



# CSB IAS ACADEMY

*The Road Map to Mussoorie...*



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# Polity

## WAQF (AMENDMENT) BILL

**Context:** The Govt. introduced the Waqf (Amendment) Bill in the Lok Sabha for discussion and eventual passage of the law.



### About Waqf (Amendment) Bill:

- The objective of the Bill is to **amend the Waqf Act, 1995**, to redress the issues and challenges in regulating and managing Waqf properties.

### Meaning of Waqf:

- Waqf refers to **properties dedicated exclusively for religious or charitable purposes under Islamic law**, and any other use or sale of the property is prohibited.
- Waqf means that the ownership of the property is now taken away from the person making Waqf and is **transferred to and detained by Allah**.
- 'Waqif' is a person who creates a waqf for the beneficiary.
- As Waqf properties are bestowed upon Allah, in the absence of a physically tangible entity, a **'mutawalli' is appointed by the waqif, or by a competent authority**, to manage or administer a Waqf.

- A Waqf can be established through a written deed, legal instrument, or orally.
- Once designated as waqf, the ownership is transferred from the person making the waqf (waqif) to Allah, **making it irrevocable**. This is the principle of **"once a waqf, always a waqf"**.

### Origin of the concept of 'waqf':

- Waqf has existed in India since the early days of the **Delhi Sultanate**. Sultan **Muizuddin Sam Ghaor** dedicated two villages to Multan's Jama Masjid and appointed Shaikhul Islam as its administrator.
- As the Delhi Sultanate and subsequent Islamic dynasties flourished in India, the number of Waqf properties grew.
- British Raj Controversy:** In the late 19th century, the Privy Council criticized Waqf as "perpetuity of the worst kind" and declared it invalid.
- However, the **Mussalman Waqf Validating Act of 1913** upheld the Waqf system in India, despite British criticism.

### The Waqf Act of 1995:

- It governs the management and administration of Waqf properties in India. It mandates the establishment of **Waqf Boards at the state level** to oversee these properties.

### Key Provisions of the Waqf Act, 1995:

- Defines Waqf** as a permanent dedication of property for religious

or charitable purposes under Muslim law.

- Requires **each state** to establish a **Waqf Board** for managing and administering Waqf properties.
- Establishes the **Central Waqf Council** to advise on Waqf matters.
- **Waqf Tribunals** are created under the Act to adjudicate disputes related to waqf properties. These tribunals have exclusive jurisdiction over matters related to waqf properties. They **function at the state level**, with a judicial officer (usually a district judge) presiding over cases. The decisions of Waqf Tribunals can be **appealed in the High Courts**.
- Mandates the registration and surveying of Waqf properties for proper management.

#### **Proposed changes by the Amendment:**

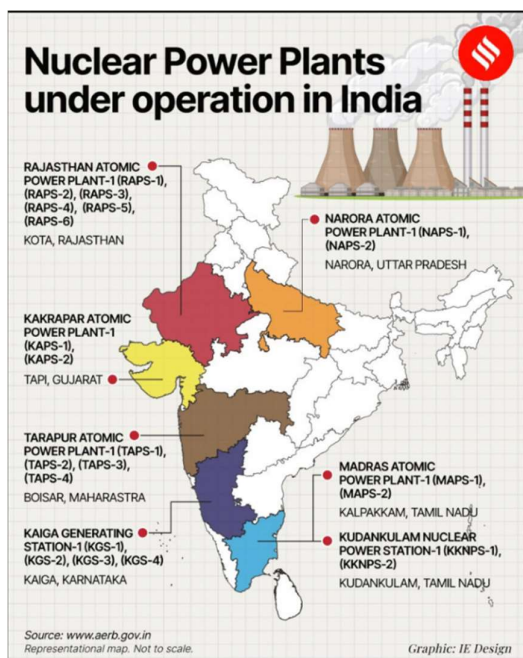
- The Waqf Amendment (Bill) proposes changing the name of the Act to the **Unified Waqf Management, Empowerment, Efficiency, and Development Act of 1995**.
- **Waqf Formation:** Waqfs can be formed by (i) declaration, (ii) recognition of long-term use, or (iii) endowment when succession ends.
  - Only practicing Muslims for at least five years can declare waqfs, with ownership of the property being mandatory.
- **Govt Properties:** Govt properties identified as waqf will **revert to state ownership**. The District Collector will determine ownership in disputed cases.

- **Waqf Property Determination:** The Waqf Board's power to determine waqf properties is removed.
- **Waqf Survey:** Collectors will conduct waqf surveys under state revenue laws.
- **Central Waqf Council:** Two non-Muslim members are added. MPs, judges, and eminent persons need not be Muslims. However, Muslim members must include two women.
- **Waqf Boards:** State govts will appoint representatives, including two non-Muslims and members from Shia, Sunni, and backward Muslim communities. Women representation is mandatory.
- **Tribunal Composition:** Muslim law experts are removed. Tribunals will include a District Court judge and a state officer of joint secretary rank.
- **Appeals:** Tribunal decisions can be appealed to High Court within 90 days.
- The Union Govt can set rules on registration, waqf accounts, and Board proceedings. **Audits can be conducted on Waqf Boards by the CAG.**
- **Separate Waqf Boards:** Separate Waqf Boards are allowed for **Bohra** and **Agakhani** sects.

### **CIVIL LIABILITY FOR NUCLEAR DAMAGE ACT 2010**

**Context:** The govt has recently announced that amendments will be made to the Civil Liability for Nuclear Damage Act 2010.





- Laws on civil nuclear liability ensure that compensation is available to the victims for nuclear damage caused by a nuclear incident or disaster and set out who will be liable for that damage.

#### About Civil Liability for Nuclear Damage Act (CLNDA):

- India enacted the CLNDA in 2010 to put in place a **speedy compensation mechanism** for victims of a nuclear accident.

#### Liability on Operator:

- The CLNDA provides for **strict and no-fault liability** on the operator of the nuclear plant, where it will be held liable for damage regardless of any fault on its part.
- It specifies the amount the operator will have to pay in case of damage caused by an accident at **₹1,500 crore**.
- It also **requires the operator to cover liability through insurance** or other financial security.

#### Government's Role:

- In case the **damage claims exceed ₹1,500 crore**, the CLNDA expects the government to step in.
- It has limited the government liability amount to the rupee equivalent of **300 million Special Drawing Rights (SDRs)**.

#### Supplier Liability Clause:

- Having realized that the defective parts were partly responsible for the Bhopal gas tragedy in 1984, the govt went **beyond the provisions of international conventions (Convention on Supplementary Compensation)** to provide for **supplier liability** over and above that of the operator in CLNDA.
- Under this provision, the **operator of the nuclear plant can seek recourse from suppliers** in the event of a nuclear incident caused by supplier actions, including the supply of equipment or materials with defects, sub-standard services, or the actions of supplier employees.

#### International Conventions

- The **International Atomic Energy Agency** serves as depositary for several international legal instruments on civil liability for nuclear damage, these include the **Vienna Convention on Civil Liability for Nuclear Damage** and the **Convention on Supplementary Compensation for Nuclear Damage**.
- The umbrella Convention on Supplementary Compensation (CSC) was adopted in 1997 with the aim of establishing a minimum national



compensation amount. **India** has ratified CSC in 2016.

## NATIONAL EDUCATION POLICY

**Context:** The Phased implementation of NEP 2020 faces challenges while offering better opportunities to students

### Key Highlights

- **Holistic and Multidisciplinary Education:** The NEP emphasises a shift from a rigid, compartmentalised education system to one that promotes holistic learning.
- The policy advocates the integration of arts, humanities, and sciences, encouraging students to explore diverse subjects and discover their passions.
- **Early Childhood Care and Education (ECCE):** The policy focuses on the crucial early years of a child's development.
- It aims to provide a strong foundation for learning by integrating Early Childhood Care and Education into the formal education system. This will help enhance children's cognitive, social, and emotional skills from an early age.
- **Reimagining School Education:** It aims to transform the current 10+2 schooling system into a **more flexible 5+3+3+4 structure**.
  - The first five years will focus on foundational learning, followed by three years of preparatory education and four years of multidisciplinary secondary education.
  - This approach aligns with global standards and promotes experiential learning and critical thinking.
- **Three Language Policy:** Recognizing India's linguistic diversity, the NEP encourages the teaching of regional languages along with Hindi and English.
  - This move not only promotes cultural inclusivity but also aims to improve language proficiency and communication skills among students.
- **Assessment Reforms:** The policy seeks to replace rote memorization with a competency-based approach to assessments. It encourages formative and continuous evaluations to gauge a student's progress based on their understanding and problem-solving abilities rather than just marks.
  - India's first national assessment regulator PARAKH has been launched as part of the implementation of the NEP 2020 that will bring the

much-needed uniformity in assessment.

- **Promoting Digital Learning:** With a focus on leveraging technology to improve access and quality of education, the NEP emphasizes the use of digital resources and e-learning platforms. This will help bridge the digital divide and ensure that students from all walks of life have equal access to educational opportunities.
- **Higher Education Reforms:** The NEP envisions a multidisciplinary and flexible higher education system. It aims to promote research and innovation, foster creativity, and establish robust connections between academia and industry.
- The policy also paves the way for foreign universities to set up campuses in India, promoting international collaboration.
- **Teacher Empowerment:** Recognizing the pivotal role of teachers in shaping young minds, the NEP aims to enhance teacher training and professional development. It also encourages a more learner-centric pedagogical approach and a greater emphasis on nurturing teachers' creative and critical thinking skills.
- **Gender and Social Inclusion:** The NEP emphasises the importance of inclusivity, aiming to bridge gender and social gaps in education. It strives

to ensure equal opportunities for all, regardless of gender, caste, or economic background.

- **Greater Flexibility:** Implementation of the Multi Entry and Multiple Exit (MEME) options within the framework of the NEP is a vital component of NEP 2020, offering students greater flexibility and choice in their educational pathways.

#### Targets set under NEP 2020

- Universalization of education from Early Childhood Care and Education to Secondary Education by 2030, aligning with SDG 4.
- Attaining Foundational Learning & Numeracy Skills through National Mission by 2025.
- 100% GER in Pre-School to Secondary Level by 2030.
- 50% GER in Higher Education by 2035.
- Bring back 2 Crore children to the mainstream through the open schooling system.
- Teachers to be prepared for assessment reforms by 2023
- Inclusive & Equitable Education System by 2030

### NATIONAL RESEARCH FOUNDATION (NRF)

**Context:** Dr. S. Kalyanaraman has assumed charge as Chief Executive Officer (CEO) of the Anusandhan National Research Foundation.

**About National Research Foundation (NRF):**

- NRF is a **proposed entity to replace Science & Engineering Research Board of India (SERB)** and catalyse interdisciplinary research for accelerating India's development agenda, through impactful knowledge creation and translation.
- It will function under the **Ministry of Science and Technology**.

#### The NRF's Goals:

- **Promote interdisciplinary research** that will address India's most pressing development challenges.
- **Minimize duplication of research.**
- Promote **translation of research into policy and practice.**

#### Features of NRF:

- **Presided by PM (ex-officio chairman)** and consists of 10 major directorates focusing on science, arts, humanities, entrepreneurship, etc.
- **Union Ministers of Education and of Science and Tech** will be ex-officio Vice Presidents.
- Will have an **18-member board** with eminent Indian and intl. scientists, senior govt functionaries and industry leaders.
- Will be registered as a society and have an **independent secretariat.**

#### Expectations from NRF:

- Increasing investment in **R&D from 0.7% of GDP to 2% of GDP by 2030**

- **Enhancing India's share of global scientific publications** from about 5% to 7% by 2030
- Create a **pool of talented researchers** across disciplines and sectors
- Developing innovative **solutions for India's development challenges**

#### Budgetary Updates

- **2021-22 Budget:** Govt announced that for the NRF, it would set aside Rs **50,000 crore over five years.**
  - 28% of it (14,000 crore) coming from govt and **72% (36,000 crore) from private sector.**
- **2022-23 Budget:** NRF was allocated a budget of just Rs 1 lakh.
- **2023-24 Budget:** Allocated Rs 2,000 crore for the NRF, which was then revised to Rs 258.60 crore.
- **2024-25 Budget:** Govt was silent on allocation for the institution or progress made so far.



India's R&D spend is only around 0.64% of its GDP, which is lower than developing economies such as Brazil (1.16%) and South Africa (0.84%). The contribution of the private sector to India's total R&D spend is only 36.4%.

## FOREIGN CONTRIBUTION REGULATION ACT (FCRA)

**Context:** The Union Home Ministry said on Monday that foreign funds obtained through the prior permission route would be valid only for four years. Not adhering to the time limit would be a violation of the FCRA.



### About FCRA:

- It was originally enacted during the **emergency in 1976**.
- **Reason for enactment:** Apprehensions that foreign powers were interfering in India's affairs by pumping money into the country through independent organizations.
- The law sought to **regulate foreign donations** to individuals and associations so that they functioned in a manner consistent with the values of a sovereign democratic republic.

### Amendments:

- **2010 Amendment:**
  - Enacted to consolidate the law to regulate the **acceptance and utilization of foreign contribution** by certain individuals or associations and to **prohibit** acceptance

and utilization of foreign contribution for any **activities detrimental to the national interest**.

- **2020 Amendment:**

- Prohibiting the **transfer of foreign contribution to any other person** or organization.
- **Reducing the limit** of usage of foreign contribution for **administrative expenses** from 50% to 20%.

### FCRA Registration:

- Registration under the FCRA is **essential for receiving foreign donations** in India.
- It's granted to **individuals** or **associations** engaged in various areas of work, including **cultural, economic, educational, religious, or social programs**, among others.
- The FCRA regulates foreign contributions in these defined areas to **ensure transparency and compliance with the law**.

### Criteria:

- The FCRA requires every person or NGO seeking to receive foreign donations to be:
  - **registered** under the Act.
  - to open a bank account for the receipt of the foreign funds in **State Bank of India, Delhi**
  - to utilize those funds **only for the purpose for which they have been received** and as stipulated in the Act.

### Prohibitions under FCRA:

- The applicant **must not** represent **fictitious entities**.



- The applicant **should not** have been involved in **religious conversion** activities, either directly or indirectly.
- The applicant should not have a history of prosecutions related to **communal tension or disharmony**.
- The applicant must not be engaged in activities related to **sedition**.
- The FCRA prohibits **election candidates, journalists, media companies, judges, government servants, politicians, and political organizations** from receiving foreign funds.

#### Validity and Renewal:

- FCRA registration is valid for **five years**.
- NGOs are required to apply for renewal **within six months** of the registration's expiry.
- The government can cancel an FCRA license for violations of the Act or a lack of reasonable activity in their chosen field for two consecutive years.
  - Once cancelled, an NGO is **ineligible for re-registration for three years**.

#### FCRA 2022 rules:

- In July 2022, the MHA **introduced changes to FCRA rules**. These changes included **increasing the number of compoundable offences** from 7 to 12.
- The rules also **raised the limit for contributions from relatives abroad** that do not require government intimation from **Rs 1 lakh to Rs 10 lakh** and extended the time limit for intimation of the opening of bank accounts.

## REGISTRATION OF BIRTHS AND DEATHS ACT, 1969

**Context:** The Registrar General of India cautioned hospitals over delays in reporting births & deaths.



#### About Registration of Births and Deaths (RBD) Act, 1969:

- **Registration of Births and Deaths in India is mandatory** after enactment of the RBD, Act 1969 and is done at the place of occurrence of the event.
- Under the RBD Act, it is the **responsibility of the States to register births and deaths**.
- State govts have set up facilities for registering births and deaths and keeping records.
- **A Chief Registrar is appointed in every State** as the executive authority for implementation of the Act.
- The Act entrusts **Registrar General and Census Commissioner of India (RGI-CCI)** with the responsibility of coordinating and unifying the implementation of the Act.


### 2023 Amendment to the RBD Act:

- **Digital Birth Certificates:** The Act introduces digital birth certificates to serve as a comprehensive document for multiple purposes, reducing the need for multiple documents to prove birth details.
- **Aadhaar Details:** The Act provides for linking Aadhaar details of parents & informants to birth certificates.
- **Centralized Database:** It will manage birth and death records, facilitate service delivery, and maintain up-to-date information. In addition to birth certificates, the database **will also be used to update National Population Register (NPR), ration cards & property registration databases.**
- Act makes it **mandatory for States to register births and deaths on the Centre's Civil Registration System (CRS) portal**, and to share the data with the RGI-CCI which functions under the **Union Home Ministry.**
- It shall be **mandatory for hospitals and medical institutions to provide a copy of all death certificates**, stating cause of death, to the local registrar apart from relatives of the deceased.

#### National Population Register (NPR)

- ✓ It is a database containing a list of all usual residents of the country.

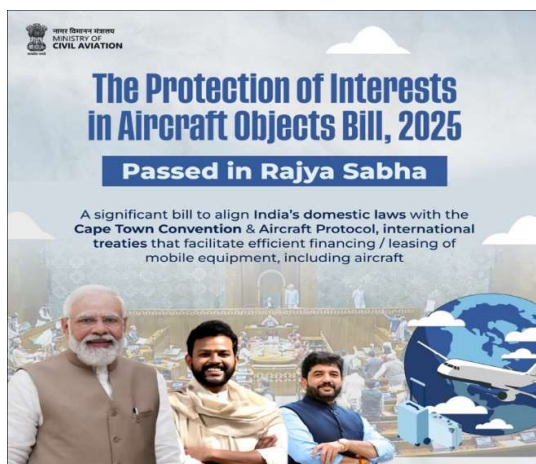
- ✓ A usual resident under the NPR is a person who has resided in a place for 6 months or more and intends to reside there for another 6 months or more.
- ✓ Its aims to have a comprehensive database of people residing in India.
- ✓ It is generated through house-to-house enumeration during the Census.
- ✓ The NPR was first collected in 2010 and then updated in 2015.
- ✓ It is prepared under the provisions of Citizenship Act, 1955 and Citizenship (Registration of Citizens and Issue of National Identity Cards) Rules, 2003.
- ✓ It is mandatory for every "usual resident of India" to register in NPR.

 According to the Civil Registration System (CRS) report, registration of births increased to 92.7% in 2019 from 82% in 2010 and for registered deaths, it rose from 66.9% in 2010 to 92% in 2019.

### PROTECTION OF INTERESTS IN AIRCRAFT OBJECTS BILL 2025

**Context:** Parliament recently passed the Protection of Interests in Aircraft Objects Bill 2025.





### About Protection of Interests in Aircraft Objects Bill 2025:

- The bill aims to **implement international agreements**, particularly the **Convention on International Interests in Mobile Equipment (commonly known as the Cape Town Convention of 2001)** and its Protocol on Aircraft Equipment.
- **India became a signatory** to these agreements in **2008**.
- The bill is designed to bring international aviation lease agreements into India's legal framework, ensuring that creditors and stakeholders in the aviation leasing space are protected under clear guidelines.
- The bill **empowers the central government to make rules** to implement the provisions of the Convention and the Protocol.
- The legislation designates the **Directorate General of Civil Aviation (DGCA)** as the **registry authority for the purposes of the convention**.

- The registry authority is responsible for the **registration and de-registration of aircraft**.
- Key provisions of the bill include the **requirement for creditors to notify the DGCA before initiating any remedies in the event of a default**.
- In cases where defaults occur, **creditors will be entitled to recover assets such as aircraft, helicopters, and engines within two months**, or a mutually agreed upon timeframe.
- The bill is expected to provide much-needed clarity and security, particularly in the leasing industry.

### Cape Town Convention and Protocol

- **Aim:** Standardise transactions involving movable property, particularly high-value assets like aircraft, engines, and helicopters, to ensure creditors can enforce their rights in case of default.
- **Adoption:** Jointly by International Civil Aviation Organisation (ICAO) and UNIDROIT (International Institute for the Unification of Private Law) in 2001.
- **Parties:** **65 Parties (2016) [India signed in 2008]**.

## DIGITAL PERSONAL DATA PROTECTION ACT, 2023

**Context:** Union Minister of Electronics and Information Technology Ashwini Vaishnaw has asked the UIDAI to come up with a new law for Aadhar compatible with the Digital Personal Data Protection Act 2023.



### Key features of the Digital Personal Data Protection Act, 2023 (DPDP Act):

- It applies to the **processing of digital personal data within India**. It applies to processing of **personal data outside India, if it is to offer goods or services to individuals in India**.
- Personal data may be processed only for a lawful **purpose for which an individual has given consent**. A notice must be given before seeking consent. **Consent may be withdrawn at any point in time**.
- An individual, whose data is being processed (**data principal**), **will have the right to:**
  - obtain info about processing
  - seek correction and erasure of personal data
  - nominate another person to exercise rights in the event of death or incapacity
- **Data principals will have the following duties**. They must not:
  - register a false or frivolous complaint
  - furnish any false particulars or impersonate another person in specified cases.
- The entity determining the purpose and means of processing, (**data fiduciary**), **must:**
  - make reasonable efforts to ensure accuracy of data
  - build security safeguards to prevent a data breach
  - inform Data Protection Board of India and affected persons in the event of a breach
  - erase personal data as soon as the purpose has been met and data retention is not necessary.
- **For govt entities, right of data principal to erasure will not apply.**
- **Transfer of Personal Data outside India:** Union Govt. will notify countries where a data fiduciary may transfer personal data. Act relaxes data localisation rules and permits data to flow to certain destinations, based on data security landscape.
- **Data Protection Officer and an independent data auditor:** They will be appointed by businesses of a certain size (based on volume of data processed), to evaluate compliance.
- **Union govt. may also exclude certain enterprises from Act's restrictions** based on volume of users and personal data handling.

### Exemptions:

- **Union Govt. is empowered to exempt its agencies** from the Act in the interest of:

- Sovereignty and integrity of India, Security of state, Friendly relations with foreign states, Public order, Incitement to offence.
- **Union govt may exempt certain activities** the Act. These include:
  - Data processing by govt entities in the interest of the security of the state and public order
  - Research, archiving, or statistical purposes.
- **Rights of the data principal and obligations of data fiduciaries will not apply** in cases of:
  - Prevention and investigation of offences
  - Enforcement of legal rights or claims.

#### Penalties:

- **Focus is more on financial penalties than a criminal conviction.**
- **For companies: Between Rs 50 – 250 crores** for data breaches and noncompliance.
- A consumer who **submits false documents for an online service or makes bogus grievance complaints may face Rs 10,000 fine.**

#### Data Protection Board (DPB)

- It will act as the **adjudicating body** to enforce the provisions of the Act.
- Key functions of the Board include
  - monitoring compliance and imposing penalties

- directing data fiduciaries to take necessary measures in the event of a data breach
- hearing grievances made by affected persons

- Appeals will lie to **Telecom Disputes Settlement and Appellate Tribunal (TDSAT)** set up under TRAI Act, 1997.

#### Draft DPDP Rules, 2025

- **Data Transfer:** Allow the transfer of certain personal data outside India, as approved by the Union Govt.
- **Citizens at the Core:** Citizens have the right to demand data erasure, appoint digital nominees, and have user-friendly mechanisms to manage their data by Data Fiduciaries.
- **Data Erasure:** Data retention can be done up to 3 years from the last interaction with the Data Principal. The Data Fiduciary must notify the Data Principal at least 48 hours before erasure.
- **Graded Responsibility:** Startups and MSMEs have a lower compliance burden, while larger Data Fiduciaries have higher obligations.
- **Consent Managers:** Platform may also collect consent via Consent Managers (they handle collection, storage, and use of user consent). A Consent Manager must be a firm incorporated in India with sound financial & operational capacity, and a minimum net worth of Rs. 2 crore.
- **Setting up of DPB:** DPB will have the powers of a civil court.

## PMLA, 2002

**Context:** The ED has started the process to attach properties under the PMLA, 2002 in Delhi, Mumbai and Lucknow, under the National Herald Case.



### About Prevention of Money Laundering Act (PMLA), 2002:

- PMLA was **enacted under Article 253**, which empowers Parliament to make laws for implementing international conventions. It was enacted in pursuance of two treaties to which India was a party:
  - **UN Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, 1998**
  - **UN Convention against Trans-national Organized Crime, 2000** (Palermo Convention)

### Key Provisions of PMLA

- **Offences & Penalties:** Defines money laundering offences and imposes penalties for such activities - rigorous imprisonment and fines for offenders.
- **Attachment and Confiscation of Property:** Allows for attachment and confiscation of property involved in money laundering. It establishes an Adjudicating

Authority to oversee these proceedings.

- **Reporting Requirements:** Mandates certain entities, such as banks and financial institutions, to maintain records of transactions and report suspicious transactions to the Financial Intelligence Unit (FIU).
- **Designated Authority and Appellate Tribunal:** Establishes a Designated Authority to assist in investigation and prosecution. It also provides for the establishment of an Appellate Tribunal to hear appeals against orders of the Adjudicating Authority.
  - **Appeals against decisions of the PMLA Appellate Tribunal lie to the High Courts.**

### Amendments to PMLA in 2023

- **Clarification about Proceeds of Crime:** Proceeds of the Crime not only includes property derived from the offence but now also includes any other property derived or obtained from any criminal activity relatable or similar to the alleged offence.
- **Money Laundering Redefined:** Money Laundering was not an independent crime – rather, it depended on another crime, known as predicate offence or scheduled offence. The amendment seeks to treat money laundering as a stand-alone crime.
- **Defines PEPs (Politically Exposed Persons):** Individuals who have been entrusted with



prominent public functions by a foreign country.

- **For Cryptocurrencies:** Virtual digital assets (VDA) trade has been brought under PMLA. New rules mandate crypto exchanges and intermediaries dealing in virtual assets to maintain the KYCs of their clients and report suspicious transactions to FIU.
- **Due diligence documentation for companies:** It has been expanded to include the submission of details such as names of persons holding senior positions, names of partners, etc.
- **Beneficial Owners:** Lowered the threshold for identifying beneficial owners by reporting entities, where the client is acting on behalf of its beneficial owner.
  - 'Beneficial owners' are those entitled to more than 25% of shares/capital/profit – this has now been reduced to 10%.
- **NPOs:** Reporting entities have to register details of the client on DARPAN portal of NITI Aayog if it is a non-profit organization (NPO).

#### Enforcement Directorate (ED)

- ✓ It is a domestic law enforcement & economic intelligence agency. It is responsible for **enforcing economic laws & fighting economic crimes.**
- ✓ Its origin goes back to **May 1956**, when an "enforcement unit" was formed for the Foreign Exchange

Regulation Act. In 1957, it was renamed as ED.

- ✓ **Nodal Agency: Department of Revenue, Ministry of Finance**
- ✓ The ED enforces three Acts:
  - **Foreign Exchange Management Act, 1999 (FEMA)**
  - **Prevention of Money Laundering Act, 2002**
  - **Fugitive Economic Offenders Act, 2018 (FEOA).**

## RIGHT TO INFORMATION ACT 2005

**Context:** An amendment to Section 8(1)(j) of the Right to Information Act through Section 44(3) of the Digital Personal Data Protection Act 2023 has raised some controversy regarding the dilution of RTI.



#### About Right to Information Act:

- It was enacted in June 2005 and came into force in October 2005.
- The act **provides citizens the right to secure access to information** under control of Public Authorities (PAs).

- **Coordinating agency:** Department of Personnel and Training under **Ministry of Personnel, Public Grievances and Pensions** (MoPPG&P).

#### Background:

- Right to Information finds articulation as a **human right in the Universal Declaration of Human Rights, the International Covenant on Civil and Political Rights** and the **International Covenant on Economic, Social and Cultural Rights**.



**State of Uttar Pradesh v. Raj Narain (1975):** Supreme Court established the Right to information as a fundamental right under the Article 19 of Indian Constitution.

- In the 1990s, movements like **Mazdoor Kisan Shakti Sangathan (MKSS)** in Rajasthan exposed corruption in wage payments through **Jan Sunwai** (public hearings).
- In 1996, the **National Campaign for People's Right to Information (NCPRI)** was formed, which **drafted an RTI Bill** with the **Press Council of India**.
- In 1997, the government referred the draft to **H.D. Shourie Committee**, which submitted its recommendations.
- India enacted the **Freedom of Information Act in 2002** but it was never notified.
- Finally in 2005, the Right to Information Act was enacted.

#### Key Provisions of the RTI Act:

##### Institutional framework:

- **Central and State Information Commissions:** to oversee its implementation and address appeals regarding non-disclosure of information.
- **Central Public Information Officers (PIO) or State PIO:** in every public authority to provide information to persons requesting for the information under this Act.

##### Rights provided:

- Every citizen has the right to request information from a public authority.

##### Obligations of Public Authorities (Section 4):

- To **maintain records and proactively disclose** certain categories of information to minimize the need for formal requests.
- **Applicability:** Public Authorities, including all authorities/ bodies/ institutions of government established under the Constitution, any other law made by the Parliament or a State Legislature or through notification issued/order made by the appropriate Government.
- It also includes **bodies owned, controlled or substantially financed by the Central/State Government** and Non-Government Organisations (NGOs) substantially financed by the Central/State government

##### Exemptions from Disclosure:

- **Section 8:** Certain information is exempt from disclosure.



- Cases exempt from disclosure include information that:
  - Affects sovereignty and integrity, security, strategic, scientific, or economic interests of India.
  - Affects relations with foreign State
  - Leads to incitement of an offence
  - Causes breach of privilege of Parliament/State Legislature
  - Expressly forbidden to be published by any court of law/tribunal
  - May constitute contempt of court.
  - Commercial confidence, trade secrets, or intellectual property.
  - Information received in confidence from foreign Government
  - Endangers the life or physical safety of any person.
  - Cabinet papers
  - Impedes investigation process or apprehension/prosecution of offenders, etc.
  - Relates to **personal information**
- **Certain intelligence and security organisations specified in the Second Schedule:** Includes 27 organizations like Computer Emergency Response Team (CERT-In), Intelligence Bureau, Research and Analysis Wing, Directorate of Enforcement, National Technical Research Organisation etc.

#### Jurisdictions:

- Lower courts are barred from entertaining suits or applications.
- However, the writ jurisdiction of the Supreme Court and high courts under Articles 32 and 225 of the Constitution remains unaffected.

#### Other key Provisions:

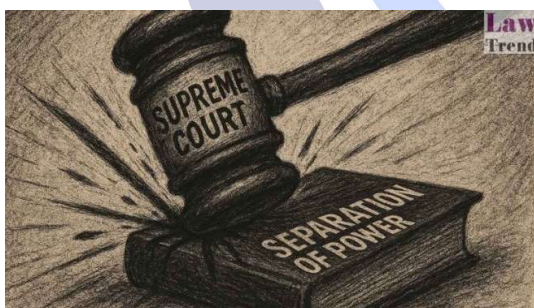
- **Penalties:** In case of failure to provide information on time, incorrect, incomplete etc.
- **Time Frame for Providing Information:** Within **30 days of the request**; for matters concerning life or liberty, it must be provided within **48 hours**.
- **Appeals:** Citizens can appeal against decisions of PIOs if their requests are denied or inadequately addressed.

#### Amendments:

- **Right to Information (Amendment) Act, 2019** modified the terms and conditions of employment for the Information Commissioners (ICs) at the Central and State Levels.
- It empowered the **Central Government to prescribe the Terms, Salaries, Allowances** and Other terms of service of Chief ICs and ICs (at the central and state level).
- **Digital Personal Data Protection (DPDP) Act, 2023:** Amended **section 8(1)(j) of RTI law to exempt all personal information** from disclosure.
- This amendment is what has led to the present controversy:
  - **Section 8(1)(j)** of the RTI Act allows government bodies to

- withhold **“information which relates to personal information”** provided its disclosure is not related to public interest or results in an unnecessary invasion of privacy.
- It provides the safeguard that if the Public Information Officer finds **public interest** in disclosing such information, it could still be available.
  - **Section 44(3)** of the DPDP Act amends **Section 8(1)(j)** by **allowing government bodies to simply withhold “personal information”** without the safeguard provisions on public interest or other such exceptions.

## ARTICLE 142



- **Article 142** empowers the Supreme Court to **pass any order or decree necessary for complete justice** in any pending case before it.
  - This power is **discretionary and unique** to the apex court.
  - The concept of complete justice means **ensuring justice beyond technicalities** by filling legislative
- gaps, and interpreting or even overriding laws when necessary to protect constitutional values, fundamental rights, and social welfare.
  - The framers of the Constitution, especially Dr. B.R. Ambedkar, intentionally entrusted this extraordinary power only to the Supreme Court.
  - The jurisprudence under Article 142 has developed over 50+ years, with the Court maintaining self-imposed limits.
  - Article 142 elevates the Supreme Court's role as the guardian of the Constitution, enabling it to intervene in cases involving public interest, human rights, or democratic breakdown, ensuring justice where legislative or executive action is lacking.
  - The Article strengthens democracy by protecting the rights of minorities, ensuring equal treatment before the law, and acting as a check on executive and legislative overreach.
  - Article 142 **promotes judicial innovation** by allowing the Court to create guidelines and direct government authorities, especially in cases involving public interest and constitutional values.
  - The lack of a clear definition of “complete justice” can lead to subjectivity, inconsistent rulings, and unaccountable discretion.
  - This raises concerns under the basic structure doctrine, particularly the separation of powers.

## SENIOR ADVOCATE DESIGNATION

**Context** Supreme Court recently ordered a fresh assessment of applications for the designation of senior advocates at the Delhi HC.



### Who is a Senior Advocate ?

- **Advocates Act 1961** states 2 classes of advocate – **senior advocates and other advocates.**
- In **2017**, the **SC laid down guidelines** on the designating senior advocates and set up a Permanent Committee & a Permanent Secretariat.
- The **Permanent Committee** confers the title of senior advocate and it consists of the CJI, the two senior-most SC judges, Attorney General, and a member of the Bar Council of India nominated by CJI.
- The **Permanent Secretariat** is tasked with receiving and compiling all applications for designation.
- The permanent committee then makes an overall evaluation based on: years of practice, pro-bono work, judgement, publications, and a personality test.

- Once a candidate is approved, it is **forwarded to the Full Court to decide based on majority.**

### Special Provisions for Senior Advocates:

- They shall **not appear in SC without an advocate on record** or without an advocate in any other court.
- They shall **not accept instructions to draft pleadings or affidavits**, advice on evidence, or to do any drafting work in any Court/Tribunal.
- They shall **not accept directly from a client any brief or instructions** to appear in any Court or Tribunal.

### Guidelines for Designation by SC:

- The candidates need to have at **least ten years' standing** as an Advocate or ten years' combined standing as an Advocate and as District or Session Judge or as a member of any Tribunal.
- The **minimum age limit for applying for designation as senior advocate is 45 years**, unless the age limit is relaxed by the Permanent Committee.

## CABINET COMMITTEE ON SECURITY (CCS)





- The CCS is a cabinet committee of the Govt of India that discusses, debates and is **the final decision-making body on senior appointments in the national security apparatus, defence policy and expenditure & generally all matters of national security.**
- It also deals with policy matters of **foreign affairs that may have a bearing on internal/external security of India**, including cases relating to agreements with other countries on security-related issues.
- CCS is headed by the **Prime Minister**, and it includes ministers of **Finance, Defence, Home Affairs, and External Affairs**. Other members may include defence chiefs and senior bureaucrats.
- The National Security Advisor, the Cabinet Secretary and the Defence Secretary have also been attendees of the CCS meetings on some occasions.
- It plays a key role in India's national security framework, dealing with critical matters related to defense, law and order, and foreign affairs.
- **The CCS was first convened during the Indo-Pak War of 1947–48**, chaired by then Prime Minister Jawaharlal Nehru. **After the 1999 Kargil War, it adopted a formal structure**, and became India's apex decision-making body for defense & national security.

## CONSERVATION OF FOREIGN EXCHANGE AND PREVENTION OF SMUGGLING ACTIVITIES ACT (COFEPOSA) 1974

**Context:** Central Economic Intelligence Bureau has invoked the COFEPOSA Act against actor Ranya Rao, allegedly caught smuggling 14.2 kg of gold.



### About COFEPOSA Act 1974:

- It was passed by the Parliament on 13th December 1974, to provide for **preventive detention** in certain cases for the purposes of **conservation and augmentation of foreign exchange and prevention of smuggling activities** and for matters connected therewith.
- **Power to make orders detaining certain persons:** The Central Government or the State Government or any joint secretary of central government and secretary of state government can order the detention of a person (including a foreigner), in case of-
  - Smuggling;
  - Abetting smuggling;
  - Transport, concealing, storing;
  - Harboursing persons involved in smuggling;

- Dealing in smuggled goods;
- Any order by the State government is to be forwarded to the Central government within 10 days.
- Grounds for detention are **to be communicated within 5 days** to detenu.
- Delay of **up to 15 days** is allowed if **the reason is given in writing**.
- The detaining authority requires to satisfy the courts and also the detenu that he has acted in accordance with the laws with due consideration.
- **High Courts can examine detention orders prior to execution.**
- A detention order cannot be challenged at pre-execution stage on the grounds of delay in execution.
- The **order can be executed anywhere in India**, similar to arrest warrants under the Code of Criminal Procedure, 1973.

#### Advisory Boards:

- Government should, **within 5 weeks of the date of detention**, make a reference to the Advisory Board.
- Advisory Board to **report within 11 weeks** of the detention order.
- If satisfied, the **detention period can be extended to one year**.
- If, in the opinion of the advisory board, there is insufficient cause for detention, the order is revoked, and the person is released.

### CRIMINAL DEFAMATION

- As per the Black's Law Dictionary, defamation means "The offence of **injuring a person's character, fame, or reputation** by false and malicious statements".

- Defamation is categorized into two types **written or libel and oral or slander**:
  - **Libel** is an untrue defamatory statement that is made in writing.
  - **Slander** is an untrue defamatory statement that is spoken orally.
- According to Indian Law, libel and slander, both are considered to be criminal offences.
- Such statements **are to be made in public** to constitute defamation.
- **Indian Penal Code (IPC) section 499** makes it unlawful to communicate any false information about an individual to harm their reputation and the prescribed **maximum punishment is two years**.
- However, **Section 354(2) of the 2023 Bharatiya Nyaya Sanhita Act** states: "Whoever defames another shall be punished with simple imprisonment for a term which may extend to two years, or with fine, or with both or with **community service**."
- The Supreme Court of India in **Subramanian Swamy v. Union of India** (2016) upheld criminal defamation, balancing free speech and the right to protect reputation.
- Law commission highlighted that **reputation is an important facet of Article 21** of the Constitution, which "cannot be allowed to be jeopardized just because an individual has to enjoy his freedom of speech" at the expense of hurting the sentiment of another.

- **Article 19 (2)** enumerates **grounds on which restrictions on the freedom of speech and expression can be imposed**, one of which is defamation.
- According to data published by UNESCO, **160 countries in the world criminalize defamation**.

## INDIAN CYBER CRIME COORDINATION CENTRE (I4C)

**Context:** The government has authorized Indian Cyber Crime Coordination Centre to share and receive information from the Enforcement Directorate under the PMLA.



### About I4C:

- I4C has been established under the **Ministry of Home Affairs (MHA)** to deal with cybercrime in the country in a coordinated and comprehensive manner.
- The I4C focuses on tackling issues related to cybercrime and improving coordination between various Law Enforcement Agencies (LEAs) and stakeholders.
- It is located in **New Delhi**.

### Functions:

- To act as a nodal point in the fight against cybercrime.

- Identify the research problems and needs of LEAs and **take up R&D activities** in developing new technologies and forensic tools in collaboration with academia / research institutes within India and abroad.
- To **prevent misuse of cyberspace** for furthering the cause of extremist and terrorist groups.
- Suggest **amendments in cyber laws** to keep pace with fast changing technologies and international cooperation.
- To coordinate all activities related to implementation of **Mutual Legal Assistance Treaties (MLAT)** with other countries related to cybercrimes in consultation with the concerned nodal authority in MHA.

### Components of I4C:

- **National Cybercrime Threat Analytics Unit (TAU):** For reporting threats pertaining to cybercrimes at regular intervals.
- **National Cybercrime Reporting Portal (NCRP):** To report various cybercrime complaints by citizens at all India level on a common platform on a 24x7 basis from “anywhere, anytime”.
- **National Cybercrime Training Centre (NCTC):** To impart training to government officials, especially state law enforcement agencies.
- **National Cybercrime Research and Innovation Centre:** To carry out research for the development of indigenous tools for the prevention of cybercrimes.
- **Platform for Joint Cyber Crime Coordination Team:** For



coordination, sharing of modus operandi of cybercrimes, data/information among states/UTs LEAs.

- **Cybercrime Ecosystem Management Unit:** For creating mass awareness in cyber hygiene for prevention of cybercrimes.
- **National Cybercrime Forensic Laboratory (Investigation) Ecosystem:** For helping LEAs in cyber forensics investigation.

## PADMA AWARDS

**Context:** President Droupadi Murmu presented the Padma Awards to 71 out of the 139 persons who were announced as awardees in Jan 2025.



### About the Padma Awards:

- They are **announced annually on Republic Day** (26<sup>th</sup> January).
- They were **instituted in 1954** and are the highest civilian honours of India.
- Awards are given in **three categories/degrees**:
  - **Padma Vibhushan** (exceptional and distinguished service)
  - **Padma Bhushan** (distinguished service of higher-order)
  - **Padma Shri** (distinguished service).
- They are conferred based on the recommendations made by the **Padma Awards Committee (constituted by the Prime Minister every year)**.
- There are several rules concerning the conferment of the Padma awards:
  - If someone is a recipient of a lesser degree of the awards, they can be awarded a **higher degree of award only after 5 or more years since the last one**.
  - Awards are **rarely given posthumously**, but exceptions can be made.
  - There ought to be an **element of public service** in the achievements of the person to be selected. It should not be merely on the basis of excellence in any field.
  - Govt. servants including those working in PSUs, **except doctors and scientists**, are not eligible for these awards
- These awards have experienced interruptions in their annual conferment. They were **suspended in 1978 and 1979, as well as from 1993 to 1997**. This was due to govt. policy reviews and legal challenges concerning the awards' constitutional validity and selection processes. The awards were reinstated after these issues were addressed.

### Bharat Ratna

- ✓ It is the **highest civilian award of India**. It was established in 1954 and is awarded in recognition of **exceptional service/performance of the highest order in any field**.
- ✓ **Recommendations for Bharat Ratna are made by the Prime Minister** to the President.
- ✓ On conferment, the recipient receives a Sanad (certificate) signed by the President and a medallion. It **does not carry any monetary grant**.
- ✓ In pursuance of Art. 18 (1) of the Constitution, it cannot be used as a prefix or suffix to recipient's name.
- ✓ Number of awards is **generally restricted to a max of 3 in a year**. However, there have been exceptions to this guideline:
  - 1999 (4 awardees): Amartya Sen, Jayaprakash Narayan, Gopinath Bordoloi, and Pandit Ravi Shankar.
  - 2024 (5 awardees): Karpoori Thakur, C. Charan Singh, P. V. Narasimha Rao, L.K Advani and M. S. Swaminathan.

## NATIONAL MEDICAL COMMISSION

**Context:** To increase the faculty pool for medical colleges across the country, the NMC has allowed

specialists working in non-teaching government healthcare institutes will be eligible to work as faculty in medical colleges.



### About National Medical Commission:

- In 2019, the **Medical Council of India** was replaced by **National Medical Commission**.
- NMC is constituted under **National Medical Commission Act**.
- The change is aimed at bringing in reforms in the medical education sector and especially aimed at replacing the MCI, which was tainted by corruption and other problems.
- The NMC functions as the country's **top regulator of medical education**.
- The NMC consists of **25 members**, appointed by the central government.
- A Search Committee will recommend names to the central government for the post of Chairperson, and the part time members.

### Functions of the National Medical Commission:

- i. Framing policies for regulating medical institutions and medical professionals
- ii. Assessing the requirements of healthcare related human resources and infrastructure

- iii. Ensuring compliance by the State Medical Councils of the regulations made under the Bill
  - iv. Framing guidelines for determination of fees for up to 50% of the seats in private medical institutions and deemed universities which are regulated under the Act
- licensed medical practitioners, and regulate professional conduct.
  - Only those included in the Register will be allowed to practice medicine. The Board will also maintain a separate National Register for community health providers.

**Autonomous Boards under NMC:**

NMC have four separate autonomous boards:

- **Under-Graduate Medical Education Board (UGMEB) and the Post-Graduate Medical Education Board (PGMEB):**

- These Boards will be responsible for formulating standards, curriculum, guidelines, and granting recognition to medical qualifications at the undergraduate and post graduate levels respectively.

- **The Medical Assessment and Rating Board (MARB):**

- MARB will have the power to levy monetary penalties on medical institutions which fail to maintain the minimum standards as laid down by the UGMEB and PGMEB.
- The MARB will also grant permission for establishing a new medical college, starting any postgraduate course, or increasing the number of seats.

- **The Ethics and Medical Registration Board:**

- This Board will maintain a National Register of all

- Each autonomous board will consist of **a President and four members**, appointed by the **central government**.

# International Relations

## SHANGHAI COOPERATION ORGANISATION

**Context:** In the wake of 75 years of India-China relations, the SCO has been in the news.



### About Shanghai Cooperation Organization:

- SCO is a **permanent intergovernmental** international organisation.
- It is a Eurasian political, economic and military organisation aiming to maintain peace, security and stability in the region.
- It was created in 2001.
- The **SCO Charter** was signed in 2002, and entered into force in 2003.
  - It is a statutory document which outlines the organisation's goals and

principles, as well as its structure and core activities.

- The SCO's official languages are Russian and Chinese.

### Origins of the SCO:

- Its origins lie in the “**Shanghai Five**”, formed in 1996 and consisting of China, Russia, Kazakhstan, Kyrgyzstan and Tajikistan.
- With the dissolution of the USSR in 1991 into 15 independent countries, there were concerns in the region about extremist religious groups and ethnic tensions coming to the fore.
- To manage these issues, a grouping was created for cooperation on security matters.
- Building on this, SCO was established on June 15, 2001, in Shanghai as an international organisation, and also included Uzbekistan as a sixth member.
- At present it has **ten members**: India, Iran, Kazakhstan, China, Kyrgyzstan, Pakistan, Russia, Tajikistan, and Uzbekistan, Belarus.
- **Belarus** joined as the 10<sup>th</sup> member in 2024.
- **Afghanistan** and **Mongolia** hold Observer Status.

### Guiding Principle – Based on Shanghai Spirit

- Internal policy based on the principles of mutual trust, mutual benefit, equality, mutual consultations, respect for cultural



diversity, and a desire for common development.

- External policy in accordance with the principles of non-alignment, non-targeting any third country, and openness.

### Structure of the Shanghai Cooperation Organisation

- **Heads of State Council** – The supreme SCO body which decides its internal functioning and its interaction with other States & international organisations, and considers international issues.
- **Heads of Government Council** – Approves the budget, considers and decides upon issues related economic spheres of interaction within SCO.
- **Council of Ministers of Foreign Affairs** – Considers issues related to day-to-day activities.
- **Regional Anti-Terrorist Structure (RATS)** – Established to combat terrorism, separatism and extremism.
- **SCO Secretariat** – Based in Beijing to provide informational, analytical & organisational support.

### Operations

- Initially, the SCO focused on mutual intraregional efforts to curb terrorism, separatism and extremism in Central Asia.
- In 2006, SCO's agenda widened to include **combatting international drug trafficking** as a source of financing global terror.
- In 2008, SCO actively participated in bringing back stability in Afghanistan.

- At the same time, the SCO took up a variety of economic activities:

- In 2003, SCO member states signed a **20-year Programme of Multilateral Trade and Economic Cooperation** for the establishment of a free trade zone within the territory under the SCO member states.

## THE ARCTIC COUNCIL

**Context:** As the Arctic ice melts, it is transformed into the new geopolitical theatre.

### About the Arctic Council

- The Arctic Council is the leading intergovernmental forum promoting cooperation, coordination, and interaction among the Arctic States, Arctic Indigenous Peoples, and other Arctic inhabitants.
- It addresses the concerns related to the Arctic region, including sustainable development and safeguarding the environment in the Arctic region.
- It was formally established in 1996 through the Ottawa Declaration.
- The establishment was preceded by the Arctic Environmental Protection Strategy (June 1991), a declaration on protecting the Arctic environment.

### Members of the Arctic Council

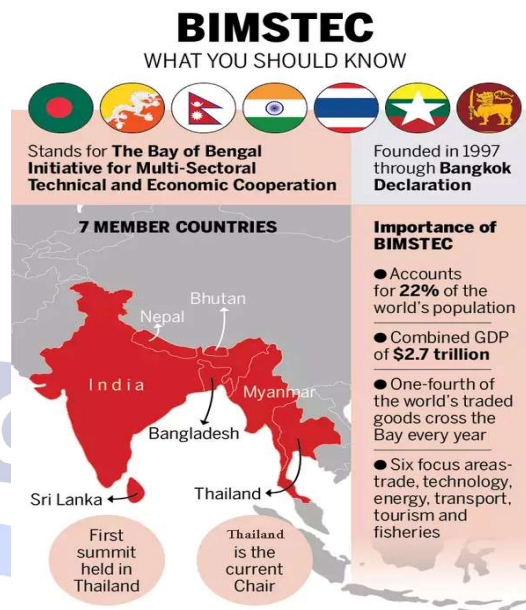
- The eight Arctic States (whose territories fall in the Arctic region) are members of the Arctic Council.

- These are Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, and the US.
- All Arctic Council decisions:
  - Require consensus of the eight Arctic States.
  - Happens in consultation with the permanent participants.
- Permanent Participants
  - Six organizations representing the indigenous people of the Arctic region have been granted the status of permanent participants.
- Observer Status
  - The Observer status is granted to entities that support the objectives of the Arctic Council and have demonstrated capabilities, including the ability to make financial contributions.
  - Observers of the Arctic Council are: Thirteen Countries, including India, Thirteen intergovernmental and inter-parliamentary organizations, Twelve Non-governmental organizations.
  - India had been given the Observer status in 2013.

## BIMSTEC

**Context:** Recently, External Affairs Minister S Jaishankar addressed the ministerial meeting of the seven-member Bay of Bengal Initiative for

## Multi-Sectoral Technical and Economic Cooperation (BIMSTEC).



### About BIMSTEC:

- The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) was established in the **1997 Bangkok Declaration** with a secretariat in Dhaka.
- Its members lie in the littoral and adjacent areas of the **Bay of Bengal** constituting a contiguous regional unity.
- BIMSTEC not only connects South and Southeast Asia, but also the ecologies of the Great Himalayas and the Bay of Bengal.
- **Members:** Bangladesh, India, Myanmar, Sri Lanka, Thailand, Nepal and Bhutan (No Maldives, Afghanistan, Pakistan)
- The BIMSTEC Permanent Secretariat **Dhaka** was opened in 2014.

### Evolution:

- Initially, it was formed **with four Member States with the acronym 'BIST-EC'** (Bangladesh, India, Sri-Lanka and Thailand Economic Cooperation).
- It became renamed 'BIMST-EC' in 1997, following the inclusion of Myanmar.
- With the **admission of Nepal and Bhutan** in 2004, the name of the grouping was changed to '**Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation**' (BIMSTEC).

### Institutional Mechanism:

- BIMSTEC Summit** – highest policymaking body in BIMSTEC process and is comprised of heads of state/government of member states.
  - The **6<sup>th</sup> BIMSTEC summit** is taking place in April 2025 in **Thailand**.
- Ministerial Meeting** – second apex policy-making forum of BIMSTEC attended by the External/Foreign Ministers of Member States.
- Senior Officials' Meeting** – represented by Senior Officials of Foreign Ministries of the Member States.
- BIMSTEC Working Group** – attended by Ambassadors of BIMSTEC Member Countries to Bangladesh or their representatives on a monthly basis at the BIMSTEC Secretariat in Dhaka.
- Business Forum & Economic Forum** – the two important forums to ensure active participation of private sector.

### BIMSTEC Connectivity Project

#### 1. Kaladan Multimodal Project – links India and Myanmar

- It will connect Kolkata port with Sittwe port in Myanmar by sea, and then link Sittwe seaport to Lashio in Myanmar via Kaladan river via inland water transport and then from Lashio to Mizoram in India by road transport.
- When completed, the KMTT will shorten the current time taken to transport goods from Kolkata to Mizoram by three-four days, and the distance by around 950 km.
- KMMT is hailed as "Future gateway to South East Asia".

#### 2. Asian Trilateral Highway

- The 1360 kms long India-Myanmar-Thailand Trilateral Highway is an initiative pertaining to India, Myanmar and Thailand.
- India is undertaking construction of two sections of the Trilateral Highway in Myanmar
- The road will boost trade and commerce in the ASEAN-India Free Trade Area, and with the rest of Southeast Asia.
- India has also proposed extending the highway to Cambodia, Laos and Vietnam.

#### 3. Bangladesh-Bhutan-India-Nepal (BBIN) Motor Vehicles Agreement

- Bangladesh, Bhutan, India and Nepal (BBIN) had signed a framework MVA in June 2015 to enable movement of passenger and cargo vehicles across borders among the four countries.
- Bhutan has not yet ratified the pact for its entry to come into force.

## AFRICAN UNION

**Context:** An opinion piece in the Hindu mentions the case for the Global South in securing peace in Ukraine and mentions the African Union in this context.



### About African Union:

- It is a continental body consisting of the **55 member states** that make up the countries of the African Continent.
- It was officially **launched in 2002** and **replaced its predecessor, the Organization of African Unity (OAU)**, which was founded in 1963.
- **Primary Objective:** To promote unity, cooperation, and development among African nations while advancing the continent's interests on the global stage.
- The AU is guided by its vision of “**An Integrated, Prosperous, and Peaceful Africa**, driven by its own citizens and representing a dynamic force in the global arena.”
- To ensure the realization of its objectives and the attainment of the Pan African Vision of an integrated, prosperous and peaceful Africa, **Agenda 2063** was developed as a strategic framework for Africa's long

term socio-economic and integrative transformation.

- **Agenda 2063** calls for greater collaboration and support for African led initiatives to ensure the achievement of the aspirations of African people.
- **Headquarters:** Addis Ababa, Ethiopia
- In 2023, the African Union became a member of the G20.

### Structure:

- **Assembly:** It is the highest decision-making body, consisting of the **heads of state and government** of member countries.
- **Executive Council:** Made up of foreign affairs ministers, handles policy matters and makes recommendations to the Assembly.
- **AU Commission:** Headquartered in Addis Ababa, is the administrative arm responsible for implementing the decisions of the Assembly and the Executive Council.
- **The Peace and Security Council:** Responsible for maintaining peace and security on the continent.
- The AU structure promotes the participation of African citizens and civil society through the **Pan-African Parliament** and the **Economic, Social & Cultural Council (ECOSOCC)**.

### Achievements:

#### African Continental Free Trade Area

- It was established in 2018 by the **African Continental Free Trade Agreement (AfCTA)**.
- AfCFTA seeks to create a **single continental market for goods and**



**services**, with free movement of business persons and investments, and thus pave the way for accelerating the establishment of the **Continental Customs Union** and the **African customs union**.

- The AfCFTA preliminary work is on steps such as incremental tariff reduction, elimination of non-tariff barriers, supply chains and dispute settlement.
- It is expected to boost intra-African trade by about USD35 billion by the end of 2022.
- The larger market area will likely attract investment for continental infrastructure development.
- The increased trade will create jobs, enhance Africa's global competitiveness, improve social welfare and position Africa for greater industrialization.

## LINE OF ACTUAL CONTROL

**Context:** The recent rapprochement between India and China should be viewed with caution considering the persisting issues along the Line of Actual Control.



### About Line of Actual Control:

- The LAC is the **demarcation** that separates Indian-controlled territory from Chinese-controlled territory.

- It is divided into **three sectors**: the eastern sector which spans Arunachal Pradesh and Sikkim, the middle sector in Uttarakhand and Himachal Pradesh, and the western sector in Ladakh.
- India considers the LAC to be **3,488 km** long, while the Chinese consider it to be only around **2,000 km**.
- The LAC is **not India's claim line**.
- India's claim line is the line seen in the official boundary marked on the maps as released by the Survey of India, including both Aksai Chin and Gilgit-Baltistan.
- In China's case, LAC is the claim line except in the eastern sector, where it claims the entire Arunachal Pradesh as South Tibet.

### Disagreements on LAC:

- The western sector of the LAC is heavily contested.
- Here, the LAC emerged from two letters written by Chinese PM Zhou Enlai to PM Jawaharlal Nehru in 1959, after he had first mentioned such a 'line' in 1956.
- After the 1962 War, the Chinese claimed they had withdrawn to 20 km behind the LAC of 1959, which coincides with the so-called **McMahon Line** in the eastern sector.

### Indian Response to China's Designation of the LAC:

- India rejected the concept of LAC in both 1959 and 1962, as it is the line China has created.
- The Chinese line was a disconnected series of points on a map that could be joined up in many ways.

- India wants the line to omit gains from aggression in 1962 and base it on the actual position on September 8, 1962 before the Chinese attack.
- During the Doklam crisis in 2017, the Chinese Foreign Ministry spokesperson urged India to abide by the '1959 LAC'.

#### Current scenario:

- India formally accepted the **concept of the LAC** when the Indian PM paid a return visit to Beijing in 1993 (after Chinese Premier Li Peng's 1991 visit to India).
- The two sides signed the **Agreement to Maintain Peace and Tranquility** at the LAC.
- The reference to the LAC was unclear on whether it referred to the LAC at the time of the one identified in 1959 or 1962.
- To reconcile the differences about some areas, the Joint Working Group on the border issues has been assigned the task of clarifying the alignment of the LAC.

#### Legacy Issues of Depsang Plains and Demchok:

- The **Depsang Plains** are located close to the strategically important Daulat Beg Oldie.
- The Depsang Plains issue began in 2013 when China carried out an 18-km incursion in the area.
  - Despite the two countries agreeing then to go back from their positions, the PLA troops did not vacate the area completely.
- In **Demchok**, which is in the southern part of eastern Ladakh, the problem

is mainly at the Charding Ninglung Nullah (CNN) junction.

- In multiple instances, the PLA also stopped Indian graziers at the Saddle Pass at the CNN junction, well within India's perception of the LAC.

#### Present agreement:

- The Union government has announced that India and China have reached an agreement on patrolling arrangements and the resolution of the military standoff at the LAC, including Depsang and Demchok.



#### LAC v LoC

- The LoC emerged from the 1948 ceasefire line negotiated by the UN after the Kashmir War.
- It was designated as the LoC in 1972, following the Shimla Agreement between the two countries (India and Pakistan).
- It is delineated on a map signed by DGMOs of both armies and has the international sanctity of a legal agreement.
- On the other hand, the LAC is only a concept. It is not agreed upon by the two countries, neither delineated on a map or demarcated on the ground.

### INDIA-MIDDLE EAST-EUROPE ECONOMIC CORRIDOR (IMEC)

**Context:** India and Italy decided to enhance cooperation in trade, defence, clean energy, and tech while working jointly on the IMEC.



#### About IMEC:

- IMEC is a key initiative under the **Partnership for Global Infrastructure and Investment (PGII)**, aimed at infra development in developing regions.
- It was formally endorsed during the **2023 G20 New Delhi summit**.
- It is an ambitious project consisting of Railroad, Ship-to-Rail networks and Road transport routes extending across **two corridors**, that is:
  - The East Corridor – connecting India to the Arabian Gulf,
  - The Northern Corridor – connecting the Gulf to Europe.
- The IMEC corridor will also include an electricity cable, a hydrogen pipeline and a high-speed data cable.
- **Signatories:** India, the US, Saudi Arabia, UAE, the European Union, Italy, France, and Germany.

#### Ports to be Connected:

- **India:** Mundra (Gujarat), Kandla (Gujarat), and Jawaharlal Nehru Port Trust (Navi Mumbai).
- **Middle East:** Fujairah, Jebel Ali, and Abu Dhabi (UAE); Dammam and Ras Al Khair (Saudi Arabia).
  - A railway line will link Fujairah port (UAE) to Haifa

port (Israel) via Saudi Arabia and Jordan.


- **Israel:** Haifa port.
- **Europe:** Piraeus port in Greece, Messina in South Italy, and Marseille in France.

#### Objective:

- It aims to create a comprehensive transportation network, comprising rail, road, and sea routes, connecting India, the Middle East, and Europe.
- It aims to enhance transportation efficiency, reduce costs, increase economic unity, generate employment, and lower Greenhouse Gas (GHG) emissions.

#### Significance:

- It is estimated that the time and cost of transporting goods to Europe from India will be reduced by 40% and 30% respectively.
- The project is also seen as a challenge to China's Belt and Road Initiative (BRI).

 The PGII was launched as a joint initiative of G7 Nations (during the 2022 G7 summit in Germany) to help fund infrastructure projects in developing countries through public and private investments.

## WORLD PANDEMIC TREATY

#### About World Pandemic Treaty

- The proposal to draft and negotiate this convention was finalised by the **Intergovernmental Negotiating Body (INB)**, established in **December**

2021 under the WHO Constitution.



- The treaty aims to **strengthen pandemic prevention, preparedness and response**.

#### Key Provisions of Treaty:

- Legally binding accord:** It is a legally enforceable accord aimed at strengthening global cooperation to prevent, prepare for, and respond to future pandemics.
- Pathogen access and Benefit Sharing System (PABS):** It establishes a framework for sharing pathogens and ensuring **equitable access to vaccines, diagnostics, and treatments** derived from them.
- One Health Approach:** The treaty promotes integrated surveillance and prevention strategies that consider human, animal, and environmental health to anticipate and mitigate pandemic risks.
- Technology transfer and capacity building:** It encourages the transfer of technology, knowledge, and skills to build geographically diverse research and development capacities.

- Respect for national sovereignty:** The treaty explicitly affirms countries' sovereignty over their public health policies, stating **WHO will not have authority to mandate** specific national actions such as lockdowns, travel bans, or vaccination mandates.
- Ratification:** The treaty will be formally considered at the upcoming World Health Assembly in **May 2025**.
- USA's status:** The United States, having withdrawn from WHO negotiations, is **not a party to the treaty and will not be bound** by its provisions after its exit in 2026.

## INDUS WATER TREATY

**Context:** India has suspended the IWT in response to the recent attack by Pakistani terrorists in Pahalgam in Jammu and Kashmir.



#### About Indus Water Treaty (IWT):

- It was signed in Sept., 1960 after nine years of negotiations, with



**World Bank being a signatory to the pact.**

- It sets out a mechanism for mutual **cooperation as well as information exchange on the use of water of Indus River and its five tributaries.**
  - Sutlej, Beas, Ravi, Jhelum, and Chenab (and all its tributaries)
- This exclusivity restricts what hydro projects India can make (**run of the river projects only**).

#### **Water Sharing under the IWT:**

- IWT allocated three western rivers (**Indus, Chenab and Jhelum**) to Pakistan for unrestricted use (but allows agricultural and domestic uses by India).
- The three Eastern rivers - Ravi, Beas and Sutlej - were allocated to India for unrestricted usage.
- This meant **that 80% of the share of water went to Pakistan**, while leaving 20% of water for use by India.

#### **Permanent Indus Commission:**

- The IWT created a **Permanent Indus Commission** constituted by permanent commissioners on both sides. It is required to **meet at least once a year**.
- Permanent Indus Commission meetings have been put on hold until India and Pakistan discuss about India's demand to update the IWT. Its **last meeting was held in May 2022**.


#### **Dispute Resolution Mechanism:**

- The IWT creates a **3-step graded dispute resolution mechanism** under Article IX.
- Questions on both sides can be resolved at **Permanent Commission or inter-government level**.
- In case of unresolved questions - both sides can approach the **World Bank to appoint a Neutral Expert (NE)**.
- Appeals against the NE's decision or disputes with regards to interpretation and extent of the IWT itself will be referred to a **Court of Arbitration**.

#### **Why is India rethinking the IWT ?**

- **IWT mostly favours Pakistan:** 80.52% of water flow in the Indus system is allotted to Pakistan.
- **Reclaiming riparian rights:** India conceded upper riparian position on western rivers for complete rights on eastern rivers. Water supply is critical for developmental plans in the region.
- **Blow against terrorism:** PM Modi stated that "Blood and waters cannot flow together".
- **Changed Demographics:** A major increase in its population in the Punjab-Haryana region necessitate a reassessment of the IWT.
- **Environmental Considerations:** The need to accelerate clean energy development (hydropower) to meet emission targets has been highlighted as a reason for modifying the IWT.

- **Security Issues:** Cross-border terrorism has undermined India's ability to utilize its rights fully.
- **Water Scarcity:** Declining ground water tables in the Punjab-Haryana region increase dependence on the river systems covered in the IWT.
- **Economic Development:** A new IWT would allow India to expand its hydroelectric power projects.

 In Sept 2024, India had served formal notice to Pakistan seeking "review and modification" of the IWT.

## SHIMLA AGREEMENT

**Context:** Pakistan has suspended the Shimla Agreement in light of Indian actions in response to the Pahalgam attacks.



### About Shimla Agreement:

#### Origins and Context:

- **Post-1971 War Dynamics:** The agreement was a direct consequence of the 1971 Indo-Pakistani War, which resulted in the **independence of Bangladesh** (formerly East Pakistan).
- India's military intervention played a crucial role in this conflict, significantly altering the geopolitical landscape of South Asia.
- **Key Negotiators:** Prime Minister **Indira Gandhi** and Pakistan's President **Zulfikar Ali Bhutto**.
- The agreement aimed to establish peace and normalize relations between the two countries after the intense hostilities.
- **Objectives of the Simla Agreement:**
  - **Resolution of Kashmir Issue:** India aimed for a **bilateral resolution** to the Kashmir dispute, restraining Pakistan from internationalizing the issue.
  - **Normalisation of Relations:** Hoping for improved relations with Pakistan based on the new regional power balance.
  - **Avoiding Humiliation of Pakistan:** India chose not to press for turning the ceasefire line into a permanent boundary to prevent further resentment and potential revanchism in Pakistan.

#### Key Provisions:

- **Conflict Resolution and Bilateralism:** The agreement emphasized resolving all issues between India and Pakistan through **peaceful means, primarily through bilateral negotiations**.
- **Status of Kashmir:** One of the most contentious issues addressed was the **Line of Control (LoC) in Kashmir, established after the 1971 war**.
- Both sides agreed to **respect this line** without prejudice to their respective claims and to **refrain**

from altering its status unilaterally.

- **Withdrawal of Forces:** It stipulated the withdrawal of forces to their respective sides of the international border, marking a significant step towards de-escalation.
- **Future Diplomacy:** The agreement also laid down provisions for future meetings between the heads of both governments and ongoing discussions to establish durable peace, normalize relations, and address humanitarian issues like the repatriation of prisoners of war.

#### Significance:

- **Geopolitical Tensions:** The agreement remains relevant today as the Kashmir issue and broader Indo-Pak relations continue to be a flashpoint in South Asian geopolitics.
- **Legal and Diplomatic Framework:** It provides a legal framework for future discussions and negotiations between the two countries, despite its limitations and differing interpretations.

#### History of Indo-Pak conflicts:

- Pakistan's assault on Kashmir after Raja Hari Singh's decision to remain independent led to the king signing the **Instrument of Accession** and the **Indo-Pak war** of 1947-48.
- **1965 and 1971 Wars:** The 1965 war began with border skirmishes and escalated into a full-scale conflict. It ended with a **UN-mediated ceasefire** and no major territorial changes.
- In 1971, India intervened in East Pakistan's struggle for independence, leading to the creation of Bangladesh.

- **Simla Agreement (1972):** Signed after the 1971 war, it established the Line of Control (LOC) in Kashmir between India and Pakistan.
- **Insurgency in Kashmir (1989):** Pakistan supported a militant insurgency in Kashmir, leading to widespread violence and human rights abuses.
- **Kargil War (1999):** Pakistan-backed forces infiltrated Indian-controlled territory in Kargil, sparking war that ended with Indian military victory but strained relations further.
- **Mumbai Attacks (2008):** Pakistan based **Lashkar-e-Taiba militants** launched coordinated attacks in Mumbai, killing 166 people. This event severely strained relations and led to international pressure on Pakistan to act against terrorism.
- Periodic attempts at dialogue and confidence-building measures have been marred by incidents such as the **Pulwama attack (2019)** and subsequent military engagements, highlighting the fragility of peace efforts.
- The latest in the series is the 2025 **Pahalgam attacks** that resulted in the death of 26 people.

### LINE OF CONTROL

- The **Line of Control (LoC)** emerged from the **1948 ceasefire line** negotiated by the United Nations (UN) after the Kashmir War.
- It was **designated as the LoC in 1972**, following the **Shimla Agreement** between the two countries.

- LoC is demarcated up to the Siachen Glacier (Point NJ9842)- the world's highest battlefield.
- LoC is delineated on a map signed by the **Director General of Military Operations (DGM0)** of both armies and has the international sanctity of a legal agreement.



## NUTRITION FOR GROWTH SUMMIT

**Context:** Last month world leaders gathered in Paris for the Nutrition for Growth Summit.

**NUTRITION  
FOR GROWTH  
PARIS 2025**

### About Nutrition for Growth Summit:

- The Nutrition for Growth (N4G) Summit is a **global pledging event** uniting government, international organizations, civil society, research institutions, philanthropies and the private sector **to take action against malnutrition in all its forms.**
- Launched in 2013, this high-level event takes place **every four years** in the **host country of the Olympics**

and Paralympics, serving as a **stage for world leaders to make game-changing financial, policy and related commitments to improve global nutrition.**

- On 27 and 28 March 2025, Paris hosted the N4G Summit.
- The Summit's objectives are ambitious and crucial:
  - Put nutrition at the heart of the global development agenda
  - Unite the world in fighting all forms of malnutrition
  - Ensure continuity and sustain commitments to good nutrition
  - Secure strong political and financial commitments for better nutrition worldwide.
- 2025 is significant as it marks the end of the **UN Decade of Action on Nutrition.**
- The 2025 summit mobilized over \$27bn to reach nutrition related Sustainable Development Goals.

## UNITED NATIONS OCEAN CONFERENCE (UNOC3) 2025



- The 2025 UN Ocean Conference, **co-hosted by the Governments of France and Costa Rica**, will



take place from 9 to 13 June 2025 in Nice, France.

- **Theme:** “Accelerating action and mobilizing all actors to conserve and sustainably use the ocean”
- It aims to **support urgent action to conserve and sustainably use the oceans, seas & marine resources** for sustainable development and identify further ways and means to support SDG 14 (Life Below Water).
- The Conference has **three priorities** in order to produce an ambitious draft agreement:
  - **Governance:** Completion of multilateral processes linked to the oceans to boost protection, e.g. implementation of ‘Marine Biodiversity beyond National Jurisdiction’ (BBNJ Agreement).
  - **Financing:** Mobilizing finance to conserve and sustainably use oceans, seas & marine resources for SDG 14 and help create a sustainable blue economy.
  - **Knowledge sharing:** Improve the dissemination of marine scientific data to enhance policy-making.
- **Expected outcome:** The “Nice Ocean Agreements” can form a global pact for the conservation and sustainable use of oceans.
- It **will build on previous UN Ocean Conferences**, hosted by Sweden and Fiji in 2017 in New York and by Portugal and Kenya in 2022 in Lisbon.

## UNITED NATIONS REFUGEE AGENCY FOR PALESTINIANS (UNRWA)

**Context:** The UN agency for Palestinian refugees (UNRWA) said that more than 50 of its staff in Gaza were abused and used as human shields while in Israeli military detention.



### About United Nations Refugee Agency for Palestinians (UNRWA):

- It is a **subsidiary agency created by the United Nations (UN) General Assembly** in 1949.
- **Objective:** To provide **relief, health, and education services for Palestinians** who lost both their homes and their means of livelihood during the **Arab-Israeli wars** following the establishment of the State of Israel in 1948.

### Headquarters:

- Beginning operations in 1950, UNRWA was **originally headquartered in Beirut** but was **moved to Vienna** in 1978.

- Following the conclusion of the **Oslo Accords** in the early 1990s, the General Assembly **moved the agency to the Gaza Strip** in 1996 to demonstrate the General Assembly's commitment to the Arab-Israeli peace process.
- In the absence of a solution to the Palestine refugee problem, the General Assembly has **repeatedly renewed UNRWA's mandate**, most recently extending it until 30 June 2026.
- **Services:** The agency's services encompass education, health care, relief and social services, camp infrastructure and improvement, microfinance, and emergency assistance, including in times of armed conflict
- Its chief officer, the **commissioner-general—the only leader of a UN agency to report directly to the General Assembly**—is appointed by the UN secretary-general with the approval of an Advisory Commission.

#### Oslo Accords

- ✓ Oslo Accords are a series of **agreements between Israel and the Palestinians** signed in the 1990s.
  - ✓ **Oslo I (1993)** is formally known as the **Declaration of Principles (DOP)**.
  - ✓ The pact established a timetable for the Middle East peace process.
  - ✓ It planned for an **interim Palestinian government in Gaza and Jericho** in the West Bank.
  - ✓ **Oslo II** is officially called the **Israeli-Palestinian Interim Agreement on the West Bank and Gaza (1995)**, expanded on Oslo I.
  - ✓ It included provisions for the **complete withdrawal of Israeli troops** from six West Bank cities and about 450 towns.
  - ✓ Additionally, the pact set a timetable for **elections for the Palestinian Legislative Council**.
  - ✓ The interim pact was only supposed to last five years while a permanent agreement was finalized but it has tacitly been rolled over for more than two decades.
  - ✓ The **question of Jerusalem** was left undecided under the Oslo Accords.
- Fields of operations:**
- It provides services in its **five fields of operations:** Jordan, Lebanon, Syria, the Gaza Strip, and the West Bank, including the East of Jerusalem.
  - It supports more than five million registered Palestinian refugees, and their patrilineal descendants, who fled or were expelled from their homes during the **1948 Palestine war**, as well as those who fled or were expelled during and following the **1967 Six Day war**.

#### Funding:

- It is funded almost entirely by **voluntary contributions from UN Member States**.
- UNRWA also receives some funding from the **Regular Budget** of the UN, which is used mostly for international staffing costs.

## Economy

### SERIOUS FRAUD INVESTIGATION OFFICE (SFIO)

**Context:** The Serious Fraud Investigation Office is investigating companies associated with Kerala Chief Minister's daughter.



#### About Serious Fraud Investigation Office:

- It is a **corporate fraud investigating agency** set up by the Government of India.
- **Section 211** of the Companies Act, 2013, accords **statutory status** to the SFIO.
- It is a **multi-disciplinary organization** under the **Ministry of Corporate Affairs**, consisting of experts in the fields of accountancy, forensic auditing, law, information technology, investigation, company law, capital markets and taxation for detecting and prosecuting or

recommending for prosecution white-collar crimes/frauds.

- **SFIO takes up for investigation cases characterized by:**

- Complexity and having interdepartmental and multidisciplinary ramifications.
- Substantial involvement of public interest to be judged by size, either in terms of monetary.
- The possibility of investigation leading to or contributing towards a clear improvement in systems, laws, or procedures.
- Investigate serious cases of fraud received from Department of Company Affairs.
- Investigation into the affairs of a company is **assigned to SFIO**, where the Government is of the opinion that it is necessary to investigate into the affairs of a company-
  - on receipt of a **report of the Registrar or inspector** under **section 208** of the Companies Act, 2013
  - on intimation of a special resolution passed by a company that its affairs are required to be investigated

- In the public interest; or on request from any department of the Central Government or a State Government
- The SFIO **can also take up cases on its own** only when decided by the Director of the SFIO, and also giving the reasons for taking up the case in writing.
- Upon assignment of a case to the SFIO, no other investigative agency can proceed with an investigation for any offence under the Act.
- SFIO is **headed by a Director** as Head of Department in the rank of Joint Secretary to the Government of India.
  - The Director is assisted by Additional Directors, Joint Directors, Deputy Directors, Senior Assistant Directors, Assistant Directors, Prosecutors, and other secretarial staff.
- The **headquarters** of SFIO is at **New Delhi** with its regional offices at Mumbai, Chennai, Hyderabad, and Kolkata.
- initiative to foster high-end biomanufacturing.
- It was launched by the **Department of Biotechnology** (Ministry of Science and Technology) in **August 2024**.
- It focuses on manufacturing products through advanced biotechnological processes, including **medicines, materials, and bio-based products for agriculture and industry**.
- The policy covers **six thematic areas**:
  - Bio-based chemicals, enzymes and biopolymers
  - Smart proteins and functional foods.
  - Precision biotherapeutics.
  - Climate-resilient agriculture.
  - Carbon capture and utilization.
  - Marine and space research.
- It addresses critical areas such as sustainable agriculture, innovation and environmental conservation to meet national needs.

## BIOE3 POLICY

**Cabinet:** India highlighted its BioE3 Policy at the Mission Innovation (a multilateral platform for clean energy growth) Annual Gathering 2025 in Seoul, South Korea.

### What is the BioE3 Policy?

- **BioE3 (Biotechnology for Economy, Environment and Employment) Policy** is a strategic

### Aims and Objectives of the Policy:

- The policy promotes research and development and entrepreneurship in various thematic sectors, facilitating technological advancement and commercialization.
- It proposes the **establishment of Biomanufacturing & Bio-AI hubs and Biofoundries** to enhance India's bioeconomy.
- It encourages the development of bio-based products that can



address **environmental, agricultural, and industrial challenges.**

- It supports **creation of internships** for students in grades 11<sup>th</sup> and 12<sup>th</sup>, **as well as fellowships** for graduate & post-graduate research.

#### Significance of the Policy:

- **Economic Growth:** It is expected to catalyze a “bio revolution” similar to the IT revolution, generating substantial job opportunities in biotechnology and biosciences.
- **Sustainability Goals:** The policy aligns with govt initiatives for achieving a ‘Net Zero’ carbon economy and promotes sustainable lifestyles, thereby steering India towards accelerated green growth.
- **Job Creation:** By expanding the skilled workforce in biotechnology, the policy aims to create various kinds of employment opportunities, addressing critical societal issues such as climate change, food security, and human health.

#### Present Status of Indian Bio-economy:

- **Growing Potential:** Biotechnology sector is seen as a key player in addressing challenges in health, agriculture, environment, and energy. India has a large pool of young, skilled workers, with 47% of its population under the age of 25.

- **R&D Spending:** Despite its potential, India spends less than 1% of its GDP on research, compared to Israel and South Korea, which invest over 4%.
- **Existing Infra:** The government has established 9 biotech parks and 60 bio-incubators, which support the growth of the biotechnology sector.

### CRITICAL MINERALS

**Context:** China imposed restrictions on the export of seven “rare earths” after US President Donald Trump decided to impose tariffs on all US imports from China.

#### About Critical Minerals:

- They are elements that are **crucial to modern-day technologies and are at risk of supply chain disruptions.**
- They are used in making mobile phones, computers, batteries, electric vehicles, and green technologies like solar panels and wind turbines.
- **Example:** Graphite, Lithium, Cobalt, Silicon, Germanium, etc.
- In 2023, an Expert Committee under **Ministry of Mines identified a set of 30 critical minerals for India.**
  - These are Antimony, Beryllium, Bismuth, Cobalt, Copper, Gallium, Germanium, Graphite, Hafnium, Indium, Lithium, Molybdenum, Niobium, Nickel, Platinum Group Elements (PGE),

Phosphorous, Potash, Rare Earth Elements (REE), Rhenium, Silicon, Strontium, Tantalum, Tellurium, Tin, Titanium, Tungsten, Vanadium, Zirconium, Selenium and Cadmium.

### Significance of Critical Minerals for India

- **Economic Development:** High-tech electronics, smart transport telecommunications, clean/green technologies, etc.
- **National Security:** Vital for defense, aerospace, nuclear, and space applications.
- **Environmental Sustainability:** Integral to the transition toward clean energy and a low-carbon economy.
  - Indium, gallium, Tellurium (solar PV technology), REEs (wind turbines).
- **Foreign Policy and Self Reliance:** Enable India to diversify imports and reduce dependency on China. Energy security and reducing fossil fuel imports can have positive impacts on our trade balance & energy autonomy.
- **Space Exploration and Satellite Technology:** India's ambitious space program, including missions like Gaganyaan, relies heavily on critical minerals - for making high-performance magnets, specialized alloys, and advanced electronics used in satellites and spacecraft.
- **Digital Economy:** As India's Digital Economy expects to reach 1 trillion Dollar by 2025, the

success of Digital India and the rollout of 5G networks heavily depends on minerals such as gallium, indium, and tantalum.

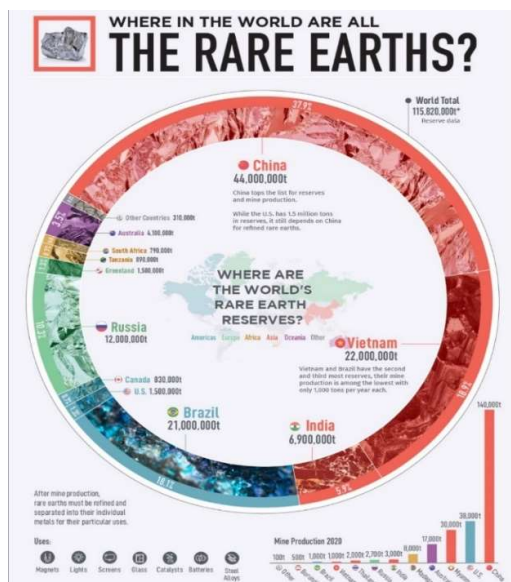
- **Semiconductors:**

Semiconductors, the brains of modern electronics, heavily rely on critical minerals. Silicon, germanium, and gallium are key to semiconductor production.

- **Geopolitical Influence:** Securing critical minerals enhances India's geopolitical standing and bargaining power.

### About Rare Earth Elements (REEs):

- Set of **17 metallic elements**. These include the **15 lanthanides on the periodic table in addition to scandium and yttrium** that show similar physical and chemical properties to lanthanides.
- Have **unique magnetic, luminescent, and electrochemical properties** and thus are used in many modern technologies, including consumer electronics, computers and networks, communications, health care, national defense, clean energy, etc.



### Govt. Initiatives:

- ✓ Dept. of Science and Technology drafted Critical Minerals Strategy for India in 2016, with a focus on requirements till 2030.
- ✓ Govt. estd Khanij Bidesh India Ltd. (KABIL) in 2019 to secure supplies for the domestic market.
- ✓ India-Australia Critical Minerals Investment Partnership.
- ✓ Creation of Indian Rare Earths Ltd. under Dept. of Atomic Energy.
- ✓ Union Govt. approved royalty rates of 3% each for lithium and 1% for REEs to attract private sector participation through auctions.
- ✓ In Dec 2023, India had its first-ever auction of critical minerals, offering 20 blocks for sale to private sectors.

### International Initiatives:

- ✓ USA has ordered a review of vulnerabilities in its critical minerals supply chains.
- ✓ Australia has established a Critical Minerals Facilitation Office (CMFO).
- ✓ UK unveiled a Critical Minerals Intelligence Centre to study future demand and supply.

92% by value and 97% by quantity of Indian imports of critical minerals and rare earth elements are from China, as of October 2023.

## INFLATION TARGETING

**Context:** India's retail inflation eased to 3.34% in March 2025, its lowest level since 2019, as food price inflation continues to decline.

### About Inflation Targeting in India:

- Inflation targeting is a monetary policy in which a **central bank sets an explicit target for rate of inflation** and adjusts its policy instruments, such as interest rates, to achieve it.
- **New Zealand pioneered** inflation targeting in 1990, and it has since become widely adopted worldwide.
- In India, **Flexible Inflation Target (FIT)** framework was adopted in 2016.
- RBI has set an **inflation target of 4% with a tolerance band of +/- 2%** with regards to the Consumer Price Index (CPI). This means that RBI aims to keep inflation at 4%

but will tolerate inflation between 2% to 6%.

#### Monetary Policy Committee (MPC):

- It was set up consequent to **Monetary Policy Framework Agreement (2015)** between Union Govt and RBI to task RBI with the responsibility for price stability and inflation targeting.
- **RBI Act, 1934 was amended and by virtue of Section 45ZB**, Union Govt constitutes a six-member MPC. Thus, the MPC is a statutory body.
- Union Govt determines the inflation target **in terms of Consumer Price Index, once in every five years** in consultation with the RBI.
- Composition: Section 45ZB says the MPC shall consist of **6 members**:
  - RBI Governor as its ex officio chairperson,
  - Deputy Governor in charge of monetary policy
  - An officer of RBI
  - 3 persons appointed by Govt.
- Members of MPC **hold office for a period of four years and are not eligible for re-appointment**. The MPC is required to meet at least four times in a year, although in practice, they meet six times a year.

#### Wholesale Price Index (WPI)

- ✓ It measures changes in **prices of goods sold and traded in bulk** by wholesale businesses to other businesses.

- ✓ Released by Office of Economic Adviser, **Ministry of Commerce & Industry** on a monthly basis.
- ✓ Base year: 2011-12

#### Consumer Price Index (CPI)

- ✓ Measures price change from point of view of a retail buyer. It is released by **National Statistical Office (NSO)**.
- ✓ Calculates price change of **services and commodities** such as food, medical care, education, housing, fuel, etc.
- ✓ Has several sub-groups including food and beverages, fuel and light, housing and clothing, bedding and footwear.
- ✓ Four types of CPI are as follows:
  - CPI for Industrial Workers
  - CPI for Agricultural Labourer
  - CPI for Rural Labourer
  - CPI (Rural/Urban/Combined)
- ✓ Of these, first 3 are compiled by Labour Bureau. Fourth is compiled by NSO.
- ✓ Base Year for CPI is 2016.

#### FRP FOR SUGARCANE

**Context:** The Maharashtra govt on rescinded a 2022 order passed by the previous Maha Vikas Aghadi govt in 2022, which allowed sugar mills to pay farmers in two instalments.





### About Fair and Remunerative Price (FRP):

- FRP is the price declared by the govt, **which mills are bound to pay farmers** for the cane procured from them.
- Payment of FRP is governed by the **Sugarcane Control order, 1966 under the Essential Commodities Act, 1955** which mandates payment within 14 days of date of delivery of the cane.
- Determined on **recommendations of Commission for Agricultural Costs and Prices (CACP) and announced by the Cabinet Committee on Economic Affairs (CCEA).**
- Mills have the option of signing an agreement with farmers to allow payment of FRP in instalments.
- Delays in payment can attract **interest up to 15% per annum**, and the sugar commissioner can recover unpaid FRP by attaching properties of mills.
- Some states (Punjab, Haryana, Uttarakhand, UP, TN) announce a **State Advised Price, which is generally higher than the FRP.**
- Price fixed by central govt is only the 'minimum price' - states can fix prices even higher than it.

### Factors considered for announcing FRP:

- **Cost of production** of sugarcane
- Return to growers from alternative crops and **general trend of prices** of agri-commodities
- **Market availability** at fair prices
- Price at which sugar produced from sugarcane is sold by sugar producers
- **Recovery of sugar** from sugarcane
- Realization made from the **sale of by-products** viz. molasses, bagasse and press mud or their imputed value
- **Reasonable margins** for growers of sugarcane on account of risk & profits

### About Sugarcane:

- ✓ **Temperature:** Between 21-27°C with hot and humid climate.
- ✓ **Rainfall:** Around 75-100 cm.
- ✓ **Soil Type:** Deep rich loamy soil.
- ✓ **Top Producer States:** Uttar Pradesh, Maharashtra, Karnataka, and Tamil Nadu, Bihar.
- ✓ India is its **2<sup>nd</sup> largest producer**, after Brazil.

In Feb 2024, union government announced 8% increase in FRP of sugarcane. The revised FRP of Rs 340 per quintal has been in effect from 1st October, 2024.



## EMPLOYEES' PROVIDENT FUND ORGANISATION (EPFO)

**Context:** The EPFO announced a net addition of 16.10 lakh members in Feb 2025, a growth of 3.99% cent compared to Feb 2025, reflecting increased job opportunities and awareness of employee benefits



### About EPFO:

- It is a **statutory body** that came into existence under the **Employees' Provident Fund and Miscellaneous Provisions Act, of 1952**.
- The EPFO is under the control of the **Ministry of Labour and Employment**.
- It is one of the world's largest organizations in terms of clientele and the volume of financial transactions undertaken by it.
- An establishment with a minimum of 20 employees is required to register with the EPFO and make provident fund contributions for eligible employees.
  - A wage ceiling of 15,000 per month is set for the employees

for mandatory availing of the benefits of the EPF Scheme.

### Structure of EPFO:

- The Act and all its schemes are **administered by a tripartite board** called the Central Board of Trustees.
- The board comprises representatives of the **government** (both central and state), **employers**, and **employees**.
- The board is **chaired by the Union Minister of Labour and Employment**.
- The Central Board of Trustees administers a contributory **provident fund**, a **pension scheme** and an **insurance scheme** for the workforce engaged in the **organised sector in India**, namely the EPF Scheme 1952, the Pension Scheme 1995 (EPS), and the Insurance Scheme 1976 (EDLI).
- EPFO is also the **nodal agency** for implementing **Bilateral Social Security Agreements** with other countries on a reciprocal basis.
  - **Bilateral Social Security Agreements** are instruments executed to protect the social security interests of workers posted in a foreign country.
  - It **avoids double coverage** under the social security legislations of the domestic and host countries.

## GREEN CRYPTOCURRENCY



- **Bhutan is exploring the mining of green cryptocurrency using hydro-power** to boost its economy, aiming to reduce youth brain drain and promote sustainable development.
- Green cryptocurrencies are **digital currencies mined using renewable energy sources** like hydropower, wind, or solar instead of fossil fuels.
- Bhutan intends to use hydropower, for cryptocurrency mining, thus making the process carbon-neutral.
- This initiative supports **growth in blockchain technology and ensures an eco-friendly footprint.**
- The also aligns with Bhutan's **Gross National Happiness (GNH) model**, which emphasizes sustainability.
- This will help Bhutan **leverage existing hydropower assets for economic diversification.**



Cryptocurrency mining is the process of using powerful computers to solve complex math problems in order to verify transactions and earn digital coins like Bitcoin. These computers race to solve puzzles, and the

first one to get the right answer adds a new block to the blockchain and gets a reward. This process needs a lot of electricity, often coming from non-renewable sources like coal & gas. Thus, cryptocurrency mining can have a big carbon footprint, which contributes to climate change.

## PURCHASING MANAGER'S INDEX

- It is an indicator of business activity -- both in the **manufacturing and services sectors.**
- It is a survey-based measure that asks the respondents about changes in their perception of some key business variables from the month before.
- It is calculated separately for the **manufacturing and services sectors** and then a **composite index is constructed.**
- The index helps in determining whether the market conditions, as seen by purchasing managers, is expanding, contracting or staying the same.
- There are two types of PMI — **Manufacturing PMI and Services PMI.**

### How is the Manufacturing PMI Derived?

- It is derived by sending fact-based questions to a large number of companies in the concerned sector.

- The questions are **related to 5 key variables**— new orders, output employment, suppliers' delivery times and stock of items purchased
- The surveys are conducted on a **monthly basis**.
- A PMI number **greater than 50 indicates expansion** in business activity.
- A number **less than 50 shows contraction**. The rate of expansion is also judged by the difference from the mid-point (50) and also by previous month's data.
- PMI data for India is **released by S&P Global** - a global major in financial information and analytics.
- Other sunrise industries include information technology and clean energy.
- A sunrise industry often has a **high degree of innovation**, and its rapid emergence may **threaten a competing industry sector already in decline**.
  - The **competing industry sector** is commonly referred to as a **sunset industry**.
- **Life Cycle of a Sunrise Industry:**
  - As an industry grows and matures, it may pass from the **sunrise phase to maturity and, finally, the sunset stage**.
  - The **compact-disc industry** is an example of such a transition.
  - It was a sunrise industry in the 1990s when compact discs replaced vinyl records and cassette tapes, but the rapid adoption of digital media in the 21st century saw the industry move into the sunset phase.

## SUNRISE INDUSTRY

- Sunrise industry is a term frequently used for a **sector that is developing and poised for rapid growth**.
- Typically, such industries register **high growth rates** and have **numerous start-ups** and **plenty of funding**.
- Sunrise industry **examples** include the **alternative energy industry highlighted in 2003** and **2007**, the **social media and cloud computing industries of 2011 and 2012**, and **blockchain industries established from 2013 to 2017**.

## INDEX OF INDUSTRIAL PRODUCTION

**Context:** The Index of Industrial Production grew 3% in March 2025, mostly on the basis of electricity generation and manufacturing.

**About the Index of Industrial Production (IIP):**



- It is one of **the prime indicators of economic development** for the measurement of trends in industrial production over a period of time with reference to a chosen base year.
- 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 computed and published by the **Central Statistical Organization (CSO) on a monthly basis.**

**Base Year:**

- The current base year for the IIP series in India is **2011-12**. The base year is always given a value of 100.
- So, if the current IIP reads as 116, it means that there has been 16% growth compared to the base year.

**Index of Eight Core Industries (ICI):**

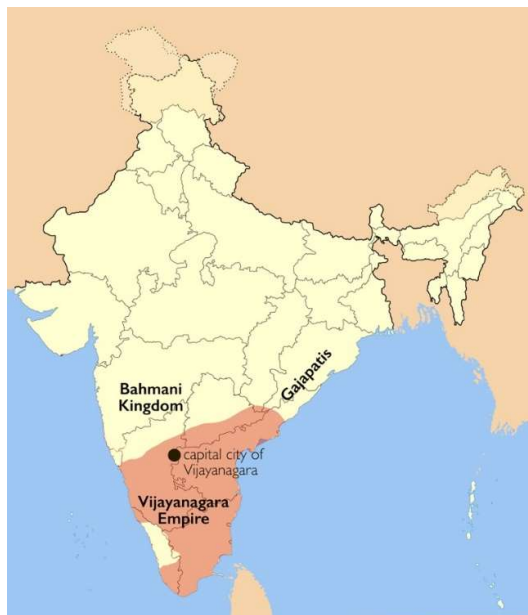
- ICI measures the collective and individual performance of production in selected eight core industries. ICI comprises **40.27% of the weight of items included in IIP.**
- The current weightage, of eight core industries is **Petroleum Refinery Products (28.04%) > Electricity (19.85%) > Steel (17.92%) > Coal (10.33%) > Crude Oil (8.98%) > Natural Gas (6.88%) > Cement (5.37%) > Fertilizer (2.63%).**
- The objective of the ICI is to provide an advance indication of production performance of industries of 'core' nature before

the release of IIP by the Central Statistics Office.

- These industries are likely to impact general economic activities as well as industrial activities. Growth rate of core sector is a **crucial indicator of the overall health of the Indian economy**. A strong growth rate in the core sector often signals a positive economic outlook.
- The Index is compiled and released by the **Office of the Economic Adviser (OEA), Dept. for Promotion of Industry & Internal Trade (DPIIT), Ministry of Commerce & Industry.**

# Art & Culture

## DEVARAYA I



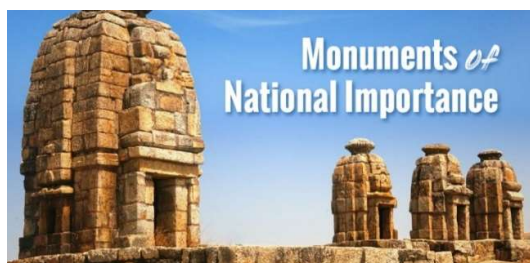
- Devaraya I was a ruler of the **Sangama dynasty** of the **Vijayanagara Empire**.
- He is noted for his military exploits and his **support to irrigation works** in his kingdom.
- He constructed a **dam across river Thungabhadra** to bring canals into the city to relieve the shortage of water.
- He also built a **dam on the river Haridra** for irrigation purposes.
- He **modernised the Vijayanagara army** by improving the cavalry, employing Turkic archers and procuring horses from Arabia and Persia.
- He maintained a **secular attitude in administrative matters**. He had 10,000 Muslims in his army, being the first Vijayanagar king to do so. He had a mosque and a slaughter house

constructed for the convenience of the Muslim soldiers in his army.

- Italian traveller, **Nicolo Conti** (in c. 1420 CE), and Russian merchant **Nikitin** (author of Voyage to India), **visited during his reign**.
- Nicolo Conti commented on Vijayanagara and Deva Raya I that 'In this city, there are 90,000 men fit to bear arms... their king is more powerful than all the kings of India'.
- Deva Raya I was a **patron of Kannada literature and architecture**. There was a pearl hall where he honoured men of eminence.
- **Madhura**, a noted Jain poet, was in his court (and also in the court of his father King Harihara II). He wrote the **Dharmanthapurana** on the life of the 15th Jain Tirthankar in Kannada, as well as a poem in eulogy of Gommateshvara of Shravanabelagola.
- The noted **Hazare Rama temple**, an excellent example of Deccan architecture, was constructed during his rule.
- The credit for making the capital city of the Vijayanagar kingdom one of the biggest cities in the 15th century goes to him.

## MONUMENTS OF NATIONAL IMPORTANCE

**Context:** A committee of Parliament has asked the Union Govt. to set up an independent panel to reform the criteria for delisting a monument of national importance.



### About Monuments of National Importance (MNI):

- MNIs in India are legally **protected** under the **Ancient Monuments and Archaeological Sites and Remains (AMASR) Act, 1958**.
- This act **empowers Union Govt. to declare certain monuments as MNIs** through official notifications in the Gazette of India.
- It mandates **protection, preservation and maintenance of MNIs** to ensure their integrity and authenticity for future generations.
- Act **empowers union govt to appoint authorities**, such as Archaeological Survey of India (ASI), to oversee the protection and management of MNIs.

### Key Features of MNI Protection:

- Act **prohibits certain activities** within the precincts of MNIs, such as **construction, excavation, & removal of artifacts, without prior approval** from the relevant authorities.
- **Designated Zones: Within a 100-meter radius** of the monument, construction activities are prohibited to prevent encroachment & damage. An

**additional 200-meter radius** (100 + 200 meters) constitutes a regulated area where **construction is subject to specific regulations** to maintain the monument's surroundings.

- The Act requires the **maintenance of records and registers documenting the history, conservation, and management** of MNIs.

### Process of Monument Delisting:

- Once delisted, **monuments are no longer subject to ASI conservation** efforts, allowing for regular construction activities in the vicinity.
- **Section 35 of the AMASR Act** allows for delisting of monuments deemed to have lost national importance.
- The delisting process involves official notifications, with a **2-month public feedback period** to address objections or suggestions.

### AMASR Act 1958:

- ✓ It provides for the -
  - Preservation of monuments, archaeological sites & remains of national importance, which are over 100 years old
  - Regulation (of archaeological excavations)
  - Protection (of sculptures, carvings and other like objects).

- ✓ Archaeological Survey of India (ASI) functions under this act.
- ✓ ASI currently has 3,675 monuments under its purview.

## JYOTIBA PHULE



- Jyotiba Phule was an **Indian social activist, thinker, anti-caste social reformer and writer from Maharashtra.**
- **Birth:** Phule was born on **11<sup>th</sup> April, 1827** in present-day Maharashtra and **belonged to the Mali caste of gardeners and vegetable farmers.**
- **Education:** In 1841, Phule was enrolled at the **Scottish Missionary High School (Pune)**, where he completed education.
- Phule was **influenced by Thomas Paine's book titled The Rights of Man** and believed that the only solution to combat the social evils was the **enlightenment of women and members of the lower castes.**
- **Major Publications:**
  - Tritiya Ratna (1855);
  - Powada: Chatrapati Shivajiraje Bhosle Yancha (1869); Gulamgiri (1873),

Shetkarayacha Aasud  
(1881).

- **Related Association:**

- Phule along with his followers formed **Satyashodhak Samaj in 1873** which meant 'Seekers of Truth' in order to attain equal social and economic benefits for the lower castes in Maharashtra.

- **Municipal Council Member:**

- He was appointed commissioner to the Poona municipality and served in the position until 1883.

**A Social Reformer:**

- In 1848, he taught his wife (**Savitribai**) how to read and write, after which the couple **opened the first indigenously run school for girls** in Pune where they both taught.
- He was a **believer in gender equality** and he exemplified his beliefs by involving his wife in all his social reform activities.
- By 1852, they **had established three schools** but all of them had shut by 1858 due to the shortage of funds after the Revolt of 1857.
- Jyotiba realised the pathetic conditions of widows and established an ashram for young widows and eventually became an advocate of the idea of **Widow Remarriage.**
- He **attacked the orthodox Brahmins and other upper**



castes and termed them as "hypocrites".

- In 1868, He **constructed a common bathing tank** outside his house to exhibit his embracing attitude towards all human beings and wished to dine with everyone, regardless of their caste.
- He started awareness campaigns that ultimately inspired the likes of Dr. B.R. Ambedkar and **Mahatma Gandhi**, stalwarts who undertook major initiatives against caste discrimination later.
- It is believed by many that **it was Phule who first used the term 'Dalit' for the depiction of oppressed masses** often placed outside the 'varna system'.
- He **worked for abolishment of untouchability and caste system** in Maharashtra.
- **Death:** 28<sup>th</sup> November, 1890.

## ARCHAEOLOGICAL SURVEY OF INDIA (ASI)

- It was **established in the year 1861** by **Alexander Cunningham**.
- After independence, it was established as a **statutory body** under the **Ancient Monuments and Archaeological Sites and Remains Act, 1958 (AMASR Act)**.
- **Headquarters:** New Delhi.
- ASI is responsible for **archaeological research** and the **conservation and preservation of cultural monuments** in the country.
- Its activities include carrying out surveys of antiquarian remains, exploration and excavation of

archaeological sites, conservation and maintenance of protected monuments etc.

- **Concerned Ministry:** Ministry of Culture.
- It also regulates **Antiquities and Art Treasure Act, 1972**.

## KAILASH MANSAROVAR YATRA

**Context:** India and China are planning to revive the annual Kailash Mansarovar Yatra.



- Mount Kailash is a diamond-shaped peak made of **black rock**, located in **Tibet**.
- India organizes the KMY annually between June and September through the **Lipulekh Pass** (since 1981) in Uttarakhand and the **Nathu La Pass** (since 2015) in Sikkim.
- Mount Kailash stands at 6,638 meters and is considered a sacred peak by Hindus, Buddhists, Jains, and Bön (indigenous religion of Tibet).
- For Tibetans Buddhists, Kailash is the cosmic axis, or Mount Meru, connecting heaven and earth.
- In Hinduism, it is the abode of Lord Shiva and Goddess Parvati.

- In Jainism, Kailash is Ashtapada, where Rishabhanatha attained enlightenment.
- Mount Kailash is considered the spiritual center of the Earth, with the Sutlej, Brahmaputra, Kamali, and Indus rivers originating from it.
- Lake Mansarovar is located at the base of the mountain.
- Mount Kailash, though lower in height than Mount Everest (8,849 meters), remains unclimbed as its ascent is prohibited due to its sacred significance.

## UNESCO MEMORY OF THE WORLD REGISTER

**Context:** Manuscripts of the Bhagavad Gita and Bharata's Natyashastra are among the 74 new additions to UNESCO's Memory of the World Register this year.



### About Memory of the World Program:

- It is a global initiative aimed at **preserving, protecting, and enhancing access to documentary heritage**, particularly those collections that are rare and at risk.
- **Launch:** It was launched by **UNESCO** in 1992.
- **Memory of the World (MOW) Register:** The Register was launched as a **core project under the MOW**

**Program** aimed at creating a **compendium of documents** — manuscripts, oral traditions, audio-visual materials, and library and archive holdings — which are of **world significance and outstanding universal value**.

- Manuscripts of the **Bhagavad Gita and Bharata's Natyashastra** are among the 74 new additions this year.
- Beginning in 1997, the Register has been **biennially updated** — with the exception of a lengthy gap between 2017 and 2023.
- In any year, at most two submissions from a country are added.
- With the latest additions, the Register now contains **570 entries**.
- With the inclusion of Gita and Natyashastra, India now has **14 entries** in the MOW Register.
- These include the **Rig Veda** (added in 2005) and the collective works of the **Shaivite philosopher Abhinavagupta** (added in 2023), the **archives of the first summit meeting of the Non-Aligned Movement** in Belgrade in 1961 (added in 2023) and the **archives of the Dutch East India Company** (added in 2003).

### Natyashastra:

- Traditionally attributed to the **sage Bharata**, it is an ancient **Sanskrit treatise on performing arts**.
- The **Natyashastra** embodies a comprehensive set of rules that define **natya** (drama), **abhinaya** (performance), **rasa** (aesthetic experience), **bhava** (emotion), **sangita** (music) in 36,000 verses.

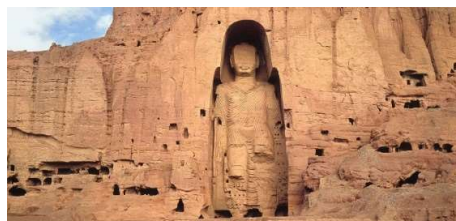
### Bhagavad Gita:

- Traditionally attributed to the sage Vyasa, **Bhagavad Gita** is a Sanskrit scripture comprising 700 verses that are organised in 18 chapters, embedded in the sixth book (**Bhishma Parva**) of the epic poem **Mahabharata**.

## BAMIYAN BUDDHAS

- The **Bamiyan Buddhas**, carved in the **6th century CE**, were two **monumental statues** of standing Buddhas measuring **115 feet and 174 feet** in height, embedded into the **sandstone cliffs of Bamiyan Valley, central Afghanistan**.
- These statues are considered exemplary of the **Gandhara School of Buddhist Art**, which reflected a unique blend of **Indian, Persian, and Greco-Roman artistic influences**.
- The **Bamiyan Buddhas**, named **Salsal** (meaning "light shines through the universe") and **Shamama** ("Queen Mother"), stood **55 metres and 38 metres tall**, respectively.
- These statues represented a **fusion of Gupta, Sassanian, and Hellenistic styles**, representing a **unique confluence of civilisations**.
- The statues represented the **confluence of cultural traditions** and were significant markers of the spread of **Buddhism** across **Central and**

### South Asia between the 1st and 13th centuries.



### Background of Destruction

- The **Taliban**, a hardline group that emerged in the **1990s**, imposed an **extremist interpretation of Islamic law**, which included **banning art, education for girls, and public expression**.
- On **27 February 2001**, the Taliban officially announced its plan to demolish the **Bamiyan Buddhas**, deeming them un-Islamic.
- Over **25 days**, the statues were systematically **destroyed using explosives**, marking one of the most egregious acts of **cultural vandalism** in modern history.
- In **2003**, **UNESCO** designated the **Bamiyan Valley** as a **World Heritage Site**, despite the irreversible damage done.
- In **2021**, a **3D holographic projection** temporarily recreated the statue of **Salsal**, offering a new way to engage with the lost heritage.



# Environment

## FOREST RIGHTS ACT, 2006

**Context:** The Supreme Court is about to hear a case pertaining to eviction of tribals from forests and their claims under the FRA 2006.

**Rights for the dwellers**

What the Forest Rights Act, 2006, entails

- Tenurial security over the forestland under occupation prior to December 13, 2005
- Recognition of community right over forest and forest products
- Protection and conservation of community forest resources
- Conversion of all forest villages and habitation located inside the forestland into revenue villages
- In situ rehabilitation of displaced persons evicted without compensation prior to December 13, 2005
- Recognition of ancestral domain (habitat) right to



Residents of Gundunbadi village in Odisha's Nayagarh district get ready for mapping their land boundaries for the Forest Rights Act implementation. • SPECIAL ARRANGEMENT

Particularly Vulnerable Tribal Groups

- Seasonal access to nomadic, pastoral and semi-nomadic communities over forestland
- Conversion of all leases granted by erstwhile governments, zamindars and king into permanent land records

**About STs and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act of 2006** (also called FRA 2006):

- It recognizes and vests forest rights and occupation in Forest land in **Forest Dwelling STs (FDST)** and **Other Traditional Forest Dwellers (OTFD)** who have been residing in such forests for generations.
- Forest rights can be claimed by **any member or community who has for at least 3 generations (75 years) prior to 13<sup>th</sup> December, 2005** primarily resided in forest land for livelihood needs.
- It strengthens the **conservation regime** of the forests while ensuring livelihood and food security of FDST and OTFD.
- **Gram Sabha** is the authority to initiate process for determining the

nature and extent of **Individual Forest Rights (IFR)** or **Community Forest Rights (CFR)** or both that may be given.

- The Act identifies **four types of rights**:
  - **Title rights:** Gives FDST and OTFD right to ownership to land farmed by tribals/forest dwellers (max. 4 hectares). Ownership is only for land that is actually being cultivated and no new lands will be granted under the Act.
  - **Use rights:** Rights of the dwellers extend to extracting minor forest produce, grazing areas etc.
  - **Relief and development rights:** Rehabilitation in case of illegal eviction/forced displacement and to basic amenities, subject to restrictions for forest protection.
  - **Forest management rights:** Rights to protect, regenerate, conserve or manage any forest resource which they have been traditionally protecting and conserving for sustainable use.

- Nodal Agency: **Tribal Affairs Ministry**

### Rationale behind FRA 2006:

- Forest management policies in both colonial and post-colonial India did not recognize the **sympiotic relationship of STs with the forests**,



reflected in their dependence on the forest and their traditional wisdom in conservation of the forests. Therefore, the Act was enacted to **undo this historic injustice** and empower the forest dwellers.



As of 2023, 22 lakh individual land titles and 1.1 lakh community titles have been accorded to tribal and forest dwellers. In the same period, 45 lakh claims to title have been received.

- **Population:** It is estimated that there are 3,122 Nilgiri Tahrs in the wild.
- **Threats:** Habitat loss and poaching are the two major threats to the Nilgiri Tahr.

#### Conservation Status

- IUCN - **Endangered**
- Wildlife (Protection) Act of India, 1972 - Schedule I

## NILGIRI TAHR



- Nilgiri Tahr is the only Caprinae species found in the **tropical mountains of southern** India.
- **Habitat:** Tropical montane grasslands sholas forests and rocky areas at high elevations.
- **Adaptation:** It is adapted to a cold and wet tropical environment. The species is **diurnal**.
- They are **endemic to the Western Ghats** and used to inhabit a large part of the Western Ghats between Kerala and Tamil Nadu.
  - Eravikulam National Park has the highest density and largest surviving population of Nilgiri tahr.

## GREEN CREDIT PROGRAMME

- It is an initiative within the government's **Lifestyle for Environment (LiFE)** movement.
- Green Credit Initiative was launched by the Indian PM on the side-lines of COP 28.
- The GCP introduces a market-based approach to incentivise environmental activities.
- The main objective was to establish a mechanism where **participants could earn incentives in the form of 'Green Credits'**.
- It encourages voluntary environmental actions by individuals, organizations, and companies.
- The GCP aims to promote sustainable lifestyles and environmental conservation.
- Its goal is to lay an emphasis on sustainability, reduce waste and improve the natural environment.
  - **Implementing agency:** The Indian Council of

Forestry Research and Education (ICFRE) is responsible for administering the GCP.

## WOOLLY FLYING SQUIRREL



- The Himachal Pradesh Forest Department (HPFD) has successfully captured the **first-ever photograph of the elusive Woolly Flying Squirrel**.
- It is one of the rarest and least known mammals in Asia. It is the **largest and heaviest of all gliding mammals** and is known for its unique appearance and elusive nature.
- They are native to Asia, particularly in the mountainous regions of northern Pakistan. It is **endemic to the northwestern Himalayas**. They are also possibly found in northern India, especially in Sikkim.
- It prefers to live in **dry conifer woodlands** within a fragmented habitat in a thin elevational band.
- This species was **long believed to be extinct until it was rediscovered in 1994**, nearly seventy years after its last recorded sighting.
- This **species is nocturnal**, meaning it is active during the night and rests during the day.

## IUCN Red List: Endangered

### WOODY ENCROACHMENT



- India's open ecosystems, such as **grasslands, face a threat from increased tree cover**, a phenomenon known as woody encroachment.
- Woody encroachment happens when **trees and shrubs start to grow and spread in areas that were earlier open grasslands** (such as savannah/prairies).
- This can happen because of factors like reduced fire frequency, changes in climate, and overgrazing by livestock.
- **Without regular fires, which naturally keep tree and shrub growth in check**, woody plants can take over, turning open spaces into more forested areas.
- It can reduce the amount of **available grass for grazing animals, impact native wildlife** that rely on open habitats, and **alter water cycles and soil health**. It can also **change the landscape's appearance and reduce biodiversity** in the area.

## DIRE WOLVES



- A US based **biotechnology** company (Colossal Biosciences) has claimed to have genetically engineered **wolf pups (Romulus, Remus, and Khaleesi)** with traits resembling the **long-extinct dire wolves (*Aenocyon dirus*)**.

### Genetically Engineered Wolf Pups:

- Scientists used ancient DNA from 13,000-72,000-year-old dire wolf fossils to identify traits like white coats and thick fur.
- By comparing dire wolf genomes with modern canids (wolves, jackals, foxes), they found 99.5% DNA similarity with gray wolves.
- Using **CRISPR**, they edited 20 gene sites in gray wolf cells, inserted them into domestic dog egg cells, and implanted embryos into dog surrogates.
- Out of 8 transfers, 3 genetically engineered pups were born after a 62-day gestation.
- Different From Extinct Dire Wolves:
  - The gene-edited pups are not exact genetic replicas of extinct dire wolves.
  - Despite a 99.5% DNA similarity with gray wolves,

millions of base pair differences exist.

- This experiment classified the recreated animals as dire wolves using the morphological species concept- based on physical resemblance, not precise genetic or evolutionary lineage.

### About Dire Wolves

- They were large prehistoric canines that went extinct around 13,000 years ago.
- Native to southern Canada and the US, they were larger than modern gray wolves, standing 3.5 feet tall, over 6 feet long, and weighing up to 68 kg, with likely white coats.
- They hunted large prey like bison and horses and likely went extinct due to prey depletion and human interference.

## MALABAR GREY HORNBILL



- **Geographical range**– It is *endemic to the Western Ghats* and associated hills of southern India.
- **Habitat**– They are found mainly in dense forest and around *rubber, arecanut or coffee plantations*.



- **Characteristics:**
  - They are the *smallest among the Asian hornbills*.
  - They have a large beak but *lack the casque* that is prominent in some other hornbill species.
  - Males have a reddish bill, females have a yellowish bill with black markings.
  - They move around in pairs or small groups, feeding on figs and other forest fruits.
  - They are *notable for their loud cackling, screeching, and laughing calls*.

- **IUCN Status**– Vulnerable

## INDIAN GIANT FLYING SQUIRREL



- **Size:** One of the largest flying squirrels, with a body length of about 30 – 45 cm and a tail measuring up to 60 cm.
- **Features:** They have a rufous coat, grey underparts, and large, round eyes. Their flying membrane extends from their wrists to their ankles, which enables them to glide from tree to tree.

- **Habitat:** Found in tropical and subtropical forests across central and southern India. Evergreen, semi-evergreen and deciduous forests frequent forest edges.
- **Diet:** Primarily feeds on fruits, nuts, leaves, and bark, contributing to seed dispersal.
- **Behaviour:**
  - Nocturnal and arboreal, it glides between trees in search of food, covering distances up to 60 meters. Owls have been found to predate on them and they are found giving alarm calls on seeing or hearing owl's calls.
  - The Indian Giant Flying Squirrel is widely distributed and plays a significant role in maintaining forest ecosystems, making it a keystone species in its habitat.

- **Protection under WPA:** The Indian giant flying squirrel is listed in Schedule II of the Wildlife Protection Act, 1972.
- **IUCN Status:** The Indian giant flying squirrel (*Petaurista philippensis*) is currently listed as "Least Concern" by the International Union for Conservation of Nature (IUCN).
  - While the global status is "Least Concern," its population in India is facing threats like habitat



loss and degradation, which have led to a "Near Threatened" status within the country.

## INDIAN STAR TORTOISE



- Its name comes from the **star-like patterns** that feature **on its high-domed shell**.
- It has very distinctive patterns and its highly rounded shell makes it popular in the **world's trade in exotic pets**.
- **Habitat**
  - They occupy a wide variety of habitats, including **semi-arid lowland forests, thorn scrub forests, semi-desert and arid grasslands**.
  - This species has a high tolerance for habitats that are seasonally wet or dry, with many populations inhabiting areas with a monsoon or rainy season followed by a long hot and dry period.
- **Distribution:** It is endemic to the subcontinent and resides in arid pockets of **northwest India** (bordering Pakistan), **South India**, and **Sri Lanka**. However, members of the species have also been found in people's homes as far afield as Canada and the U.S.
- It is **generally crepuscular**, which means they are active in the early morning and the late afternoon during dry, hot weather.
- **Diet:** Indian star tortoises are **mainly herbivores** and mostly eat grasses, herbaceous leaves, flowers etc.
- **Conservation status**
  - **IUCN:** Vulnerable
  - **CITES:** Appendix I
  - **Wildlife (Protection) Act 1972:** Schedule I
- **Threats:** The highly fragmented habitat of the species, is greatly influenced by an increased level of urbanisation and agricultural practices throughout its range.

## E-FLOW MONITORING SYSTEM



- The Union Govt. has recently launched the **E-Flow Monitoring System**, developed by the **National Mission for Clean Ganga (NMCG)**.

- It is an **integral component of the PRAYAG portal** which is a **real-time monitoring centre for the planning and monitoring of projects and river water quality** across the Ganga and its tributaries.
- This portal encompasses online dashboards such as the Ganga Tarang Portal, Project Management Tool Dashboard, and the Ganga Districts Performance Monitoring System.
- It facilitates **real-time analysis of the water quality of the Ganga, Yamuna, and their tributaries**, and monitors the Namami Gange programme activities at the central level.
- **Performance of Sewage Treatment Plants (STPs) is monitored** via the OCEMS (Online Continuous Effluent Monitoring System) to ensure that all STPs operate at their rated capacity.

#### About NMCG:






- ✓ NMCG was established in 2011. It is registered as a **society under the Societies Registration Act, 1860.**
- ✓ NMCG has a **2-tier management structure** comprising a Governing Council & an Executive Committee.
- ✓ The Executive Committee meets every month to coordinate, supervise, and deliberate on funding for NMCG projects.
- ✓ The NMCG is **supported by State Programme Management Groups** in Uttar

Pradesh, Uttarakhand, Bihar, Jharkhand, and West Bengal.

- ✓ The **NMCG operates under National Ganga Council (NGC)**, which is headed by the Prime Minister.

- Other members of NGC include the cabinet ministers of ministries that include the Ganga among their direct concerns and the chief ministers of states through which the Ganga flows.
- The NGC was originally called the National Ganga River Basin Authority, but it was renamed in 2016. It is a statutory body under Section 3 of the Environment (Protection) Act of 1986.

### "BLUE CATEGORY" FOR INDUSTRIES

Criteria and Examples of Industries	
Industry	Examples
 <b>Red</b> (PI > 80)	Cement, manufacturing of automobiles, distilleries, etc.
 <b>Orange</b> (55 ≤ PI < 80)	Brick manufacturing, dry cell battery, coal washeries, etc.
 <b>Green</b> (25 ≤ PI < 55)	Manufacturing of Compact disc Computer (CD/DVD), chilling plants, etc.
 <b>White</b> (PI < 25)	Assembly of air coolers, cardboard manufacturing, medical oxygen, etc.
 <b>Blue</b> (based on CPCB formula)	Municipal Solid Waste Management Facility (Sanitary landfill/Integrated Sanitary landfills, etc.) sewage treatment plants, etc.

- The Central Pollution Control Board (CPCB) has introduced a **revised classification system for industries**, which includes a new "Blue Category" for essential environmental services, aiming to

incentivize sectors like waste management and biominer.

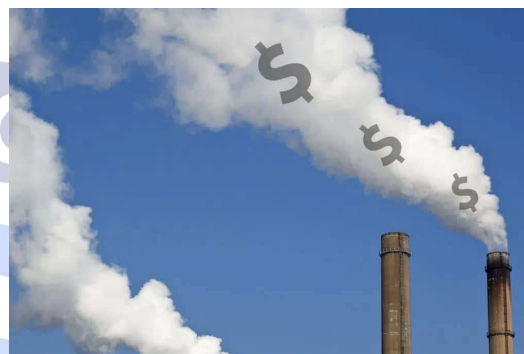
- The Blue Category was introduced by the CPCB to classify sectors that are **key for environmental management, but are relatively high on pollution**.
- The classification is **based on the Pollution Index (PI) by the CPCB**, which classifies industries based on their pollution potential, considering air, water, and waste pollutants.
- Categories include Red ( $PI > 80$ ), Orange ( $55 \leq PI < 80$ ), Green ( $PI < 25$ ), and Blue.
- It covers industries like **landfill maintenance, biominer, and waste-to-energy** plants. They will receive a two-year extension for their consent to operate as an incentive for environmental management.
- Despite a high PI (97.6), waste-to-energy plants are categorized as Blue due to the essential environmental service they provide. CBG (Compressed Biogas) plants, depending on their feedstock, are also eligible for Blue Category status.
- The Environment (Protection) Act, 1986 states that **CPCB and State Pollution Control Boards (SPCBs) have authority to classify industries**. In pursuance of this power, the CPCB launched the **'Re-categorization of Industries' Framework in 2016**.



CPCB is a statutory body under the Water (Prevention and Control of Pollution) Act, 1974.

CPCB is also entrusted with powers under the Air (Prevention and Control of Pollution) Act, 1981. It also provides technical services to the Ministry of Environment, Forests, and Climate Change under the Environment (Protection) Act, 1986.

## CARBON TAX



### About Carbon Tax

- A **Carbon Tax** is an **environmental tax** levied on the **carbon content of fossil fuels** such as coal, oil, and natural gas.
- The objective is to **reduce greenhouse gas emissions** by creating a **financial disincentive for pollution** and encouraging **clean energy alternatives**.
- It is calculated based on the **amount of CO<sub>2</sub> or other GHGs emitted** and promotes a **market-based climate solution**.

### Types of Carbon Tax

- **Emissions tax:** Tax on **total GHG emissions**, based on the **carbon content of fuels used**.



- **Energy tax:** Levied on **fossil fuel consumption**, calculated from **carbon or energy usage**.
- **Cap-and-Trade System:** Sets a cap on emissions; **permits traded** in a carbon market to incentivise reduction.
- **Border tax adjustment:** Applies carbon tax on **imported goods** based on emissions during production to **prevent carbon leakage**.

#### Carbon Tax in India

- India currently **does not have a nationwide carbon tax**, but there have been **proposals** to introduce one.
- In **2015**, India proposed a carbon tax of **INR 50 per metric ton** on **coal production/import**, but it remains **unimplemented**.
- Some states, like **Tamil Nadu**, have introduced **state-level carbon levies**, particularly on coal used in electricity generation.
- India promotes clean energy and emission reductions through initiatives like the following:
  - National Clean Energy Fund
  - National Solar Mission
  - Energy Conservation Building Code (ECBC)

#### MICROPLASTICS

- Microplastics are defined as plastic particles up to 5 millimetres in diameter, while nanoplastics are even smaller,

measuring less than 1,000 nanometres.



- **Types:** Primary microplastics (e.g., cosmetics, microfibers) and secondary microplastics (formed from the breakdown of larger plastics).
- **Environmental entry:** Through product use, abrasion, or breakdown in natural settings.
- **Persistence:** Microplastics are non-biodegradable, mobile, and accumulate in ecosystems.
- **Impact on Organisms:** It can be ingested by marine and terrestrial organisms, causing toxicity and bioaccumulation.
- **Chemical risk:** Microplastics can carry pollutants and toxic chemicals, further endangering ecological and human health.

#### NILGIRI MARTEN



- A rare species of marten, a small carnivore belonging to the weasel and badger families.



- Only marten species native to India.
- Native – Endemic to the Western Ghats.
- Distribution – Karnataka, Kerala, and Tamil Nadu.
- Habitat – Brahmagiri, Nilgiris, Anamalai, Cardamom Hills and Agasthyamalai.
- Found in – Shola ecosystems and High altitudes
  - Great habitat – Pampadum Shola National Park (Kerala)
  - Prefers evergreen forests and montane forest-grassland
- Features –
  - A small mustelid with a chocolate-coloured fur and a canary yellow throat.
  - It looks almost like a civet or a mongoose
- Diet – Omnivorous – feeds on plants and shrubs as well as small animals
- Lifestyle – Diurnal and mainly arboreal but descend to the ground occasionally.
  - They are social and spend their time and even hunt in groups.
- Threats – Habitat loss due to fragmentation and poaching
- Occurs in tea, acacia, coffee, cardamom, and wattle plantations.

- Protection status –
  - IUCN Status – Vulnerable
  - Wildlife Protection Act, 1972 – Schedule II

## SEED GERMINATION DATABASE



- The **Ecological Restoration Alliance-India (ERA-I)** has released a first-of-its-kind seed germination database aimed at **enhancing the success of growing native plants for ecological restoration.**
- ERA-I was formed in 2021 as a **collective of conservationists, ecologists and individuals.**
- ERA-I collaborated with the Wildlife Trust of India to create the database.
- It features **over 1,000 germination techniques for 465 native plant species** across India. These species are key to restoring balance in degraded ecosystems.
- It will help conservationists, nursery managers, and plant enthusiasts improve success rates

in growing plants for ecological restoration.

- It is a **free-access database** and offers valuable info on germinating native plants crucial for restoration projects.
- It supports **India's Bonn Challenge commitment** to restore 26 million hectares of degraded land by 2030.

## INTERNATIONAL BIG CAT ALLIANCE

Context: The International Big Cat Alliance (IBCA) signed an agreement with the central government recently, officially making India the headquarters and secretariat of the alliance.

### About International Big Cat Alliance (IBCA)

- It is a coalition of 96 big cat range countries and non-range countries dedicated to conserving seven big cats and their habitats.
- Its idea was first floated by India's Prime Minister in 2019. It was launched on April 9, 2023, during the 50th anniversary of India's Project Tiger.
- **Objective:**
  - Stop the illegal trade of the seven big cats.
  - Work towards protecting the natural habitats of the seven big cats.
  - Gather financial and technical resources to

support conservation and protection efforts.

- The IBCA focuses on seven big cats: **Tiger, Lion, Leopard, Snow Leopard, Puma, Jaguar, and Cheetah**. Five of these **Big Cats are found in India**

- *Tiger, Lion, Leopard, Snow Leopard, and Cheetah*

- **Depository of the Framework Agreement:** Ministry of External Affairs (MEA), Government of India.

### Membership:

- India, Nicaragua, Eswatini, and Somalia are the initial member countries, with nine international organizations partnering with the Alliance.
- Membership is open to **all UN Member States**, including:
  - **Range countries**, where big cats naturally occur.
  - **Non-range countries** that are interested in supporting **global conservation** of big cats.

### Governance:

- The IBCA has an Assembly of Members, a Standing Committee, and a Secretariat in India.
- Its governance model is inspired by the International Solar Alliance (ISA), with a Director-General (DG) appointed by the Ministry of Environment, Forest and Climate Change (MoEFCC).

## EARTH DAY



- It is observed annually on **April 22**.
- The official theme for Earth Day 2025 is **"Our Power, Our Planet"**.
- This year's message focuses on the need to **shift rapidly to renewable energy**, urging individuals, businesses, and governments to **triple clean energy production by 2030**.
- The **first Earth Day** was celebrated on April 22, 1970, initiated by U.S. Senator Gaylord Nelson as a national teach-in on environmental issues.
- The event witnessed more than 20 million Americans—10% of the U.S. population—taking to the streets, parks, and auditoriums to demand a healthy, sustainable environment.
- Earth Day went global in 1990, mobilizing over 200 million people across 141 countries.
- Since then, it has become **one of the largest civic observances in the world**, promoting climate action and eco-conscious living.
- Earth Day serves as a powerful reminder of our collective responsibility to protect the environment.

## COLOSSAL SQUID



- It is **one of the largest and most elusive invertebrates** on Earth.
- **Scientific Name:** *Mesonychoteuthis hamiltoni*
- **Distribution:** It is found in the icy depths of the **Southern Ocean near Antarctica**.
- This soft-bodied marine animal is somewhat like an octopus, but with a much bulkier frame and far greater length.
- It has a tube-shaped body, huge eyes, and arms and tentacles with suckers to grab food.
- It can reach lengths of up to 7 metres (around 23 feet) and weight as much as 500 kilograms.
- When they're young, these creatures are almost see-through, giving them the glassy, ghost-like look that's typical of many deep-sea juveniles.
- As they grow, their appearance changes drastically, taking on a **deep red or purplish colour** and developing thick, muscular arms.
- Fully grown, they are believed to be the **largest invertebrates on Earth**, meaning they have no bones but can still grow to massive sizes.
- What really sets the colossal squid apart, though, are the sharp,

swivelling hooks on its tentacles, something no other squid species has.

- It's also known for having the largest eyes of any animal ever discovered, believed to help it detect prey and predators in the pitch-black ocean depths.
- **Colossal Squid Conservation Status:** It is classified as **Least Concern** under the IUCN Red List.

## ARCTIC AMPLIFICATION



- **Arctic amplification** is a phenomenon where **temperature changes in the polar regions**, especially the Arctic, are **more intense** than the **global average** temperature change.
- It is a form of **polar amplification**, which occurs when **changes in Earth's atmosphere** lead to a **greater rise in temperatures near the poles** than in other parts of the world.
- This effect is **measured against the average temperature rise** of the planet and is **particularly pronounced in the northern polar regions**, hence the term **Arctic amplification**.

- The phenomenon is primarily driven by changes in the **net radiation balance of the atmosphere**, especially due to the **increase in greenhouse gases** like **CO<sub>2</sub>** and **methane**, which trap more heat in the Arctic region.
- The major contributing factors to Arctic amplification are: **Ice-Albedo Feedback**, **Lapse Rate Feedback**, **Water Vapour Feedback** & **Ocean Heat Transport**.

## CARBON MARKETS

**Context:** Union Govt. has notified draft Greenhouse Gases Emission Intensity Target Rules under the Carbon Credit Trading Scheme, which was launched in 2023.



### About Carbon Markets:

- They are regulatory structures that allow oil and gas-intensive companies or heavy industry to **reduce their environmental footprint through a series of incentives**.
- It is based on the idea that the most polluting countries/industries can **purchase the right to pollute**.



**more from ones that have not reached their emissions limits.**

- The **1997 Kyoto Protocol** turned polluting emissions into a commodity.
  - EU Emissions Trading System (EU ETS) is the largest in the world - in operation since 2015.
- These markets incentivise **emission reduction & better energy efficiency.**
- For e.g., an industrial unit that outperforms emission standards stands to gain credits. Another unit which did not attain prescribed standards can buy these credits and show compliance.

#### **What are Carbon Credits ?**

- Carbon credits are **measurable and verifiable emission reductions** from certified climate action projects.
- A carbon credit works as a permit by **allowing a company or govt to emit a specific amount of CO<sub>2</sub>.**
- Companies/govts that emit less than their limit can sell their extra credits to those exceeding their limits, thus aiding reduction in overall emissions.
- This helps **balance carbon emissions** while aiding **investment in clean technologies.** These projects reduce, remove or avoid GHG emissions.
- Projects must adhere to a rigorous set of criteria to pass **verification by 3rd-party agencies.** After an organization or individual buys a

carbon credit, the **credit is retired & can't be reused.**

#### **Mechanism in India:**

- **Bureau of Energy Efficiency** (Ministry of Power) - **Perform, Achieve and Trade (PAT) Scheme** - **Companies can earn efficiency certificates** if they outperform efficiency standards. **Companies that lag behind can buy these certificates** to continue operating.
- India launched PAT in 2012, under the **National Mission for Enhanced Energy Efficiency** (one of the eight missions comprising the National Action Plan on Climate Change).
- The PAT Scheme has now been **replaced with the Carbon Credit Trading Scheme of 2023.**

#### **Carbon Credit Trading Scheme, 2023 (Ministry of Power)**

- The **Energy Conservation Act of 2001 was amended in 2022** to empower the Union Govt. to specify a carbon credit trading scheme.
- **'Accredited carbon verifier':** Agency accredited by BEE to carry out validation or verification activities regarding the CCTS.
- **Indian Carbon Market Governing Board (ICMGB):** For oversight and making rules for sale of carbon certificates. ICMGB shall meet at least once in a quarter of every year
- **Bureau of Energy Efficiency** shall be its administrator and shall also work as secretariat for ICMGB.

- The **Grid Controller of India Ltd.** shall be registry for Indian Carbon Market.
- **Central Electricity Regulatory Commission** shall act as **regulator** for trading activities under the market.

#### **Draft Greenhouse Gas Emission Intensity Targets Rules, 2025:**

- The Rules will establish India's first **compliance-based domestic carbon market to drive industrial adoption of low-carbon technologies** and drive India's commitments to its Nationally Determined Contributions (NDCs).
- This market will be structured under the Carbon Credit Trading Scheme (CCTS), 2023. It is a regulatory framework for **carbon credit trading** and to facilitate emission reductions.
- The Targets will apply to 4 high-emission sector – **aluminium, pulp & paper, cement, and chlor-alkali.**
- The obligated entities need to account for **Carbon Dioxide (CO<sub>2</sub>) and Perfluorocarbons (PFCs)** such as CF<sub>4</sub>, C<sub>2</sub>F<sub>6</sub>, C<sub>4</sub>F<sub>10</sub>, and C<sub>6</sub>F<sub>14</sub>.
- Compliance mechanism:
  - It comprises **two compliance periods**, 2025-26 and 2026-27, aimed at enabling year-wise sectoral decarbonization.
  - Targets can be achieved by **reducing emissions or buying carbon credits**

**certificates** from the Indian carbon market.

- Obligated entities keeping emissions below the targets will be issued carbon credits. These can be **banked for the next compliance cycle, or sold to underperforming firms.**
- Entities that underperform will be charged **twice the average traded carbon price.**
- The price will be calculated by the Bureau of Energy Efficiency and the **compensation will be collected by Central Pollution Control Board (CPCB).**

### **BIODIVERSITY BEYOND NATIONAL JURISDICTION (BBNJ) AGREEMENT**

**Context:** The first Preparatory Commission session of the BBNJ Treaty is set to be held in New York, aiming to finalize implementation rules for the treaty.

#### **About Biodiversity Beyond National Jurisdiction (BBNJ) Agreement:**

- The BBNJ Agreement, also known as the **"High Seas Treaty,"** falls under the United Nations Convention on the Law of the Sea (UNCLOS).
- It addresses the **protection of marine biodiversity in the high seas** through international

cooperation and sustainable practices.



- The agreement **prohibits sovereign rights over high seas resources and promotes the fair sharing of benefits**, an inclusive ecosystem-centric approach, and the use of traditional and scientific knowledge.
- It will help achieve the **30x30 target** set at UN Convention on Biological Diversity (CBD) COP15 Agreement (called the **Kunming Montreal Global Biodiversity Framework**), under which countries agreed to **protect 30% of global oceans by 2030**.
- It aims to minimize environmental impacts and support the achievement of **SDG 14 (Life Below Water)**.
- BBNJ Agreement will become the **3<sup>rd</sup> implementation agreement under UNCLOS**, alongside the agreements on mineral resources and fish stocks.
- **India signed the BBNJ Treaty in Sept 2024, but has yet to ratify it.**

#### Salient Features of the BBNJ Treaty

- **Access and Benefit-sharing Committee:**

- Will set up an access- and benefit-sharing committee to frame guidelines.
- Activities concerning marine genetic resources in the interests of all States and for benefit of humanity.
- They have to be carried out only for peaceful purposes.

#### • **Environmental Impact Assessments (EIA):**

- Signatories to conduct EIAs before exploitation of marine resources.
- Identifying, prevention, and management of potential adverse effects.

#### • **Consent from Indigenous Community:**

- Marine resources in high seas held by indigenous people and local communities accessed only with their informed consent and involvement.
- No State has rights over marine bio-resources in such areas.

#### • **Clearing-House Mechanism (CHM):**

- Members to provide CHM - with details like research objective, geographical area of collection, names of sponsors, etc.

#### • **Funding:**

- A special fund will be established which will be fixed by the COP of UNCBD.

#### Significance of the High Seas:

- Accounts for **>65% of world's ocean area** and **50% of Earth's**

**surface** – the biggest hub of marine life.

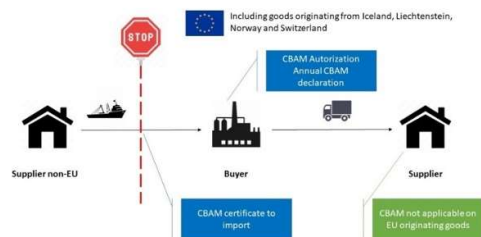
- It is home to around **2.7 lakh known species** – and many more are yet to be discovered, according to scientists.
- **Regulates the climate** by playing a fundamental role in carbon cycle.
- Helps in **mitigating effects of climate change** through absorption of carbon, storing solar radiation, distributing heat around the globe.
- Serves as a **wealth of resources and services** - seafood and raw materials, medicinal resources, aesthetic, scientific & cultural services.
- These areas are currently poorly regulated and **only 1% of them are protected**.



Under UNCLOS, areas within 12 nautical miles off the coastline are called “territorial waters”. From 12 to 24 nautical miles lies the “contiguous zone”. The Exclusive Economic Zone (EEZ) extends till 200 nautical miles off the coast. The ocean areas beyond the EEZ are called “high seas” and are not subject to any nation’s jurisdiction.

## CARBON BORDER ADJUSTMENT MECHANISM (CBAM)

**Context:** Indian industries face growing pressure with the European Union’s Carbon Border Adjustment Mechanism set to be enforced by 2026.



### About Carbon Border Adjustment Mechanism:

- The CBAM is a policy tool aimed at **reducing Carbon Emissions** by ensuring that **imported goods are subject to the same carbon costs as products produced within the EU**.
- It is part of the “**Fit for 55 in 2030 package**”, which is the EU’s plan to **reduce greenhouse gas emissions by at least 55% by 2030** compared to 1990 levels in line with the European Climate Law.
- **Purpose:** To put a fair price on the carbon emitted during the production of carbon intensive goods that are entering the EU and to **encourage cleaner industrial production in non-EU countries**.

### Implementation:

- The CBAM will be implemented by **requiring importers to declare the quantity of goods imported** into the EU and their **embedded Greenhouse Gas (GHG) emissions** on an annual basis.
- To offset these emissions, importers will need to surrender a corresponding number of **CBAM certificates**, the price of which will be based on the weekly average auction price of **EU Emission Trading System (ETS)** allowances in €/tonne of CO<sub>2</sub> emitted.



- The number of certificates required would be **defined yearly** by the quantity of goods and the embedded emissions in those goods imported into the EU.
- If importers can prove that a **carbon price has already been paid** during the production of the imported goods, the corresponding amount can be deducted.
- Companies in countries with a domestic carbon pricing regime equivalent to the EU's will be able to export to the EU without buying CBAM certificates.
- CBAM will apply in its definitive regime **from 2026**, while the current transitional phase lasts between 2023 and 2025.
- Only reporting obligations arise during the transitional period, and **financial obligations apply from 2026**.
- CBAM will initially cover several specific products in some of the most carbon-intensive sectors at risk of **"carbon leakage"**: iron and steel (including some downstream

products such as nuts and bolts), cement, fertilizers, aluminium, electricity and hydrogen.



**Carbon leakage** refers to the phenomenon where greenhouse gas emissions increase in one country or region as a result of stringent climate policies in another, typically due to industries relocating to areas with less strict environmental regulations.

# Science & Technology

## LASER TECHNOLOGY



- LASER, which stands for **Light Amplification by Stimulated Emission of Radiation**, is a technology that generates a highly **focused and coherent beam of light**.
- It relies on **quantum mechanics** and optics, and this technology is known for producing light that is both **monochromatic** and **coherent**.
- The fundamental principle behind LASER technology is the process of **stimulated emission of photons**.
- Atoms or molecules are stimulated to emit photons (light particles) with the same energy, phase, and direction when they are exposed to external energy.

### Components of a LASER

- **Gain Medium:** This is the material (solid, liquid, or gas) that amplifies light through the process of stimulated emission.
- **Excitation Source:** It provides the energy required to excite the atoms or molecules in the gain medium.
- **Optical Cavity/Resonator:** It consists of mirrors at both ends,

allowing the light to bounce back and forth, amplifying it further.

- **Output Coupler:** It allows a portion of the amplified light to exit the cavity, forming the LASER beam.

### Coherence and Monochromaticity

- **Coherence:** LASER light is characterized by its coherence, which means that the waves are in phase with each other. This coherence leads to a highly focused and narrow beam.
- **Monochromatic:** LASER light is also monochromatic, meaning it consists of a single colour or wavelength.

### Applications

- **Communication:** LASERS are used in fiber-optic communication systems for data transmission.
- **Surgery:** In medical applications, LASERS are used for precision surgeries, such as eye surgeries and skin treatments.
- **Material Processing:** LASERS are employed for cutting, welding, and engraving various materials in industries.
- **Research:** LASERS play a crucial role in scientific research, including spectroscopy, microscopy, and particle acceleration.
- **Entertainment:** LASERS are used in various entertainment applications, such as laser light shows.

## FRAM2 POLAR-ORBITING MISSION



- SpaceX has launched the Fram2 mission, sending four private astronauts on a journey to **orbit Earth from pole to pole**, marking a major milestone in space tourism.
- The mission is **named after the Fram ship**, a historical vessel used in early 20th-century polar expeditions.
- Unlike traditional space missions, it aims to fly from pole to pole – this is an **orbital journey around Earth that no space mission has attempted before.**
  - This requires **more fuel** and presents a unique challenge in terms of **mission logistics**, making the Fram2 flight one of the most ambitious private space missions to date.
- Its goal is to fly over both the North & South Poles, providing unprecedented opportunities to observe these regions from low-Earth orbit.
- The mission will involve a series of scientific **experiments focused on spaceflight** and the **effects of microgravity** on the human body.

- Additionally, it will gather **data crucial for climate change research by focusing on Earth's polar regions**, which play a vital role in studying global environmental changes.

## FUTURE CIRCULAR COLLIDER (FCC)



- CERN has unveiled the final blueprint for the FCC, which will succeed the Large Hadron Collider (LHC).
- It is a **particle accelerator planned to host the next generation of particle colliders.** It is expected to be finished in 2035 and will have much higher energy than previous colliders.
- FCC aims to create a hadron collider which will be built in a **new tunnel that is 80–100 km long.**
- FCC intends to **extend the research currently being conducted at Large Hadron Collider (LHC).** LHC has been operational since 2010.
- Estimated to cost around 16 billion Euros, FCC aims to **fully commence operations by 2040.**

### About Large Hadron Collider (LHC):

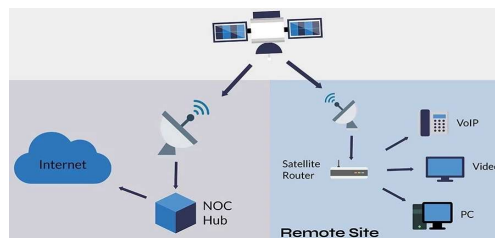
- ✓ It is an experiment that **collides two beams of sub-atomic particles to study physics at very high energies**. It is operated by **CERN** (European Organisation for Nuclear Research).
- ✓ The LHC is a circular pipe that is 27 km long and is located near Geneva.
- ✓ It consists of two D-shaped magnetic fields created by almost 9,600 magnets.
- ✓ It is the **world's largest and most powerful particle accelerator**.

### About CERN:

- ✓ CERN was established in 1954. It has 23 members. **22 members are European countries**. The only non-European nation with full membership is **Israel**. CERN is based in Geneva (Switzerland)
- ✓ **India is an associate member** of CERN while the USA and Japan have observer status at CERN.
- ✓ CERN is an **official "Permanent Observer" to the United Nations**.

## SATELLITE INTERNET

**Context:** As Airtel and Jio are collaborating with Star link to bring satellite internet to India, The geopolitical angle of the same is being discussed.



### About Satellite Internet

- Satellite Internet is a wireless broadband service that provides internet connectivity via satellites orbiting the Earth, bypassing traditional terrestrial infrastructure like cables or fiber optics.
- It operates through **constellations of Low Earth Orbit (LEO) satellites**, which transmit signals to ground-based user terminals, ensuring access in remote, rural, and geographically challenging areas.
- Satellite internet providers like Starlink (SpaceX) deploy thousands of satellites to achieve global coverage.
- Each Starlink satellite transmits and receives data from users on the ground but can only cover a few hundred kilometres.
- To ensure seamless connectivity, a mega-constellation of inter-connected satellites is deployed.
- Companies like SpaceX (Starlink), One Web, and others have pioneered this technology globally, while Jio and Airtel are working to bring similar services to India.

### How Does Satellite Internet Work?

- **Components:** Satellite based internet relies usually on three components for working –



a **satellite**, **ground stations**, and a pack of **small antennae and transceivers**, which is owned by each subscriber.

- **Mechanism:** The ground stations, known as **gateways**, relay Internet data to and from the **satellite** via radio waves. These waves are received by **satellites** and relayed back to individual antennas and transceivers.
- **Monitoring the Network:** The system also includes a **modem at the user end** which links the user's network with the transceiver, and a centralized network operations centre (NOC) for monitoring the entire system.

#### Advantages of Satellite Internet

- **Bridge Digital Divide:** Satellite internet removes geographical barriers to accessing the internet. People from any part of the Earth can have internet connectivity.
- **No Need for Wiring:** There is no need to create new wiring infrastructure to serve far-off areas.
- **Maritime Communication:** Satellite internet is suitable for communication in isolated areas, especially on high seas.
- **Security:** The chances of hacking into a satellite-based internet connection are tougher compared to simple cable-based internet.

#### Drawbacks of Satellite Internet

- **Space Debris:** The decommissioned satellites as well as junk parts may further increase space debris.
- **Ground-based Astronomy:** The satellite constellation may hamper ground-based astronomy, hurting scientific studies.
- **Congest Space:** The 12,000 satellites planned by Starlink will further congest the already over-populated satellite orbits.
- **Safety of Satellites:** The debris from Starlink may initiate Kessler syndrome. This is a scenario perpetuated by collisions between orbiting objects, creating more debris and thus creating a domino effect of future collisions.
- **Signal Latency:** The latency in satellite internet is higher than in traditional internet. Usually, satellite communications account for approximately 550 milliseconds of latency round-trip time.
- **Signal Interference:** Satellite-based internet connectivity is affected by moisture and various forms of precipitation, causing interference.
- **Higher Costs:** Compared to cable-based internet, satellite internet is costly due to the sophisticated equipment involved.

#### VIBE CODING

- Vibe coding basically refers to **using generative AI** not just to assist with coding but **to generate the entire code for an app**.



- At its core, vibe coding is about **communicating with AI in natural language to build apps**.
- **Users ask, or prompt, Large Language Model (LLM)-based models** such as ChatGPT, to **produce the code for an app or service**, and the AI system **does all the work**.
- Vibe coding can help people with ideas for tools, apps, and services to make them a reality without the challenge of learning the specifics of a programming language.
- However, it can also be seen as a major security risk as it replaces experienced human coders with amateurs or untrained coders who give orders to AI chatbots instead of coding from scratch or understanding existing codebases.
  - Human project managers and coders precisely frame how the code needs to take shape in order to best serve a specific use case.
  - But an **AI code generator may not understand the larger context of what it is creating**.
  - In other words, a Gen AI tool may indeed produce the code that the user

requested, but this **generated code might be too slow to run, too expensive to maintain, and too long to scan** regularly for security risks.

## CHASTE PROBE

- It is one of the payloads aboard the Lander (named Vikram) of the Chandrayaan-3 mission.
- **Developed by:** The instrument was designed by the **Physical Research Lab, Ahmedabad** and the **Space Physics Lab (SPL), VSSC**.
- **Objective:** It has the objectives of **measuring lunar surface temperatures, thermal conductivity, and the temperature gradient to a depth of 100 mm**.
- The probe is fitted with **10 individual temperature sensors made of Platinum (Pt-1000)**.
- **Significance:** The findings of the study will provide a comprehensive understanding of the moon's thermophysics and its near-surface and sub-surface water-ice distribution, laying the groundwork for future exploration and habitation strategies.

## MEASLES

**Context:** A measles outbreak has killed a second child in southwestern US, with almost 650 people now infected with the disease.

### About Measles:

- **Measles virus** is an **enveloped, ribonucleic acid virus** of the genus Morbillivirus.
- Measles is **highly contagious**, and an infected person **will often transmit the virus to over 90% of unprotected close contacts**.
- The virus **infects the respiratory tract**, then spreads throughout the body.
- Measles is a human disease and is **not known to occur in animals**.
- Measles **can be entirely prevented through a two-dose vaccine** and **has been officially eliminated in many countries** with advanced healthcare systems.
- Although India has made significant progress with the **Measles Rubella (MR) vaccine** as a part of the Universal Immunization Programme, it is yet to eradicate the disease.

### Treatment:

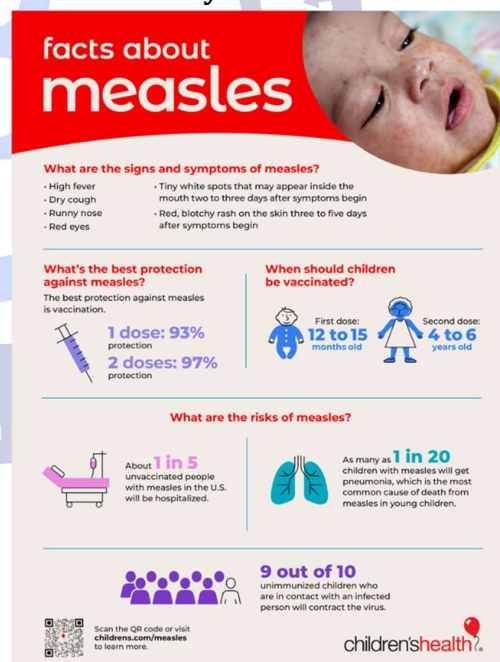
- No specific antiviral treatment exists for measles virus.
- Severe complications from measles can be avoided through medical care that ensures good nutrition, adequate fluid intake, and treatment of dehydration.

### Prevention:

- **Routine measles vaccination for children**, combined with mass immunization campaigns in countries with high case and death rates, are key public health strategies to reduce global measles deaths.

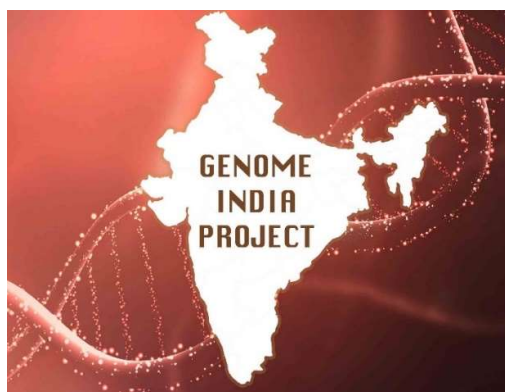
### Initiatives addressing Measles:

1. **The Measles & Rubella Initiative:** Launched in 2001, it is a global partnership led by the **American Red Cross, United Nations Foundation, Centers for Disease Control and Prevention (CDC), UNICEF and WHO**.
  - a. The Initiative is committed to ensuring that no child dies from measles or is born with congenital rubella syndrome.
2. **Measles-Rubella (MR) Vaccination:** It targets around 41 crore children across India, covering **all children aged between 9 months and less than 15 years**.



## GENOME INDIA PROJECT

**Context:** The preliminary findings of the Genome India Project were recently published in a major scientific research journal.



#### About Genome India Project:

- It is an initiative to **sequence 10,000 Indian human genomes** and create a database for the same.
  - It was started in 2020 to better understand **genetic variations and disease-causing mutations specific to the Indian population**. It was completed in February 2024.
  - It is being implemented by **Dept. of Biotechnology** under the Union Ministry of Science and Technology.
  - India's population of 1.3 billion comprises **>4,600 population groups**, many of which are endogamous (matrimony in close ethnic groups), contributing to genetic diversity and disease-causing mutations.
  - By sequencing & analyzing genomes, researchers hope to gain **insights into underlying genetic causes** of diseases and develop more effective therapies.
  - It aims to build a grid of the **Indian "reference genome"**, to fully understand the nature of diseases and traits in India's diverse population.
- About 20 institutions are involved in the project. It is coordinated by the **Centre for Brain Research at IISc, Bengaluru**.
  - Investigators in hospitals will do data collection through a simple blood test from participants and this info will be added to biobanks.
  - **Priority areas:** Precision health, Rare genetic disorders, Mutation spectrum of complex diseases & Epidemiology of Multi-factor Lifestyle Diseases.
  - This **'Genome India' database will be available to researchers** across the world for investigations and is housed at the Indian Biological Data Centre (IBDC), in Faridabad, Haryana.
  - It is **inspired by the Human Genome Project (HGP)**, an international effort that decoded the entire human genome between 1990 and 2003.

#### What Is Genome Sequencing ?

- ✓ Genome is a **complete set of genetic instructions** present in each and every organism.
- ✓ Sequencing is the **sequence of occurrence of the 4 nucleotide bases i.e., adenine (A), cytosine (C), guanine (G), and thymine (T)**.
- ✓ The human genome is made up of >3 billion of these genetic letters. This can't be sequenced at once because available methods of DNA sequencing can only handle short stretches of DNA at a time.
- ✓ While human genomes are made of **DNA**



(**Deoxyribonucleic acid**), a virus genome can be made of either DNA or RNA (Ribonucleic acid).

- ✓ Every organism has a unique genome sequence. Genome sequencing is used to **read and interpret genetic info found within DNA or RNA.**

fatigue, body aches, nausea, and vomiting.

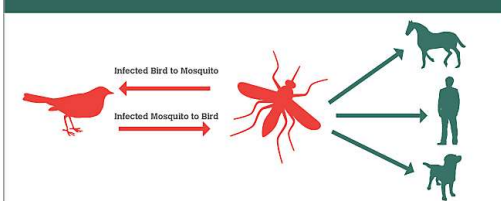
- **There is no vaccine** for the disease.

## BIOMASS SATELLITE MISSION

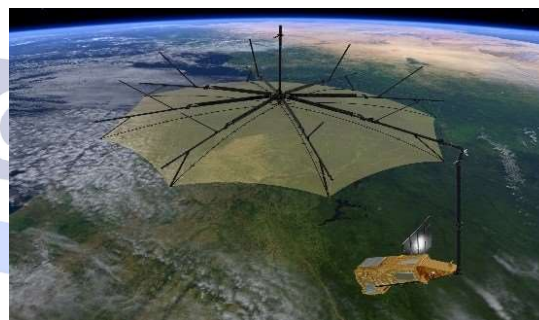
**Context:** The ESA recently launched a new mission which will map the world's forests.

## WEST NILE FEVER

### How West Nile Virus Is Transmitted



- Spain is currently facing a serious outbreak of West Nile Fever.
- **West Nile Virus (WNV)** is a **flavivirus** related to the viruses that are also responsible for causing St. Louis encephalitis, Japanese encephalitis, and yellow fever.
- It is a **mosquito-borne, single-stranded RNA virus**. It is commonly found in Africa, Europe, the Middle East, North America and West Asia.
- **Culex species of mosquitoes** act as principal vectors for transmission.
- To date, no human-to-human transmission of WNV through casual contact has been documented.
- 80% of infected individuals show no symptoms. 20% develop symptoms like fever, headache,



### About Biomass Satellite:

- It is a **European Space Agency (ESA)** mission to provide more **accurate measurements of forest biomass** to enhance our understanding of the carbon cycle.
- It will provide detailed **3D maps** of the world's most **dense and remote tropical forests**.
- The mission lifted off aboard the **Vega C rocket** from Europe's spaceport in French Guiana.
- It will be placed in a **sun-synchronous orbit (SSO)** — a type of orbit in which satellites are in sync with the Sun — at an altitude of around 666 km.
- It is the first space satellite to carry a long-wavelength radar, called **P-band**.
- This special radar means that it can scan deep through the forest canopy and collect information on different parts of the forest, such as tree

trunks, branches, and stems, where trees store most of their carbon.

- This will allow the satellite to provide experts on the ground with new information on forest height and above-ground forest biomass from space.
- Scientists will then be able to find out more about the state of our forests and how they are changing, and further our knowledge about the role that forests play in the carbon cycle.

## QUANTUM SUPREMACY

- Quantum supremacy refers to the **ability of a quantum computer to solve a problem that classical computers cannot solve efficiently**.
- It marks a milestone in quantum computing, proving that quantum machines can outperform classical computers for certain specific tasks.
- Demonstrating quantum supremacy has been a long-standing challenge due to the complexity of designing problems that showcase this advantage in an unambiguous and easily verifiable way.

### Quantum v. Classical computing:

- Classical Computers operate on **bits (0 or 1)** and rely on classical physics.
- Quantum Computers work on **qubits**, which can exist in **superposition** — being 0 and 1 at the same time.
- Qubits also exhibit **entanglement**, where the state of one qubit instantly affects another, regardless of distance.
- **Superposition** allows a quantum processor to perform many computations simultaneously.

- **Entanglement** creates non-classical correlations, which are central to quantum communication, cryptography and computation.

## RAFALE MARINE

The **90,000-cr** deal will include **26 Rafale M** aircraft consisting of 22 single-seater and 4 double-seater trainer versions

Indian Navy has expressed preference for Rafale Marine over US F-18 Super Hornet

### WHAT'S THE DEAL?

The deal to buy 26 Rafale M jets and three additional Scorpene submarines is expected to be announced during PM Modi's visit to France



IAF has already acquired 36 Rafale fighters; the commonality of fleet reportedly tilted the scale in favour of Dassault's Rafale Marine

Two different versions of the aircraft have 80% common features

Indian Navy has been exploring options to replace its ageing MIG-29K

- The Rafale Marine aircraft is designed and built by **Dassault Aviation**, a French aerospace company.

### Features:

- Multi-role, single-seat **4+ generation fighter aircraft** with advanced avionics and AESA radar.
- Capable of deep strikes, air defense, reconnaissance, and maritime operations.
- Equipped with **advanced armaments** like Meteor, Multi-mission air-to-air missile system (MICA), SCALP missiles, and EXOCET anti-ship weapons.

### Differences from Air Force Rafale:

- **Heavier airframe** due to additional reinforcements for naval operations.
- **Optimized radar and electronic warfare systems** for maritime applications.
- Enhanced landing capabilities for **Catapult Assisted Take-Off Barrier Arrested Recovery (CATOBAR)** and Short Take-Off, Barrier Arrested Recovery (STOBAR) systems.

## DIABETES

**Context :** The rising number of diabetic patients in India raises alarm bells among health experts and Economists.



### About Diabetes

- Diabetes is a **chronic disease** that occurs when the pancreas can no longer make insulin, or the body cannot make good use of the insulin it produces.
- **Insulin** is a hormone that regulates **blood glucose**.
- Not being able to produce or use insulin effectively leads to raised glucose levels in the blood, known as **hyperglycaemia**.
- Over the long-term high glucose levels are associated with damage to the body **and failure of various organs and tissues**.
- Diabetes is a major cause of blindness, kidney failure, heart attacks, stroke, and lower limb amputation.

### Types of Diabetes:

#### Type 1 diabetes:

- It is a condition in which your **immune system destroys insulin-making**

**cells** in your pancreas. These are called **beta cells**.

- When you have type 1 diabetes, **your body produces very little or no insulin**.
- It **requires daily administration of insulin** to maintain blood glucose levels under control.
- It is **usually diagnosed in children and young people**, so it used to be called **juvenile diabetes**.
- Symptoms include excessive excretion of urine (polyuria), thirst (polydipsia), constant hunger, weight loss, vision changes, and fatigue.

#### Type 2 diabetes:

- It results from the **body's ineffective use of insulin that it produces**.
- More than **95% of people with diabetes have type 2 diabetes**.
- This type of diabetes is largely the **result of excess body weight and physical inactivity**.
- **Symptoms may be similar to those of type 1 diabetes but are often less marked**. As a result, the disease may be diagnosed several years after onset.

#### Gestational diabetes (GDM):

- It is a type of diabetes that **consists of high blood glucose during preg-**

nancy and is associated with **complications for both mother and child.**

- **GDM usually disappears after pregnancy**, but women affected, and their children are at **increased risk of developing type 2 diabetes later in life.**

### Key Preventive Measures:

Preventing diabetes—especially **Type 2 diabetes**—is possible and effective through lifestyle modifications.

While **Type 1 diabetes** is not preventable, healthy living can reduce the risk and complications.

- **Healthy Eating:** Focus on a balanced diet rich in fruits, vegetables, whole grains, lean proteins, and healthy fats.
  - Reduce consumption of processed foods, sugary snacks, and drinks.
  - Maintain portion control to avoid overeating.
- **Regular Physical Activity:** Engage in at least 150 minutes of moderate aerobic activity per week (e.g., brisk walking, cycling).
  - Strength training exercises twice a week can also help regulate blood sugar levels.
- **Weight Management:** Maintaining a healthy weight can significantly reduce the risk of developing Type 2 diabetes.

- **Regular Screening:** ◦ People with a family history of diabetes or those who are overweight should undergo regular blood glucose checks.

- **Avoid Smoking and Excess Alcohol:** Smoking increases insulin resistance and cardiovascular risk.

- Alcohol, especially in large quantities, can affect blood glucose regulation.

- **Intermittent Fasting (IF):**

- Intermittent Fasting involves cycling between periods of eating and fasting (e.g., 16:8 method — 16 hours fasting, 8 hours eating window).
- It may help reduce insulin resistance, promote weight loss, and lower inflammation.
- Studies suggest that IF can improve fasting blood glucose, HbA1c, and insulin sensitivity.
- Best used under medical supervision, especially for people on medication.

### Super Drugs

- **Mounjaro** and **Ozempic** are injectable medications developed for Type 2 diabetes.
- They mimic gut hormones to regulate blood sugar and reduce appetite.
- Both significantly aid in weight loss, making them popular for obesity management.



## GAURAV GLIDE BOMB



- It is an **air launched 1,000 kg class** glide bomb capable of hitting targets at long distance.
- **Features**
  - It is an **Air to Surface LRGB** with conventional warheads to destroy enemy air strips, bunkers, hard installations, buildings etc.
  - It is designed to **integrate with fighter aircrafts**.
  - It consists of an **Inertial Navigation based guidance system** with Digital Control.
- Developed by **DRDO** in collaboration with **Armament Research and Development Establishment (ARDE), Research Centre Imarat, and Integrated Test Range**.
- After being launched, the glide bomb steers towards the target using a highly accurate hybrid navigation scheme with a combination of INS and GPS data.
- During the flight test, the glide bomb hit the target erected at Long Wheeler's island with pinpoint accuracy.
- Complete flight data during the test launch was captured

by **Telemetry and Electro optical tracking systems** deployed by Integrated Test Range along the coastline.

## THORIUM-BASED SMALL MODULAR REACTOR (SMR)



- A Small Modular Reactor (SMR) is a compact, scalable nuclear reactor designed for safe, efficient, and flexible power generation.
- Thorium-based SMRs utilise Thorium-232, a fertile material, to generate Uranium-233 fuel through transmutation.

### Key Features of Thorium-Based Small Modular Reactor (SMR):

- **Fuel Type :** Thorium-232 → Uranium-233: Uses thorium, which converts into Uranium-233 through nuclear reaction for clean energy.
- **Modular Design:** SMRs are built in small units, allowing phased and cost-effective deployment.
- **Compact Size:** Suitable for remote and smaller regions due to its small footprint and setup ease.
- **Passive Safety Systems:** Designed to shut down automatically in emergencies, reducing accident risks.

- **Regulatory Compliance:** Follows Indian nuclear safety norms under AERB and Central guidelines.

#### Significance:

- **Thorium Abundance:** India has 25% of world's thorium, mainly in Kerala and Tamil Nadu, offering energy independence.
- **Energy Security:** Reduces dependency on imported uranium and enhances long-term fuel security.
- **Eco-Friendly Option:** Produces less nuclear waste compared to conventional uranium reactors.
- **Decentralised Clean Power:** Can provide electricity to off-grid or underserved areas in a clean and reliable way.
- **State-Level Innovation:** Maharashtra becomes the first state to enter nuclear space, supporting 'Make in India'.

#### Limitations:

- **No Operational Reactor Yet:** Thorium-based SMRs are still in testing phase with no active deployment worldwide.
- **High Setup Cost:** Building reactors and safety infrastructure needs large investment and time.
- **Weak Fuel Cycle Infra:** India lacks full reprocessing systems for thorium; tech is still under development.
- **Public Fear of Nuclear:** Safety concerns and nuclear accidents in the past may affect public acceptance.

## VITAMIN D



- Vitamin D (also referred to as **calciferol**) is a **fat-soluble vitamin** that is **naturally present in a few foods**, added to others, and available as a dietary supplement.
- It is also **produced endogenously** when **ultraviolet (UV) rays** from sunlight **strike the skin** and trigger vitamin D synthesis.
  - **During periods of sunlight**, vitamin D is **stored in fat** and **then released** when sunlight is not available.
- Foods that naturally have vitamin D include **egg yolks, saltwater fish, and liver**.
- **Why is vitamin D so important?**
  - Vitamin D **promotes calcium absorption** and helps maintain adequate levels of calcium and phosphorus in the blood, which is **necessary for**

**healthy bones and teeth.**

- Without sufficient vitamin D, bones can become thin, brittle, or misshapen.
- Vitamin D also plays a **role in your nervous system, musculoskeletal system, and immune system.**

#### Vitamin D Deficiency:

- A lack of vitamin D can lead to bone diseases such as **osteoporosis or rickets**. Osteoporosis is a disease in which your bones become weak and are likely to fracture (break).
- With chronic and/or severe vitamin D deficiency, a decline in calcium and phosphorus absorption by your intestines leads to **hypocalcemia** (low calcium levels in your blood).
- This leads to secondary **hyperparathyroidism** (overactive parathyroid glands attempting to keep blood calcium levels normal).
- Both **hypocalcemia** and hyperparathyroidism, if severe, can cause symptoms, including muscle weakness and cramps, fatigue, and depression.

### GAGANYAAN MISSION

**Context:** The ISRO is currently placing tried and tested safety measures in place as it prepares for

**India's maiden spaceflight mission, Gaganyaan.**



#### About Gaganyaan:

- The Gaganyaan Mission is an ambitious and co-ordinated project of ISRO in collaboration with other agencies, such as various research labs, Indian academia, and industries.
- It aims to **demonstrate ISRO's human spaceflight capability** by launching a human crew to an orbit of 400 km and bringing them safely back to earth.
- In the long run, it will lay the foundation for a sustained Indian human space exploration programme.

#### Launch Vehicle: Human-Rated LVM3

- A modified version of ISRO's most-reliable rocket, **LVM3 (previously called Geosynchronous Satellite Launch Vehicle Mk III)**, is the launching vehicle of the Gaganyaan Mission.
- It is re-configured as a human rated launch vehicle to be capable of safely transporting humans into the intended orbit.
- It has a **three-stage propulsion system** - solid stage, liquid stage, and cryogenic stage.



- It consists of Crew Escape System (CES) as well as Orbital Module, along with solid stage, liquid stage, and cryogenic stage.

#### Components of the Spacecraft

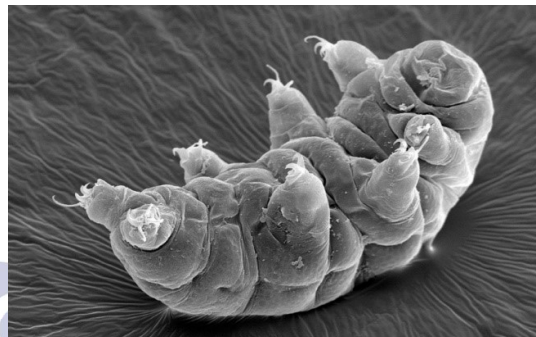
- ✓ **Orbital Module:** The Central Hub of the Gaganyaan Mission, Orbital Module (OM), which will orbit the Earth, will comprise of Crew Module (CM) and Service Module (SM).
- ✓ **Service Module:** It comprises of propulsion system, thermal system, power systems, avionics systems and deployment mechanisms, which aim to provide necessary support to Crew Module while in orbit.
- ✓ **Crew Module:** It will have an Earth like environment in space for the crew. It will include crew interfaces, human centric products, life support system, avionics and deceleration systems.
- ✓ **Vyommitra:** The 'female' robot astronaut the humanoid designed and developed ISRO to fly aboard unmanned test missions before the Gaganyaan human space-flight mission.



- ✓ **The manned flight** is the final part of the Gaganyaan mission where a human astronaut will be launched to space and will safely be escorted back to the Earth through a **soft landing in Arabian Sea** off the coast of Gujarat.
- ✓ This is the main part of the mission, whereas the previous components

were executed for ensuring safety of the final mission.

## TARDIGRADES



- Tardigrades are also known as **water bears** or **moss piglets**.
- They are **free-living tiny invertebrates** belonging to the **phylum Tardigrada**.
- They are known to **survive extreme conditions** — such as exposure to extreme temperatures, extreme pressures (both high and low), air deprivation through a latent state of life known as **cryptobiosis**.
- Tardigrades have also survived exposure to outer space
- Around 1,300 species of tardigrades are found worldwide.

#### **Habitat:**

- They are considered **aquatic** because they require a thin layer of water around their bodies to prevent dehydration, they've also been observed in **all kinds of environments**, from the deep sea to sand dunes.
- **Freshwater mosses and lichens** are their preferred habitat, hence their nickname, moss piglet.
- Researchers found **three factors** that help this species **survive radiation**.



- It has the ability to quickly **repair double-strand breaks in DNA** due to radiation exposure, by using a protein called TRID1.
- The second factor involved a **gene that was switched on during exposure to radiation**, resulting in the generation of two proteins that are known to be important for mitochondrial synthesis of ATP—in tardigrades, it appears they also help with DNA repair.
- It has the ability to **minimize damage from radiation by producing a large number of proteins that serve as effective antioxidants**—they clear out free radicals before they can cause problems in the creature's cells.

## KATRIN EXPERIMENT



- The **KATRIN (Karlsruhe Tritium Neutrino Experiment)** has made a major achievement by measuring neutrino mass with a new precision.
- The KATRIN is located at the Karlsruhe Institute of Technology (KIT) in **Karlsruhe, Germany**.

- It is aimed at **measuring the mass of the neutrino** with more precision than previously ever achieved.
- It has measured the mass of neutrinos by **studying the decay of tritium**, a radioactive form of hydrogen.
- The mass was inferred by analyzing the energy of the emitted electrons.

## Neutrinos

- ✓ They are **very light subatomic particles without an electrical charge**. They rarely interact with matter, thus making them difficult to detect. They are found in cosmic rays and solar radiation.

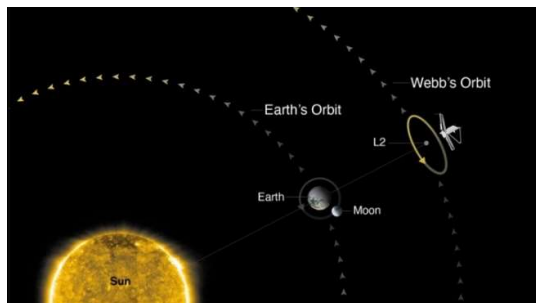
## ✓ Properties:

- **Mass:** Their small mass influences **cosmic structure formation**, such as galaxies.
- **Weak Interaction:** They interact via the weak nuclear force, allowing them to pass through vast amounts of matter.
- ✓ They aid in **particle reactions** and play a **key role in galaxy formation** and the **study of dark matter**.

## JAMES WEBB SPACE TELESCOPE (JWST)

**Context:** A team of astronomers have detected possible signs of past or present life linked to biological

activity, on an exoplanet named K2-18b, using the JWST.



#### About James Webb Space Telescope:

- The telescope is an international collaboration between **NASA**, the **European Space Agency (ESA)** and the **Canadian Space Agency** which was launched in December 2021.
- It is currently at a point in space known as the **Sun-Earth L2 Lagrange point**, approximately 1.5 million km beyond Earth's orbit around the Sun.
- It is the **largest, most powerful infrared space telescope** ever built.
- It is the successor to the **Hubble Space Telescope**. The James Webb Space Telescope would be observing infrared radiations whereas **Hubble's work involved watching the ultraviolet and the visible spectrum of light**.
- It can see backwards in time to just after the Big Bang by looking for galaxies that are so far away that the light has taken many billions of years to get from those galaxies to our telescopes.

#### Objectives:

- It will examine every phase of cosmic history: from the Big Bang to the formation of galaxies, stars, and planets to the evolution of our own Solar System.

- The goals for the Webb can be grouped into four themes.
  - The first is to **look back around 13.5 billion years** to see the first stars and galaxies forming out of the darkness of the early universe.
  - Second, to compare the faintest, earliest galaxies to today's grand spirals and understand how galaxies assemble over billions of years.
  - Third, to see where stars and planetary systems are being born.
  - Fourth, to observe the atmospheres of extrasolar planets (beyond our solar system), and perhaps find the building blocks of life elsewhere in the universe.

#### About Lagrange Points:

- ✓ Lagrange Point 2 is one of the five such **points in the orbital plane of the Earth-Sun system**.
- ✓ They are named after the Italian-French mathematician **Joseph-Louis Lagrange**.
- ✓ At these points in any revolving two-body system like Earth and Sun, the **gravitational forces of the two large bodies cancel each other out**.
- ✓ Objects placed at these positions are relatively stable & **require minimal external energy or fuel to keep themselves there**, and so many instruments are positioned here.

## NISAR MISSION

### About the NISAR Mission

- NISAR (NASA-ISRO Synthetic Aperture Radar) is a **joint Earth observation satellite mission** developed by **NASA and ISRO** under a bilateral agreement signed in 2014.
- The satellite is scheduled for **launch in June 2025** from the **Satish Dhawan Space Centre**, Andhra Pradesh, aboard **ISRO's Geosynchronous Satellite Launch Vehicle Mark II (GSLV Mk II)**.
- It marks the **first-ever collaboration of its kind** between India and the United States in **radar-based Earth monitoring from space**.
- NISAR aims to **map the entire Earth's surface every 12 days**, enabling high-frequency, precise, and repeat observations.
- It will monitor **ecosystem changes, ice sheet dynamics, vegetation patterns, sea level rise, and groundwater variation**, and will track **natural hazards** like **earthquakes, volcanoes, tsunamis, and landslides**.
- While **NASA** has provided the L-band radar, GPS, a high-capacity solid-state recorder to store data, and a payload data subsystem
- **ISRO** has provided the S-band radar, the Geosynchronous Satellite Launch Vehicle (GSLV) launch system and spacecraft.
- S band radars operate on a wavelength of 8-15 cm and a frequency of 2-4 GHz. Because of the wavelength and frequency, they are **not easily attenuated**. This makes them useful for near and far range weather observation.
- It has a **39-foot stationary antenna reflector**, made of a gold-plated wire mesh; the **reflector will be used to focus "the radar signals emitted and received by the upward-facing feed** on the instrument structure.
- By using SAR, NISAR will produce **high-resolution images**. SAR is **capable of penetrating clouds** and can collect data day and night regardless of the weather conditions.
- NASA requires the L-band radar for its **global science operations** for at least three years. Meanwhile, ISRO will utilise the S-band radar for a minimum of five years.

### Features

- It is a 2,800 kilograms satellite consisting of both **L-band and S-band Synthetic Aperture Radar (SAR) instruments**, which makes it a dual-frequency imaging radar satellite.



## FLUE GAS DESULPHURISATION (FGD)

### About Flue Gas Desulphurisation

- In an FGD system, **sulphur compounds**, particularly sulphur dioxide ( $\text{SO}_2$ ), are **removed from the exhaust emissions of fossil-fuelled power stations**.
- This is done by means of an industrial process **through the addition of absorbents**. This can **remove up to 95 % of the sulphur dioxide** from the flue gas (exhaust gas).
- The **wet process** has become the **main method of FGD** in large, fossil-fuelled power plants.
- In this method, the **flue gases are steam-saturated with the absorbent in aqueous solution**.
- Substances such as **ammonia or sodium sulphite** are used as absorbents; however, the use of **lime or limestone slurry** (wet limestone

scrubbing) is also **widespread**.

- The **uncleaned flue gas is sprayed in a scrubber tower** (absorber tower) with a mixture of water and limestone (scrubbing slurry), whereby most of the **sulphur dioxide is bonded by chemical reaction**.

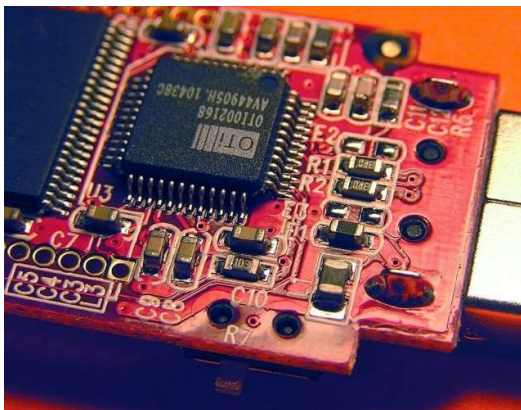
### Why Needed

- **Most fossil fuels (coal, oils, etc.) contain some sulphur**.
- When a fossil fuel is burnt, the sulphur it contains is released to the atmosphere via the process of combustion.
- Some coals may contain up to 4% sulphur, which is a significant amount considering that a coal power station may burn in excess of 5,000 tonnes of coal per day.
- **Sulphur dioxide** in itself is a **major air pollutant** which impacts all life.
- It is also a **precursor of acid rain**, which has significant adverse impacts on forests, freshwaters, and soils, in turn killing insect and aquatic life forms, causing paint to peel, corrosion of steel structures such as bridges, and weathering of stone buildings and statues.
- The **removal of sulphur dioxide is critical** to establishing a safe and clean environment where toxic



emissions are kept to a safe level.

## SURFACE MOUNT TECHNOLOGY (SMT)



- It refers to a **manufacturing technique** where **electronic components are directly applied to the surface of a printed circuit board (PCB)**.
- SMT, developed in the 1960s and 1970s, replaced conventional **through-hole technology (THT)**, producing more compact, economical, and efficient electronic devices.
- This method **enables automated production** to conduct a more extensive assembly, resulting in the creation of a fully functional circuit board.
- Any electronic element installed in this manner is identified as a **surface-mounted component (SMD)**.
- In opposition to conventional manufacturing techniques, SMT removes the necessity for elements to be placed through apertures; rather, elements are attached to the board via the process of soldering.

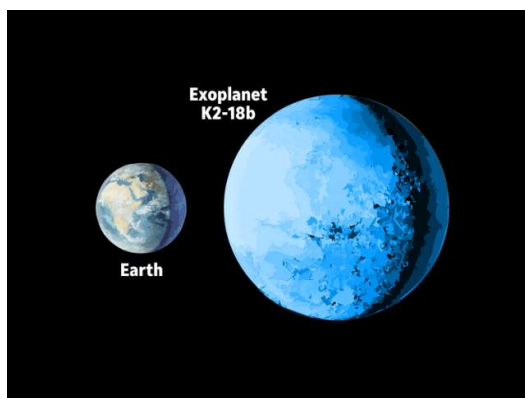
- The two main soldering techniques are reflow soldering and wave soldering.
- Assembling PCBs using SMT involves various steps like solder paste application, component placement, reflow soldering, and cleaning.
- SMT is used in many industries like **consumer electronics, medical, and aerospace industries**.

### THT vs. SMT:

- As compared to THT, SMT has **cheaper production costs, increased component density, and superior electrical performance**. But the initial cost is high, and it is difficult to repair.
- The process for SMT production setup is faster when compared to THT. This is because components are mounted using solder paste instead of drilled holes. It saves time and labor-intensive work.
- SMT supports microelectronics by allowing more components to be placed closer together on the board. This leads to designs that are more lightweight and compact.
- **Simplicity:** In THT, lead wires pass through the holes to connect components. Because SMT components are soldered right onto the PCB, the overall makeup is far less complex.
- The heat dissipated in SMT is also less than through-hole components.

## K2-18B

- It is a **super-Earth exoplanet** discovered in 2015 located **120 light years away**.



- It has a mass **8.92 times that of Earth** and orbits its **M-type star** every **32.9 days**.
- The planet lies in the **habitable zone** and is **2.6 times the size of Earth**.
- Recently, researchers from the University of Cambridge have detected **biosignature** gases such as **dimethyl sulphide (DMS)** and **dimethyl disulphide (DMDS)** in the atmosphere of exoplanet K2-18b using the **James Webb Space Telescope (JWST)**.
- On Earth, these gases are mainly produced by **biological processes**, prompting debate about the possibility of extraterrestrial life.
- While the presence of DMS and DMDS is a strong potential biosignature, although not definitive evidence of life.
  - Previous observations on planets like **Mars and Venus** have detected gases like **phosphine**, linked to life, but none provide conclusive evidence of life.

## CURIOSITY ROVER

- Curiosity is **NASA's robotic rover** launched on November 26, 2011, aboard an **Atlas V rocket** and **landed on Mars on August 5, 2012**.

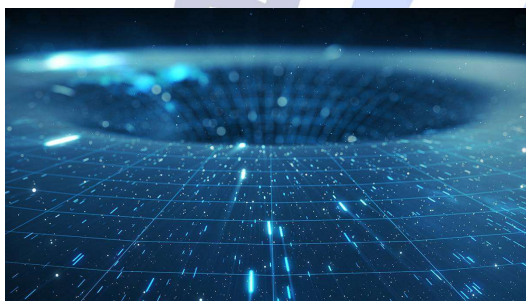


- It is part of NASA's **Mars Science Laboratory (MSL) mission** and was the first to use a **sky crane landing system** to reach the Martian surface.
- The rover runs on a **thermoelectric power generator**, which utilises the **radioactive decay of plutonium** instead of solar panels.
- Its **four primary scientific goals** are:
  - Determine whether life ever existed on Mars.
  - Characterise Mars' past and present climate.
  - Understand the geology of Mars.
  - Prepare for future human exploration.
- The rover is approximately 3 meters long, weighs around 900 kilograms, and is equipped with an onboard chemistry lab for analysing rock samples.
- Recently, the Curiosity Rover has discovered **carbon-bearing minerals** on Mars, marking the first solid evidence of a carbon cycle on the Red Planet.
- The discovery was made during the rover's exploration of an 89-meter stretch of terrain in an ancient lakebed in the **Gale Crater**, where it drilled into different types of rocks.
- The Curiosity rover identified a carbonate mineral called **siderite**,

which contains carbon and oxygen, in the sulfate-rich layers of Martian rocks.

- This is the first time this mineral has been found on Mars.
- The rocks containing **5–10% siderite** by weight suggest that a significant portion of Mars' past CO<sub>2</sub> may be trapped in the planet's crust, rather than having escaped into space.
- The rocks also showed the presence of **iron oxyhydroxides**, indicating that siderite may have dissolved in acidic water, releasing some CO<sub>2</sub> back into the atmosphere. This points to a limited and slow carbon cycle.

## QUANTUM GRAVITY



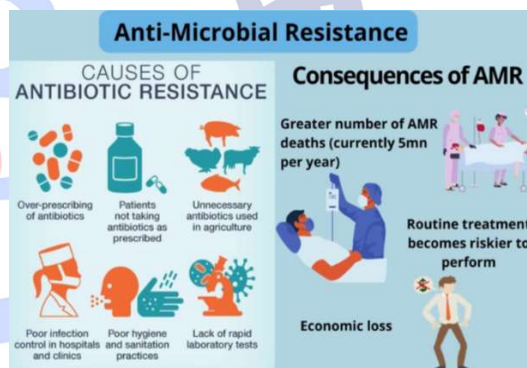
- Quantum Gravity is a **theoretical framework that aims to unify general relativity** (which explains gravity at large scales) **and quantum mechanics** (which governs subatomic particles).
- Since gravity behaves differently from the other fundamental forces in quantum mechanics, physicists have been searching for a theory that integrates gravity into the quantum world.
- General relativity treats gravity as the curvature of spacetime, while **quantum mechanics describes**

**forces through particle interactions.**

- Gravity has never been directly observed in **quantum form**, unlike the other fundamental forces.
- Theories like **String Theory and Loop Quantum Gravity** attempt to explain quantum gravity but lack experimental validation.

## ANTI MICROBIAL RESISTANCE

**Context:** Infectious diseases experts urged the Drugs Controller General of India to lay down strict rules for doctors to follow when prescribing the latest types of antibiotics.



**About Anti-Microbial Resistance (AMR):**

- AMR is **resistance acquired by any microorganism against antimicrobial drugs**. These **microorganisms are called superbugs**. It occurs when a microorganism changes over time and no longer responds to medicines.
- **Makes infections harder to treat** and increases risk of disease spread, severe illness, death.



- WHO has identified AMR as one of the **top ten threats to global health**.

**As per a study by India's National Centre for Disease Control (January 2024):**

- **57% antibiotics prescribed in India have potential** to cause high AMR.
- India has a **remarkably high prevalence of antibiotic usage** (71.9%), with 4.6% of patients getting four or more antibiotics.
- Only 6% were prescribed antibiotics after a confirmed diagnosis of the specific bacteria causing their illness.

#### **Initiatives taken to Prevent AMR**

##### ✓ **AMR Surveillance and Research Network (AMRSRN):**

- Aims to generate evidence and capture trends and patterns of drug-resistant infections in the country.

##### ✓ **National Action Plan on AMR:**

- Focuses on One Health approach and was launched in April 2017 involving various ministries/depts.

##### ✓ **Red Line Campaign:**

- Awareness campaign urging people not to use medicines marked with a red vertical line without a prescription.
- These medicines are included in Schedule H-1 of the Drugs and Cosmetics Act, 1940.

##### ✓ **WHO Global AMR and Use Surveillance System (GLASS):**

- Aims to incorporate data from surveillance of AMR in humans, surveillance of antibiotic use, AMR in food chain & environment into health policy.

##### ✓ **ICMR Antibiotic Stewardship Program (AMSP) by ICMR:**

- Aims to control misuse and overuse of antibiotics in hospital wards and ICUs.

##### ✓ **Chennai Declaration:**

- In 2012, India's medical societies adopted the Chennai Declaration, a set of national recommendations to promote antibiotic stewardship.

##### ✓ **Nafithromycin:**

- India's 1<sup>st</sup> indigenous anti-biotic (launched in Nov 2024 against drug-resistant strains of pneumonia bacteria).

#### **PHENOME INDIA PROJECT**



- The "Phenome India" project, officially named **Phenome India-**



**CSIR Health Cohort Knowledgebase (PI-CheCK)** is an initiative launched by the **Council of Scientific and Industrial Research (CSIR)** on December 7, 2023.

- The main objective of the project is to **develop India-specific risk prediction models for cardio-metabolic diseases** including diabetes, liver diseases, and cardiac diseases.
- It is India's **first-ever pan-India longitudinal health monitoring study** focused specifically on cardio-metabolic health.
- Participants include around 10,000 individuals—primarily CSIR employees, pensioners, and their spouses—from across 17 states and 24 cities.
- Collected data includes clinical questionnaires, lifestyle and dietary habits, anthropometric measurements, imaging and scanning data, and extensive biochemical and molecular data.
- This study is crucial for understanding how ethnic diversity and lifestyle patterns unique to India influence the risk and incidence of cardio-metabolic disorders.
- Through this project, CSIR is promoting a **Predictive, Personalised, Participatory, and Preventive (P4) healthcare model** suited to Indian genetic and phenotypic profiles.

## H5N1 BIRD FLU

- Bird flu, also known as avian flu, refers to an infectious viral illness

that mainly infects and spreads among poultry and some wild birds.



### • Cause of concern

- From time to time, a form of the flu virus jumps from wild birds to poultry farms, and replicates in cramped warehouses of farmed birds.
- It then quickly evolves into a highly pathogenic flu virus that causes a larger wave of illness and death than usual among birds.

### H5N1 Bird flu

- H5N1 is a type of influenza virus that causes a highly infectious, severe respiratory disease in birds called avian influenza (or "bird flu").
- Basically, it is a subtype of the influenza A virus.
- Influenza A viruses are classified by subtypes based on the properties of their surface proteins.
  - There are 18 different hemagglutinin subtypes and 11 different neuraminidase subtypes (H1 through H18 and N1 through N11, respectively).
  - For example, A(H1N1) and A(H3N2).

- Human cases of H5N1 avian influenza occur occasionally, but it is difficult to transmit the infection from person to person.
  - When people become infected, the mortality rate is about 60%.
- **Origin and circulation**
  - The currently circulating type of H5N1 has descended from a virus that caused an outbreak on a goose farm in Guangdong, China, in 1996.
  - The new version of H5N1 first emerged in Europe in 2020 and then rapidly reached Africa, and Asia.
  - By late 2021, it had spread to North America and in the fall of 2022, it appeared in South America.
  - In February 2024, the virus stormed through mainland Antarctica.
- **Reasons behind the large-scale spread of H5N1**
  - The exact factors behind the large outbreaks of the bird flu are still largely unknown. Some scientists suggest that one reason could be climate change.
  - According to studies, soaring global temperatures impact the behaviour of birds in such a way that it exacerbates the spread of the flu.
- These birds are forced to move into new territories and mix with species that they usually don't interact with, which possibly boosts the chances for the virus to spread even further.
  - Higher sea surface temperatures might also be at play.
  - E.g., warmer sea temperatures near northern Chile have led to a fall in the forage fish population and that has made sea lions weaker and more susceptible to disease.
- **Spread of H5N1 to people**
  - Almost all cases of H5N1 infection in people have been associated with close contact with infected live or dead birds, or H5N1-contaminated environments.
  - The virus does not infect humans easily, and spread from person to person appears to be unusual.
- **Cause of concern**
  - H5N1 infection in humans can cause severe disease and has a high mortality rate.
  - If the H5N1 virus were to change and become easily transmissible from person to person while retaining its capacity to cause severe disease, the consequences for public health could be very serious.

# Places in News and Geography

## TONGA



- Tonga, officially the Kingdom of Tonga, also called Friendly Islands, is an archipelago composed of 169 islands, of which only 36 islands are inhabited, and is located in the South Pacific Ocean.
- It lies south of Samoa, **east of Fiji**, and just **north of the Tropic of Capricorn**.
- Tonga's western islands are volcanic (four with active volcanoes) and sit well above sea level. Those to the east are coral and are more low-lying.
- The **capital, Nuku'alofa**, is on the **island of Tongatapu**.
- Due to its location within the **Pacific Ring of Fire**, Tonga experiences relatively frequent volcanic activity.
- A former British protectorate, Tonga became fully independent in 1970, although it was never formally colonised.
- **Political System:** It is a constitutional monarchy.

- **Language:** Tongan, English
- **Currency:** Tongan Pa'anga (TOP)
- **Economy:** Tonga has no strategic or mineral resources, and relies on agriculture, fishing and the money sent home by Tongans living abroad.

## NIGERIA



- Nigeria, officially known as the Federal Republic of Nigeria, is a country in **West Africa**. It is situated between the **Sahel Region** in the north and the **Gulf of Guinea** in the south (Atlantic Ocean).
- It borders **Niger** in the North, **Chad** in the North-East, **Cameroon** in the East & **Benin** in the West.
- With >230 million citizens, it is the **most populous country in Africa**, and the world's sixth-most populous country.
- Nigeria is a very diverse nation with **more than 250 ethnic groups** speaking 500 distinct languages, all identifying with a wide variety of cultures.

- Before 2000, economic development was hindered by years of military rule, corruption, and mismanagement. In the decades thereafter, the restoration of democracy and subsequent economic reforms led to rapid growth.
- Nigeria also has an **abundant supply of under-exploited resources**, including coal, bauxite, tantalite, gold, tin, iron ore, limestone, niobium, lead and zinc.
- Nigeria has long suffered from political instability, and **militant groups such as Boko Haram and Al-Shabab** frequently clash with the government.

## GREENLAND



- **Location:** North Atlantic Ocean, between North America and Europe
- **Capital:** Nuuk
- **Climate:** Arctic climate, with temperatures ranging from -50°C in winter to 10–15°C in summer
- **Natural resources:** Minerals, oil, gas, and rare earth elements
- **Strategic importance:** Pituffik Space Base is crucial for US missile defense systems
- **Historical and Political background:** Greenland is an autonomous territory of Denmark but holds strategic significance due to its location between North America and Europe.
  - The island was a Danish colony until 1979, when it gained home rule; in 2009, it achieved self-governing status, but foreign policy, defence, and monetary matters remain under Denmark's control.

### US Interests in Greenland

- **Strategic military location:** The Pituffik Space Base is crucial for the US ballistic missile warning system due to its position along the shortest route between North America and Europe.
  - The 1951 Agreement allows the US access to the base but requires prior notification to Greenland and Denmark.
- **Natural resources and economic interests:** Greenland is rich in minerals, oil, and natural gas, including rare earth minerals, which are vital for US economic and technological interests.
  - Despite this, most mining companies operating in Greenland are Australian, Canadian, or British.
- **US attempts to acquire Greenland:** In 2019, Trump proposed to buy Greenland from Denmark, but the offer was rejected.



- In 2025, Trump reaffirmed his belief that the US should control Greenland, arguing it is strategically and economically necessary.

## NORTH SENTINEL ISLAND



- It is one of the **Andaman Islands** - an archipelago in the **Bay of Bengal** - and part of the **Indian Union Territory of Andaman and Nicobar Islands**.
- It is located **west of the central cluster of the Andaman Islands**.
- The island measures approximately 8 kilometers (5.0 mi) in length and 7 kilometers (4.3 mi) in width, covering an area of about 60 square kilometers (23 sq mi).
- The island is densely covered in **tropical rainforest**.
- It's also circled by a shallow reef.
- It harbours one of the world's last secluded tribes — **the Sentinelese**.
  - They are believed to be **direct descendants of the first humans who migrated out of**

**Africa** around 60,000 years ago.

- The **tribe** has **lived in voluntary isolation** for thousands of years, fiercely resisting contact with the outside world.

- The island falls under the **Andaman and Nicobar Protection of Aboriginal Tribes Act, 1956**, making it **illegal to approach closer than 5 nautical miles**.

## KATCHATHEEVU



- **Katchatheevu** is a 285-acre **uninhabited island in the Palk Strait** between India and Sri Lanka.
- Located **northeast of Rameshwaram**, approximately 33 km from the Indian coast, it sits about 62 km **southwest of Jaffna**, at the northern tip of Sri Lanka.
- Katchatheevu is not suited for permanent human settlement as there is **no source of drinking water** on the island.
- The island's sole structure is **St. Anthony's church**, an early 20th-

century Catholic shrine, where Christian priests from India and Sri Lanka conduct an annual festival service attended by devotees from both countries.

#### History of the Island:

- **Origin:** The Island was formed as a result of **volcanic eruption** in the 14th-century.
- **Early Rulers:** The region was **initially ruled by the Jaffna kingdom of Sri Lanka** in the early medieval period, but control later **shifted to the Ramnad zamindari under Nayak dynasty of Madurai** in the 17th century.

#### Dispute:

- **India:** The ownership dispute over Katchatheevu between India and Sri Lanka, which had been part of the Madras Presidency during the British Raj, persisted until 1974, with both countries claiming the island as their own.
- **Sri Lanka:** Sri Lanka claimed sovereignty over Katchatheevu on the ground that the Portuguese who had occupied the island during 1505-1658 CE had exercised jurisdiction over the islet.
- **1974:** Under **Indo-Sri Lankan Maritime Agreement** the island's transfer to Sri Lanka occurred.
- **1976:** An additional **agreement** was made that **prevented both countries from fishing in each other's Exclusive Economic Zones**, with Katchatheevu positioned at the boundary of these zones, causing ambiguity over fishing rights.

- **2009:** After Sri Lanka's civil war ended in 2009, tensions escalated over Indian fishermen entering Sri Lankan waters, leading to arrests, allegations of custodial torture, and renewed retrieval demands regarding Katchatheevu.

#### Contentious Issues:

- The **1974 agreement permitted Indian fishermen to continue accessing Katchatheevu.**
- Due to differing interpretation of the agreement by both sides, it failed to resolve the fishing rights issue, with Sri Lanka limiting Indian fishermen's access to activities such as resting, drying nets, and visiting the Catholic shrine without visa.

### CORINGA WILDLIFE SANCTUARY



- The Wildlife Institute of India-Dehradun is preparing to execute **India's first Fishing Cat Collaring Project at the Coringa Wildlife Sanctuary** in Andhra Pradesh.
- It is **part of the Godavari estuary**, where the **Coringa River (a tributary of the Godavari)** merges with the Bay of Bengal. **The Kakinada Port** is located at the mouth of the Coringa River.

- As a result, about 40% of the sanctuary consists of backwaters and the rest of the area is intermingled with creeks and gets inundated with tidal waters.
- It has extensive mangrove forests. It is the **third largest stretch of mangrove forests in India**, after the Sunderbans (West Bengal) and Pichavaram (Tamil Nadu) mangroves.
- It is home to rare and endangered mammals like Smooth Indian otter, Fishing cat, Jackal, etc. They also offer excellent habitat for birds like Black capped kingfisher, Brahminy kite, Sea gulls, etc. Its estuary is sometimes used as a **nesting site by the Olive Ridley Turtle**.
- **"Hope Island", located near the sanctuary**, marks the confluence of the Godavari and the Bay of Bengal.

#### About the Fishing Cat:



- Fishing cat (*Prionailurus viverrinus*) is a medium-sized wild cat. It is a **solitary and nocturnal predator**.
- It is known for its **exceptional swimming abilities**; it can cover

long distances in water while chasing fish.

- They primarily inhabit **wetlands and mangrove forests**.
- They are found in Sri Lanka, Bangladesh, Pakistan, India, China and Indonesia.
- **Conservation Status**
  - IUCN: Vulnerable
  - CITES: Appendix II
  - Wildlife Protection Act 1972: Schedule I

### DHANSIRI RIVER



- Environmental activists have flagged the alleged discharge of hazardous effluents by oil refineries into the Dhansiri River in Assam.
- It serves as a significant tributary of the Brahmaputra River.
- It originates from the **Laisang Peak in Nagaland** and travels approximately 352 kms from south to north before **merging with the Brahmaputra River on its southern bank**.
- As it forms the boundary between Karbi Anglong and Nagaland, the River passes via **Dhansiri Reserved Forest and Intanki National Park**.



- The riverbank is home to a variety of timber-yielding trees, particularly within the Intanki Forest region.
- The river is associated with numerous **perennially waterlogged swampy areas, locally known as bils.**
- Certain stretches of the Dhansiri are **highly polluted**, mostly near major cities in Assam. Pollution is also caused by **domestic waste and sewage** generated from Dimapur city in Nagaland.

## BANDIPUR TIGER RESERVE



- It is situated in the Mysore and Chamarajanagar revenue districts of **southern Karnataka.**
- It is located at the **tri-junction area** of the States of **Karnataka, Tamil Nadu and Kerala.**
- Geographically, it is an “**ecological confluence**” of the **Western and Eastern Ghats.**
- It was once a **hunting ground for the rulers** of the neighbouring kingdom of **Mysore.**
- It is part of the larger Nilgiri Biosphere Reserve, which is recognized as a UNESCO World Heritage Site.
- BTR is surrounded by:
  - **Nagarahole Tiger Reserve** (Tamil Nadu) in the North West (**Kabini Reservoir** separates the two).
  - **Mudumalai Tiger Reserve** (Tamil Nadu) in the South.
  - **Wayanad Wildlife Sanctuary** (Kerala) in the South West.
- **Rivers:** It is surrounded by **River Kabini** in its north and **River Moyar** in its south.
- **Climate:** Bandipur has a typical **tropical climate** with **distinct wet and dry seasons.**
- **Flora:**
  - It comprises diverse vegetation of **dry deciduous to tropical mixed deciduous.**
  - It includes **rosewood, Indian kino tree, sandalwood, Indian laurel, clumping bamboo and giant clumping bamboo** etc.
- **Fauna:**
  - It is a shelter for the **largest population of wild Asian elephants in South Asia.**



- It comprises other mammals such as **Bengal tiger, gaur, sloth bear, golden jackal, dhole** and four-horned antelope etc.

## DEMOCRATIC REPUBLIC OF CONGO



- Located in Central Africa, DRC is the **2nd largest country in Africa** and **11th largest in the world** by land area.
- It has a **25-mile (40-km) coastline** on the Atlantic Ocean.
- It shares borders with **nine countries**: Republic of the Congo, Central African Republic, South Sudan, Uganda, Rwanda, Burundi, Tanzania, Zambia, and Angola.
- **Capital: Kinshasa**, the largest city and economic hub, is situated on the **Congo River** (the only river in Africa that crosses the equator twice).

## PAMBAN BRIDGE



- The Pamban Bridge was commissioned on **February 24, 1914**, to improve connectivity between the mainland Tamil Nadu and Rameswaram Island.
- Over the years, it has become a key landmark in the region.
- **Strategic Importance**
  - **Sole Link:** For much of its history, the bridge was the only link between Rameswaram Island and the mainland, making it a crucial infrastructure piece for both transportation and economic activities.
  - **Pilgrimage Significance:** The bridge has played a pivotal role in facilitating the movement of **pilgrims traveling to the Rameswaram Temple**, a major religious site in Tamil Nadu.
  - **Humanitarian Role:** During the **Sri Lankan Civil War**, the bridge also served as an important route for refugees seeking asylum in

India, further emphasizing its strategic significance.

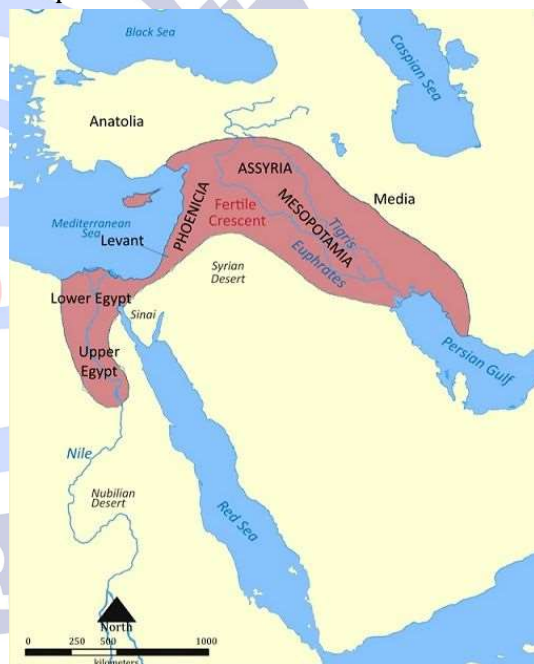
### Key Developments and Upgrades

- In recent years, the Pamban Rail Bridge has undergone significant upgrades to enhance its functionality and accommodate modern transportation needs:
- Vertical Lift Span: In 2025, a new vertical lift span was added, making the Pamban Bridge India's first vertical lift sea bridge. This feature allows the central span to lift, providing 22 meters of clearance for ships, an improvement from the previous 19 meters.
- Faster Train Operations: The upgraded bridge now supports double-line electrification, allowing for faster train operations between the mainland and Rameswaram Islands.

## MESOPOTAMIA

- Mesopotamia is located in the region now known as the Middle East, which includes parts of southwest Asia and lands around the eastern Mediterranean Sea.
- It is **part of the Fertile Crescent**, an area also known as the '**Cradle of Civilization**' for the number of innovations that arose from the early societies in this region, which are among some of the earliest known human civilizations on earth.
- The word "mesopotamia" is formed from the ancient words "**meso**," meaning between or in the middle of, and "**potamos**," meaning river.

- Situated in the fertile valleys **between the Tigris and Euphrates rivers**, the region is now home to modern-day **Iraq, Kuwait, Turkey, and Syria**.
- It was home to the ancient civilizations of **Sumer, Assyria, and Babylonia**.
- It was one of the first places where humans started practicing settled agriculture, and the earliest known writing system, **cuneiform**, originated there as well.
- For some three thousand years, Mesopotamia remained the preeminent force in the Near East.



### Decline:

- In 539 BC, however, Cyrus the Great captured Babylon and incorporated Mesopotamia into the **Persian Empire**.
- Periods of Greek and Parthian rule followed, and by about AD 100 Mesopotamian culture had effectively come to an end.

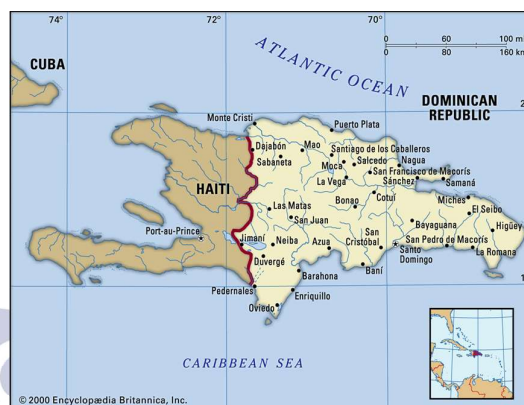
## MOUNT KANLAON



- It is a **stratovolcano** in the north-central part of the island of **Negros, Philippines**.
- It is one of the active volcanoes in the Philippines and part of the **Pacific Ring of Fire**.
- The volcano comprises a number of pyroclastic cones and craters.
- The summit of Canlaon contains a **broad, elongated northern caldera** with a **crater lake** and a smaller, but higher, historically active crater to the south.
- It is underlain by tropical volcanic materials composed of sheeted lava flows, lahar deposits, airfall tephra, and apron pyroclastic materials.
- It is biologically diverse; and home to a number of species of flora and fauna.
- The slopes are also headwater catchments of major river systems on the entire Negros Island.
- Historical eruptions, recorded since 1866, have typically consisted of phreatic explosions of small-to-

moderate size that produce minor ashfalls near the volcano.

## DOMINICAN REPUBLIC



- **Location:** It is a Caribbean nation that shares the island of Hispaniola with Haiti to the west.
- **Capital :** Santo Domingo
- It has the largest economy in the Caribbean and the seventh-largest in Latin America.
- The Dominican Republic is the most visited destination in the Caribbean.
- **Geographical Features:** Its terrain comprises rainforest, savannah and highlands. It is home to both the Caribbean's tallest mountain peak, Pico Duarte, and the Caribbean's largest lake and lowest point, Lake Enriquillo.
- The island has an average temperature of 26 °C and great climatic and biological diversity.



## MANDOVI RIVER



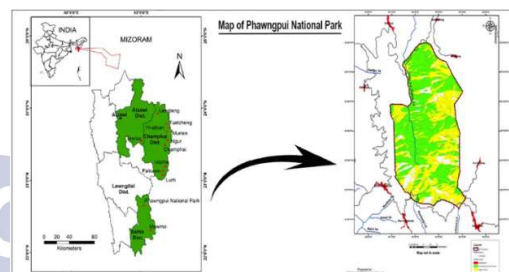
- The Mandovi River (also known as Mahadayi or Mhadei) is one of the main West Flowing Rivers of Goa State.
- Alongside the Zuari River, it is one of the two principal rivers in the state, playing a crucial role in its ecology and economy.
- **Origin:** It rises at Bhimgad in the Western Ghats of Belgavi district in **Karnataka state**.
- **River course:** It travels 35 km in Karnataka; 82 km in Goa and 1 km in Maharashtra before joining the Arabian Sea at Panji (North-Goa).
- **Tributaries:** Kalasa Nala, Banduri Nala, Surla Nala, Haltar Nala, Singar Nala, Doli Nala, Kotni Nala, Irti Nala, Bail Nadi, Pansheer Nala, Madhuhalla Nala.

### Other Details

- **Dudhsagar Falls and Vajrapoha Falls:** These prominent waterfalls are located on this river.
- **The Atal Setu (Third Mandovi Bridge),** inaugurated in 2019, is the **largest bridge** in Goa.

- The **Salim Ali Bird Sanctuary** is located on the **island of Chorao** in the Mandovi river.
- **National Waterway-68** is part of Mandovi River.

## PHAWNGPUI NATIONAL PARK



- Nearly one-ninth of **Mizoram's Phawngpui National Park** has **been affected by forest fires** that originated from a jhum (shifting) cultivation site in March 2025.
- It is also known as **Blue Mountain National Park** and is named after Phawngpui, the **highest peak in Mizoram**, which stands at an elevation of 2,157 meters.
- Phawngpui mountain holds great cultural significance for the Mizo people. It is considered a sacred peak and is believed to be the **abode of the guardian spirit of Mizoram**.
- It is **located in the Mizo Hills (Lushai Hills)** and is part of the larger **Patkai range**, which stretches across parts of northeastern India and Myanmar.
- It features **montane sub-tropical forests**, expansive **grasslands**, and **bamboo groves**, with Himalayan **oak** and Indian **pine** along the ridges.



- It is home to a variety of **flowering plants**, including orchids and rhododendrons.
- The park also shelters rare and endangered species such as the **leopard, clouded leopard** and many birds such as the **Blyth's tragopan, the mountain bamboo partridge**, and the **oriental pied hornbill**.
- The **Kaladan River** flows along the eastern side of Phawngpui National Park and forms the **international border between India and Myanmar**.



- Gabon is a country on the **Atlantic coast** of Central Africa.
- It is bordered by **Equatorial Guinea** and **Cameroon** to the north, the **Republic of Congo** to the east & south, and the **Gulf of Guinea** to the west.
- It has an area of 270,000 square kilometers and a population of 2.3 million people. **Libreville** is the country's capital and largest city.
- Gabon was **colonized by France** in the late 19<sup>th</sup> century. Since its independence in 1960, Gabon has

**struggled with maintaining stable, democratic rule.**

- In the 1990s, Gabon introduced a multi-party system & a constitution that aimed for a more transparent election and reformed govt. institutions. Despite this, **in 2023, the military overthrew the elected govt.** and Gabon has been under military rule ever since.
- Gabon is a **developing country**, ranking 123<sup>rd</sup> in the Human Development Index.
- It is **one of the wealthiest countries in Africa** in terms of per capita income, mostly due to its **large petroleum reserves and investor-friendly policies**. It has the fourth highest HDI and the fifth highest GDP per capita of any African nation. However, despite this, large parts of the population are still very poor.
- The official language of Gabon is **French**, and **Bantu ethnic groups** constitute around 95% of the country's population. **Christianity** is the predominant religion, practiced by 80% of the population.

## DARFUR REGION

### Geographical Details

- Located in **western Sudan**, bordering **Chad, Libya, and the Central African Republic**.
- Covers an area of about **493,180 sq. km**, nearly **the size of France**.



- Predominantly **arid and semi-arid**, with desert in the north and more fertile land in the south.
- Climate-driven **water and grazing conflicts**, worsened by **desertification and climate change**.
- Composed of **five states: North, South, West, Central, and East Darfur**.
- **El Fasher** is the capital and largest city, serving as an administrative and humanitarian hub.

#### About the Conflict

- It is a conflict-prone region in **western Sudan**, affected by **ethnic violence and resource conflicts** since 2003.
- Site of **one of the world's worst humanitarian crises**, with **mass killings and displacement**.
- Home to multiple **ethnic groups**, with tensions between **Arab pastoralists**

and **non-Arab farming communities**.

- **Janjaweed militias**, backed by the Sudanese government, accused of **genocide and mass atrocities**.
- **Rapid Support Forces (RSF)**, formerly Janjaweed, play a key role in ongoing instability.
- Renewed violence in **2023**, worsening the humanitarian situation.

#### ALGERIA



- It is a country in **North Africa** located in **Maghreb region**.
- **Maghreb region** comprises essentially the **Atlas Mountains** and the **coastal plain of Morocco, Algeria, Tunisia, and Libya**.
- Bounded by **Tunisia and Libya** (east); **Niger, Mali, and Mauritania** (south); **Morocco and Western Sahara** (west); and **Mediterranean Sea** (north).

## Geographical Features

- **Key Rivers:** Chelif River and Djedi River
- **Highest Point:** Mount Tahat
- **Climate:** Mediterranean climate, with warm, dry summers and mild, rainy winters.

## GANDHI SAGAR WILDLIFE SANCTUARY



- The Cheetah Project Steering Committee, under the National Tiger Conservation Authority, approved the relocation of some cheetahs from Kuno National Park to the Gandhi Sagar Wildlife Sanctuary.
- Gandhi Sagar Wildlife Sanctuary is **located in northwestern Madhya Pradesh**, bordering Rajasthan.
- It features a diverse ecosystem of **savanna, open grasslands, dry deciduous forests & riverine areas**, and is recognized as an Important Bird and Biodiversity Area (IBA).
  - It is part of the **Khathiar-Gir dry deciduous forests** region.
- The **Chambal River bifurcates it into two** parts, with the **Gandhi**

**Sagar Dam** situated within the sanctuary.

- The sanctuary's **resemblance to the Maasai Mara**, a protected area in Kenya known for its savannah, highlights its suitability for cheetahs.

## TUTI ISLAND

- **Location**– It is located at the confluence of the Blue and White Niles in Khartoum, Sudan.
- **Bordering urban centres**– It is surrounded by the “Three Towns”: Khartoum (Sudan’s capital), Omdurman (the country’s largest city), and Khartoum North (also called Bahri, a major industrial area).



### Significance:

- The island covers 8 square kilometres and was traditionally known for farming and fishing, earning it the nickname “Khartoum’s garden.”
- It is culturally important to the Mahas community, who settled there in the 15th century, making it a symbol

of local identity and sustainable living.

- Flood management system- Due to its location, Tuti has always been susceptible to floods. In response to increasing flood events, the community developed its own flood management system- The Taya system.
  - The HEART project (Heritage Empowered Action for Risk in Tuti) was launched to preserve the Taya system's knowledge.

## RED SEA



- Egypt announced its plans to develop a large-scale tourism sector in the Red Sea's fragile marine ecosystem.
- The **Red Sea** is a semi-enclosed, **inlet of the Indian Ocean**. It is the **world's northernmost tropical sea** and is also one of the busiest waterways.
- It is connected to the Arabian Sea to the south through the **Gulf of Aden** and the narrow strait of **Bab el Mandeb**.

- Its northern portion of is bifurcated by the **Sinai Peninsula** into the **Gulf of Aqaba** and the **Gulf of Suez**, where it is connected to the Mediterranean Sea via the famous **Suez Canal**.
- It is bordered by **Egypt** to the north and by **Sudan, Eritrea, and Djibouti** to the west. **Yemen and Saudi Arabia** border the Red Sea to the east. **Israel and Jordan** border the Red Sea via the Gulf of Aqaba.
- It is one of the world's warmest seas. It contains **some of the world's hottest and saltiest seawater**. No significant river drains into the Red Sea.
- Its name is derived from the **colour changes** observed in its waters.
  - Normally, the Red Sea is an intense blue-green; but occasionally, it is populated by extensive **blooms of algae**, which, upon dying off, turn the sea a reddish brown colour.

## DAL LAKE



- It is a **mid-altitude urban lake** located in **Srinagar, Jammu and Kashmir**.
- It is **surrounded by the Pir Panjal mountains**.



- It is integral to tourism and recreation in Kashmir and is named the **"Jewel in the crown of Kashmir" or "Srinagar's Jewel"**.
- It is also known as the **Lake of Flowers**.
- The **shoreline** of the lake, which is about 15.5 kilometres (9.6 mi), is **encompassed by a boulevard lined with Mughal-era gardens, parks, houseboats, and hotels**.
- It has an average depth of almost 5 ft and a maximum depth of 20 ft.
- It is **one of the world's largest natural lakes**.
- The lake covers an area of **18 sq.km.** and is **part of a natural wetland** which covers 21.1 sq.km., **including its floating gardens**.
- The **floating gardens, known as "Raad" in Kashmiri**, blossom with lotus flowers during July and August.
- The **wetland is divided by causeways into four basins; Gagribal, Lokut Dal, Bod Dal, and Nagin** (although Nagin is also considered an independent lake).
- **Lokut-dal and Bod-dal each have an island** in the centre, known as **Rup Lank** (or **Char Chinari**) and **Sona Lank, respectively**.
- Dal Lake is also popular for the **floating market** where vendors have their own Shikaras/wooden boats and approach tourists.

## TAPI RIVER

- The Tapi River, also known as the Tapti River, is one of the major rivers in central India.
- It is considered one of the **only three major rivers in India that flow from east to west**, the other two being the **Narmada and the Mahi rivers**.
- It covers a large area in the State of Maharashtra besides areas in the states of Madhya Pradesh and Gujarat.

### Course:

- **Origin:** It rises in the **Gawilgarh Hills** of the central Deccan plateau in south-central Madhya Pradesh state.
- It flows westward between two spurs of the Satpura Range, across the Jalgaon plateau region in Maharashtra state, and through the plain of Surat in Gujarat state to the **Gulf of Khambhat** (an inlet of the Arabian Sea).
- It has a total length of about 700 km. For the last 51 km it is tidal but is navigable by small vessels.
- It drains an area of 65,145 sq.km., which is nearly two percent of the total area of India.
- The basin lies in the states of **Maharashtra** (51,504 sq.km.), **Madhya Pradesh** (9,804 sq.km.) and **Gujarat** (3,837 sq.km.).
- Situated in the Deccan plateau, the basin is bounded by the **Satpura range on the north**, by the **Mahadev hills on the east**, by the **Ajanta Range and the Satmala hills on the**

south, and by the **Arabian Sea on the west.**

- The major part of the basin is covered with agriculture, accounting for 66.19% of the total area.
- The Tapi flows roughly parallel to the longer Narmada River to the north, from which it is separated by the main part of the Satpura Range.
- The two river valleys and the intervening range form the natural barrier between northern and peninsular India.
- The Tapi River's three major tributaries—the **Purna, Girna, and Panjhra**—flow from the south in Maharashtra state.
- **Ukai Dam:** A major hydroelectric project located on the Tapi River, providing water and electricity to surrounding areas.



## PEROVSKITE

- Perovskites are a class of materials that **share a similar structure** and which display a myriad of **exciting properties like superconductivity, magnetoresistance**, etc.



### Crystal Structure:

- It is a material that has the **same crystal structure as the mineral calcium titanium oxide (CaTiO<sub>3</sub>)**, the first-discovered perovskite crystal.
- It is characterized by a **three-dimensional arrangement of atoms.**
- It has the general formula ABX<sub>3</sub>, where "A" and "B" represent cations (positively charged ions) and "X" represents anions (negatively charged ions).
- **Discovery:** The mineral was **discovered in the Ural Mountains of Russia** by Gustav Rose in 1839 and is named after Russian mineralogist Lev Perovski.
- Due to its compositional flexibility, scientists can design perovskite crystals to have a wide variety of physical, optical, and electrical characteristics from insulating, semiconducting, metallic, and superconducting characteristics.

### Optical Properties:

- They are known for their **exceptional optical properties.**
- They can efficiently **absorb and emit light across a wide range of**

wavelengths, from visible to near-infrared.

- This property has made them a promising candidate for **solar cells and light-emitting devices**.

#### Applications:

- It includes uses in **sensors and catalyst electrodes**, certain types of **fuel cells, solar cells, lasers, memory devices and spintronics applications**.
- **Solar cells** are currently the **most prominent perovskite application**, as synthetic perovskites are recognized as potential inexpensive base materials for high-efficiency commercial photovoltaics.

## CLOUDBURST

**Context:** Jammu and Kashmir was left with a trail of destruction following cloudbursts and flash floods over the weekend.



#### About Cloudbursts:

- A cloudburst is a **sudden, intense rainstorm** that results in **more than 10 cm of rain in less than an hour** over a small area (approximately 10 km<sup>2</sup>).
- It can also be accompanied by hail and thunder. Cloudbursts are

**common in mountainous areas**, especially in the Himalayas.

- Due to their **localized nature**, cloudbursts are **hard to predict or detect** but can unleash sudden, devastating rainfall, leading to flash floods and landslides.

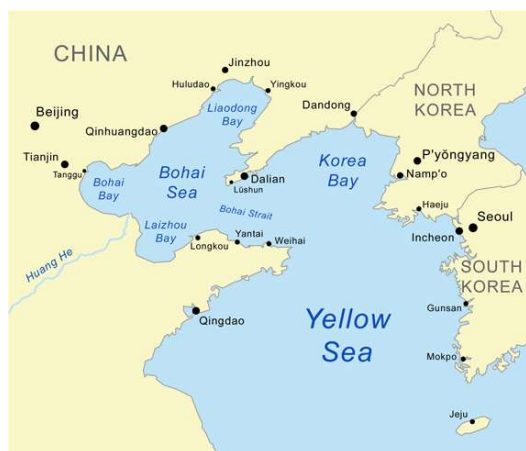
#### Causes:

- **Orographic Lifting:** It occurs when moist air is forced to rise over a mountain range.
- As the air ascends, it cools and condenses, resulting in heavy rainfall.
- Strong upward air currents can cause raindrops to grow larger before they fall. When these currents weaken, the accumulated raindrops fall suddenly, leading to intense rainfall.
- **Monsoon Dynamics:** In the Indian subcontinent, a cloudburst typically occurs when a monsoon cloud moves northwards from the Bay of Bengal or Arabian Sea, crosses the plains, and reaches the Himalayas, releasing rainfall of up to 75 millimeters per hour.
- **Examples:** Cloudbursts in Himachal Pradesh (2024) and Uttarakhand (2021) caused fatal floods, landslides, and extensive damage to infrastructure.

## YELLOW SEA

- Also referred to in China as Huang Hai and in North and South Korea as the West Sea, Yellow Sea is a **marginal sea of the Western Pacific Ocean**.
- It is positioned to the **north of the East China Sea**.





- It is bordered by **mainland China in the north and west** and by **North Korea and South Korea in the east**.
- The sea was named for the **yellowish sand particles originating from the Gobi Desert** that descend on the surface of the sea, thereby giving it a golden yellow color.
- It covers an area of approximately 400,000 sq.km.
- It measures about 960 km from north to south and some 700 km from its east to west.
- It is **relatively shallow** with an average depth of 180 to 394 feet (55 to 120 meters).
- The sea is **one of the world's largest portions of continental shelf submerged in water**.
- **Climate:** It is characterized by very cold, dry winters and wet, warm summers.
- **Major rivers** discharging directly into the Yellow Sea include the **Han, Yangtze, Datung, Yalu, Guang, and Sheyang**.
- **Islands:** The Yellow Sea is dotted with numerous islands, the largest of which include Jeju Island (South Korea), Shandong Peninsula islands

(China), and Ganghwa Island (South Korea).

- Leading port cities include Qingdao and Dalian in China, Incheon in South Korea, and Namp'o in North Korea.

## DAVIS STRAIT



- The Davis Strait is a large body of water located between **southeastern Baffin Island (Canada)** and **southwestern Greenland**, serving as part of the **Northwest Passage**.
  - The Northwest Passage is a sea route through the Arctic Archipelago of Canada, linking the Atlantic and Pacific Oceans.
- It separates the **Baffin Bay** (to the north) from the **Labrador Sea** (to the south), and it connects the **Atlantic Ocean and Arctic Ocean**.
- It is an important maritime route for shipping and trade. It is one of the **broadest straits in the world**. It stretches approx. 650 kms north to south and 200 to 400 miles wide.
- Named after **John Davis**, the English explorer who navigated the area in the late 16th century,



the Davis Strait plays a significant role in the **tectonic evolution of the Arctic region**.

- The Davis Strait is home to complex geological formations such as **underwater basins and ridges** that were created due to the strike-slip faulting along the **Ungava Fault Zone** around 45 to 62 million years ago.

## SYRIA



- Syria received its first wheat shipment since the ouster of former President Bashar al-Assad in Dec 2024, signalling efforts to rebuild its food security amidst economic recovery.
- Syria, officially known as the Syrian Arab Republic, is a country in West Asia in the **Eastern Mediterranean and the Levant region**.
- It is bounded by the **Mediterranean Sea** to the west, **Turkey** to the north, **Iraq** to the east, **Jordan** to the south, and **Israel and Lebanon** to the southwest.
- The capital and largest city is **Damascus**.

- Syria is home to **diverse ethnic and religious groups**, including the majority Arabs, Kurds, Turkmens, Assyrians, Circassians, Armenians, Albanians, Greeks, and Chechens.
- Religious groups include Muslims, Christians, Alawites, and Yazidis.
- The country has been **embroiled in a civil war since 2011**, which has resulted in one of the most violent and longest conflicts in the world.

## STRAIT OF GIBRALTAR



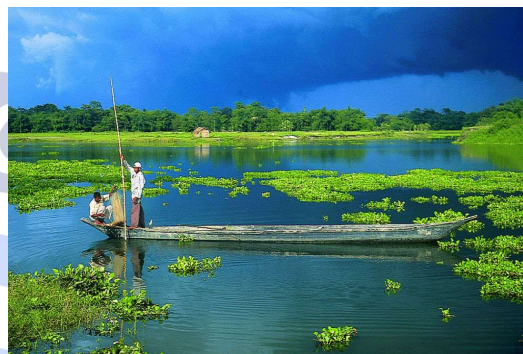
- It is the **body of water separating Europe from Africa and connects the Mediterranean Sea to the Atlantic Ocean**.
- **Bordering Countries:** The Strait is **bordered by Spain and the British Overseas Territory of Gibraltar** in the **north** and by the African country of **Morocco and the Spanish enclave of Ceuta** in the **south**.
- It is about 58 km long and has a width of about 13 km at its **narrowest point** between **Morocco's Point Cires and Spain's Point Marroquí**.

- The western end of the strait located between Spain's Cape Trafalgar and Morocco's Cape Spartel has a width of about 43 km.
- The strait's eastern end, located between the Rock of Gibraltar in the north and Mount Hacho or Jebel Moussa in the south, has a width of about 23 km.
  - These two land features in the strait's eastern extremity are known as the **Pillars of Heracles**.
- The Strait of Gibraltar's depth ranges from 300 to 900 m and it forms a significant gap between the high plateau of Spain and the Atlas Mountains of Northern Africa.
- **Formation:** Geological studies have revealed that the Strait was **formed due to the northward movement of the African Plate towards the European Plate**.
- **Waterflow:** The Atlantic Ocean and the Mediterranean Sea have different salinity levels, and therefore the **highly saline waters** from the **Mediterranean Sea flow outward and underneath the currents from the Atlantic Ocean**, whereas the **less saline Atlantic waters flow inward and on top of the Mediterranean Sea current**.
- It is the only natural link between the Atlantic Ocean and the Mediterranean Sea and is one of

the busiest waterways in the world.

- An **important port** located on the Strait of Gibraltar is the **Moroccan port of Tanger-Med, near Tangier**.

## MAJULI ISLAND



- Often called the **soul of Assam**, Majuli is the **world's largest river island**.
- It lies at the heart of **Assam**, spreading over an area of 421 sq. km.
- The island is **formed by the Brahmaputra River** in the south and the **Kherkutia Xuti, an anabranch of the Brahmaputra, joined by the Subansiri River** in the north.
- In 2016 it became the **first island to be made a district in India**.
- The island's landscape is characterised by lush greenery, water bodies, and paddy fields.
- The island has also been the **hub of Assamese neo-Vaishnavite culture**, initiated around the 16th century by the **great Assamese saint-reformer Srimanta**

### Sankerdeva and his disciple Madhavdeva.

- They initiated the **tradition of Satras** (monastic institutions), and these Satras have preserved **Sattriya dance**, literature, **bhaona (theatre)**, dance forms, mask making, and boat-making.
- **Most of the islanders** belong to **three tribes-Mishing, Deori, and Sonowal Kachari**, with the non-tribal Assamese comprising the rest.
- Apart from Satras or Vaishnavite monasteries, Majuli is **famous for mask-making** and has a tradition of **pottery making**.
- **Rice cultivation** is the **primary livelihood** for the residents of Majuli, with several **unique varieties** of rice, such as **Komal Saul and Bao Dhan**, grown in the region.

- It is a **landlocked country** in Southern Africa, predominantly inhabited by the **Tswana ethnic group**.
- It borders **South Africa, Namibia, and Zimbabwe**, and is **connected to Zambia via the Kazungula Bridge**.
- It is one of the **world's most sparsely populated countries**.
- **Tropic of Capricorn** passes through Botswana.
- **Kalahari Desert** covers more than 70% of Botswana.
- Major Rivers: Okavango, Limpopo, Zambezi.
- **Okavango Delta** in Botswana is Africa's largest endorheic delta (no outflow to ocean).
- Botswana is home to the world's **largest elephant population** and is a popular destination for safari tourism.
- Botswana is one of the largest producers of **diamonds** and it accounted for 20% of global production.

### BOTSWANA



### VATICAN CITY



- It is the **smallest sovereign country in the world**, covering about 44 hectares (110 acres).



- It is **landlocked within Rome**, Italy, and became independent from Italy with the signing of the **Lateran Treaty in 1929**.
- It is situated on the west bank of the **Tiber River**.
- **Religious centre**: It is the **seat of the Pope**, the spiritual leader of over a billion Catholics worldwide.
- **The Holy See**: It is the **central governing body** of the Church and Vatican City, presided over by the **Pope**.
  - It operates **independently**, with its own postal system, financial structure, and **no income tax**.
- The city is home to **Peter's Basilica, Vatican Museums, Sistine Chapel** with frescoes by **Michelangelo**.
- It was designated a **UNESCO World Heritage site in 1984**.
- It has been formed from **adjoining eruptive centres** with large collapse craters.
- Its **main crater** is about 1.5 km wide and 300 meters deep—**one of the largest active craters** in the world.
- **Since 1989**, it has markedly increased the **emission of gases causing acid rain phenomena** that have damaged the flora in some sectors of the Park and surrounding agricultural plantations to the area.
- **Throughout 2024**, the volcano's **crater lake has been drying up, triggering ash-producing eruptions** and releasing **increased gas levels**.
- **Small explosions** ejecting **rocks** have also occurred, and the drying process continues.

## POÁS VOLCANO

- Poás is one of **Costa Rica's most active volcanoes**.
- The volcano is located within the **Poas Volcano National Park**.
- It is a **composite stratovolcano** with an irregular complex form and a basal area of about 400 sq.km.
- It rises to 2,708 metres above sea level.



## SEA OF MARMARA

- A **powerful 6.2 magnitude earthquake** struck Istanbul with its epicentre in the Sea of Marmara.
- The Sea of Marmara is a small inland sea in **northwestern Turkey**, connecting the **Black Sea**



to the Aegean Sea through the Bosphorus and Dardanelles Straits, respectively.



million Kurds live in Turkey, Syria, Iraq and Iran.



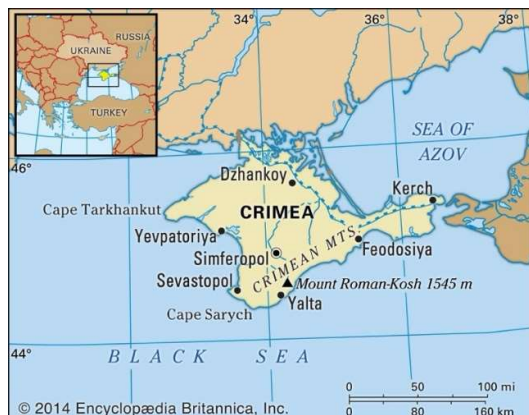
- It is an integral part of the **Turkish Straits System**, acting as a gateway between Asia and Europe.
- It lies **entirely within Turkey's borders** and separates European Turkey (Thrace) from Asian Turkey (Anatolia).
- The city of **Istanbul** lies on its shoreline.
- The sea was formed 2.5 million years ago due to tectonic shifts, lying directly above the **North Anatolian Fault Line** - a major seismic zone.
- Major Islands: Marmara Island (rich in marble), Prince Islands, Avşa, Imrali, and Paşalimani.

## KURDISTAN REGION

- The Kurdistan Region refers to **areas inhabited by ethnic Kurds**.
- The Kurds, a distinct ethnic and linguistic group, have long sought independence and greater autonomy. An estimated 25-30

- The Kurds are mostly **Sunni Muslim without any official homeland** and continue to seek recognition, political rights, autonomy or independence
- **Kurdish independence movement** is a nationalist aspiration for self-determination among the Kurdish people. This has led to tensions with govts in the region. It **faces opposition from Iraq, Turkey, Iran & Syria**, fearing territorial loss.
- Iraq rejected the **2017 Kurdistan independence referendum**, leading to military and economic retaliation.
- **Turkey continues to do military operations** against Kurdish groups, considering them a security threat.
- It has been alleged that Turkey indirectly helped ISIS against Kurds. **Kurdish forces (Peshmerga) have played a key role in fighting ISIS** and maintaining security in Iraq.

## CRIMEA



- **Location:** Located in **Eastern Europe**, Crimea is almost entirely surrounded by the **Black Sea** and the **Sea of Azov**.
- It connects to mainland Ukraine via the **Isthmus of Perekop** and to Russia via the Crimean Bridge over the **Kerch Strait**.
- **Borders:** Shares maritime proximity with Romania to the west and Turkey to the south across the Black Sea.
- **Historical Significance:** Known as the Tauric Peninsula in early modern history, it has been **under Russian occupation since 2014 after annexation**.

### Geological Features:

- **Mountains:** The Crimean Mountains dominate the southern region, with Ai-Petri being a notable peak.
- **Rivers:** Includes small rivers like Salhir and Alma.

**Coastal Features:** The Arabat Spit separates the Syvash lagoons from the Sea of Azov.

## AFGHAN BUDDHIST SITES

- The Taliban has recently changed their stance towards heritage conservation calling for preservation of Buddhist sites in Afghanistan.

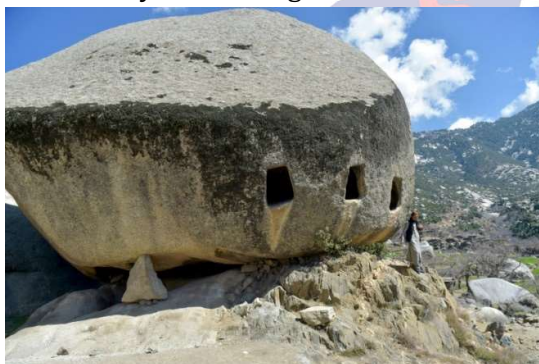
### Mes Aynak:

- Mes Aynak (in Logar province) is a major **Buddhist archaeological site** discovered in 1963.
- Occupied from the 1st century BC to the 10th century AD, it includes **monasteries, stupas, a Zoroastrian fire temple**, a mint, copper smelting workshops, and over 1,000 Buddhist statues, frescoes, and coins.
- Its art reflects **Hellenistic, Indian, Persian, and Chinese influences**.
- **Situated on the Silk Road**, it played a key role in spreading Buddhism from India to China.



### Shewaki Stupa:

- The **Shewaki Stupa of Kabul** is over 20 meters wide and is a major Buddhist-era monument from the 1<sup>st</sup> to 3<sup>rd</sup> centuries AD.
- It reflects both **Kushan and Hellenistic architectural styles** (influenced by Greek culture) and was built with fieldstones, mud, and plaster.
- The stupa, once a key religious and caravan site, was first excavated in 1820 by archaeologists.



- **Kushan-era Inscriptions:** In **Laghman Province**, archaeologists discovered 2,000-year-old Kushan-era rock niches, Brahmi inscriptions, and winemaking tools, highlighting the empire's vast reach from the Gobi Desert to the Ganga Valley.

### KUNO NATIONAL PARK



- It is located in the Morena and Sheopur districts in Madhya Pradesh.

- It is nestled near the Vindhyan Hills and covers an area of 750 sq.km.
- It derives its name from the **meandering Kuno River** (one of the main **tributaries of the Chambal River**) that graces the region.
- Initially established as a wildlife sanctuary, it was only in 2018 that the government changed its status into a national park.
- It was selected under 'Action Plan for Introduction of Cheetah in India'.
- **Vegetation:** Kuno is primarily a **grassland region**, though a few rocky outcrops are found here too.
- **Flora:** Kardhai, Salai, and Khair trees dominate the forested area of Kuno National Park, which is mostly mixed forest.
- **Fauna:** The protected area of the forest is home to the **jungle cat, Indian leopard, sloth bear, Indian wolf, striped hyena, golden jackal, Bengal fox, and dhole**, along with more than 120 bird species.
- Five cheetahs were released into the wild in Kuno National Park (KNP) in Madhya Pradesh's Sheopur district recently.

### MAHUADANR WOLF SANCTUARY

- Mahuadanr Wolf Sanctuary, located in the Latehar district of **Jharkhand**, is **India's first and only wolf sanctuary**, dedicated to the



conservation of the **Indian grey wolf** (*Canis lupus pallipes*).



- The sanctuary, spread over approximately 63 square kilometers, was **declared in 1976** specifically for the protection of the Indian wolf population.
- It is an integral part of the **Palamau Tiger Reserve**.
- The wildlife of the sanctuary includes species such as **spotted deer, wild boar, hyena, bear**, and notably, the **Indian wolf**.

#### Indian Grey Wolf

- The Indian grey wolf is a subspecies of the grey wolf found across Southwest Asia and the Indian subcontinent.
- It inhabits **scrublands, grasslands, and semi-arid agroecosystems** and thrives in warmer temperatures.
- Unlike other wolf subspecies, it lives in **smaller packs** and is less vocal, being **primarily nocturnal** and hunting from dusk to dawn.

#### Conservation Status:

- **IUCN Red List: Endangered** (Indian population estimated between 2,000–3,000 individuals).
- **CITES:** Listed in **Appendix I**, indicating the highest level of international protection.
- **Wildlife Protection Act, 1972:** Schedule I

## IRAN



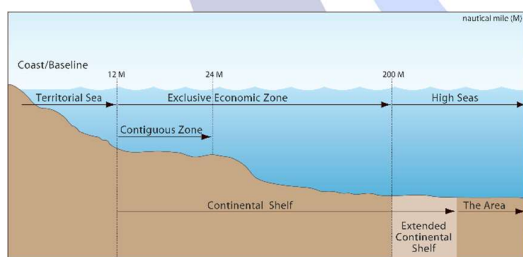
- A chemical blast at Iran's Bandar Abbas Port killed at least 18 people and injured >700, triggering concerns about industrial safety in Iran.
- Iran, officially the Islamic Republic of Iran, is a country in West Asia. It borders **Iraq** to the west; **Turkey** to the northwest; **Armenia, Azerbaijan** and **Turkmenistan** to the north & **Pakistan** and **Afghanistan** to the east.
- Iran shares maritime borders with **Caspian Sea** to the north, and **Gulf of Oman** and **Persian Gulf** to the south.
- **Tehran** is the nation's capital, largest city and financial centre.
- With a population of almost 90 million, Iran ranks **17th globally in both geographic size and population**. It is the 2nd-largest nation in West Asia, after Saudi Arabia.
- Iran is a founding member of the **UN, Non-Aligned Movement**, the **(Organization of Petroleum Exporting Countries)** and the



**Organisation of Islamic Cooperation (OIC).** It is also a member of both **SCO** (Shanghai Cooperation Organisation) and **BRICS**.

- Iran is a **unitary Islamic republic with a presidential system**, with ultimate authority vested in a **supreme leader**. The govt has got widespread criticism for its violations of human rights and civil liberties.
- Iran has the **world's 2<sup>nd</sup> largest natural gas supply** and the **3<sup>rd</sup> largest proven oil reserves**.
- It is a major regional power due to its location, military, cultural hegemony, **regional proxies ( Hamas, Hezbollah, Houthis, etc.)**, and role as the world's **focal point of Shia Islam**.

## EXTENDED CONTINENTAL SHELF (ECS)



- **India expanded its claim in the Central Arabian Sea by 10,000 km<sup>2</sup> as part of its 'extended continental shelf'**, modifying an earlier claim to resolve a dispute with Pakistan.
- ECS refers to the **area beyond 200 nautical miles that countries can claim** by submitting geological and geophysical evidence to the **UN Commission**

**on the Limits of the Continental Shelf (CLCS).**

- These claims allow countries to explore resources like oil, gas, and minerals on and beneath the seabed.
- Coastal states have rights to an Exclusive Economic Zone (EEZ) up to 200 nautical miles from their coastline. However, such States can claim additional seabed area beyond this limit if they **prove scientifically that the continental shelf extends naturally from their landmass**.



The Commission on the Limits of the Continental Shelf (CLCS) is a body under the UNCLOS (UN Convention on the Law of the Sea) that helps states determine the outer limits of their continental shelf beyond 200 nautical miles. It reviews data provided by states and makes binding recommendations on the extent of the outer shelf limits. The commission comprises 21 experts from geology, geophysics, and hydrography – thus ensuring legal compliance and peaceful boundary resolution

## UTURUNCU VOLCANO

- It is located in **southwestern Bolivia**, within the **Andes Mountains**.
- It is a **stratovolcano** dominated by dacitic lava domes and flows.
- **Elevation:** About 6,008 meters (19,711 feet) above sea level — it is the tallest mountain in the southern part of Bolivia.

- Uturuncu **last erupted 250,000 years ago**, yet is seismically active and lies at the centre of a 70 km diameter uplifted region.
- Uturuncu **sits above an enormous and extremely deep underground reservoir of magma** named the **Altiplano-Puna Magma Body (APMB)**, which stretches beneath southern Bolivia, northern Chile, and northern Argentina.
- Uturuncu is known as a **'zombie' volcano** because of its **ongoing but non-eruptive activity**.
- The zombie-like unrest of Uturuncu is due to the **movement of liquid and gas beneath the crater**, with a low likelihood of an imminent eruption.



# Government Schemes

## ATAL INNOVATION MISSION

**Context:** India's educational transformation has been aided by the Atal Innovation Mission.



### About Atal Innovation Mission (AIM):

- It is the **Union Govt's flagship initiative to promote a culture of innovation and entrepreneurship** in the country and was set up in 2016.
- Aim: To create/promote an ecosystem of innovation and entrepreneurship across India at **school, university, research institutions, MSME and industry levels**.
- All the initiatives of AIM are currently monitored and managed systematically using **real-time data systems and dynamic dashboards**.
- Implementing Agency: **NITI Aayog**
- AIM has multiple programs to encourage and support innovation in the country.
- **Atal Incubation Centers:** Fostering world class startups and adding a new dimension to the incubator model.
- **Atal New India Challenge:** Aims to seek, select, support and nurture innovations that solve sectoral challenges of national importance and societal relevance. It solicits innovations in the prototype stage and supports the selected start-ups through to the commercialization stage over a course of 12 - 18 months.
- **Mentor India Campaign:** A national mentor network in collaboration with the public sector, corporates, and institutions, to support all the initiatives of the mission.
- **Atal Community Innovation Center:** To stimulate community centric innovation and ideas in unserved & underserved regions of India, especially Tier 2 and Tier 3 cities.
- **Atal Research and Innovation for Small Enterprises (ARISE):** To stimulate innovation and research in the MSME industry.

### Major Initiatives under AIM:

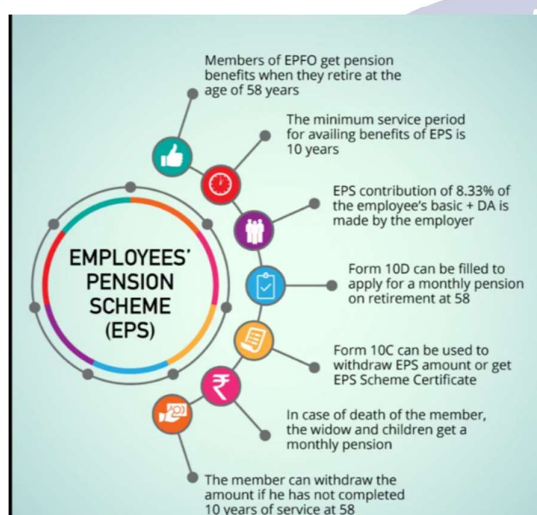
- **Atal Tinkering Labs (ATL):** State-of-the-art spaces established in schools with a goal to foster curiosity and innovation in young minds, between grade 6 to 12 across India through tools and technologies such as Internet of Things, 3D printing, rapid prototyping tools, robotics etc.



The 2nd Phase of the Atal New India Challenge (ANIC 2.0) was launched in 2022 and will see 18 challenges being thrown open across the following seven sectors: E-mobility, Road Transport, Space Sector, Sanitation Technology, Medical Devices, Waste Management, and Agriculture.

## EMPLOYEES' PENSION SCHEME

**Context:** The Parliamentary Standing Committee on Labour had recently recommended increasing the minimum pension of ₹1,000 paid by the Employees' Provident Fund Organisation (EPFO) under the Employees' Pension Scheme (EPS).



### About Employees' Pension Scheme:

- It was introduced in 1995 by the **Employees Provident Fund Organisation (EPFO)** under the **Ministry of Labour and Employment**.
- It provides **pension benefits to employees in the organized sector**.

### Aim:

- To provide pension benefits to employees in the organized sector.
- Ensures financial security for employees' post-retirement or in case of disability or death.

### Features:

- Employee and Employer Contribution:** Both contribute **12% of the salary** towards the EPF.
- Employer's Contribution:** 8.33% of the employer's contribution goes towards the pension fund.
- Union Government Contribution:** 1.16% of the employee's basic salary is contributed to the pension fund.
- Pension Fund Setup:** The fund is created by allocating **8.33% of the employer's contribution from the EPF corpus**.

### Eligibility Criteria:

- Applies to employees whose **basic salary exceeds ₹15,000 per month**.
- Employees who are members of the Employees' Provident Fund (EPF) and meet the contribution requirements are eligible for the scheme.

### Employees' Provident Fund Organisation (EPFO)

- ✓ It is a **statutory body** that came into existence under the **Employees' Provident Fund and Miscellaneous Provisions Act, of 1952**.
- ✓ The EPFO is under the administrative control of the **Ministry of Labour and Employment**.
- ✓ It is one of the world's largest organizations in terms of clientele and the volume of financial transactions undertaken by it.
- ✓ An establishment with a minimum of 20 employees is required to register with the EPFO and make provident fund contributions for eligible employees.



- A wage ceiling of 15,000 per month is set for the employees for mandatory availing of the benefits of the EPF Scheme.

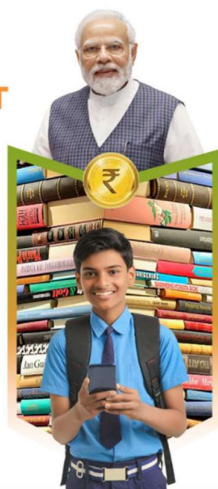
## BHARATIYA BHASHA PUSTAK SCHEME

**Context:** India's education transformation and decolonization as part of the NEP is being furthered by the Bharatiya Bhasha Pustak Scheme.



#VKSITBHARAT  
BUDGET2025

"We propose to implement a **Bharatiya Bhasha Pustak Scheme** to provide digital-form Indian language books for school and higher education. This aims to help students understand their subjects better."



### About Bharatiya Bhasha Pustak Scheme:

- It is a new initiative aimed at making learning more accessible by offering **digital textbooks and study materials in various Indian languages**.
- Under the Bharatiya Bhasha Pustak Scheme, **students** in schools and universities **will be able to access textbooks and learning resources in digital formats**.
- The scheme is designed to benefit students from different linguistic

backgrounds by providing study materials in regional languages.

- The initiative aims to bridge the gap in educational resources for students from diverse linguistic groups.

## VIBRANT VILLAGES PROGRAMME

**Context:** Union Cabinet approved Vibrant Villages Programme-II (VVP-II) with an outlay of ₹6,839 crore 2024-25 to 2028-29, covering border villages other than the ones already covered under VVP-I.



### About Vibrant Villages Programme (VVP):

- VVP is a **centrally sponsored scheme** announced in the **2022-23 Budget (to be implemented till 2025-26)** for the **development of villages on India's borders**, thus improving the quality of life of people living in identified border villages.
- It will cover the **Indo-China border**, along the states of Himachal Pradesh, Uttarakhand, Arunachal Pradesh, Sikkim and the UT of Ladakh.
- It will cover **2,963 villages** with 663 of them to be covered in the 1<sup>st</sup> phase.

- The scheme has been allocated **Rs. 4,800 crore** for 2023-24, 2024-25 and 2025-26. The amount allocated for road construction is Rs. 2,500 crore.
- Work is ongoing in order to provide **4G connectivity in these areas by Dec 2024**. Steps are being taken to ensure **financial inclusion in these villages** and India Post-Payment Banks (IPPB) are also being facilitated as part of the VVP Scheme.
- Tourist circuits will be developed in these villages to promote tourism. **Capacity building and tourism-related infra** are being developed in coordination with the Ministry of Tourism.
- **Vibrant Village Action Plans** will be created by the district administration with the help of Gram Panchayats.
- It will **not have any overlap with the BADP** (Border Area Development Programme) of MHA.
- Nodal agency: **Ministry of Home Affairs (MHA)**

#### Objectives of VVP:

- The scheme aids to **identify and develop the economic drivers** based on local, natural, human and other resources of the border villages on the northern border;
- **Development of growth centres on 'hub and spoke model'** through promotion of entrepreneurship and women and youth empowerment through skill development and entrepreneurship;

- **Leveraging full tourism potential** through promotion of local, cultural, traditional knowledge and heritage;
- **Development of sustainable eco-agri businesses** based on 'one village one product' through community-based organisations, cooperatives, NGOs.
- Focus Areas: **Road connectivity, drinking water, electricity** including solar & wind energy, **mobile and 4-G connectivity, and healthcare infra.**



In April 2023, the Union Govt. announced that the VVP will be integrated with the PM Gati Shakti mega project for infrastructure development.

## POSHAN ABHIYAN



#### About POSHAN Abhiyan

- **Ministry:** Union Ministry of Women and Child Development.
- **Nature:** Centrally Sponsored Scheme.
- **Objective:** **Improve nutritional status** of adolescent girls, pregnant women, lactating

mothers, and children from 0-6 years age.

- **Mission POSHAN 2.0:** Launched in 2021, it amalgamated various programmes with similar objectives such as **Supplementary Nutrition Programme** and **POSHAN Abhiyaan** under one umbrella.

#### Components:

- **Convergence:** The Abhiyaan is to ensure convergence of all nutrition related schemes of MWCD on the target population. The Abhiyaan will ensure convergence of various programmes.
- **ICDS-CAS:** Software based tracking of nutritional status will be done.
- **Behavioral change:** The Abhiyaan will be run as a Jan Andolan where mass involvement of people is desired. A community-based event will happen once a month to create awareness and address issues.
- **Incentives:** Front line workers will be given incentives for performance.
- **Training and Capacity Building:** Incremental Learning Approach will be adopted to teach 21 thematic modules. The training will be given by Master Trainers to front line workers.
- **Grievance Redressal:** A call centre will be set up for ease of access to solutions to any issues faced.

#### Funding pattern:

- **For States & UTs with a legislature:** 60:40 between Union and State/ UT Government.
- **For Northeastern (NER) & Himalayan States:** 90:10 between Union and State Government.
- **For UTs without a legislature:** 100% by Union Government.

### PM JAN AROGYA YOJANA

- PM-JAY is the world's largest health insurance scheme fully financed by the government.
- **Launched in 2018**, it offers a sum insured of **Rs.5 lakh per family** for secondary care and tertiary care.
- Health Benefit **Packages** covers **surgery, medical** and day care treatments, cost of medicines and diagnostics.

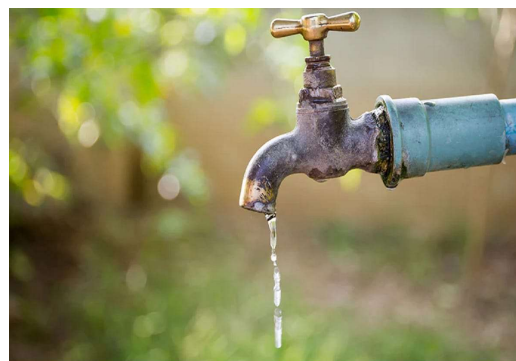


#### Beneficiaries:

- It is an entitlement-based scheme that targets the beneficiaries as identified by latest **Socio-Economic Caste Census (SECC)** data.



- The National Health Authority (NHA) has provided flexibility to States/UTs to use **non-Socio-Economic Caste Census (SECC)** beneficiary family databases with similar socio-economic profiles for tagging against the leftover (unauthenticated) SECC families.



#### Funding:

- The funding for the scheme is shared – **60:40 for all states and UTs** with their own legislature, 90:10 in Northeast states and Jammu and Kashmir, Himachal and Uttarakhand and 100% Central funding for UTs without legislature.

#### Nodal Agency:

- The **National Health Authority (NHA)** has been constituted as an autonomous entity under the Society Registration Act, 1860 for effective implementation of PM-JAY in alliance with state governments.
- The State Health Agency (SHA) is the apex body of the State Government responsible for the implementation of AB PM-JAY in the State.

### JAL JEEVAN MISSION

- National Rural Drinking Water Programme was restructured and subsumed in JJM.
- **Nodal Ministry:** Department of Drinking Water and Sanitation, Ministry of Jal Shakti.
- 

- **Type:** Centrally Sponsored Scheme.

#### Funding pattern between Centre and State:

- **90:10** for Himalayan (Uttarakhand, Himachal Pradesh) and North-Eastern States.
- **100%** for UTs.
- **50:50** for rest of the States.

#### Key Achievements under JJM

- **Over 12 crore families have gained access of piped drinking water** since 2019, up from **3.23 Crore** (Economic Survey 2024-25).
- **States achieved 100% coverage:** Arunachal Pradesh, Goa, Haryana, Himachal Pradesh, Gujarat, Punjab, Telangana and Mizoram.
- **UTs achieved 100% coverage:** Andaman & Nicobar Islands, Dadra Nagar Haveli & Daman Diu and Puducherry.



## eSANJEEVANI



- It is a **cloud-based integrated telemedicine solution** of the Ministry of Health and Family Welfare, Govt. of India.
- It is a telemedicine app that provides both doctor-to-doctor and doctor-to-patient telecommunication.
- It is being designed, developed, deployed, and maintained by The Centre for Development and Advanced Computing (C-DAC), Mohali.

### Two modules of eSanjeevani:

- **eSanjeevani AB-HWC:**
  - The **doctor-to-doctor telemedicine platform**, being implemented at all the **Health and Wellness Centres (HWCs)** in the country under the **Ayushman Bharat (AB) Scheme** of Government of India.
  - It **operates on a Hub-and-Spoke model** wherein the 'Ayushman Bharat-Health and Wellness

Centers' (HWCs) are set up at the state level, which is connected with the hub (comprising MBBS/ Specialty/Super-Specialty doctors) at the zonal level.

- It was rolled out in 2019.

- **eSanjeevani OPD:**

- It is the **Patient-to-Doctor remote consultation services** rolled out in 2020 amid the first lockdown imposed to fight the **Covid-19** pandemic, while the Outpatient Departments (OPDs) in the country were closed.

- It enables people to get **outpatient services** in the confines of their homes.

## PM MUDRA YOJANA

**Context:** April 8, 2025 marked the 10<sup>th</sup> anniversary of Pradhan Mantri MUDRA Yojana (PMMY), which was launched to fund micro and small enterprises and entrepreneurship.



### About PM Mudra Yojana (PMMY):

- The PMMY, launched in 2015, is a Central Sector Scheme designed to provide **financial support to non-corporate, small & micro-entrepreneurs** previously excluded from the formal financial system.
- MUDRA stands for **Micro Units Development & Refinance Agency Ltd.**, a financial institution created to support the development and refinancing of micro-enterprises.
- It aims to **foster grassroots entrepreneurship** and remove barriers to accessing loans, especially for businesses that lack collateral.
- It provides **collateral-free loans up to Rs. 20 lakhs** for small business enterprises. Loans are provided by **Scheduled Commercial Banks, Regional Rural Banks, NBFCs, and Micro Finance Institutions.**
- Loan can be used for income-generating activities in **trading, manufacturing, services sector, and agriculture/allied activities.**
- 3 loan products under PMMY:
  - **Shishu** (loans up to Rs. 50,000)
  - **Kishor** (Rs. 50,000 to Rs. 5 lakh)
  - **Tarun** (Rs. 5 lakh to Rs. 10 lakh)
    - **Tarun Plus:** Individuals who already got loans under Tarun

category & have **fully repaid them will be eligible for loans up to Rs. 20 lakh.**

### Steps Taken under PMMY:

- Provision for online applications through udyamimitra portal.
- Some Public Sector Banks (PSBs) have put end-to-end digital lending for automated sanctions under PMMY.
- Intensive publicity campaigns by PSBs for increased visibility of the scheme.
- Mudra Nodal Officers in PSBs.

### MUDRA 2.0 (launched in Union Budget 2024):

- It is an upgraded version of PMMY to **extend its outreach, particularly in rural and semi-urban areas.**
- It introduces services such as **financial literacy programs, business mentorship, and comprehensive business support** to improve the overall impact of the scheme.
- **Enhanced Credit Guarantee Scheme (ECGS)** is a new feature introduced to encourage more lending to small and microenterprises by reducing the risk for financial institutions.

### Achievements of PM Mudra Yojana:

- **Loan sanctioned:** Over ₹32.61 lakh crore disbursed through 52 crore loans, benefitting millions.
- **Inclusive growth:** 69% accounts under the scheme belong to

women entrepreneurs and 51% of accounts belong to SC/ST/OBC entrepreneurs.

- **Credit to budding entrepreneurs:** Approx. 21% of total loans have been sanctioned to New Entrepreneurs.
- **MSME Credit Growth:** Lending increased from ₹8.51 lakh crore in FY14 to ₹27.25 lakh crore in FY24.
- **International Recognition:** Praised by IMF for expanding financial access, especially for women-led businesses.
- **Employment Generation:** As per a survey by Ministry of Labour and Employment, PMMY helped generate >1 crore net additional employment from 2015 to 2018, out of which women accounted for 69 lakh (62%).

## PRADHAN MANTRI KRISHI SINCHAYEE YOJANA

**Context:** The Union cabinet approved Modernisation of Command Area Development and Water Management sub scheme under PMKSY.



### About PM Krishi Sinchayee Yojana:

- It was **launched in 2015** to **improve farm productivity** and ensure better

utilization of the resources in the country.

- **Nodal ministry:** Ministry of Jal Shakti

### Objectives:

- Convergence of **investment in irrigation** at the field level
- **Expand cultivable area under irrigation**
- Improve on-farm **water use efficiency** to reduce the wastage of water
- Enhance the adoption of being precise in irrigation and other water-saving technologies (more crop per drop)

### Components:

- It consists of **two major components** namely:
  - **Accelerated Irrigation Benefit Programme (AIBP)**
  - **Har Khet Ko Pani (HKKP):** It consists of four sub-components, being **Command Area Development & Water Management (CAD&WM)**, **Surface Minor Irrigation (SMI)**, **Repair, Renovation and Restoration (RRR)** of Water Bodies, and **Ground Water (GW) Development** component.
- **Per Drop More Crop (PDMC)** component is being implemented by the Department of Agriculture and Farmers Welfare.
- The **Watershed Development component (WDC)** is being implemented by the Department of Land Resources.

## INDIA SKILLS ACCELERATOR INITIATIVE

- It is a **national public-private collaboration platform** designed to enhance workforce development by addressing skill gaps and encouraging public-private partnerships.
- It focuses on **preparing India's youth for future job markets**, particularly in high-growth sectors such as artificial intelligence, robotics, and energy.
- Launched by: **Ministry of Skill Development and Entrepreneurship (MSDE)**, in collaboration with the **World Economic Forum (WEF)**
- **Aim:** The initiative aims to **close the skill gaps** through-
  - inclusive upskilling and reskilling
  - mobilizing investment in lifelong learning
  - fostering government-industry collaboration
- The Ministry will work towards **aligning** the newly launched initiative with insights from the **World Economic Forum's Future of Jobs 2025 report**.

## SWADESH DARSHAN SCHEME

अतुल्य भारत



Incredible India

SWADESH  
DARSHAN

- It was launched in 2015 by the **Ministry of Tourism**, Government of India, to develop sustainable and responsible tourism destinations in the country.
- It is **100% centrally funded scheme**.
- Under the scheme, the Ministry of Tourism provides financial assistance to State governments, Union Territory Administrations or Central Agencies for development of tourism infrastructure in the country.
- Operation & Maintenance (O&M) of the projects sanctioned under Swadesh Darshan Scheme is the responsibility of the respective State Government/UT Administration.
- **Swadesh Darshan 2.0:**
  - The Ministry of Tourism has revamped its Swadesh Darshan scheme as Swadesh Darshan 2.0 (SD2.0) for development of sustainable and responsible tourist destinations covering tourism and allied infrastructure, tourism



services, human capital development, destination management and promotion backed by policy and institutional reforms.

- The objective for the Swadesh Darshan 2.0 scheme envisage increase in private sector investment in tourism & hospitality.
- It may help in increasing Public Private Partnerships (PPP) in the field of tourism and operation and maintenance of the created assets under the scheme.

## UNIVERSAL IMMUNIZATION PROGRAMME (UIP)

**Context:** Union Govt. launched the Measles and Rubella Elimination Campaign 2025-26 during World Immunization Week (Apr 24-30), to eliminate measles & rubella by 2026.



### About Universal Immunization Programme (UIP):

- **Expanded Programme on Immunization** was launched in 1978. It was renamed as **UIP** in

**1985** when its reach was expanded beyond urban areas.

- In 1997 it was included in the ambit of **National Reproductive and Child Health Programme**.
- Since the launch of **National Rural Health Mission in 2005**, UIP has always been an integral part of it.
- UIP is one of the largest public health programmes targeting close to **2.67 crore newborns and 2.9 crore pregnant women annually**.
- Under UIP, immunization is provided **free of cost against 12 vaccine preventable diseases**:
- Nationally against 9 diseases - **Diphtheria, Pertussis, Tetanus, Polio, Measles, Rubella, severe form of Childhood Tuberculosis, Hepatitis B and Meningitis**.
- Sub-nationally against 3 diseases - **Rotavirus diarrhoea, Pneumococcal Pneumonia & Japanese Encephalitis**;
- A child is said to be fully immunized if child **receives all due vaccine as per national immunization schedule within 1st year age of child**.
- The two major milestones of UIP have been the **elimination of polio in 2014** and **maternal and neonatal tetanus elimination in 2015**.

### Mission Indradhanush (MI):

- **Launched in Dec 2014** and aims at increasing the full immunization **coverage of children to 90%**.

- Under this drive, **focus is given on pockets of low coverage and hard to reach areas** where the proportion of unvaccinated and partially vaccinated children is highest.
- A total of **six phases of Mission Indradhanush** have been completed covering 554 districts across the country.
- In 2017, the union govt introduced **Intensified Mission Indradhanush (IMI)** to significantly enhance the immunization campaign.
- Under IMI, **greater focus was given on urban areas which were one of the gaps** of Mission Indradhanush.
- It focused to **improve immunisation coverage in select districts and cities** to ensure full immunisation to more than 90%.



Phase 4 of IMI was launched in 2022 and aims to ensure that immunization services reach unvaccinated and partially vaccinated children and pregnant women. Children up to two years will be covered in this drive. It will be conducted in 416 districts across 33 States/UTs, which have been identified based on vaccination coverage as per the latest National Family Health Survey-5 (NFHS-5) report. Phase 4 of IMI aims to reverse the slowdown in rate of vaccination caused by CoVID pandemic.

## INDIAAI MISSION

**Context:** Bengaluru-based 'Sarvam AI' will become the first firm to

receive funding under the IndiaAI mission to develop a large language model (LLM).



### About IndiaAI Mission:

- The IndiaAI Mission will establish a comprehensive ecosystem catalysing AI innovation through strategic programmes and partnerships across the public and private sectors.
- Under this scheme, the government will allocate funds towards subsidising private companies looking to set up AI computing capacity in the country.
- **To be implemented by:** IndiaAI independent business division under Digital India Corporation.

### Key Features:

- **IndiaAI Compute Capacity:** Aims to build a high-end scalable AI computing ecosystem to cater to the demands of India's AI start-ups.
  - The ecosystem will comprise AI compute infrastructure of **10,000 or more Graphics Processing Units (GPUs)**, built through public-private partnerships.
  - Further, an AI marketplace will be designed to offer AI as a service and pre-trained models to AI innovators.

- It will act as a one-stop solution for resources critical for AI innovation.
- **IndiaAI Innovation Centre:** The IndiaAI Innovation Centre will undertake the development and deployment of indigenous **Large Multimodal Models (LMMs)** and domain-specific foundational models in critical sectors.
- **IndiaAI Datasets Platform:** The IndiaAI Datasets Platform will streamline access to quality non-personal datasets for AI Innovation.
- **IndiaAI Application Development Initiative:** It will promote AI applications in critical sectors for the problem statements sourced from Central Ministries, State Departments, and other institutions.
  - It aims at the adoption of impactful AI solutions with the potential for catalysing large-scale socio-economic transformation.
- **IndiaAI FutureSkills:** It is conceptualised to mitigate barriers to entry into AI programmes and will increase AI courses in undergraduate, Masters level, and Ph.D. programmes.
  - **Data and AI Labs** will also be set up.
- **IndiaAI Startup Financing:** The IndiaAI Startup Financing pillar is conceptualised to support and accelerate deep-tech AI startups and provide them with streamlined access to funding to enable futuristic AI projects.
- **Safe & Trusted AI:** For responsible development, deployment, and adoption of AI, the Safe & Trusted AI

pillar will enable implementation of responsible AI projects including the development of indigenous tools and frameworks, self-assessment checklists for innovators, and other guidelines and governance frameworks.

## SMILE SCHEME



- The **Support for Marginalized Individuals for Livelihood and Enterprise (SMILE)** scheme was launched in 2022 by the **Ministry of Social Justice and Empowerment**.
- It is a new scheme created after the **merger of existing schemes for Beggars and Transgenders**. It provides for the use of the existing **shelter homes** available with the State/UT Governments and Urban local bodies for **rehabilitation** of the persons engaged in the act of Begging.
- In case of non-availability of existing shelter homes, new dedicated shelter homes are to be set up.

- The focus of the scheme is on **rehabilitation, provision of medical facilities, counselling, education, basic documentation, and skilling.**
- It will be implemented with the support of States/UTs/Local Urban Bodies, NGOs, etc.
- Two years since the Union Govt. started identifying, surveying, and profiling people engaged in begging under the SMILE scheme, it has so far identified 9,958 such individuals across 81 major cities and towns. **Of the 9,958 persons identified, only 970 have been rehabilitated.**



According to the Census 2011, total number of beggars in India is 4,13,670 (2,21,673 males and 1,91,997 females) and the number has increased from the last census. West Bengal tops the chart followed by Uttar Pradesh and Bihar at number two and three.

## NATIONAL MISSION ON NATURAL FARMING

**Context:** The Union Govt. has come up with the guidelines for setting up of bio-input resource centres (BRC) under the National Mission on Natural Farming (NMNF).

### About Natural Farming:

- Natural farming is an agricultural practice that emphasizes **minimal intervention** and the **use of natural resources** to cultivate crops.
- It seeks to enhance soil health, biodiversity, and ecosystem balance

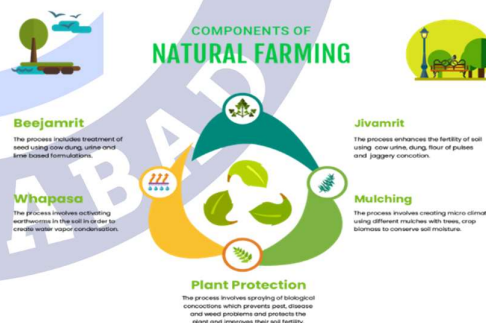
without relying on synthetic fertilisers, pesticides, or herbicides.

- It is largely based on **on-farm biomass recycling** with major stress on **biomass mulching, use of on-farm cow dung-urine formulations; maintaining soil aeration and exclusion of all synthetic chemical inputs.**

### Aims and Objectives:

- Preserve natural flora and fauna
- Restore soil health and fertility
- Maintain diversity in crop production
- Efficient utilization of land and natural resources
- Promote natural beneficial insects, animals, and microbes
- Promotion of local breeds for livestock integration
- Use of natural/local resources & inputs
- Reduce input cost for farmers
- Improve economics of farmers

### Components:



### About National Mission on Natural Farming (NMNF):

- It replaces the **Bhartiya Prakritik Krishi Paddhati (BPKP)**, which was launched in 2019 as a sub-mission under the **Paramparagat Krishi Vikas Yojna (PKVY)**.



- The PKVY is a part of the centrally-sponsored umbrella scheme of **National Mission for Sustainable Agriculture** (which is one of the eight missions under India's National Action Plan on Climate Change).
- The Union Govt. also promoted natural farming in a five-kilometer belt along the Ganga River under the Namami Gange scheme in 2022-23.
- The govt has now decided to **upscale the experience gained from the BPKP** through the NMNF.
- In the 2024 Budget, the Union Govt. announced a plan to **initiate one crore farmers** into natural farming in the **next two years**.
- An overall area of **22 lakh hectares** is presently under natural farming in India, with **34 lakh farmers engaged** in the practice. This includes 4 lakh hectares under BPKP and 88,000 hectares under Namami Gange. About **17 lakh hectares are covered under various state government initiatives** to promote natural farming.
- The NMNF mission aims to bring an **additional 7.5 lakh hectares** of area under natural farming.
- It has an outlay of Rs. 2,481 crores, of which the union govt will contribute Rs.1584 crore, till the **15th Finance Commission period (2025-26)**.
- Under NMNF, around **2000 Natural Farming Model Demonstration Farms** shall be

**established** at Krishi Vigyan Kendras (KVKs), Agricultural Universities (AUs) and farmers' fields, and shall be supported by experienced and trained **Farmer Master Trainers**.



Bio-Input Resource Centres (BRCs) are cluster-level enterprises aimed to support local production, availability and supply of ready-to-use bio-inputs for natural farming to farmers who may not be able to produce them individually. It is also envisaged as a centre to disseminate knowledge and experience to farmers who face challenges while transitioning to natural farming.

## UDAN SCHEME

**Context:** The UDAN Scheme recently commemorated its 8th anniversary, highlighting its role in making air travel accessible for the masses.



**UDAN  
SCHEME**

**About UDAN (Ude Desh ka Aam Naagrik) Scheme:**

- The scheme was launched by the **Ministry of Civil Aviation** for regional airport development and regional connectivity enhancement.

- It is a **part of the National Civil Aviation Policy 2016** and is applicable for a period of 10 years.
- Aim: Expand access to **air travel for Tier 2 & Tier 3 cities** and shift traffic pattern away from Metro routes.

#### Key Features:

- Under the scheme, airlines have to **cap airfares for 50% of the total seats at Rs. 2,500 per hour** of flight.
- This would be achieved through:
  - Financial stimulus/concessions from Central & State govts.
  - **Viability Gap Funding (VGF)** - A govt grant provided to bridge gap between cost of operations and expected revenue.
  - **Regional Connectivity Fund (RCF)** was created to meet VGF requirements of the scheme.

#### Phases of the Scheme:

- **Phase 1** was launched in 2017 to connect underserved and unserved airports in the country.
- **Phase 2** was launched in 2018 to expand air connectivity to more remote and inaccessible parts.
- **Phase 3** was launched in Nov 2018 to enhance air connectivity to hilly and remote regions of the country.
- **Phase 4** was launched in Dec 2019, with a focus on connecting islands and other remote areas of the country.

- **Phase 5** launched in April 2023 with a focus on Category-2 (20-80 seats) and Category-3 (>80 seats) aircrafts with no restriction on distance between origin and destination.

#### Achievements of the Scheme:

- The number of **operational airports has gone up to 141 from 74** in 2014.
- **68 underserved and unserved destinations** which include 58 Airports, 8 Heliports & 2 Water Aerodromes have been connected.
- **425 new routes** initiated, with air connectivity to 29 States/UTs.
- **More than 1 crore passengers** have availed the benefits of this scheme.

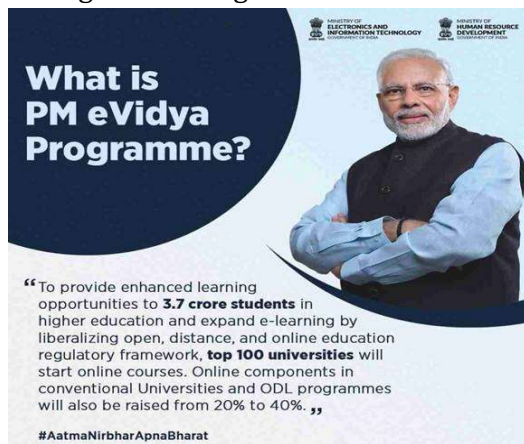
### PM E-VIDYA

**Context:** At the Uniting Academia, Industry and Innovators for Viksit Bharat (YUGM) conclave, PM Modi stated that PM e-Vidya and the DIKSHA platform has created a 'One Nation, One Digital Education Infrastructure'.

#### About PM e-Vidya:

- PM e-Vidya was launched as part of the **Atmanirbhar Bharat Abhiyaan** by the **Ministry of Education** on 17<sup>th</sup> May 2020.
- It is aimed at **bridging the digital divide** and ensuring inclusive, quality education for all learners across the nation.
- Through its diverse components, it provides the necessary tools for both

students and educators to adapt to a digital learning environment.



- It provides **multi-mode access to education through digital, online, and on-air platforms** to minimize learning losses.
  - It supports the vision of the **National Education Policy (NEP) 2020**, ensuring equitable and quality education across the country.
  - The initiative **leverages technology to make education accessible** to all students, including those in rural and remote areas, by providing a wide range of digital resources, courses, and interactive content.
- **SWAYAM (Study Webs of Active-Learning for Young Aspiring Minds):** A national **Massive Open Online Courses (MOOC)** platform offering **higher education courses with credit transfer** provisions.
  - It also offers school courses (9th–12th) via NIOS and NCERT. Currently, over 10,000 courses are available, with 4.1 lakh students enrolled for NCERT courses.
  - **Radio, Community Radio & CBSE Podcast - Shiksha Vani:** These platforms are used to broadcast educational content to a wider audience, especially in areas with limited internet access.
  - **e-Content for Teachers:** It provides various e-courses and digital resources for school and teacher education include interactive videos, audiobooks, and digital events like quizzes for teachers and students.

#### Components:

- **DIKSHA (Digital Infrastructure for School Education):** A national digital platform providing high-quality e-content, including **QR-coded Energized Textbooks** for all grades (one nation, one digital platform).
- **PM e-Vidya DTH TV Channels:** It had initially 12 DTH channels, now expanded to **200 channels**, providing supplementary education in multiple Indian languages for classes 1-12 across States/UTs.

# Reports and Indices

## DIGITAL THREAT REPORT 2024

**Context:** In a landmark initiative to strengthen cybersecurity resilience in the Banking, Financial Services, and Insurance (BFSI) sector, CERT-In (MeitY), CSIRT-Fin and SISA, a global Cybersecurity company, collaborated to launch the Digital Threat Report 2024 for the BFSI sector.



### About Digital Threat Report 2024:

- It is a report released by **SISA** (Strategic Information Services Agreement), a global cybersecurity company, in collaboration with the **Computer Emergency Response Team (CERT-In)** and CSIRT-Fin.
- It offers an in-depth analysis of the **growing cybersecurity risks in India's Banking, Financial Services, and Insurance (BFSI) sector.**
- Built on frontline threat intelligence and real-world incident data, the report outlines a unified view of the cyber threat landscape and the shifting dynamics of digital security

in an era of rapid technological transformation.

### Key Highlights of the Report:

- **Social Engineering on the Rise:** Business Email Compromise (BEC) and **phishing** attacks have become more precise and damaging, targeting BFSI institutions with tailored tactics that bypass traditional security barriers.
- **Supply Chain Vulnerabilities:** Breaches through **third-party vendors** and **open-source software** have introduced threats at scale, underlining the need for stricter vendor risk management.
- **Compliance Evolution:** Regulatory frameworks are moving toward harmonization, transforming compliance from a rigid obligation into a strategic tool that can drive growth, improve operations, and build cyber resilience.
- **Persistent Control Gaps:** Misconfigurations, over-privileged access, and weak access controls continue to plague even the most security-conscious organizations.
- **AI-Powered Threats:** With artificial intelligence being leveraged by both defenders and attackers, the report warns of a future dominated by highly personalized, large-scale cyber-attacks driven by AI technologies.



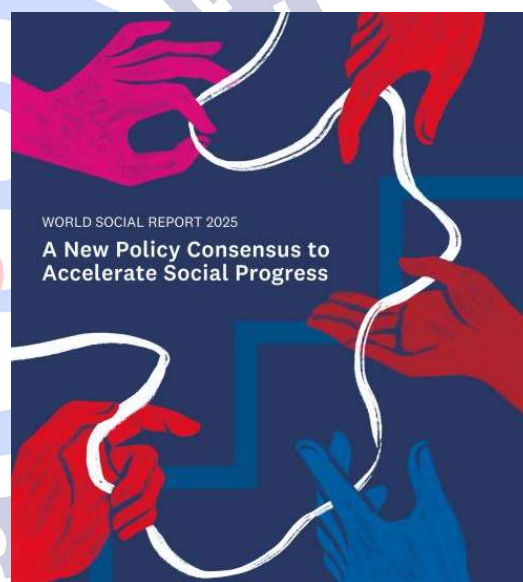
### CERT-In

- ✓ It is the **national nodal agency** for **responding to computer security incidents** as and when they occur.
- ✓ It is a functional organization of the **Ministry of Electronics & Information Technology**, with the objective of securing Indian cyberspace.
- ✓ CERT-In has been operational since January 2004.
- ✓ The **Information Technology (Amendment) Act 2008**, designated CERT-In to serve as the national agency to perform the following functions in the area of cybersecurity:
  - **Collection, analysis, and dissemination of information** on cyber incidents.
  - Forecasts and **alerts of cyber security incidents**
  - Emergency measures for handling cyber security incidents
  - Coordination of cyber incident response activities.
  - **Issue guidelines, advisories, vulnerability notes, and white papers** relating to information security practices, procedures, prevention, response, and reporting of cyber incidents.
- ✓ To perform these functions, CERT-In is empowered to call for information and issue directions to service providers, intermediaries, data centres, body corporates, and any other person.

- ✓ CERT-In **provides services** to organizations in the **Government, Public, and Private sectors**.
- ✓ In addition, CERT-In provides services to **individuals and home users** as well.

## WORLD SOCIAL REPORT

**Context:** The UN released the World Social Report 2025, highlighting the need for a global consensus on equity, economic security, and solidarity amid rising inequality & declining trust worldwide.



### Summary of World Social Report 2025:

- **Rising Economic Insecurity:** 60% of global population is in economic insecurity, with over 690 million people still in extreme poverty.
- **Persistent Inequality:** Despite poverty reduction gains, income inequality widened in two-thirds of countries; the richest 1% hold

more wealth than 95% of humanity.

- **Fragile Livelihoods:** Informal and precarious employment remains dominant, especially in Africa and South Asia, leading to unstable incomes and vulnerability.
- **Declining Institutional Trust:** >50% of people globally report low trust in govts – due to economic distress, misinformation & policy failures.
- **Climate and Conflict Impacts:** One in five people faced climate shocks and one in seven endured conflicts in 2024, reversing development gains.
- **Positive Trends:** Over 1 billion people lifted out of extreme poverty since 1995; with improvements in literacy, life expectancy, and access to services.
- **Policy Gaps Identified:** Weak social protection, unfair taxation, and underinvestment in public goods continue to widen the gap between rich and poor nations.
- **Call for a New Social Contract:** Urges building inclusive, equitable, and resilient societies through fair taxation, universal social protection, and renewed multilateralism

#### Positives in the Report:

- **Poverty Reduction:** >1 billion people exited extreme poverty since 1995.
- **Education & Health Gains:** Major improvements in global literacy, life expectancy, and well-being.
- **Social Inclusion Efforts:** Closing gaps related to ethnicity,

residence, and socio-economic status.

- **Multi-Inequality:** Clear recognition of interconnectedness of economic, social, and environmental factors.

#### Negatives in the Report:

- **Persistent Inequality:** Income inequality increased in two-thirds of countries despite economic growth.
- **Insecure Jobs:** 60% of workers globally fear job loss; informal and precarious employment dominate.
- **Trust in Institutions:** Institutional trust declined steadily since the late 1990s, especially among youth.
- **Digital Misinformation:** Echo chambers and digital polarization threaten social cohesion.
- **Fragile Progress:** Climate change and conflicts continue to reverse gains in poverty alleviation and equity.

## Terms in News

### TIGER TRIUMPH



- It is an **India-US Humanitarian Assistance and Disaster Relief (HADR) Exercise**.

#### Aim:

- To develop interoperability for conducting HADR operations.
- To formulate SOPs (Standard Operating Procedures) to establish a Combined Coordination Center for rapid and smooth coordination between Indian and US Joint Task Forces (JTF) during exercises, crises, and contingencies.
- Indian Armed forces, as well as the US Navy and Marine troops, will participate in various phases including joint command exercises and medical aid camps.
- **Other exercises between India and USA:** Yudh Abhyas, Vajra Prahar, Cope India

### STATES ECONOMIC FORUM PORTAL

- The **“NITI-NCAER States Economic Forum Portal”** is a comprehensive platform developed by **NITI Aayog** in and

the **National Council of Applied Economic Research (NCAER)**.



- It is a centralized repository of **data, research reports, and commentary on state-level finances** and social, economic, and fiscal parameters spanning from **1990-91 to 2022-23**.
- It aims to **facilitate evidence-based policymaking** by providing users with easy access to key trends and insights on state performance.

#### Features of the Portal:

- **State Reports:** Summarizes the macro and fiscal landscape of all 28 states. Structured around indicators on demography, economic structure, socio-economic & fiscal parameters.
- **Data Repository:** A comprehensive database categorized into 5 verticals: Demography; Economic Structure; Fiscal Data; Health; Education.
- **State Fiscal & Economic Dashboard:** Provides graphical representations of key economic variables over time; Includes summary tables and raw data for easy reference.

- **Research and Commentary:** Offers in-depth research reports and expert commentary on state finances, fiscal policy, financial management, etc. to support academic & policy research.

## UNDERSEA CABLE NETWORK

- They are **high-capacity optic fibre cables** laid on the **ocean floor** that play a crucial role in providing **global connectivity for high-speed data exchange**.
- Fiber optic cables that use **fast-traveling pulses of light** to transfer digital information. It relies on **total internal reflection** for their operation.
- Lasers on one end fire at **extremely rapid rates** down thin glass fibers to receptors at the other end of the cable.
  - These glass fibers are wrapped in **layers of plastic** (and sometimes steel wire) for protection.
- They provide **unlimited bandwidth and very low latency compared to satellite communication** which face risks from space weather, radiation, and debris.

## ACQUIRED IMMUNODEFICIENCY SYNDROME (AIDS)

- Acquired Immunodeficiency Syndrome (AIDS) is a chronic, potentially life-threatening

condition caused by the Human Immunodeficiency Virus (HIV).

- HIV attacks the body's immune system, making a person more vulnerable to other infections and diseases.
- If HIV is not treated, it can lead to AIDS.
- AIDS is the late stage of HIV infection that occurs when the body's immune system is badly damaged because of the virus.
- HIV attacks **CD4, a type of White Blood Cell (T cells)** in the body's immune system.
- T cells are those cells that move around the body detecting anomalies and infections in cells.
- After entering the body, **HIV multiplies itself and destroys CD4 cells**, thus severely damaging the human immune system. Once this virus enters the body, it can never be removed.
- The CD4 count of a person infected with HIV reduces significantly. In a healthy body, CD4 count is between 500- 1600, but in an infected body, it can go as low as 200.

### Transmission:

- It is a sexually transmitted infection (STI).
- It can also be spread by contact with infected blood, and from illicit injection drug use, or sharing needles.
- It can also be spread from mother to child during pregnancy, childbirth, or breastfeeding.



- Once HIV converts into AIDS then it may present in initial symptoms like **unexplained fatigue, fever, sores around genitals or neck, pneumonia etc.**
- It is estimated that **globally 39 million persons are living with HIV (Human Immunodeficiency Virus).**
- In India the figure is 2.4 million.

#### Treatment:

- There is currently **no** effective cure. Once people get HIV, they have it for life.
- But with proper medical care, HIV can be controlled. People with HIV who get effective HIV treatment (called antiretroviral therapy, or ART) can live long, healthy lives and protect their partners.

#### HIV and AIDS (Prevention and Control) Act, 2017:

- According to this act, the central and state governments shall take measures to prevent the spread of HIV or AIDS.
- India has made **Antiretroviral Therapy (ART)** affordable and accessible to over 90 per cent of people living with HIV in the world.
- World AIDs Day is observed every year on **December 1** to spread awareness about HIV/AIDS.

### KANNADIPAYA

- It is a **traditional craft from Kerala** that uses **reed bamboo** to weave

baskets, mats, and other daily use items.



- Kannadipaya, crafted by **Urali, Mannan, and Muthuvan** tribal communities (from the Idukki district), is made using **Teinostachyum wightii** (a species of bamboo), which the tribal people call 'njoonjiletta'.
- The mat has a **polished surface**, which is smooth and **reflects light like a mirror**. Hence, the name kannadipaya (kannadi meaning mirror and paya meaning mat).
- The mat — which usually measures 0.75-1.0 m × 2 m — is so flexible that it **can be rolled up** into a culm of bamboo less than 10 cm in diameter.
- It takes **more than a month** for a weaver to complete a kannadipaya.
- It is woven with a specific layer of slivers – the fourth or fifth, which can be made ultra-thin and shiny – split out of a reed bamboo species endemic to the region.
- The bamboo collection is a full-moon ritual, with each expedition to the forest and back extending to a day and night.

### HANSA 3 TRAINER AIRCRAFT

- It is India's **first indigenous flying trainer aircraft**.
- It was designed and developed by **CSIR-National Aerospace**

**Laboratories**, Bangalore, under the aegis of the Council of Scientific and Industrial Research (CSIR).



- It is designed to meet the Indian flying club's needs and it is an **ideal aircraft for Commercial Pilot Licensing (CPL)** due to its low cost and low fuel consumption.

#### Features:

- It is a **two-seater, low-wing aircraft**.
- It is powered by a Rotax Digital Control Engine with unique features like Just-In-Time Prepreg (JIPREG) Composite lightweight Airframe, Glass Cockpit, Bubble Canopy with wide panoramic view, electrically operated flaps etc.
- It has an **advanced electronic fuel injection system**, which controls the fuel and air mixtures electronically and provides optimum fuel air mixture at every altitude.

### DIAMOND IMPREST AUTHORIZATION (DIA) SCHEME

- Department of Commerce under the **Ministry of Commerce and Industry** has launched the Diamond Imprest Authorization (DIA) Scheme to **bolster the**

**global competitiveness of India's diamond sector.**

- It allows **duty-free import of natural cut and polished diamonds for export purposes**. It aims to retain India's leadership in the global diamond industry value chain by facilitating ease of doing business.
- It will be implemented starting April 1, 2025.

#### Features of the Scheme:

- **Duty-Free Import:** Duty-free import of natural cut and polished diamonds of less than  $\frac{1}{4}$  Carat (25 Cents).
- **Export Obligation:** Requires a minimum 10% value addition to ensure beneficiation.
- **Eligibility:** Exporters with annual exports of at least USD 15 million.
- **Support for MSMEs:** Provides a level playing field for smaller exporters, enabling them to compete globally.
- **Global Beneficiation Practices:** Inspired by beneficiation policies in diamond-mining countries like Botswana, Namibia, and Angola, where manufacturers must establish cutting and polishing facilities.

India processes over 90% of the world's diamonds and provides jobs to approx. 5 million people. India contributes 19% of total global diamond exports.

## CAPTCHA SYSTEM



- CAPTCHA stands for “Completely Automated Public Turing test to tell Computers and Humans Apart.”
- It is a human verification tool designed to distinguish between real users and automated bots.

### How CAPTCHA Works?

- Users are prompted to **solve puzzles**, like identifying distorted text or selecting images (e.g., traffic lights or cars).
- **reCAPTCHA**, introduced in 2009, used scanned words from books to aid in **digitization**.
- **Invisible reCAPTCHA (2014)** detects human presence using **mouse movement** and **user behaviour**

### Significance

- **Protects websites** from spam, fake registrations, and automated attacks.
- Adds a **security layer** to sensitive actions like logins, payments, and data recovery.
- Used in **online forms, comment sections, polls, and e-commerce** for human validation.

- Supported by major tech players, including **Google**, and deployed across thousands of platforms.

### Limitations

- **Accessibility issues** for people with visual or auditory impairments.
- Can be **frustrating** for users, especially on **mobile devices**.
- **Advanced bots** using AI and machine learning can **bypass** certain CAPTCHA systems.
- Adds an **extra verification step**, which may deter users or lower UX quality.

## HADEAN PROTOCRUST



- It refers to the early crust of the Earth that formed during the Hadean Eon (around 4.5 to 4 billion years ago).
- This is a crucial concept for understanding the Earth's early geological history, especially in the context of the origin of the planet and its early development.

### Key Points:



- **Hadean Eon** (4.6 to 4 billion years ago) – The period when the Earth was cooling and forming its initial crust after the formation of the planet.
- **Protocrust** – The first solid crust that formed as the planet cooled. It was likely made of lighter minerals, such as basaltic rocks, due to the high temperatures.

#### Nature of Hadean Crust:

- The **Hadean protocrust** was unstable and constantly reshaped due to intense volcanic activity, meteorite impacts, and a hot environment.
- It was likely **thin and fragile**, possibly disintegrating and reforming multiple times due to ongoing bombardment from space debris.

#### Significance:

- The Hadean protocrust is critical for understanding the development of the Earth's solid outer layer and the conditions that later allowed for the formation of continents.
- The study of this crust gives insights into the **early atmosphere, early oceans, and early geochemical processes** that led to the formation of life.

## DEFENCE SPACE AGENCY



- The **Defence Space Agency (DSA)** is a specialized agency of the Government of India responsible for **enhancing the country's capabilities in space** and ensuring the **security of India's space assets**.
- The Defence Space Agency was **officially formed in 2019** to consolidate and streamline India's defense efforts in space.
- It operates under the **Integrated Defence Staff (IDS)** of the **Ministry of Defence** and works closely with the **Indian Space Research Organisation (ISRO)**.
- The **primary objective** of the DSA is to ensure the effective **utilization of space technology for defense purposes** while safeguarding India's space assets from potential threats.
- It aims to **enhance situational awareness in space** and strengthen India's capabilities in space-based **intelligence, surveillance, and reconnaissance (ISR)**.

#### Functions of the Defence Space Agency:

- **Space Situational Awareness (SSA):** The DSA is responsible for **monitoring and tracking space objects**, including satellites, debris,



and potential threats to India's space assets.

- SSA enables the agency to predict collisions and respond to space hazards.
- **Counter-Space Capabilities:** As space becomes a contested domain, the DSA is entrusted with developing and operationalizing counter-space capabilities to protect India's space assets from adversarial actions.
- **Integration of Space Assets:** The DSA integrates various space-based assets, such as communication satellites, remote sensing satellites, and navigation systems, into defense operations to enhance situational awareness and operational effectiveness.
- **Coordination with ISRO:** Close collaboration with ISRO is a critical aspect of the DSA's functioning.
  - It works with ISRO to leverage its space expertise, launch capabilities, and satellite technologies for defense applications.

## DUMPING

- Dumping is said to occur when the **goods are exported by a country to another country at a price lower than the price it normally charges** in its own home market.
- This is an unfair trade practice which can have a distortive effect on international trade.

## INS VARSHA



- India is set to commission its new strategic naval base INS Varsha in coastal Andhra Pradesh.
- It is a **strategic submarine base designed to accommodate India's nuclear-powered submarines**, including both ballistic missile submarines (SSBNs) and nuclear-powered attack submarines (SSNs).
- It is located near the small coastal village of Rambilli in Andhra Pradesh, **50 kilometers away from Eastern Naval Command headquarters** in Visakhapatnam, Andhra Pradesh.
- The base will **enable Indian nuclear submarines to quietly slip into the Bay of Bengal** without being detected by spy satellites, allowing them to move towards the Malacca Strait and beyond for deterrent patrols.
- It features a **complex network of tunnels** specifically designed to house nuclear-powered submarines.
- It will offer **concealed access to the sea and protect critical assets from surveillance and potential attacks**.
- The design of the base **enhances India's second-strike capability**,

thus strengthening the underwater leg of its nuclear triad.

## LASHKAR E-TAIBA (LeT)



- **Lashkar-e-Taiba (LeT)** is a Pakistan-based Islamist terrorist organization founded in 1990 by Hafiz Saeed.
- Headquartered in Muridke, near **Lahore**, it seeks to **establish Islamic rule in South Asia** and primarily targets India, especially Jammu & Kashmir.
- LeT is responsible for several major attacks, including the **2001 Indian Parliament attack** and the 2008 **Mumbai attacks (26/11)**, which killed over 170 people.
- It operates through front organizations like **Jamaat-ud-Dawa (JuD)** and **Falah-i-Insaniyat Foundation** for fundraising and recruitment.
- India, the USA, the UN, and the EU have designated LeT as a terrorist group.
- Hafiz Saeed is a UN-listed global terrorist.
- LeT remains a key concern in India-Pakistan relations and internal security.

## BATECHOMON



- BatEchoMon (Bat Echolocation Monitoring) is an autonomous, AI-powered acoustic monitoring system that detects, analyses, and classifies bat echolocation calls in real-time.
- **Developed by:** Indian Institute for Human Settlements (IIHS), Bengaluru.
- **Objective:** To simplify and accelerate bat data processing, enabling deeper research into bat ecology and biodiversity with minimal manual intervention.

### Key Features

- **Real-time Acoustic Analysis:** Activates at sunset and uses a Raspberry Pi microprocessor to isolate and analyse bat calls.
- **Species Identification:** Employs convolutional neural networks (CNN) to match call structures with known bat species.
- **Visual Output:** Generates spectrograms and statistical activity data across species and time intervals.
- **Compact & Modular:** Housed in a 200×80×80 mm unit, with solar-powered battery backup (8-day

runtime) and WiFi for data transfer.

- **Low-Cost Innovation:** Costs less than a third of conventional international detectors.

## OPERATION CHAKRA V



- The CBI has arrested 4 people for **alleged involvement in 'Digital Arrests'** fraud. The arrests, made as part of '**Operation Chakra V**', followed searches at 12 locations across India.
- In digital arrest scams, **fraudsters make phone/video calls to targets, posing as police or officials from agencies** such as RBI, SEBI, TRAI, etc.
  - After they collect the personal info of potential victims, they create an atmosphere of fear by presenting themselves in probe agency uniforms and quoting legal provisions.
  - They put pressure on victims by claiming that they have been "digitally arrested" for some offence and **extort money from them for "releasing" them for their "custody"**.

- In his "**Mann Ki Baat**" address in **Oct 2024**, PM Modi had cautioned people against 'digital arrest' fraud and asked them to report such cases.

## LONG PERIOD AVERAGE (LPA)

- It is the **averages of rainfall received between 1951 and 2001**. This comes to **89 cm of rainfall**.
- This is the average rainfall recorded during June to Sept, calculated during the 50-year period, and is kept as a **benchmark while forecasting the quantitative rainfall for that region for a specific month or season**.
- The Indian Meteorological Dept. has prepared this value based on the data for the period of 50 years and is **updated periodically once every decade** by incorporating the latest data from rain gauge stations.
- There are 5 rainfall distribution categories on an all-India scale:
  - **Excess:** Rainfall is >110 % of LPA.
  - **Above Normal:** Rainfall is between 104 and 110 % of LPA.
  - **Normal:** Rainfall is between 96 and 104 % of LPA.
  - **Below Normal:** Rainfall is between 90 and 96 % of LPA.
  - **Deficient:** Rainfall is < 90 % of LPA.



### Why is LPA needed?

- Because **annual rainfall can vary greatly** not just from region to region and from month to month but also from year to year in a specific region or month, an LPA is needed to smooth out trends so that a reasonably accurate prediction can be made.
- 50-year LPA balances large variations **in either direction** caused by years of unusually high or low rainfall (as a result of El Nino or La Nina), periodic drought years, and increases in extreme weather events caused by climate change.

### EXERCISE DUSTLIK-VI



- The **6th edition of India-Uzbekistan Joint Military Exercise DUSTLIK-VI** recently commenced in Pune.
- It is an annual event conducted alternatively in India and Uzbekistan. The last edition was conducted in **Termez, Uzbekistan in April 2024**.
- Indian contingent of 60 personnel is being represented by the Jat Regiment and the Indian Air Force.
- The exercise will be based on the theme of **Joint Multi Domain Sub**

### Conventional operations in Semi-Urban Scenario.

- It will enable both sides to share best practices, thus aiding camaraderie & inter-operability between the armies as well as overall defence cooperation.

### PEN-PLUS APPROACH



- The WHO released a report on 20 African countries have expanded access to critical services for severe **non-communicable diseases (NCDs)** by adopting the PEN-Plus approach.
- PEN-Plus (**Package of Essential NCD Interventions Plus**) is an integrated healthcare model launched by the **African Union (AU)**, aimed at **managing severe and chronic NCDs at secondary-level health facilities**.
- It aims to **decentralize diagnosis and management of severe NCDs** like type-1 diabetes, rheumatic heart disease, sickle-cell disease, and severe hypertension. It will ensure access to care for people living in poverty.
- It seeks to **train nurses and doctors to deliver services** like diagnosis, treatment, symptom management, and psychosocial support.
- It also aims to **expand healthcare delivery** to secondary-level health



centers, close to rural and underserved communities.

## VEHICLE-TO-GRID (V2G) TECHNOLOGY



- V2G allows electric vehicles (EVs) to not only consume electricity from the grid but also to **return excess electricity to the grid when needed**.
- This bidirectional flow **allows EVs to serve as mobile energy storage units**. During peak demand periods, EVs can provide power back to the grid, acting as distributed energy resources. This can help power companies manage grid stability, balance load, and avoid the need for extra power generation.
- It enables load shifting, allowing EVs to **charge during periods of low electricity demand and discharge during peak demand**. This helps optimize energy consumption and reduces stress on the grid.
- EVs with V2G capabilities can provide ancillary services to the grid, such as **frequency regulation, voltage support, and grid stabilization**.
- It relies on advanced communication technologies to enable smart charging &

discharging. This needs **bi-directional communication** between the vehicle, **charging infrastructure**, and the grid to optimize energy flow.

- It can aid grid resilience by providing **backup power during grid outages**. In emergencies or power failures, V2G equipped EVs can supply stored electricity to critical infra or homes.

## PLASTIC ICE VII



- Plastic Ice VII is a **hybrid phase of water that displays the dual characteristics of both a solid and a liquid**:
- Like a crystalline solid, the water molecules remain in fixed positions within a cubic crystal lattice.
- Simultaneously, these molecules can rotate freely, similar to the behavior of molecules in a liquid.
- This unique plasticity means the ice can deform under pressure like a malleable substance, making it fundamentally different from conventional ice types found on Earth.
- The term "plastic" refers not to synthetic materials but to its physical property of plasticity—the ability to mold or deform

under pressure while still maintaining a solid structure.

- Physicist Livia Bove, one of the lead researchers, describes it as a solid that can be squeezed through a hole, highlighting its semi-fluid behavior under stress.

## Q-SHIELD PLATFORM

- It is a **comprehensive cryptography management platform** designed to secure critical infrastructure against future quantum threats.
- **Developed by:** QNu Labs, incubated at IIT Madras Research Park (2016) and one of the startups selected by the Department of Science and Technology (DST) under the National Quantum Mission (NQM)

### Purpose and features of Q-Shield Platform

- **Purpose:** Q-Shield is designed to **secure critical enterprise infrastructure** using advanced quantum technologies.
- These tools **aim** to defend digital assets against rising cyber threats, especially in critical sectors like defense, finance, healthcare, and infrastructure.
- The platform offers seamless cryptography management across multiple environments

— cloud, on-premises, and hybrid systems.

- Q-Shield covers a wide range of security services including:
  - Connect Service
  - Collaboration Service
  - File Storage and Sharing
  - Key Management
  - Quantum Entropy Generation

## STELLAR MODEL

- It is a next-gen software tool for **integrated planning of power generation, transmission, storage, and demand response.**
- It is developed in line with Resource Adequacy Guidelines issued by the Ministry of Power in June 2023.
- **Launched by:** Central Electricity Authority
- **Collaborating Partners:** The Lantau Group (TLG) and Asian Development Bank (ADB) under its Technical Assistance Programme
- This software will be provided **free of cost** to all **State Distribution Companies (Discoms)** and **Load Despatch Centres (LDCs).**

### Key Features of STELLAR

- **Chronological Power System Modelling–** Simulates real-time grid operations,

considering load flow, ramp rates, and unit-level constraints.

- **Integrated Resource Planning**– Simultaneously models generation, transmission, storage, and demand-side expansion up to FY 2034–35.
- **Endogenous Demand Response**– Includes consumer flexibility in electricity usage to optimize load and system cost.
- **Ancillary Services Optimization**– Plans for essential grid services like frequency control and reserves to maintain stability.

#### Benefits:

- **Ensures optimal resource adequacy** – Avoiding both power shortages and overcapacity.
- **Supports zero load shedding** and removes the need for stressed capacity.
- **Promotes least-cost planning** for efficient and affordable operations.
- **Identifies optimal storage size and location**, crucial for renewable energy integration.

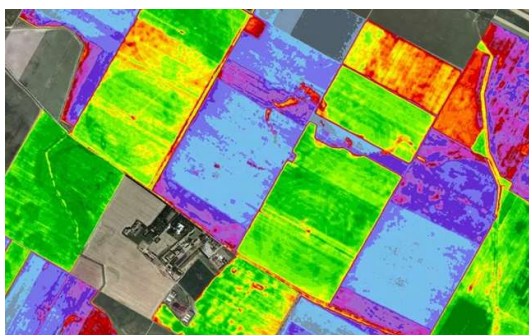
## EXERCISE DESERT FLAG X



- Exercise Desert Flag is an **annual multinational warfare exercise hosted by the UAE Air Force**. The 10<sup>th</sup> edition of the Exercise is currently taking place in UAE.
- It aims to provide **operational exposure to the participating forces** while training them to undertake simulated air combat operations in a controlled environment.
- The IAF would be participating with five Light Combat Aircraft, LCA Tejas and two C-17 Globemaster III aircraft.
- It features participation from UAE, India, Australia, Bahrain, France, Germany, Qatar, Saudi Arabia, South Korea, Turkey, the UK and the USA.
- The exercise aims to **simulate complex aerial combat scenarios**. It allows for operational knowledge exchange and **sharing of best practices**.

among the world's leading air forces.

## COMPREHENSIVE REMOTE SENSING OBSERVATION ON CROP PROGRESS (CROP)



- ISRO's satellites, under the CROP framework, have **forecasted India's wheat production** at 122.724 million tonnes across 8 major wheat-growing States for the Rabi season 2024-25.
- CROP is a **semi-automated, scalable remote sensing framework** that **monitors crop sowing, growth, and harvesting stages** in near real-time.
- It was developed by National Remote Sensing Centre (NRSC), under ISRO.
- It aims to enable **systematic, timely, & scalable monitoring of crops** using satellite data. It will provide accurate crop condition assessments, thus aiding early agricultural planning and food security strategies.

### Features:

- **Satellites:** Utilizes Synthetic Aperture Radar (SAR) data from satellites like EOS-04 (RISAT-1A),

EOS-06 (Oceansat-3), and Resourcesat-2A.

- **Crop Simulation Models:** Integrates sowing dates, crop area, and in-season condition using 5 km<sup>2</sup> resolution.
- **Multi-Source Data Fusion:** Enhances estimation precision by combining optical and radar observations.

## MISSION MAUSAM

- Launched by Indian Meteorological Department, It aims to **boost India's weather- and climate-related science, research, and services** and make India a 'Weather-ready and Climate-smart' nation.
- The ambitious programme, with an outlay of Rs 2,000 crore over two years, will chiefly be **implemented by the India Meteorological Department, the Indian Institute of Tropical Meteorology, and the National Centre for Medium-Range Weather Forecasting.**
- It will enhance forecasting accuracy, provide near real-time local weather forecasts and research the development of weather management technologies.
- The mission aims to achieve this by developing cutting-edge weather surveillance technologies and systems, implementing high-resolution atmospheric observations, next-generation



radars and satellites, and high-performance computers.

- By leveraging these technologies, the program **aims to refine data collection** and analysis to improve the spatial and temporal accuracy of forecasting and to help address the challenges posed by climate change.
- It will also focus on improving the understanding of weather and climate processes, and **provide air quality data** that will help strategise weather management and intervention in the long run.
- It will help to better equip stakeholders, including citizens and last-mile users, in tackling extreme weather events and the impacts of climate change.

## DHRUV HELICOPTERS



- Advanced Light Helicopter (ALH) Dhruv is a **multi-role and multi-mission light utility helicopter** in the 5.5-ton weight class, intended for both **military and civil operators**.
- It is **developed indigenously by Hindustan Aeronautics Limited (HAL)**.
- The ALH choppers are **operated by all three Indian defense**

**forces, including the Army, Navy, and Air Force, along with the Indian Coast Guard.**

- The **major variants** of Dhruv are classified as **Dhruv Mk-I, Mk-II, Mk-III & Mk-IV**.
- **The Mk-IV version** of the HAL ALG Dhruv helicopter is **the Armed variant for Attack**, Close Air Support, and High altitude operations.

### • Features of Dhruv Mk-IV:

- It is also called **ALH Rudra** and can carry a **20 mm Turret Gun, 70 mm Rocket, and Air to Air missiles**.
- It has a **twin-engine configuration** allowing continued flight virtually throughout the flight envelope.
- It has a **maximum take-off weight of 5800 kg** and a **range of 590 km**.
- ALH Mk-IV has a **rigid rotor design** making it **aggressively maneuverable** in the air.
- It has a dedicated **Electronic Warfare suite for self-protection**.
- Its **countermeasures suite** can include **radar and missile detectors, infrared jammers, chaff, and flare dispensers**.

## AKSHVI PLATFORM



- **Akshvi (Aapda Kshati Vivaran)** is an e-digital wallet developed by **SEEDS India** (Sustainable Environment & Ecological Development Society - India), an NGO, aimed at **assisting in disaster relief and improving the accuracy of loss reporting**.
- The platform allows people to **self-report economic and non-economic losses** during climate-induced events.
- It bridges the data gap in disaster reporting and enhancing relief distribution and climate resilience.

### Key Features of Akshvi:

- **Self-Reporting Mechanism:** Enables affected communities to log their losses during disasters, ensuring accurate and timely assessments.
- **Localized Data Collection:** Collects hyperlocal data, which can help tailor disaster management strategies and relief efforts to the specific needs of affected communities.
- **WhatsApp Chatbot:** For tech-savvy users to log data.

- **Assisted Data Entry:** Available for those needing help with data entry.
- **Traceability:** Tracks the progress of relief, ensuring that aid reaches the affected households transparently.
- **Integration with Govt Schemes:** Its data links to social welfare schemes and index-based insurance programs, improving disaster response efforts.

## CHLORPYRIFOS



- Policymakers and scientists are set to gather in Geneva for the Conferences of the Parties to the **Basel, Rotterdam, and Stockholm (BRS) Conventions**.
- Many environmental NGOs will **advocate for a global ban on Chlorpyrifos**, a pesticide still in use despite its ban in >40 countries.
- Chlorpyrifos is an **organophosphate pesticide** used to control insects, fungi, and weeds on crops like corn, soybeans, and fruits, as well as

non-crop areas like turf and buildings.

- It **disrupts the nervous system of pests by inhibiting the production of acetylcholinesterase**, an enzyme critical for nerve function, causing paralysis and death in pests. Despite its ban in over 40 countries due to its health risks, it continues to be used in many countries.
- **Chlorpyrifos is not entirely banned in India.** It is strictly regulated under the **Insecticides Act of 1968** and its use is permitted for certain crops such as rice, cotton, groundnut, and onion.

#### About BRS Conventions:

- ✓ The **Basel, Rotterdam, & Stockholm (BRS) Conventions** are multilateral agreements to **protect human health and the environment from hazardous chemicals and wastes**. The Conference of Parties (COP) to these treaties are held together.
- ✓ The **Basel Convention aims to reduce transboundary movements of hazardous waste** from developed to less developed countries & ensure their safe disposal as closely as possible to the source of generation.
- ✓ The **Rotterdam Convention covers pesticides & industrial chemicals that have been banned/restricted** for health and environmental reasons by Parties and which have been

notified for inclusion in **Prior Informed Consent (PIC)** procedure.

- ✓ The **Stockholm Convention aims to protect human health and the environment from persistent organic pollutants (POPs)**. POPs are chemicals that remain intact in the environment for long periods, get widely distributed, accumulate in the fatty tissue of living organisms and are toxic to humans & wildlife.

#### LANJIA SAORA TRIBE

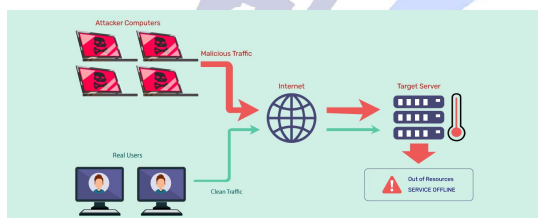


- The Lanjia Saora, a culturally rich and isolated **subgroup of the Saora tribe**, inhabit the forested hills of **Gajapati and Rayagada districts in Odisha**.
- They speak **Saora**, a **Mundari language** of the Austroasiatic family.
- They are one of the oldest tribes of Odisha, mentioned in the **Ramayana and Mahabharata**, and also found in parts of Andhra Pradesh, Jharkhand, Madhya Pradesh, and Assam.
- Saoras follow an ingrained and intricate religion, **having faith in and worshipping a number of gods and spirits**, who they

believe to control their day-to-day lives. Their unique cultural identity includes ritual art and **traditional tattoos (Tantangbo)**.

- The Saoras can be divided broadly into two economic classes:
  - **Plains (Sudha Saora)** - depend on settled agriculture and selling minor forest produce.
  - **Hills (Lanjia Saora)** - practice shifting and terraced cultivation on the hill slopes.

## DISTRIBUTED DENIAL OF SERVICE ATTACK (DDoS)



- Unlike other kinds of cyberattacks, DDoS assaults **do not attempt to breach your security perimeter**.
  - Rather, a DDoS attack aims to make your website and servers unavailable to legitimate users.
  - DDoS can also be used as a **smoke screen for other malicious activities** and to take down security appliances, breaching the target's security perimeter.
- How does a DDoS attack work?**
- DDoS attacks are carried out with networks of Internet-connected machines.
  - These networks consist of computers and other devices (such as IoT devices) which have been infected with malware, allowing them to be controlled remotely by an attacker.
  - These individual devices are referred to as **bots (or zombies)**, and a group of bots is called a **botnet**.
  - Once a botnet has been established, the attacker is able to direct an attack by sending remote instructions to each bot.
  - When a victim's server or network is targeted by the botnet, each bot sends requests to the target's IP address, potentially **causing the server or network to become overwhelmed**, resulting in a denial of service to normal traffic.
  - Because **each bot is a legitimate Internet device**, separating the attack traffic from normal traffic can be difficult.
- A DDoS attack is a **malicious attempt to disrupt the normal traffic of a targeted server, service, or network by overwhelming the target or its surrounding infrastructure with a flood of Internet traffic**.
  - It is a **cybercrime to prevent users from accessing connected online services** and sites.
  - DDoS attacks achieve effectiveness by utilizing **multiple compromised computer systems as sources** of attack traffic.
  - Exploited machines can include computers and other networked resources, such as IoT devices.