 coup attempts**, making the **Sahel–West Africa belt** a global hotspot.
10	**Auckland**	• A **Sikh religious procession** was temporarily halted by a **Haka display**. • Largest city and economic hub of New Zealand. • Built on the **Auckland Volcanic Field**, which is dormant but active. • Unique **dual-harbour city**, facing both the **Pacific Ocean** and **Tasman Sea**.

NATIONAL PLACES IN NEWS

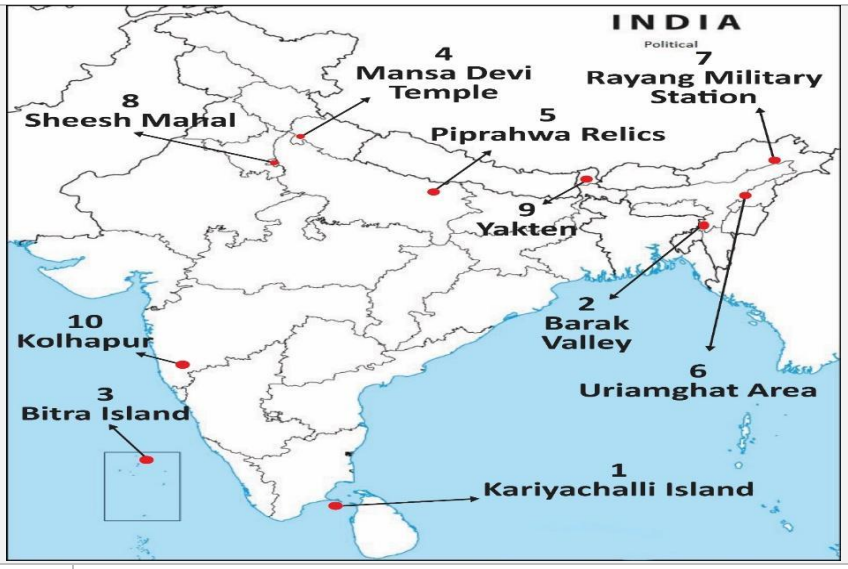


1	**Hampi, Karnataka**	• Capital of Vijayanagara Empire; lies on Tungabhadra River • UNESCO World Heritage Site (1986, *Group of Monuments at Hampi*)
2	**Chondi, Maharashtra**	• Birthplace of Ahilyabai Holkar • 2025 marks her 300th birth anniversary (born May 31, 1725).
3	**Parasnath Hill, Jharkhand**	• Sacred to Santals (*Marang Buru*) and Jains (*Parasnath*) • Site where 20 Jain tirthankaras attained *nirvana* • Houses 40+ Jain temples
4	**Wadge Bank, Kanniyakumari**	• Submarine plateau ~80 km south of Kanyakumari • Part of India's EEZ under 1976 India–Sri Lanka agreement • Fisher protests are ongoing against the hydrocarbon exploration project (HELP).
5	**Sikkim**	• 50th anniversary of statehood (May 26, 1975) • Under Chogyal monarchy until 1975 • Became India's 22nd state via referendum
6	**Chambaghat, Himachal Pradesh**	• Discovery of 600-million-year-old stromatolite fossil • ~1,500 m altitude with temperate climate • Houses Directorate of Mushroom Research and Solan the "Mushroom City of India."
7	**Vembanad Lake, Kerala**	• Longest lake in India (96.5 km), Ramsar site (2002) • Brackish lagoon spanning Alappuzha, Kottayam, Ernakulam, Kochi • Fed by 6 rivers • Venue for Kerala boat races (e.g., Nehru Trophy).
8	**Hemis National Park, Ladakh**	• Largest national park in India with altitude 3,000–6,000 m • Snow leopard density ~2.07 per 100 km² (world's highest) • Trans-Himalayan cold desert (Zone 1A) • Part of the Global Snow Leopard & Ecosystem Protection Program



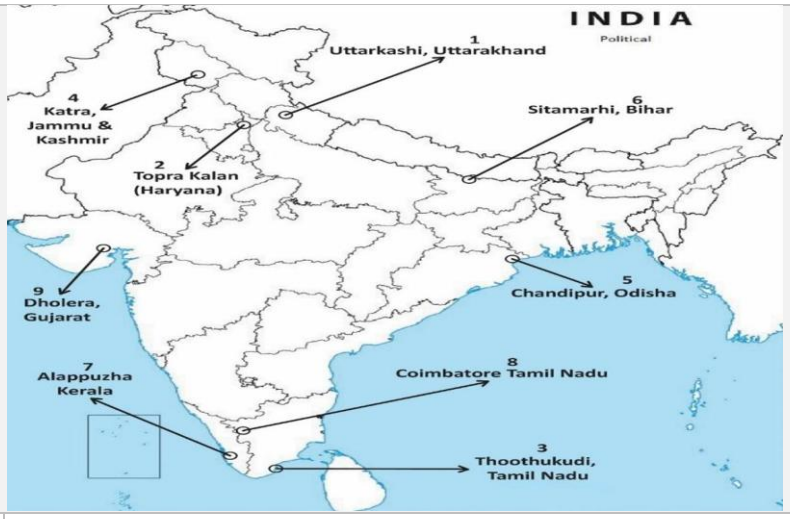
1	**Thiruvananthapuram, Kerala**	• Hosted the **'Bhoomi' Conclave** on digital land surveys. Located in **southern Kerala**, the city is a **space technology hub** (IIST, VSSC). • Major attractions include **Napier Museum**, **Kovalam Beach**, **Kuthiramalika Palace**, and **Ponmudi Hills**. The upcoming **Vizhinjam Port** aims to rival **Colombo** and **Singapore** ports.
2	**Lakhapar (Kutch, Gujarat)**	• Archaeologists discovered a **5,300-year-old Early Harappan settlement**, predating Dholavira's peak. • Offers insight into **pre-urban Harappan culture** and regional networks. • Found a rare **in-situ burial** within habitation layers. Nearby: **Narayan Sarovar Sanctuary** with chinkara habitat.
3	**Chenab Rail Bridge, Reasi (J&K)**	• **Inaugurated by PM Modi**, it is the **world's highest railway bridge**, built across the **Chenab River**, a landmark in Indian engineering.
4	**Lakkundi (Karnataka)**	• Excavations launched at the **Chalukya-era Kote Veerabhadreshwara Temple**. • Once a **Hoysala capital** and major **agrahara** (learning centre). • Houses over **50 restored temple ruins** of Hindu and Jain traditions.
5	**Solahkhambi Pillars, Bhopal (Madhya Pradesh)**	• **10th–11th century CE Paramara-era structure** dismantled for conservation, sparking debate. • Located in **Bihar Kotra village**, near **Chidikoh Bird Sanctuary**. Features **14 pillars in two rows**, inspired by **Greek architectural style**.
6	**Tipam Deosali Pahar (Assam)**	• Heritage project to honour **Chaolung Sukapha**, founder of the Ahom kingdom (1228 AD). • The site, also called **Tipam Hills**, was the dynasty's first temporary capital. Offers views of **Burhi Dihing River** and **Dihing–Patkai Rainforest**.
7	**Eravikulam National Park (Munnar, Kerala)**	• Rated **India's best-managed national park (MEE 2025)**. High-altitude grasslands (~2,000–2,695 m) around **Anamudi Peak**. • Habitat of the **endangered Nilgiri Tahr** and **Raorchestes resplendens** frog. Known for **Neelakurinji blooms** every 12 years (next in 2030).
8	**Krishna Raja Sagar (KRS) Dam, Mandya (Karnataka)**	• Reached **full capacity (124.8 ft)** for the first time in **85 years**. Built across the **Kaveri River** under **Sir M. Visvesvaraya** (1911–1931). • Supplies **irrigation, drinking water, and hydropower**, benefiting **Mandya, Mysuru, Bengaluru**, and **Tamil Nadu**.
9	**Madurai, Tamil Nadu**	• Hosted the **Murugan Devotees Conference**. Among the **world's oldest cities**, situated on the **Vaigai River**.

		• Historic **Pandya capital** and centre of **Tamil Sangam literature** (dating back over 2,500 years).



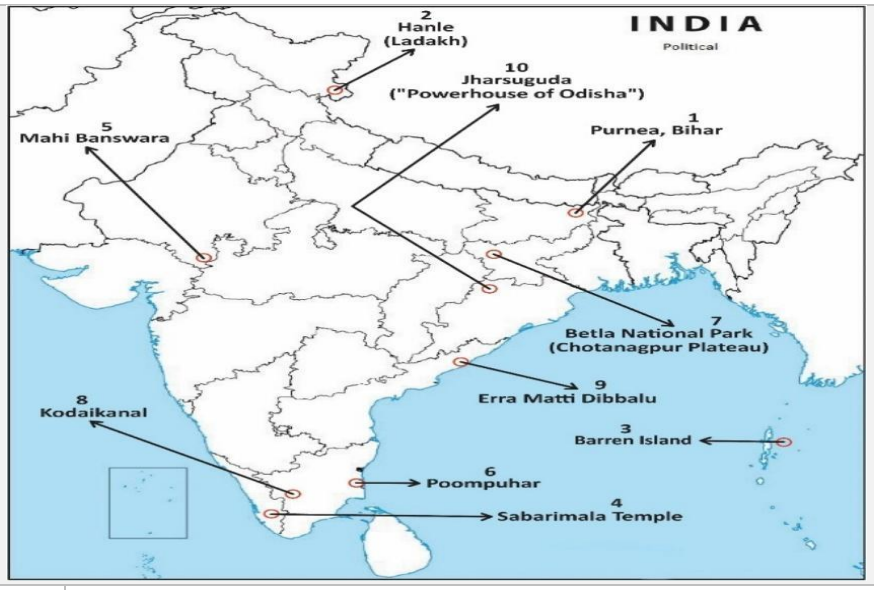
1	**Kariyachalli Island (Tamil Nadu)**	• Tamil Nadu is working to save the sinking Kariyachalli Island in the Gulf of Mannar Marine National Park by deploying 8,500 artificial reef modules under the TNSHORE initiative. • Surrounded by coral reefs and seagrass meadows, it supports endangered species like the dugong and 132 coral types. • The island has lost over 70% of its landmass since 1969 and may vanish by 2036 if erosion continues.
2	**Barak Valley (Southern Assam)**	• The Lumding–Badarpur railway section, a vital lifeline for Barak Valley, passes through the unstable hills of Dima Hasao. • The valley shares a 129-km border with Bangladesh and is surrounded by Meghalaya (north), Mizoram (south), Manipur (east), Tripura (southwest), and Sylhet division of Bangladesh (west).
3	**Bitra Island (Lakshadweep)**	• The smallest inhabited island in Lakshadweep, located near Agatti Island in the Arabian Sea, is being considered for defence acquisition. • Its strategic position along major maritime routes connecting the Strait of Malacca, Gulf of Aden, and Gulf of Hormuz enhances India's maritime surveillance capabilities.
4	**Mansa Devi Temple (Haridwar, Uttarakhand)**	• A stampede near Har Ki Pauri claimed eight lives on the route to the Mansa Devi Temple, located atop Bilwa Parvat (Shivalik Hills) at over 500 feet elevation. • Dedicated to Goddess Mansa, it is one of Haridwar's Panch Tirthas and a Siddhpeeth. Panch Tirthas include Har Ki Pauri, Kankhal, Kushwart, Bilwa (Mansa Devi), and Neel Parvat (Chandi Devi).
5	**Piprahwa (Uttar Pradesh)**	• Buddha's relics from Piprahwa were returned to India after 127 years, having been discovered in 1898 by William Claxton Peppé. • ASI excavations (1971–77) confirmed Piprahwa's link to Kapilavastu through additional caskets and sealings. • The stupa shows three phases — Sakya-era mud stupa, Asokan brick expansion, and Kushana-period monastery.
6	**Uriamghat (Golaghat District, Assam)**	• The Assam government conducted an eviction drive to clear 3,600 acres of encroached land in the Rengma Reserve Forest, a key habitat for Indian elephants and hoolock gibbons.

		• Families with Forest Rights Certificates (FRCs) under the Forest Rights Act, 2006, were exempted from eviction.
7	**Rayang Military Station (Arunachal Pradesh)**	• The Indian Army conducted "Exercise Drone Prahar" at Rayang near Pasighat, East Siang district, to test drone-based tactical operations. • The area partly includes the D'Ering Memorial Wildlife Sanctuary.
8	**Sheesh Mahal, Shalimar Bagh (Delhi)**	• The Sheesh Mahal (Palace of Mirrors) in Delhi's Shalimar Bagh reopened after 370 years, following restoration by ASI and DDA. • Built in 1653 under Shah Jahan, it is known for its floral stucco and red sandstone. • The palace also hosted Aurangzeb's first coronation (July 1658).
9	**Yakten (Sikkim)**	• Yakten village, in Pakyong district, has been declared India's first Digital Nomad Village under the 'Nomad Sikkim' initiative. • It promotes rural entrepreneurship and year-round income by attracting remote workers. • The initiative aligns with Digital India and Sikkim's 'One Family, One Entrepreneur' mission.
10	**Kolhapur (Maharashtra)**	• Prada, the global fashion brand, acknowledged that its new leather sandal design was inspired by Kolhapuri chappals (which have a GI tag). • Located on the banks of the Panchganga River and surrounded by the Sahyadri ranges and is rich in bauxite deposits. • Kolhapur was a princely state under Shahu Maharaj (1894–1922)



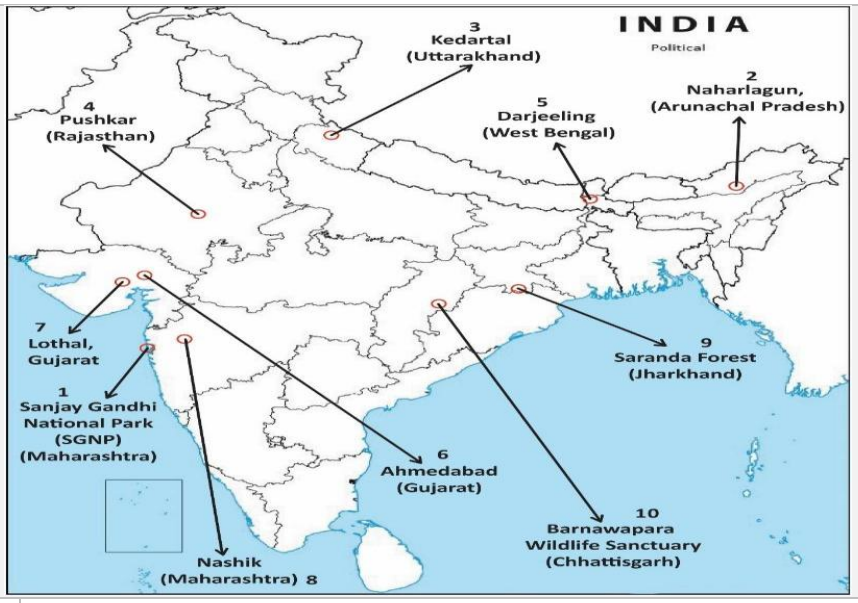
1	**Uttarkashi, Uttarakhand**	• A cloudburst triggered flash floods and landslides, sweeping away a village and forming a 1-km long lake at Tel Gad in Harsil. • **Location:** Town and district headquarters in Garhwal region; on the banks of the Bhagirathi River. • **Geography:** Called the "Kashi of the North"; part of an ecologically fragile Himalayan zone prone to landslides, floods, and earthquakes.
2	**Topra Kalan (Haryana)**	• Ground Penetrating Radar surveys uncovered a 1500 BCE settlement with Mauryan-era cultural remains, including PGW and a possible Buddhist stupa. • Associated with an Ashokan pillar; shows evidence of continuous habitation and Buddhist presence with subsurface walls and room-like structures at 4–5 m depth. • **Material Culture:** Painted Grey Ware, stamped pottery, moulded bricks—indicating transition from Bronze to Iron Age.

3	**Thoothukudi (Tamil Nadu)**	• VinFast inaugurated a $500M EV factory in Thoothukudi (Tuticorin). • **Location:** Coastal city along the Gulf of Mannar; known as the "Pearl City" for historic pearl fishing. • Major salt-producing hub (30% of India's salt); part of the Gulf of Mannar Biosphere Reserve. • The VOC Port is being developed as India's first carbon-neutral port with green methanol and hydrogen initiatives.
4	**Katra, Jammu & Kashmir**	• Heavy rains triggered a massive landslide near the Vaishno Devi shrine. • **Location:** Town in Reasi district; in the foothills of the Trikuta Mountains; on the banks of the Banganga River. • Base camp for the Vaishno Devi shrine.
5	**Chandipur, Odisha**	• India successfully test-fired the Agni-5 missile from the Integrated Test Range at Chandipur. • Known as the "Vanishing Sea" — water recedes up to 5 km during low tide. • Home to the DRDO's Integrated Test Range at Abdul Kalam Island. • Testing site for Agni, Prithvi, Akash, BrahMos, and Shaurya missiles.
6	**Sitamarhi, Bihar**	• Foundation stone was laid for redevelopment of Janki Mata Temple at Punaura Dham. • Located on the western bank of the Lakhandei River. • Flat alluvial plains prone to flooding from Nepal-origin rivers: Baghmati, Burhi Gandak, Gandak. • Devastated in the 1934 Bihar earthquake; historically part of Mithila, later ruled by Mauryas, Mughals, and Senas.
7	**Alappuzha, Kerala**	• 71st Nehru Trophy Boat Race held on Punnamada Lake. • Known as the "Venice of the East" for backwaters, canals, lagoons, and houseboats. • Part of Kuttanad ("Rice Bowl of Kerala"), famous for below-sea-level farming (polders). • Early trade centre with Dutch and Portuguese influence. • Lies on National Waterway-3.
8	**Coimbatore, Tamil Nadu**	• Hosted WAREMAT 2025 and TOPRINT EXPO 2025. • Known as the "Manchester of South India" — major centre for cotton-based textiles. • Home to India's first textile research institute (SITRA, 1956); expanded into IT and manufacturing.
9	**Dholera, Gujarat**	• Being developed as India's first Greenfield Smart Industrial City under the Delhi–Mumbai Industrial Corridor (DMIC). • Historically an ancient port city dating to the Harappan era (c. 2500 BCE). • Important trade hub during the Gujarat Sultanate, Mughal period, and British rule.



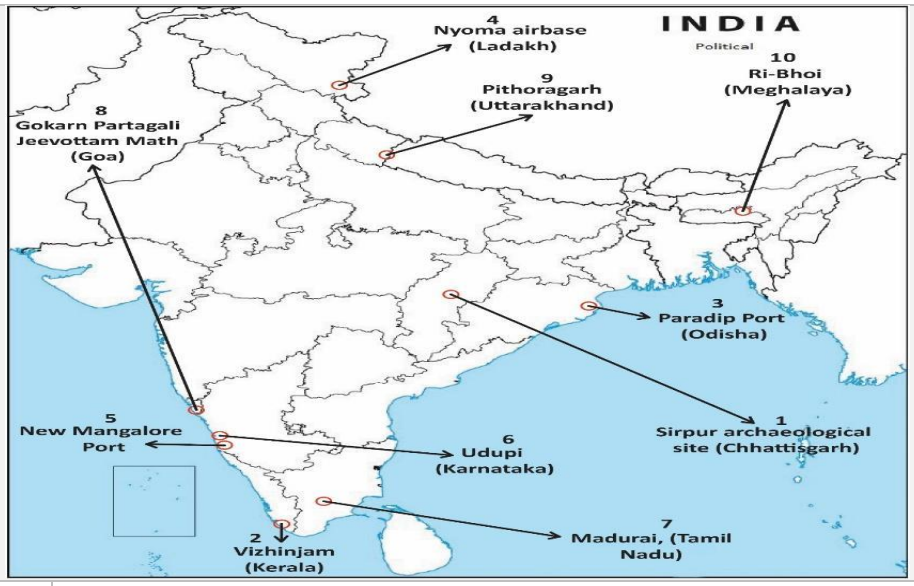
1	**Purnea (Bihar)**	• The National Makhana Board was inaugurated here under the Union Budget 2025 initiative. • Established by the East India Company in 1770, Purnea is known for its fertile alluvial soils. • Several Himalayan rivers, including the Kosi, Mahananda, and Panar, flow through the district, making it agriculturally rich.
2	**Hanle (Ladakh)**	• A remote village in Leh district's Changthang region, Hanle is famous for its clear, jet-black skies. • It hosts the Indian Astronomical Observatory and the high-altitude **Major Atmospheric Cerenkov Experiment Telescope (MACE)** gamma-ray telescope. Hanle is also India's first officially declared Dark Sky Reserve, making it ideal for astronomy.
3	**Barren Island (Andaman & Nicobar Islands)**	• India and South Asia's only active volcano erupted twice in September 2025. • The island sits near the Indian Plate–Burma Microplate boundary. • A **stratovolcano** composed of basalt and andesite, it lies along the **West Andaman Fault,** part of the Indo-Burmese subduction zone known for earthquakes and volcanic activity.
4	**Sabarimala Temple (Kerala)**	• The Travancore Devaswom Board announced the Global Ayyappa Sangamam for the temple's development. • Located in the Periyar Tiger Reserve, Sabarimala is one of India's major pilgrimage centres. • It is known for the 18 gold-plated steps and its ethos of inclusivity, with devotees of all faiths welcomed—including the nearby Vavar mosque.
5	**Mahi Banswara (Rajasthan)**	• PM Modi laid the foundation for the Mahi Banswara Atomic Power Project near the Mahi Dam. • Located in southern Rajasthan's tribal belt, Banswara is called the "City of Hundred Islands" due to the Mahi River's branching streams. • The Mahi is Rajasthan's only perennial south-flowing river.
6	**Poompuhar (Tamil Nadu)**	• Underwater archaeological explorations have begun at the ancient port city of Poompuhar. • Known in Sangam literature as **Kaveripattinam** or Puhar, it lies near the **Kaveri River mouth.** • Once a major Chola port and capital, the site offers valuable insights into early maritime trade and urban life.

7	**Betla National Park (Jharkhand)**	• India's first AI-enabled nature centre with VR and AR holograms has been established here. Declared a National Park in 1986, Betla was originally part of the Palamau Tiger Reserve. • Its name (BETLA) is an acronym for key fauna—Bison, Elephant, Tiger, Leopard, and Axis deer. • The area is dominated by dry deciduous forests such as sal and bamboo.
8	**Kodaikanal (Tamil Nadu)**	• Ancient megalithic dolmens over 5,000 years old face threats from road projects and urban growth. • Located in the Palani Hills, Kodaikanal is known for its cool climate, Kodaikanal Lake, Coaker's Walk, Pillar Rocks, and seasonal Kurinji blooms. • It also hosts the historic Kodaikanal Solar Observatory established in 1899.
9	**Erra Matti Dibbalu (Andhra Pradesh)**	• The Red Sand Dunes near Visakhapatnam have been added to the UNESCO Tentative List. • These coastal dunes, rich in iron minerals, date back 12,000–18,500 years to the Late Quaternary period. • Prehistoric artefacts found here indicate early human presence. The site was declared a National Geo-heritage Monument in 2016.
10	**Jharsuguda (Odisha)**	• PM Modi launched ₹60,000 crore projects in Jharsuguda, known as the "Powerhouse of Odisha." • Bordering Chhattisgarh, the region is rich in coal, bauxite, and other minerals. • It is also a key node in the Mumbai–Nagpur–Jharsuguda GAIL LNG pipeline, which is nearing completion.



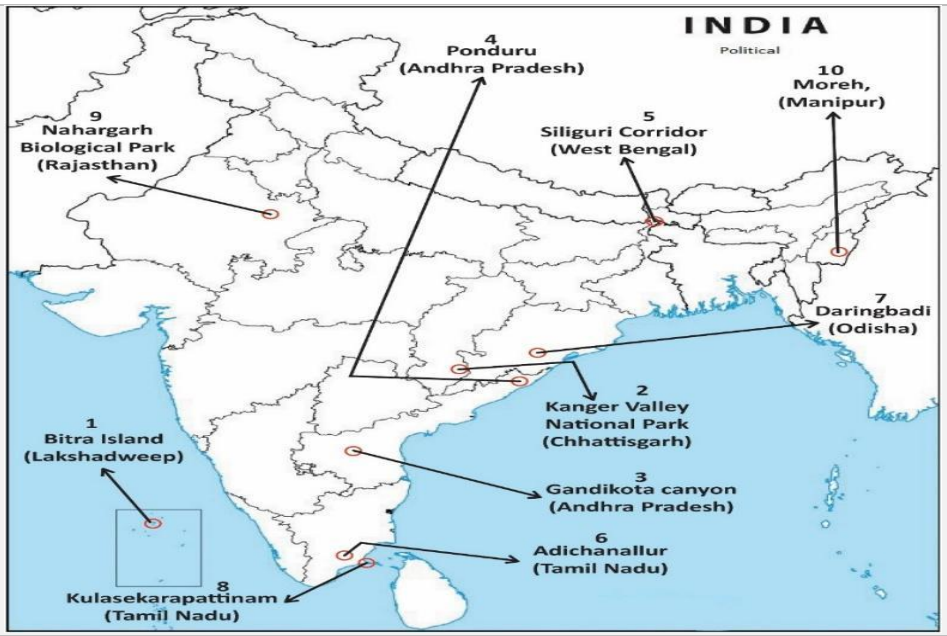
1	**Sanjay Gandhi National Park SGNP (Maharashtra)**	• The Bombay High Court has formed a high-power committee led by former Chief Justice to strengthen conservation efforts in SGNP. • It is a 104 km² protected area in the Mumbai suburbs and one of the world's largest urban national parks. The park hosts the **Kanheri Jain temples** and major religious gatherings. • In 2025, the **SGNP–Tungareshwar Wildlife Corridor** was notified. • The SGNP was nominated for UNESCO's Man and Biosphere Programme.
2	**Naharlagun (Arunachal Pradesh)**	• A part of the twin-capital region with Itanagar, Naharlagun hosted the 18th Raising Day of BRO's Project Arunank.

		• Situated in the **Pappu Valley** at around 1,200 metres in the Himalayan foothills, the area plays an important role in border infrastructure development and connectivity across Arunachal Pradesh.
3	**Kedartal (Uttarakhand)**	• A **high-altitude glacial lake near Gangotri** at 4,750 metres, will undergo detailed surveys under the National GLOF Risk Mitigation Programme. • The region is inhabited by the **Jadung Bhotia tribe,** lies close to the Indo–China LAC, and hosts ITBP deployments along the trekking route.
4	**Pushkar (Rajasthan)**	• Pushkar, known for its **iconic Camel and Cattle Fair,** is situated around Pushkar Lake within the Aravalli hills and semi-arid terrain. • The valley hosts **India's only Brahma temple** and attracts pilgrims and tourists to its culturally significant desert landscape.
5	**Darjeeling (West Bengal)**	• Darjeeling, located on the **Singalila Ridge of the eastern Himalaya**, recently experienced severe floods and landslides affecting northern Bengal and nearby Nepal. • **Close to the strategic Siliguri Corridor** and the China border, the region also contains the biodiverse **Singalila National Park,** home to species such as the red panda and clouded leopard.
6	**Ahmedabad (Gujarat)**	• Situated on the Sabarmati River and known as Gujarat's commercial capital, it has been recommended as the **host city for the 2030 Centenary Commonwealth Games.** • It is **India's first UNESCO World Heritage City** and has previously hosted major global events, including G20 Sherpa and Culture track meetings.
7	**Lothal (Gujarat)**	• Lothal, near the mouth of the Sabarmati along the Khari Creek, has been proposed as the **venue for a Maritime Heritage Festival.** • As a major Harappan port site (2400–1900 BCE), it contains the **world's earliest known tidal dock** and evidence of warehouse complexes, bead industries, and Persian Gulf trade. • It forms part of the **UNESCO-listed Harappan cities** and houses **the National Maritime Heritage Complex.**
8	**Nashik (Maharashtra)**	• Nashik gained prominence after HAL's Nashik division completed the maiden flight of the first Tejas Mk-1A fighter aircraft. • Located near the Godavari's origin in the Western Ghats, Nashik has deep historical links to the Satavahanas, features sites like the **Pandavleni Caves**, hosts the **Kumbh Mela,** and today leads **India's wine tourism industry.**
9	**Saranda Forest (Jharkhand)**	• The Supreme Court provided relief to the Jharkhand government regarding the proposal to declare Saranda as a wildlife sanctuary. • **Situated on the Chotanagpur Plateau**, Saranda is **Asia's largest contiguous sal forest,** rich in biodiversity and iron-ore deposits, and culturally associated with the **Ho tribe,** which forms the dominant local population.
10	**Barnawapara Wildlife Sanctuary (Chhattisgarh)**	• Barnawapara Wildlife Sanctuary, located in Mahasamund district **between the Balamdehi and Jonk Rivers**, has successfully revived its locally extinct blackbuck population. • Positioned within the Central India Tiger Corridor, the sanctuary also supports Baiga tribal communities living along its fringes and contributes to regional ecological connectivity.



1	**Sirpur Archaeological Site (Chhattisgarh)**	• Sirpur, also known as Shripur or Sripura, is a major early-medieval, multi-religious urban centre located on the banks of the Mahanadi River. • Dating from the 5th to 12th centuries CE, it flourished as the capital of Dakshina Kosala under the Panduvanshi and later Somavamshi rulers. • The site contains Shiva and Vishnu temples, Buddhist and Jain viharas, and notable monuments such as the 7th-century Lakshmana Temple, one of India's finest brick temples. The site is being upgraded to strengthen its bid for UNESCO World Heritage status.
2	**Vizhinjam Port (Kerala)**	• Vizhinjam is an international deep-water seaport located on the Arabian Sea coast, about 16 km south of Thiruvananthapuram. • It has a natural deep draft of nearly 20 metres, allowing it to handle the world's largest container ships with little or no dredging. • IIT Madras recently deployed India's first indigenous Vessel Traffic Management System (VTMS) at this port.
3	**Paradip Port (Odisha)**	• Paradip Port, situated at the confluence of the Mahanadi River and the Bay of Bengal, achieved the fastest-ever handling of 100 million metric tonnes of cargo in a single financial year in November 2025. • It is a centrally administered deep-water major port with a 16-metre draft, enabling it to handle large bulk carriers. The port is one of India's busiest by volume and plays a key role in bulk cargo trade.
4	**Nyoma Airbase (Ladakh)**	• The Mudh-Nyoma airbase in eastern Ladakh, inaugurated in November 2025, is located at an altitude of about 13,700 feet. • The upgraded airbase is designed for all-weather operations, including harsh winter conditions. • Its proximity to the Line of Actual Control (LAC) gives India a strategic forward base for rapid troop deployment, surveillance, and logistical support in sensitive border areas.
5	**New Mangalore Port (Karnataka)**	• New Mangalore Port, located on India's west coast near the Gurupura river estuary, is the only major port of Karnataka. • During its Golden Jubilee celebrations in 2025, the Government of India launched modernisation projects worth ₹1,500 crore. • The port is a crucial outlet for agricultural, industrial, and mineral products and plays a significant role in the export of coffee and cashew from the Karnataka hinterland.
6	**Udupi (Karnataka)**	• Udupi gained attention following the Prime Minister's visit to the Sri Krishna Matha, highlighting the legacy of Jagadguru Madhvacharya.

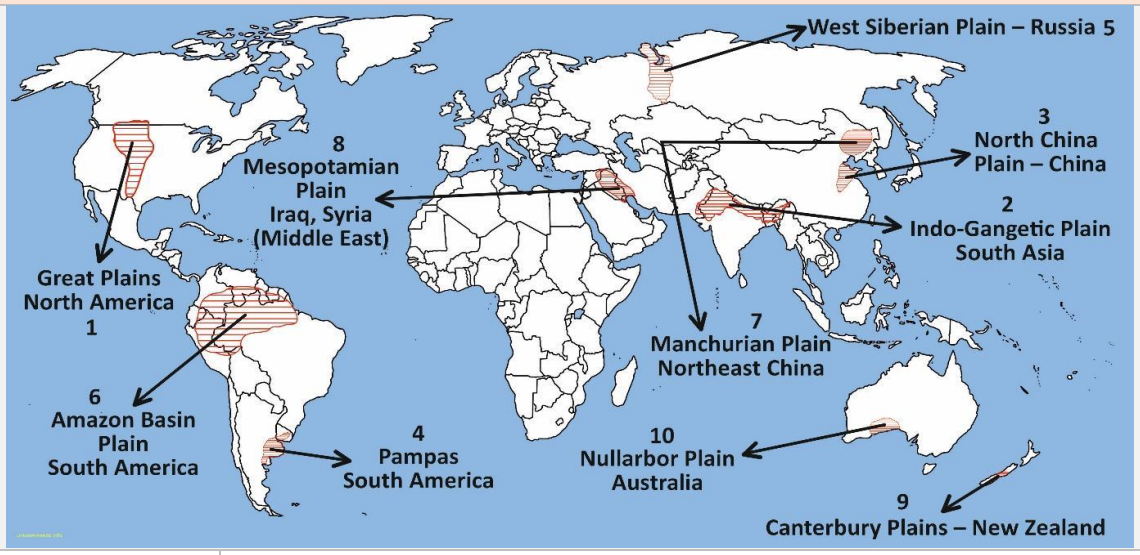
		• Founded in the 13th century, the temple is the centre of the Dvaita (dualistic) Vedanta philosophy. • Often called the "Temple City" and the "Mathura of South India," Udupi is also a cultural hub of the Tulunadu region, known for folk traditions like Yakshagana and Kambala.
7	**Madurai (Tamil Nadu)**	• Madurai hosted the 2025 Men's FIH Hockey Junior World Cup, drawing global attention to the city. • Known as the "City that Never Sleeps," Madurai is one of the world's oldest continuously inhabited cities. • It served as the capital of the ancient Pandyan Kingdom for centuries and remains the cultural capital of Tamil Nadu, deeply associated with Tamil language, literature, and temple architecture.
8	**Gokarn Partagali Jeevottam Math (Goa)**	• The Gokarn Partagali Jeevottam Math came into the news after the unveiling of a 77-foot bronze statue of Lord Ram. • Established in the 15th century, the Math follows the Dvaita school of Vedanta founded by Madhvacharya. • It is regarded as the first Gowd Saraswat Brahmin Vaishnava Math and a key institution preserving Saraswat religious and cultural identity.
9	**Pithoragarh (Uttarakhand)**	• Pithoragarh hosted the 19th Indo-Nepal Joint Military Exercise SURYAKIRAN XIX. • Located in eastern Uttarakhand, the district shares borders with Nepal and China, making it strategically significant. • Nestled in the Soar Valley, it also serves as a traditional gateway for the Kailash-Manasarovar pilgrimage route via the Lipulekh Pass.
10	**Ri-Bhoi District (Meghalaya)**	• Ri-Bhoi district came into focus with the discovery of a new fruit fly species, *Euphranta undulata*, in its bamboo ecosystems. • The district lies along National Highway-6, which connects Assam's Brahmaputra Valley with the Shillong Plateau. • It is predominantly inhabited by the Khasi tribe and represents the ecological richness of Meghalaya's forested landscapes.



1	**Bitra Island (Lakshadweep)**	• The Indian Navy is setting up a **naval detachment** to strengthen maritime security.

		• A **very small oval-shaped island** (0.105 sq km) but has the **largest lagoon** in Lakshadweep. • Forms a **three-point maritime surveillance grid** with **INS Dweeprakshak (Kavaratti)** and **INS Jatayu (Minicoy)** in the Arabian Sea.
2	**Kanger Valley National Park (Chhattisgarh)**	• Chhattisgarh is pursuing **UNESCO World Heritage Site** status. • Located on the **Bastar Plateau**, between the **Eastern Ghats** and **Central Indian Highlands**. • Known for **karst limestone caves**, speleothems, and as an **ecotone** where teak and sal forests overlap.
3	**Gandikota Canyon (Andhra Pradesh)**	• Emerging as a major **tourism and geological site**. • Called the **"Grand Canyon of India"**, carved by the **Penna River**. • Made of **reddish quartzite** (Cuddapah Supergroup). • A clear example of **river erosion** in a semi-arid region.
4	**Ponduru**	• A village in Andhra Pradesh, Gained a **GI tag** for **Ponduru Khadi**. • Known as the **Khadi Capital of South India** for ultra-fine hand-spun khadi. • **Mahatma Gandhi (1921)** praised it as the finest khadi. • Uses indigenous cotton varieties like **Punasa and Red cotton**.
5	**Siliguri Corridor (West Bengal)**	• Under heightened surveillance due to regional military developments. • Narrow land corridor between **Nepal, Bhutan, and Bangladesh**. • Located in the **Eastern Himalayan foothills**, shaped by **Teesta and Mahananda rivers**. • Faces strategic pressure from China's **Chumbi Valley**, close to the corridor.
6	**Adichanallur (Tamil Nadu)**	• Sand mining was banned to protect this **archaeological site**. • Close to **Korkai**, the ancient Pandyan port city. • Evidence suggests early use as a **mining and metallurgical site**. • Pottery with **Tamil-Brahmi inscriptions** shows early Tamil literacy.
7	**Daringbadi (Odisha)**	• This village in Odisha is experiencing an **intense cold wave**. • Called the **"Kashmir of Odisha"** due to high altitude (~915 m). • Only place in Odisha where **frozen dew (snow-like condition)** occurs. • Located in the **Eastern Ghats**, with pine forests and valleys.
8	**Kulasekarapattinam (Tamil Nadu)**	• India's **second spaceport**, launches expected from **2027**. • Dedicated to **Small Satellite Launch Vehicles (SSLV)**. • Allows **direct southward launches**, saving fuel compared to Sriharikota. • Close to **ISRO Propulsion Complex, Mahendragiri**, easing logistics.
9	**Nahargarh Biological Park (Rajasthan)**	• Tourists narrowly escaped a **bus fire during lion safari**. • Located near **Jaipur**, along the Delhi–Jaipur highway. • Part of the **Nahargarh Wildlife Sanctuary** in the **Aravalli Range**. • Has **dry deciduous and thorn forests** under a semi-arid climate.
10	**Moreh (Manipur)**	• In focus due to **ethnic tensions and border trade issues**. • Gateway to Southeast Asia via the **IMT Trilateral Highway** and **Asian Highway-1**. • **Free Movement Regime (FMR)** scrapped; **smart fencing** introduced. • A **cosmopolitan town**, home to many ethnic and religious groups.

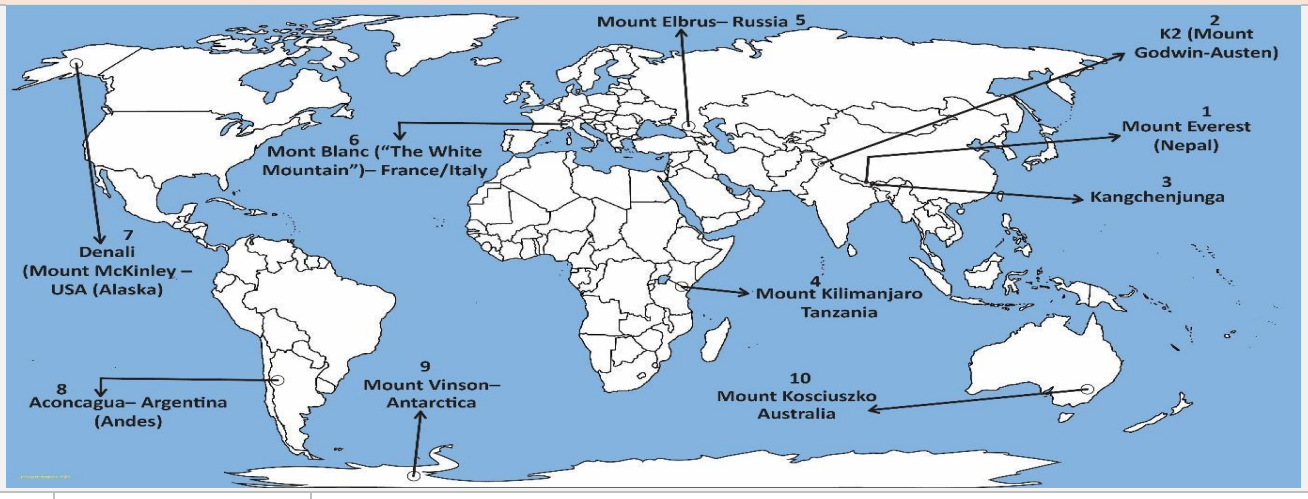
MAJOR PLAINS AROUND THE WORLD



1	**Great Plains - North America**	• **Location**: Extends from Canada to Texas, between Rocky Mountains and Mississippi River. • **Geographical Type:** These are flat land covered in prairie, steppe and grassland ecosystems • **Agricultural Importance:** Called the "Breadbasket of the World" (wheat, maize, barley).
2	**Indo-Gangetic Plain - South Asia**	• **Location**: Along the Indus and Ganga River systems. • **Geographical Type:** Alluvial plain, formed by river deposition. • **Agricultural Significance**: One of the most fertile plains in the world; dense irrigation network. • **Demographic Relevance:** Highly populated; major cities like Delhi, Lahore,Dhaka.
3	**North China Plain - China**	• **Location**: The plain is bordered to the north by the Yanshan Mountains, to the west by the Taihang Mountains, to the south by the Dabie Mountains, and to the east by the Yellow Sea and Bohai Sea. • **Geological Feature:** Formed by Yellow River loess deposition. • **Agriculture**: Rich in wheat, maize, sorghum, millet, peanuts, sesame seed, cotton, and various vegetables. • **Urbanization**: Hosts Beijing and Tianjin, industrial and political hubs.
4	**Pampas - South America**	• **Location**: Central Argentina stretching to Uruguay (from the Atlantic Ocean westward toward the Andes Mountains.) • **Geographical Type:** Temperate grassland plain • **Economic Role:** Cattle ranching and wheat farming; hub of Argentina's agroeconomy. • **Cultural Note**: Home to Gaucho culture (cowboys).
5	**West Siberian Plain - Russia**	• **Location**: Between Ural Mountains and Yenisei River. • **Geographical Feature:** Largest continuous flatland in the world • **Economic Significance:** Rich in natural gas, oil, and minerals. • **Climate:** Harsh continental; poor agricultural potential due to permafrost andmarshes.
6	**Amazon Basin Plain - South America**	• **Location**: Surrounds the Amazon River across Brazil, Peru, and Colombia. • **Geographical Nature:** Low-lying alluvial plain. • **Ecological Role:** Houses the Amazon Rainforest (largest tropical rainforest), keyfor global carbon sink and biodiversity.

		• **Strategic:** Rich in resources (timber, minerals), but faces threats fromdeforestation and illegal mining.
7	**Manchurian Plain - Northeast China**	• **Location**: Lies in northeast China, primarily in Heilongjiang, Jilin, and Liaoning provinces. • **Geography**: Parts of the region, have volcanic features, but the plain itself is mainly alluvial • **Economic Importance:** Rich in soybeans, maize, and coal. • **Geo-political Relevance:** Shares border with Russia and North Korea; military sensitivity.
8	**Mesopotamian Plain - Iraq, Syria (Middle East)**	• **Location**: Between Tigris and Euphrates Rivers. • **Historical Value:** Cradle of Mesopotamian Civilization (Sumerians, Babylonians). • **Geography**: Alluvial plain, prone to flooding. • **Modern Use:** Agriculture-based (wheat, barley); oil-rich regions (southern Iraq). • **Strategic Relevance**: Geopolitical tensions, water disputes.
9	**Canterbury Plains - New Zealand**	• **Location**: Eastern South Island, stretching from the Southern Alps to the PacificOcean. • **Geological Nature**: Formed by glacial and alluvial deposits. • **Agricultural Output**: Key region for dairy, sheep farming, and wine production • **Tourism**: Scenic plain near Southern Alps; adventure tourism hub.
10	**Nullarbor Plain - Australia**	• **Location**: Southern Australia, between South and Western Australia. It lies along the Great Australian Bight and is traversed by the Eyre Highway. • **Nature**: Karst limestone plateau, one of the driest places. • **Human Use:** Sparse population; highway transport corridor. • **Environmental Note:** Unique subterranean cave systems many with underground lakes and fossils. Despite the harsh environment, it supports unique flora and fauna, including species adapted to extreme aridity.

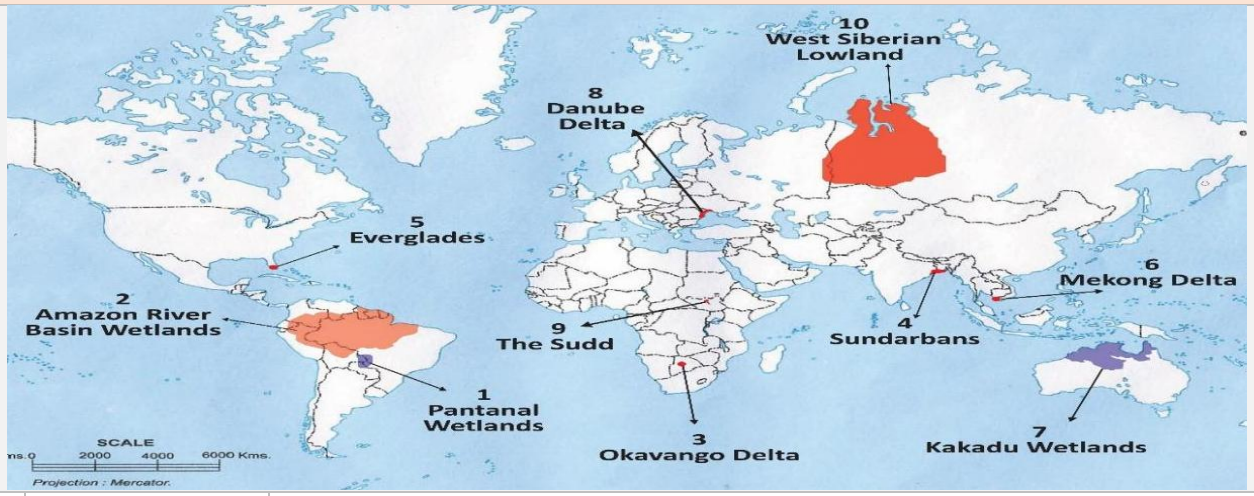
MAJOR MOUNTAINS/PEAKS AROUND THE WORLD



1	**Mount Everest (Nepal)**	• **Location**: Mahalangur Himal, Nepal–China border (8,848.86 m, world's highest peak). • Formed by Indo-Australian–Eurasian plate collision. • **First ascent:** Edmund Hillary & Tenzing Norgay (1953). • Sacred to Sherpa and Tibetan people as "Chomolungma" (Mother Goddess of the World).
2	**K2 (Mount Godwin- Austen)**	• **Location**: Karakoram Range, Pakistan-occupied Kashmir (8,611 m, 2nd highest).

		• Known as "**Savage Mountain**" for its fatality rate. • Glacial melt sustains Indus River, vital for India–Pakistan water security.
3	**Kangchenjunga (India–Nepal)**	• **Location**: Sikkim Himalayas, on India–Nepal border. • 3rd highest peak, called "**Five Treasures of Snow**" for its five summits. • Part of Kangchenjunga Biosphere Reserve (UNESCO). • Bounded by Tamur (W), Lhonak (N), and Teesta (E) Rivers.
4	**Mount Kilimanjaro (Tanzania)**	• **Africa's highest peak**; dormant volcano with cones—Kibo, Mawenzi, Shira. • Equatorial glacier melting due to climate change. • UNESCO World Heritage Site, part of Seven Summits.
5	**Mount Elbrus (Russia)**	• Located in the Caucasus, near the Georgia border. • **Highest peak in Europe and Russia**; snow-covered year-round. • Member of the Seven Summits.
6	**Mont Blanc ("White Mountain") (France–Italy)**	• On the France–Italy border (Haute-Savoie–Aosta Valley). • **Highest peak in the Alps**; birthplace of modern mountaineering. • Mont Blanc Tunnel (11.6 km) links Chamonix and Courmayeur.
7	**Denali (Mount McKinley) (USA–Alaska)**	• North America's highest peak; "Denali" means "Great One" in Koyukon. • Name reverted from McKinley in 2015. • Composed mainly of granite uplifted by Pacific–North American plate subduction.
8	**Aconcagua (Argentina)**	• **Highest peak outside Asia**; Andes range (6,961 m). • Lowest summit pressure (~40% of sea level); altitude sickness common.
9	**Mount Vinson (Antarctica)**	• **Highest peak in Antarctica;** part of Vinson Massif, Ellsworth Mountains. • Remote and essential for Seven Summits challenge. • Winter lows –60 °C; 24 hr daylight in summer.
10	**Mount Kosciuszko (Australia)**	• Located in Snowy Mountains, NSW (2,228 m). • Part of Great Dividing Range; rounded summit with glacial remnants. • Sacred to Ngarigo people; Australia's highest mainland peak.

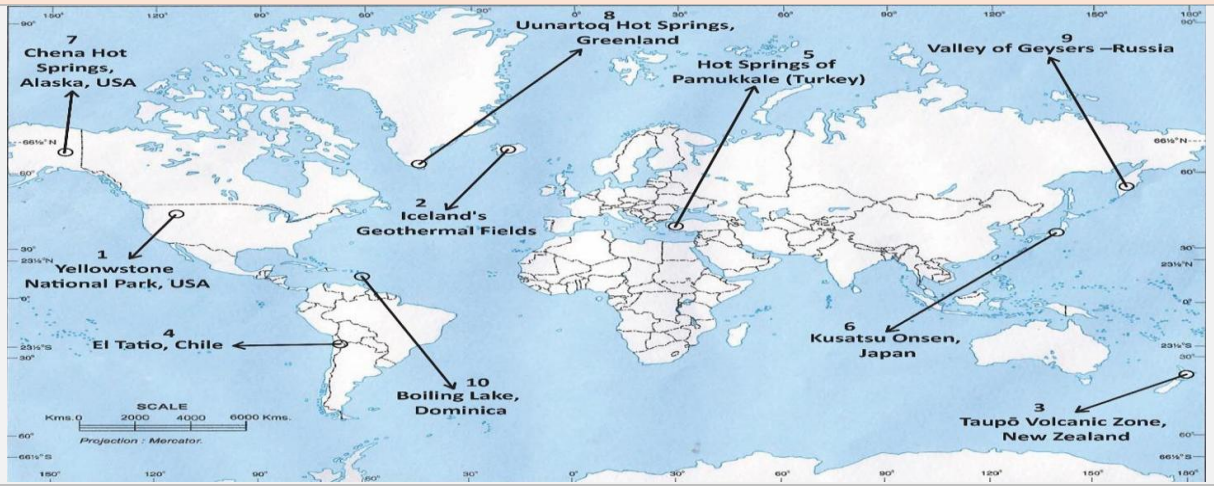
IMPORTANT WETLANDS AROUND THE WORLD



1	**Pantanal (Brazil, Bolivia, Paraguay)**	• The world's largest tropical wetland, covering about 75,000 sq. miles. A tropical seasonal floodplain wetland, it forms a mosaic of grasslands, rivers, and swamps. • Often called the "Serengeti of South America" for its exceptional biodiversity and high biomass density.

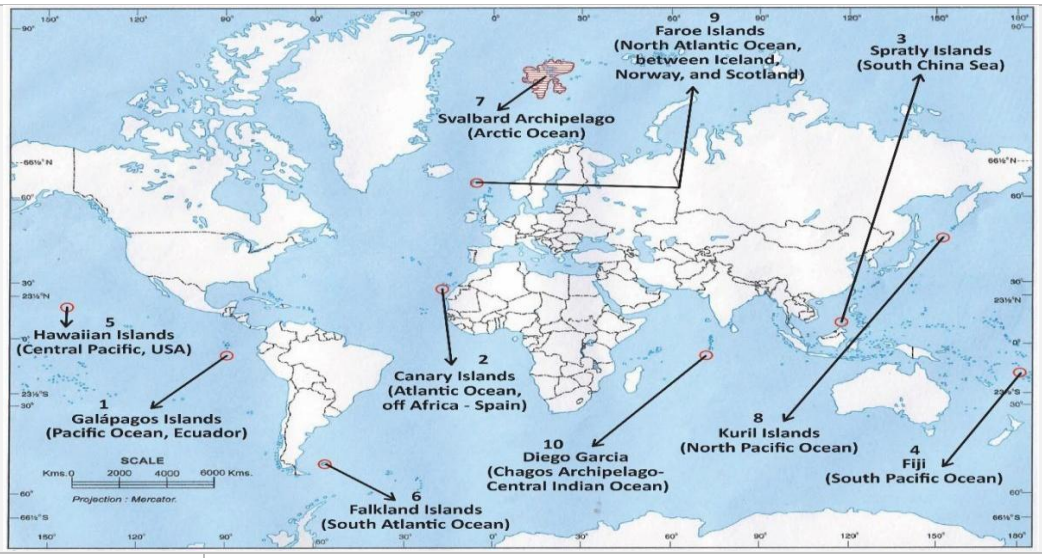
2	**Amazon River Basin Wetlands (South America)**	• A network of riverine and rainforest wetlands forming part of the Amazon Rainforest. • Includes floodplains, oxbow lakes, and inundated forests. Stores ~10% of the world's carbon and supports unique species like the pink river dolphin and giant otter.
3	**Okavango Delta (Botswana)**	• One of the largest inland deltas with no outlet to the sea, and a UNESCO World Heritage Site. • Known for its abundant wildlife that migrates here seeking water in the arid Kalahari Desert.
4	**Sundarbans (India & Bangladesh)**	• A deltaic mangrove wetland and the world's largest contiguous mangrove forest. • A UNESCO World Heritage Site, it serves as the habitat of the Royal Bengal Tiger and protects coastal regions from cyclones.
5	**Everglades (Florida, USA)**	• A subtropical marshland ecosystem, often called the "River of Grass." • Comprises slow-moving waters, sawgrass marshes, and cypress swamps. • Home to species like the Florida panther and American alligator.
6	**Mekong Delta (Vietnam)**	• A river delta and estuarine wetland, known as the "Rice Bowl of Vietnam." • Among the world's most fertile wetlands, it sustains millions through agriculture and fisheries but faces threats from sea-level rise and upstream dams.
7	**Kakadu Wetlands (Australia)**	• Comprising seasonal floodplains, estuarine mangroves, and billabongs, Kakadu is a UNESCO World Heritage Site for both natural and cultural heritage. • Inhabited by Aboriginal peoples for over 65,000 years, it hosts saltwater crocodiles and rich birdlife.
8	**Danube Delta (Romania & Ukraine)**	• Europe's largest continuous marshland and a UNESCO World Heritage Site. • Noted for its diverse bird population, including the largest pelican colony outside Africa, and rich freshwater fish species.
9	**The Sudd (South Sudan)**	• An inland floodplain and swamp, among Africa's largest freshwater wetlands (~57,000 sq. miles). • Supports local livelihoods (e.g., Dinka people) through fishing and grazing and harbours floating vegetation and marsh ecosystems.
10	**West Siberian Lowland (Russia)**	• The world's largest wetland system (~1 million km²), consisting of boreal peatlands, bogs, and tundra wetlands. • A major carbon sink, it mitigates climate change and supports migratory birds like Siberian cranes.

MAJOR GEOTHERMAL WONDERS OF THE WORLD



1	**Yellowstone National Park, USA**	• Located in Wyoming; home to **Old Faithful Geyser**, which erupts roughly every 90 minutes. • Yellowstone sits on a **supervolcano**, powered by a massive magma chamber. • The **Grand Prismatic Spring**—largest hot spring in the U.S.—is famous for its rainbow colours caused by thermophilic bacteria thriving in different temperature zones.
2	**Iceland's Geothermal Fields**	• Iceland, the "**Land of Fire and Ice**," lies on the Mid-Atlantic Ridge, making it a major geothermal hotspot. • **Golden Circle:** Includes the **Geysir Geothermal Area**, with the original Geysir and the active Strokkur geyser. • **Blue Lagoon:** A geothermal spa with milky-blue, mineral-rich waters produced as a byproduct of a nearby geothermal power plant.
3	**Taupō Volcanic Zone, New Zealand**	• One of the world's most active volcanic zones, located on North Island. • **Wai-O-Tapu Thermal Wonderland:** Known for colourful geothermal pools and the erupting **Lady Knox Geyser**. • **Champagne Pool:** A bubbling, hot crater with distinctive orange mineral deposits.
4	**El Tatio, Chile**	• High-altitude geyser field in the Andes; one of the world's highest. • Geysers release steam and hot water dramatically, especially at sunrise when cold air enhances steam visibility.
5	**Hot Springs of Pamukkale, Turkey**	• "**Cotton Castle**" terraces formed by calcium-rich geothermal springs. • Warm waters (≈35°C) used since Roman times; located near the ancient city of **Hierapolis**. • A **UNESCO World Heritage Site**, blending geological beauty with cultural history.
6	**Kusatsu Onsen, Japan**	• Famous hot spring resort in Gunma Prefecture with highly acidic, mineral-rich waters. • The **Yubatake** is a central feature, channeling steaming geothermal water into public baths.
7	**Chena Hot Springs, Alaska, USA**	• Hot spring resort in Fairbanks (North Star Borough). • Natural pools (~40°C) with views of the **Northern Lights**; geothermal heat linked to granite intrusions. • Site of Alaska's **first geothermal power plant**. • Popular for aurora watching, the ice museum, and Arctic research.
8	**Uunartoq Hot Springs, Greenland**	• Natural geothermal springs warmed by heat beneath Greenland's crust. • Water stays **34–38°C year-round**, even in Arctic winters. • Surrounded by mountains, fjords, and icebergs—one of the few warm oases in a polar region.
9	**Valley of Geysers, Russia**	• Remote UNESCO-listed site in Kamchatka. • World's **second-largest geyser concentration** (90+), after Yellowstone. • Located along the **Pacific Ring of Fire**, a major volcanic belt.
10	**Boiling Lake, Dominica**	• Found in Morne Trois Pitons National Park. • Heated by underlying magma; world's **second-largest hot lake** (after Frying Pan Lake, New Zealand). • Supports unique microbial life adapted to extreme geothermal conditions.

MAJOR ISLANDS & ARCHIPELAGOS AROUND THE WORLD



1	**Galápagos Islands (Pacific Ocean, Ecuador)**	• A volcanic archipelago of 19 main islands and over 100 islets, the Galápagos is a UNESCO World Heritage Site known as a "living laboratory of evolution." • It hosts unique species such as giant tortoises, marine iguanas, and Darwin's finches. • Formed by hotspot volcanism, the islands remain geologically active.
2	**Canary Islands (Atlantic Ocean, Spain – off Africa)**	• Located near Morocco and Western Sahara, this volcanic archipelago of seven main islands includes Mount Teide, Spain's highest peak. • The islands have rich endemic biodiversity, such as Canary pine forests, and support diverse marine life due to nutrient upwelling zones.
3	**Spratly Islands (South China Sea)**	• A scattered group of reefs and atolls, the Spratlys lie in a crucial maritime zone linking the Pacific and Indian Oceans. • Claimed by multiple countries—China, Vietnam, the Philippines, Malaysia, and Brunei—they form a major flashpoint due to overlapping sovereignty claims and strategic sea lanes.
4	**Fiji (South Pacific Ocean)**	• An archipelago of more than 300 volcanic and coral islands situated east of Australia and northeast of New Zealand. • Fiji's islands are surrounded by reefs and lagoons, making it a major hub for biodiversity and tourism in the Pacific region.
5	**Hawaiian Islands (Central Pacific, USA)**	• The only U.S. state outside North America, Hawaii is formed by hotspot volcanism and includes Mauna Loa, the world's largest volcano, and Kīlauea, one of the most active. • It hosts Pearl Harbor, a key U.S. Indo-Pacific naval base central to Pacific security.
6	**Falkland Islands (South Atlantic Ocean)**	• Located about 500 km east of Argentina, this archipelago of around 778 islands features a cold, windy climate and abundant wildlife such as penguins and seals. The islands were the site of the 1982 Falklands War and remain subject to a sovereignty dispute between the UK and Argentina.
7	**Svalbard Archipelago (Arctic Ocean, Norway)**	• Situated between Norway and the North Pole, Svalbard is governed under the 1920 Svalbard Treaty, granting equal economic rights to signatory nations. • It hosts the Svalbard Global Seed Vault, storing backup seeds for global food security, and serves as a key gateway to Arctic shipping routes.
8	**Kuril Islands (North Pacific Ocean)**	• Stretching from Japan's Hokkaido to Russia's Kamchatka Peninsula, the Kurils are a volcanic chain within the Pacific "Ring of Fire."

		• Controlled by Russia but claimed by Japan, the islands are prone to earthquakes and tsunamis and hold major strategic importance for naval access between the Pacific and the Sea of Okhotsk.
9	**Faroe Islands (North Atlantic Ocean)**	• This group of 18 volcanic islands lies between Iceland, Norway, and Scotland. Known for rugged terrain and a subpolar oceanic climate, the Faroe Islands are an autonomous territory of Denmark. • Their location gives them strategic relevance for North Atlantic maritime and NATO operations.
10	**Diego Garcia (Chagos Archipelago, Central Indian Ocean)**	• Situated south of the Maldives, Diego Garcia is a remote coral atoll with a tropical lagoon and reefs. • Though administered by the UK as part of the British Indian Ocean Territory, Mauritius claims sovereignty. • It hosts a major U.S. military base essential for Indian Ocean security and surveillance.

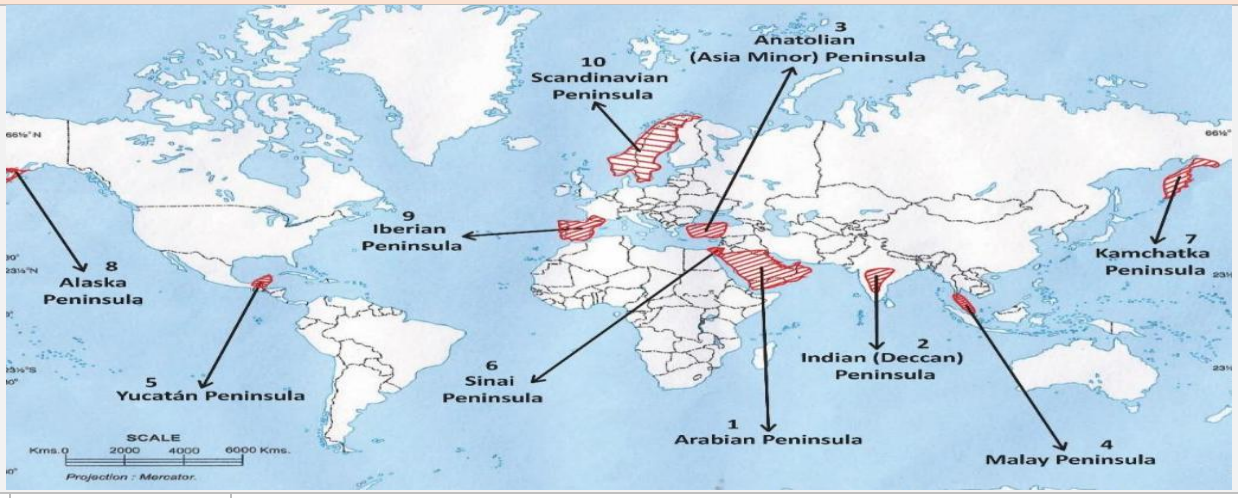
IMPORTANT VOLCANOES OF THE WORLD



1	**Mauna Loa (Hawaii, USA)**	• Mauna Loa is a shield volcano formed over the Hawaiian hotspot, away from any plate boundary. • It is the world's largest active volcano by volume and area, covering more than half of Hawaii's Big Island. • Its eruptions release fluid basaltic lava, which spreads easily and creates broad, gently sloping landforms with generally non-explosive eruptions.
2	**Mount Toba (Sumatra, Indonesia)**	• Mount Toba is a supervolcano located at a subduction zone where the Indo-Australian Plate moves beneath the Eurasian Plate. • Around 74,000 years ago, it produced one of the largest volcanic eruptions in Earth's history, forming the vast Lake Toba caldera. • This eruption is believed to have caused global climatic cooling.
3	**Barren Island (Andaman Islands)**	• Barren Island is a stratovolcano formed due to the subduction of the Indian Plate beneath the Burma Plate. • It is India's only confirmed active volcano and lies in the Andaman Sea. • Though its eruptions are usually small, they indicate ongoing tectonic activity in the region.
4	**Stromboli (Aeolian Islands, Italy)**	• Stromboli is a stratovolcano famous for its continuous, mild, and regular eruptions, which are often visible at night. • Due to this constant activity, it is called the "Lighthouse of the Mediterranean."

		• Its eruption style, marked by small but frequent lava bursts, is known as the Strombolian eruption.
5	**Mount Kilimanjaro (Tanzania)**	• Mount Kilimanjaro is a dormant stratovolcano associated with intra-plate volcanism linked to the East African Rift System. • It is Africa's highest peak and the world's largest free-standing mountain. • Its three volcanic cones - Kibo, Mawenzi, and Shira- are closely studied because their glaciers are rapidly shrinking due to climate change.
6	**Mount St. Helens (Washington, USA)**	• Mount St. Helens is a stratovolcano in the Cascade Volcanic Arc, part of the Pacific Ring of Fire. • It was formed by the subduction of the Juan de Fuca Plate beneath the North American Plate. • Its 1980 eruption was the deadliest and most economically destructive volcanic event in United States history.
7	**Krakatoa (Krakatau) (Indonesia)**	• Krakatoa is a caldera volcano located in the Sunda Arc, formed due to the subduction of the Australian Plate beneath the Sunda Plate. • The 1883 eruption was one of the most catastrophic ever recorded, causing massive tsunamis and global temperature decline. • It also produced the loudest sound ever documented by humans.
8	**Mount Fuji (Japan)**	• Mount Fuji is a stratovolcano located at the junction of the Eurasian, Pacific, and Philippine Sea plates. It is Japan's highest peak and a powerful national symbol. • Although **volcanically active,** it is also recognized as a **UNESCO World Cultural Heritage Site** for its cultural and spiritual importance.
9	**Cotopaxi (Ecuador)**	• Cotopaxi is a stratovolcano in the Andean Volcanic Belt, formed by the subduction of the Nazca Plate beneath the South American Plate. • It is one of the world's highest active volcanoes. Its summit ice cap poses a serious risk, as eruptions can trigger destructive lahars that threaten nearby settlements.
10	**Aconcagua (Argentina)**	• Aconcagua is a dormant or extinct stratovolcano located in the Andes mountain range. It is the highest peak in the Americas and the highest mountain outside Asia. • Although no longer active, its volcanic origin highlights the intense tectonic and volcanic processes along the Andean subduction zone.

IMPORTANT PENINSULAS OF THE WORLD



1	**Arabian Peninsula**	• The Arabian Peninsula in Southwest Asia is the world's largest peninsula, bordered by the Red Sea, Arabian Sea, and Persian Gulf. • Dominated by vast deserts such as the Rub' al Khali and rugged plateaus, it holds geopolitical importance due to its vast oil and natural gas reserves in countries like Saudi Arabia, Qatar, and UAE. • It is also the birthplace of Islam, hosting the holy cities of Mecca and Medina.

2	**Indian (Deccan) Peninsula**	• The Indian or Deccan Peninsula occupies southern India, bounded by the Arabian Sea, Bay of Bengal, and the Indian Ocean. • Geologically shaped by ancient Gondwana rocks and the volcanic Deccan Traps, it contains major rivers like the Godavari and Krishna. • Rich in minerals and biodiversity, the region is flanked by the Western and Eastern Ghats and has been home to major civilizations including the Chola and Vijayanagara empires.
3	**Anatolian (Asia Minor) Peninsula**	• Located in western Asia, the Anatolian Peninsula forms the Asian part of Turkey and is surrounded by the Aegean, Mediterranean, and Black Seas. It features a central plateau, mountain belts, and the active North Anatolian Fault. • As a land bridge between Europe and Asia, it controls the Bosphorus and Dardanelles straits and has hosted ancient civilizations such as the Hittites, Greeks, and Romans.
4	**Malay Peninsula**	• Stretching across Southeast Asia and including parts of Thailand and Peninsular Malaysia, the Malay Peninsula is characterised by tropical rainforests and significant karst landscapes. • It is one of the world's great biodiversity hotspots and hosts the critical global trade chokepoint of the **Strait of Malacca**, one of the busiest maritime routes.
5	**Yucatán Peninsula**	• Located in southeastern Mexico and extending into Belize and Guatemala, the Yucatán Peninsula lies between the Gulf of Mexico and the Caribbean Sea. • Formed largely of karst limestone, it is known for its cenotes and underground river systems. It served as a major centre of the Mayan civilization and today remains a key eco-tourism and biodiversity region.
6	**Sinai Peninsula**	• The Sinai Peninsula, part of Egypt, lies between the Mediterranean Sea and Red Sea. It consists of arid mountains—including Mount Sinai—and desert plateaus. • Serving as a land bridge between Africa and Asia, it is strategically important due to its proximity to the Suez Canal and carries deep religious significance in Biblical history.
7	**Kamchatka Peninsula**	• Located in the Russian Far East, Kamchatka extends between the Sea of Okhotsk and the Bering Sea into the Pacific Ocean. • The peninsula contains numerous active volcanoes as part of the Pacific Ring of Fire and features permafrost, geysers, and dramatic mountain landscapes. • Rich in geothermal energy and ecological purity, it is sparsely populated and home to Indigenous groups like the Koryak and Itelmen.
8	**Alaska Peninsula**	• The Alaska Peninsula projects from northwestern North America into the Pacific Ocean and connects to the Aleutian Islands. • It contains a volcanic chain with several active volcanoes, along with tundra and subarctic ecosystems. • The region is significant for fisheries, oil resources, and its strategic location as an Arctic gateway reflecting both Russian and American historical influences.
9	**Iberian Peninsula**	• Situated in southwestern Europe, the Iberian Peninsula comprises Spain, Portugal, Andorra, and a small part of France. • Dominated by the Meseta Plateau and bordered by the Pyrenees, it presents diverse Mediterranean landscapes. • Its location near the Strait of Gibraltar gives it major strategic importance for naval movement between the Atlantic Ocean and the Mediterranean Sea.
10	**Scandinavian Peninsula**	• Extending across Norway and Sweden with a small portion of northern Finland, the Scandinavian Peninsula features fjord-indented coastlines, taiga forests, and the Scandinavian Mountains.

		• The region is rich in hydropower, has high development indicators, and plays a key role in Arctic geopolitics and NATO's northern security landscape.

MAJOR DELTAS OF THE WORLD



1	**Sundarbans**	• Spread across **India (40%) and Bangladesh (60%)**, it is the **largest contiguous mangrove forest** in the world and an important **carbon sink**. • **Active delta** with constantly shifting mudflats, tidal creeks, and islands; nearly **one-third of the land surface submerges and re-emerges daily** due to tides. • **Fauna**: The **only mangrove habitat** globally that supports the **Royal Bengal Tiger**. • **Conservation status**: Recognised as a **UNESCO World Heritage Site**, **Ramsar Wetland**, and **Biosphere Reserve**.
2	**Nile Delta**	• A **classic arcuate (fan-shaped) delta**, often called the **"Cradle of Civilization."** • **Extent**: Stretches from **Cairo** to the **Mediterranean Sea**, covering about **160 km in length** and **240 km of coastline** from Alexandria to Port Said. • Though it occupies only **2.4% of Egypt's area**, it supports **nearly 50% of the population** and **63% of arable land**. • Faces **sediment starvation** due to the **Aswan High Dam**, affecting Mediterranean coastal stability and geopolitics.
3	**Mekong Delta**	• Known as the **"Rice Bowl of Vietnam"**, crucial for **ASEAN food security**. • **Flagship species** include the **Mekong Giant Catfish** and the **Irrawaddy Dolphin**. • A **low-lying delta** (mostly below 2 m above sea level) governed by a **flood-pulse system**, where Cambodia's **Tonle Sap River reverses flow seasonally**. • Heavily impacted by **upstream dams in China** and increasing **saline intrusion**.
4	**Mississippi Delta**	• A **river-dominated or bird-foot delta**. • Formed because the river's force is stronger than waves or tides, allowing the river to **extend finger-like channels** into the Gulf of Mexico. • A major **energy and trade hub**, housing the **Port of South Louisiana** and **Port of New Orleans**. • Drains **40% of the continental United States**, carrying sediment from **32 U.S. states and 2 Canadian provinces**.
5	**Indus Delta**	• An **arid delta**, receiving very **low rainfall (25–50 cm annually)** and facing extreme temperatures. • Contains strategic tidal creeks, especially **Sir Creek**, a **96 km long estuary** forming part of the disputed India–Pakistan maritime boundary.

		• Dispute over the **Thalweg Principle** (mid-channel boundary) affects **EEZ claims** and rich fishing grounds in the **Arabian Sea**.
6	**Volga Delta**	• **Europe's largest inland delta**, draining into the **Caspian Sea**. • A **classic arcuate delta** with an extremely complex network of **over 500 channels and distributaries**. • Famous for **sturgeon (caviar)** fisheries and as a major **migratory bird stopover**. • Characterised by unique **Baer Knolls** landforms.
7	**Lena Delta**	• The **world's largest Arctic delta**, located in Russia and frozen for most of the year. • Covers about **30,000 sq km**, with **6,500 distributaries**, **30,000 lakes**, and **1,500 islands**. • A key **indicator of Arctic climate change**. • Acts as a massive **carbon vault**, storing large amounts of **dissolved organic carbon (DOC)**.
8	**Huang He Delta**	• A **lobate delta** formed by the **world's highest sediment load**; the river is known as the **"Sorrow of China."** • Famous for frequent **course shifts**, with the river mouth moving over **800 km** in the past 4,000 years. • Carries nearly **1.6 billion tonnes of sediment annually**, mainly from the **Loess Plateau**.
9	**Danube Delta**	• Shared between **Romania (86%) and Ukraine (14%)**, it is Europe's **second-largest delta**. • One of the **best-preserved deltas** in Europe and a **UNESCO Biosphere Reserve**. • Functions as a **natural biological filter**, cleaning water from 10 upstream countries before it enters the **Black Sea**. • Currently significant as a **strategic grain corridor** during the Russia–Ukraine conflict.
10	**Niger Delta**	• Located on the **Gulf of Guinea**, separating the **Bight of Benin** and **Bight of Bonny**. • Formed by sediments from the **Niger River** and **Benue River**. • Central to **Africa's oil production**, but affected by **oil spills, pollution, and resource conflicts**.
11	**Irrawaddy Delta**	• Known as the **"Rice Bowl of Myanmar"**, producing nearly **60% of the country's rice**. • Historically covered with dense **mangrove forests (Kanazo)**. • One of the **highest mangrove loss rates globally** due to charcoal production and farming. • Vital for Myanmar's food security; severely impacted by **Cyclone Nargis (2008)**.

REPORTS & INDICES IN NEWS

Report	Publisher	Highlights
State of the Climate in Asia 2024	World Meteorological Organization (WMO)	• 2024 was Asia's warmest or second warmest year, 1.04°C above 1991–2020 average. • Asia is warming twice as fast as the global average. • Glaciers melt in the Central Himalayas and Tian Shan due to reduced snowfall and extreme heat. • Highest sea-surface temperatures; decadal warming rate nearly double global average.
Global Drought Outlook, 2025	Organisation for Economic Co-operation and Development (OECD)	• 40% of global land faces frequent and severe droughts (e.g., Europe 2022, California 2021, Horn of Africa & Somalia). • 3–7.5% annual increase in drought costs; affects hydroelectric power, inland water transport (e.g., Panama Canal), and crop yields (up to 22% decline). • 37% of land shows reduced soil moisture since 1980; 62% of monitored aquifers declining. • Droughts cause 34% of disaster-related deaths and worsen poverty, inequality, and displacement (WMO, 2021).
Global Gender Gap 2025	World Economic Forum (WEF)	• Introduced in 2006 to benchmark gender parity across **Economic opportunities, Education, Health, and Political leadership.** • **Gender Gap:** Difference between women and men in social, political, cultural, intellectual, or economic attainments. • Parity score: 1 = full parity, 0 = complete inequality • **India**: Ranked 131/148 (slipped from 129 in 2024) but score improved from 0.641 to 0.644. • **Global**: Iceland leads for 16th year, followed by Finland, Norway, UK, New Zealand. • **Projection:** 123 years needed to reach full gender parity globally.
State of World Population 2025	United Nations Population Fund (UNFPA)	• Titled "The real fertility crisis: The pursuit of reproductive agency in a changing world." • Focus on reproductive agency: capacity to make informed reproductive choices free of legal, political, economic, and social constraints. • Highlights unfulfilled fertility aspirations (unintended/underachieved pregnancies). • Calls for policies prioritizing rights and choice over population engineering.
Global Education Monitoring 2024	UNESCO	• Monitors SDG 4 (Quality Education) and other SDGs under Education 2030 framework. • 75% of extreme weather events closed schools, affecting ≥5 million people. • **India**: Early-life rainfall shocks affected vocabulary and math/non-cognitive skills.

State of Food Security and Nutrition in the World (SOFI) 2025 Report	Food and Agriculture Organization (FAO), International Fund for Agricultural Development (IFAD), UNICEF, World Food Programme (WFP), World Health Organization (WHO)	• Global hunger decreased to 8.2% in 2024, showing improvement from 2022 levels. • Hunger continues to rise in subregions of Africa and Western Asia. • Excluding India, lower-middle-income countries show an upward trend in unaffordable diets.
Towards Resilient and Prosperous Cities in India	World Bank, collaboration with Ministry of Housing and Urban Affairs (GoI)	• By 2030, Indian cities will generate 70% of new employment but will face risks from flooding and extreme heat, urging the need for greater autonomy and climate-resilient planning.
OECD-FAO Agricultural Outlook 2025-2034	Organisation for Economic Co-operation and Development (OECD) and FAO	• Provides a ten-year assessment of trends in agricultural and fish commodity markets at national, regional, and global levels, serving as a key reference for evidence-based policy planning.
Climate Change and Workplace Heat Stress 2025	World Health Organization (WHO) and the World Meteorological Organization (WMO)	• 2024 was the hottest year ever, with temperatures often above 40°C and sometimes over 50°C. • 2.4 billion workers face dangerous heat, causing 22.85 million injuries and 19,000 deaths annually. • Every 1°C rise above 20°C reduces productivity by 2–3%, risking $2.4 trillion economic losses by 2030.
State Finances Report 2022–23	Comptroller and Auditor General (CAG)	• First comprehensive 10-year fiscal review of all 28 states. • States' total debt: **22.17% of India's GDP** (FRBM target: 20% by 2024–25). • Highest debt-to-GSDP: **Punjab (40.35%)**, Nagaland, West Bengal.
World Trade Report 2025	World Trade Organization (WTO)	• AI can raise global trade by **34–37% by 2040** by reducing logistics and regulatory costs. • AI may reduce the global skill premium by **3–4%**. • A 10% rise in digital services trade → **2.6% rise in cross-border AI patent citations**.
OECD Economic Outlook Report 2025	Organisation for Economic Co-operation and Development	• **Biannual report** (twice-yearly) covering GDP, inflation, employment, trade, and investment trends. • OECD upgrades India's **GDP forecast to 6.7% (2025)**.
State of Global Water Resources 2024	World Meteorological Organization (WMO)	• The water cycle is becoming increasingly erratic, marked by swings between floods and droughts. • Global glaciers recorded losses for the third consecutive year; many small glaciers are reaching Peak Water (maximum meltwater runoff before decline).
Production Gap Report 2025	Stockholm Environment Institute, Climate Analytics, and International Institute for Sustainable Development	• Planned fossil fuel output for 2030 exceeds the 1.5°C temperature limit pathway by over 120%, and the 2°C pathway by 77%. • Coal shows the greatest mismatch—projected 2030 production is 500% higher than levels compatible with the 1.5°C goal.
Unified District Information System for	Ministry of Education (GoI)	• The total number of teachers has crossed the 1 crore mark in 2024–25.

Education Plus (UDISE+) 2024-25		• Pupil-Teacher Ratios (PTRs) have surpassed NEP's recommended 1:30 ratio.
Comprehensive Modular Survey (CMS) on Education	NSO, MoSPI	• Covers only school education. • **Government schools:** 55.9% enrolment (rural 66%, urban 30.1%). • **Private unaided schools:** 31.9% enrolment. • 27% of students use private coaching (urban 30.7%, rural 25.5%).
National Institutional Ranking Framework (NIRF) 2025	Ministry of Education	• Introduced in 2015 to create a transparent national ranking system. • Assessment Parameters: Teaching, Learning & Resources (30%), Research & Professional Practice (30%), Graduation Outcome (20%), Outreach & Inclusivity (10%), Perception (10%)
Global Forest Resources Assessment (GFRA) 2025	Food and Agriculture Organization (FAO), United Nations	• India rises from **10th to 9th** globally in total forest area; remains **3rd** in annual forest area growth. • India ranked 5th among the top global carbon sinks. • Annual forest gain: **191,000 ha**; top two countries: China (**1.69 mn ha**), Russia (**0.942 mn ha**). • Global forest area: **4.14 bn ha** (≈ **32%** of Earth's land), with **54%** concentrated in Russia, Brazil, Canada, USA, and China.
IUCN World Heritage Outlook 2025	International Union for Conservation of Nature (IUCN) (with World Heritage Programme & WCPA)	• Fourth edition launched at the **IUCN World Conservation Congress 2025** (Abu Dhabi). • Evaluates natural World Heritage sites every **3–5 years**; assessment covers **271 sites**.
India's National Red List Roadmap (2025–2030)	Ministry of Environment, Forest & Climate Change (MoEFCC) with ZSI, BSI, WII	• First national initiative to evaluate extinction risk for **~11,000 species** (7,000 flora + 4,000 fauna). • Goal: Publish peer-reviewed **National Red Data Books** for flora and fauna by **2030**. • Aligns with **CBD** and **Kunming–Montreal Global Biodiversity Framework (KM-GBF)** — meets **Target 4** (halt extinctions, protect genetic diversity, manage human–wildlife conflict). • Uses **IUCN Red List methodology** for scientific species assessment. • Covers terrestrial, freshwater, and marine biodiversity
Adaptation Gap Report 2025: "Running on Empty	United Nations Environment Programme (UNEP)	• Tracks global progress on climate adaptation planning, implementation, and finance, assessing how far the world is from achieving climate resilience goals • These findings highlight a **"triple gap": finance, implementation, and governance**, with inflation and geopolitical shifts exacerbating the divide
State of Finance for Forests (SFF) 2025 Report	UN Environment Programme (UNEP)	• Global forest investment in 2023 was US$84 billion, with 91% from public sources and 9% from private sources. • To meet 2030 targets, annual investment must triple to US$300 billion, and by 2050, it should reach US$498 billion.

Global Finance Stability Report (GFSR)	International Monetary Fund (IMF)	• It is a semiannual publication by the IMF, focusing on current market conditions, systemic risks, and structural imbalances. • Latest findings indicate that stretched asset valuations, rising sovereign bond market pressures, and the growing influence of nonbank financial institutions (NBFIs) continue to pose significant risks to global stability
Global Burden of Disease (GBD) Report 2025	Institute for Health Metrics and Evaluation (IHME)	• Non-communicable diseases (NCDs) now account for nearly two-thirds of global deaths and disease burden. • India is experiencing a clear transition from infectious diseases to non-communicable diseases as the main causes of death.
WMO Greenhouse Gas Bulletin 2025	World Meteorological Organization	• Bulletin, the global average concentration of carbon dioxide (CO_2) rose sharply in 2024, reaching 423.9 parts per million (ppm). • The year 2024 was the warmest year on record, with the global average temperature rising to 1.55°C above pre-industrial levels.
State of Climate Action Report 2025	Change Lab (a joint initiative of the Bezos Earth Fund, Climate Analytics, Climate High-Level Champions, ClimateWorks Foundation, and World Resources Institute)	• None of the 45 climate indicators are currently on track to meet the 2030 targets required to limit global warming to 1.5°C, as committed under the Paris Agreement. • It highlights the urgent need to dramatically accelerate climate action across sectors to avoid dangerous levels of warming.
Climate Inequality Report 2025	World Inequality Lab	• Wealthy individuals contribute disproportionately to climate change, mainly through their investment choices, rather than through lifestyle alone. • At the global level, the top 1% of the population is responsible for about 15% of consumption-based emissions, but accounts for a much larger 41% of emissions linked to private capital ownership.
UNEP Emissions Gap Report 2025	United Nations Environment Programme (UNEP)	• 2025 Report finds that despite new climate pledges, global warming is projected to reach 2.3–2.5°C by 2100 if all current Nationally Determined Contributions (NDCs) are fully implemented • To align with the Paris Agreement's 2°C pathway, global emissions must fall by 35% from 2019 levels by 2035; for the 1.5°C pathway, a 55% reduction is required. • The report warns that overshooting 1.5°C is now unavoidable within the next decade, even if all current pledges and net-zero targets are met.
Global Methane Status Report 2025	UN Environment Programme (UNEP) and the Climate and Clean Air Coalition (CCAC)	• Global methane emissions continue to rise despite increased policy attention and action since the launch of the Global Methane Pledge (GMP) in 2021. • Methane emissions reached about 352 million tonnes (Mt) per year in 2020 and are projected to increase to 369 Mt by 2030 under current legislation, which is about 5% higher than 2020 levels.

		• Agriculture is the largest source (42%), followed by energy (38%) and waste (20%).
State of the Cryosphere Report 2025	International Cryosphere Climate Initiative	• The report highlights the status and impact of changes in five key components of the cryosphere – Ice Sheets, Mountain Glaciers and Snow, Polar Oceans, Sea Ice, and Permafrost. • The report warns that even 1°C of warming threatens the stability of polar ice sheets, with glaciers and ice loss accelerating globally.
Global Cooling Watch 2025 Report	UNEP's Cool Coalition	• Global cooling demand is projected to more than triple by 2050, under a Business-as-Usual (BAU) Cooling Pathway, • It details a Sustainable Cooling Pathway aimed at dramatically reducing projected GHG emissions from cooling by 2050.
World Urbanisation Prospects 2025 Report	Population Division of the United Nations Department of Economic and Social Affairs (UN DESA)	• 45% of the world's population are living in cities, 36% in towns, and 19% in rural areas in 2025. • The growth of the world's city population until 2050 will be concentrated in seven countries: India, Nigeria, Pakistan, Democratic Republic of Congo, Egypt, Bangladesh, and Ethiopia. • Dhaka (Bangladesh) is projected to become the world's largest city by 2050.
World Inequality Report 2026	World Inequality Lab	• The third edition of the World Inequality Report (after 2018 and 2022). The top 10% of global earners receive more income than the remaining 90%. • The poorest 50% of the world's population gets less than 10% of total global income. • The top 10% own about 75% of global wealth. The bottom 50% own only 2%. Top 10% earners in India capture 58% of national income, bottom 50% get only 15%
International Migration Outlook 2025	Organisation for Economic Cooperation and Development (OECD)	• Permanent migration to OECD countries declined by 4% in 2024 compared to 2023 but remains 15% above 2019 levels, with 6.2 million new permanent immigrants recorded. • In 2023, 2.25 lakh Indian citizens acquired the nationality of an OECD country.
Global Value Chain Report 2025	World Trade Organization (WTO)	• **Fifth biennial report,** examining how global value chains (GVCs) are being reshaped by technology, green transition, and changing geopolitical conditions. • Cross-border production (in value-added terms) accounted for 46.3% of world trade in 2024.
State of the World's Land and Water Resources for Food and Agriculture 2025	Food and Agriculture Organization	• Published every two years, the report highlights how sustainable management of land, soil and water can enhance agricultural production, food security, resilience, and ecosystem services • **Theme:** The potential to produce more and better • Agriculture must produce about 50% more food, feed

		and fibre by 2050 compared with what was produced in 2012, to feed the growing population.

Index	Publisher	Key Information
Global Peace Index 2025	Institute for Economics and Peace (IEP)	• Iceland remains the world's most peaceful country, followed by Austria, New Zealand, and Switzerland. • India ranks 115th with a GPI score of 2.229. • India's rank trajectory: 115 (2025), 116 (2024), 126 (2023), 139 (2020), 141 (2019).
Global Terrorism Index 2025	Institute for Economics and Peace (IEP)	• Reports an increase in countries experiencing terrorist incidents, from 58 to 66, the highest since 2018. • India ranks 14th with a score of 6.411. • Burkina Faso tops the index with a score of 8.581.
Global Liveability Index 2025	Economist Intelligence Unit (EIU)	• Covers 173 cities globally; average livability score remains 76.1/100, same as last year. • Copenhagen (Denmark) becomes the world's most liveable city, ending Vienna's three-year lead. • Delhi and Mumbai are jointly placed at 141st.
Critical and Emerging Technologies Index	Harvard Kennedy School	• Assesses 25 countries across five technology sectors: AI, biotechnology, semiconductors, space, and quantum. • **Criterion**: geopolitical significance, systemic leverage, GDP contribution, dual-use potential, supply chain risk, and time to maturity. • **Key Findings:** India lags behind the U.S., China, and Europe across most sectors, particularly in semiconductor technology.
Global Gender Gap Index 2025	World Economic Forum	• India slipped to 131st out of 148 countries, down from 129th in 2024. India's parity score: 0.644. • The index measures gender parity across Economic Participation & Opportunity, Educational Attainment, Health & Survival, and Political Empowerment. • **Top performers:** Iceland (top for 16th year), Finland, Norway, UK, New Zealand. • South Asia: Bangladesh ranked highest
Global SDG Index 2025 (Sustainable Development Report)	UN Sustainable Development Solutions Network	• India entered the top 100 for the first time, ranking 99th out of 167 countries. • Part of the annual Sustainable Development Report, measuring progress on 17 SDGs on a 0–100 scale, where 100 indicates full achievement. • India scored 67 in 2025, showing steady improvement in sustainable development performance.
Energy Transition Index (ETI), 2025	World Economic Forum (WEF)	• **Top Countries**: Sweden (1st), followed by Finland, Denmark, Norway. • **India**: Rank dropped from 63 (2024) to 71 (2025). • Ranks countries on progress from fossil fuels to clean energy based on two aspects: **System Performance** (energy security, equity, sustainability) and **Transition Readiness** (regulation, infrastructure, investment).
Henley Passport Index 2025	Henley & Partners (using data from IATA)	• India's rank improved from 85 (2024) to 77 (2025). • Indian passport holders can travel to 59 destinations visa-free or with visa-on-arrival. • Singapore holds the top position globally.

Financial Conditions Index (FCI)	Reserve Bank of India (RBI)	• Developed to track financial market trends with daily frequency. • Assesses tightness or ease of financial conditions relative to the average since 2012. • Covers five market segments: Money Market, G-Sec, Corporate Bond, Forex, and Equity Markets. • A higher positive value indicates tighter financial conditions.
Global Findex 2025	World Bank	• Reflects global progress in financial inclusion and digital access. • India Highlights: Account ownership near 90%. 16% of account owners have inactive accounts (global average: 4%).
Air Quality Life Index (AQLI) 2024	Energy Policy Institute at the University of Chicago (EPIC)	• India's average PM2.5 concentration is almost 8 times higher than the WHO safe limit of 5 µg/m³. • High PM2.5 exposure is shortening life expectancy in India by about 3.5 years. • In Delhi, the most polluted region, the average loss rises to 8.2 years.
Climate Change Performance Index (CCPI) 2026	Germanwatch, NewClimate Institute, and Climate Action Network (CAN)	• No country has been placed in the top three positions. Denmark ranks 4th, followed by the United Kingdom and Morocco. • India dropped 13 places to 23rd position, moving from "high performer" to "medium performer" due to the absence of a national coal phase-out timeline and continued expansion of fossil fuels.
Climate Risk Index (CRI) 2026	Germanwatch	• Introduced in 2006 as an annual global index assessing the impacts of climate-related extreme events. • India ranked 15th in the CRI 2024 and 9th in the long-term assessment for 1995–2024.