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## PREFACE

### Current Affairs UPSC CSE Prelims 2025

This high-quality monthly compilation of Current Affairs for Civil Services Exam Prelims 2025 is designed to help Civil Services Exam aspirants by:

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# POLITY

## 1. Arbitration and Conciliation Act, 1996

**Context:** The Supreme Court of India, in a majority 4:1 judgment, ruled that courts have the limited power to modify arbitral awards under Section 34 of the Arbitration and Conciliation Act, 1996.

### Background

- This decision responds to a legal question referred by a three-judge bench in February 2024, seeking clarity on whether courts can modify arbitral awards.

### Arbitration

- It is an alternate mode of dispute resolution under the **1996 law** and it minimises the role of courts to interfere with the awards by the tribunals.

### Major Highlights of the Judgement

- Courts can modify awards to remove invalid portions or correct typographical, computational, or clerical errors.
- Courts can also adjust the interest post-award if necessary.
- Judicial intervention under **Section 34 of the Arbitration and Conciliation Act, 1996** is confined to limited grounds, **such as public policy or fraud**.
- Courts cannot correct factual errors, reconsider costs, or review the merits of the award.
- Article 142 Powers:** The Supreme Court can use its inherent powers under Article 142 to ensure complete justice in cases involving arbitral awards.
  - However, this power must be exercised cautiously and in line with the **principles of the 1996 Arbitration Act**.
- The Act is largely based on the UNCITRAL Model Law, aiming to harmonize international commercial arbitration standards.

- The Act strongly recognizes party autonomy, especially in selecting arbitrators (Section 11) and procedural rules (Section 19).
- Conciliation is non-judicial. A settlement agreement under conciliation is enforceable like a contract, not a court decree (Section 73), unless parties move to enforce it.
- Judicial intervention under Section 34 of the Arbitration and Conciliation Act, 1996 is confined to limited grounds, such as public policy or fraud.

## 2. Private Member's Bill

**Context:** Vice President and Rajya Sabha Chairman Jagdeep Dhankhar recently emphasised that PMBs are “forward-looking” and a “gold mine” for legislative progress.

### About Private Member's Bill (PMB)

- A **Private Member's Bill (PMB)** is a legislative proposal introduced by any Member of Parliament (MP) who is not a Minister, whether elected or nominated.
- The drafting responsibility of a PMB lies entirely with the MP concerned, not with any Ministry.
- For introducing a PMB in Parliament, a **notice period of one month** is required under parliamentary rules.
- PMBs often reflect the ideological stance, personal convictions, or public interest concerns of the MP, especially those in the **Opposition**.

### Time Allocation for PMBs in Parliament

- In the **Lok Sabha**, the **last two-and-a-half hours of business on every Friday** are earmarked for the introduction and discussion of PMBs.
- In the **Rajya Sabha**, PMBs are taken up every alternate Friday for two-and-a-half hours.

### Historical Record and Trends

- Since Independence, only 14 PMBs have ever been passed and received Presidential assent, with the last one becoming law in 1970.
- In the 17th Lok Sabha (2019–2024), 729 PMBs were introduced in the Lok Sabha and 705 in the Rajya Sabha. Yet, only 2 PMBs were discussed in Lok Sabha, and 14 in the Rajya Sabha.
- In the 18th Lok Sabha, as of the 2024 Budget Session, only 20 MPs introduced PMBs, and not a single one was discussed due to disruptions and prioritisation of other business.

### 3. Santhara

**Context:** A three-year-old girl battling a brain tumour died after her parents initiated her into the Jain ritual of Santhara.

#### What is Santhara?

- Santhara—also known as **Sallekhana** or **Samadhi Maran**—is a solemn vow in Jainism, where one gradually gives up food and water to embrace death with spiritual detachment, believed to cleanse the soul of karma.
- Jain scriptures emphasize that this vow should only be undertaken when death is near, or in cases of extreme old age, incurable illness, or unavoidable hardship (like famine).
  - For example, if someone's worsening eyesight leads them to unknowingly harm living beings – violating the principle of **ahimsa** – they may choose Santhara.
- However, the recent death of a toddler has raised serious **ethical and legal concerns**. Child rights activists and medical professionals argue that a child cannot give informed consent for such a life-ending ritual, which is meant for spiritually aware adults.

#### Is Santhara Legal?

- The debate over Santhara in legal and religious circles intensified in 2015 when the **Rajasthan**

**High Court** declared the practice a **punishable offence** under sections 306 (abetment to suicide) and 309 (attempt to suicide) of the Indian Penal Code.

- However, the **Supreme Court** later **stayed the judgment** following petitions by Jain religious bodies, upholding the community's right to religious freedom.
- Santhara or Sallekhana is a centuries-old Jain practice of **voluntary gradual fasting unto death**, taken by the terminally ill or elderly as a means of **spiritual purification and detachment from worldly desires**.
- In 2015, the **Rajasthan High Court** briefly declared it illegal, equating it with suicide. However, this decision was **stayed by the Supreme Court of India**, and there is **no national ban** on Santhara as of now.
- The ritual is undertaken **only under specific spiritual circumstances**, often with **religious oversight and community acceptance**, and it's viewed as an act of **spiritual transcendence**, not despair.
- The **Supreme Court** has **not permanently banned** Santhara. Instead, it has emphasized the need for **careful examination of the distinction between religious freedom and right to life**.

### 4. 'Safe harbour' under Section 79 of the IT Act

**Context:** The government is considering revising guidelines for intermediary platforms and re-evaluating the "safe harbour" protections under Section 79 of the Information Technology Act.

#### 'Safe harbour' under Section 79 of the IT Act

- Section 79 of the IT Act grants intermediaries safe harbour protection from liability for third-party content, as long as they follow certain conditions.
- However, under Section 79(3)(b), this protection is void if the intermediary, upon receiving actual knowledge or a government notice about unlawful content, fails to promptly remove or block access to it.



### Latest Developments

- The recent move aims to curb the spread of fake news, particularly following the Pahalgam terror attack, which led to the blocking of several YouTube channels, including two Indian ones.
- The Ministry of Information and Broadcasting (I&B) stated that platforms may be required to take proactive steps against fake news, although no new law is currently planned due to constitutional concerns around free speech.
- Instead, the government favours self-regulation and supports giving statutory backing to the Press Information Bureau's Fact Check Unit.
  - Meanwhile, the Ministry of Electronics and IT plans to challenge a Bombay High Court ruling that limited this unit's power to remove content and revoke safe harbour status.

## 5. Chief Justice of India

**Context:** Justice BR Gavai was sworn in as the 52nd Chief Justice of India on May 14, 2025, by President Droupadi Murmu at Rashtrapati Bhavan. He is the first Buddhist and the second Dalit to hold the post, after Justice KG Balakrishnan.

### About the Chief Justice of India (CJI)

- **Qualifications of CJI:** A person is eligible to be appointed as **Chief Justice of India** if they:
  - **Are a citizen of India.**
  - **Have served as a Judge of a High Court for at least five years.**
  - **Have been an advocate in a High Court for at least ten years.**
  - **Are considered a distinguished jurist by the President of India.**

### Appointment of CJI

- The **President appoints the CJI** under **Article 124(2) of the Constitution.**
- The **outgoing CJI recommends their successor** based on seniority.
- The **Union Law Minister forwards the recommendation** to the **Prime Minister**, who then advises the **President.**

- As per the **Second Judges Case (1993)**, the **senior-most Supreme Court judge** is appointed as the **CJI.**
- **The CJI is the head of the judiciary and the Supreme Court in India.**

### Role and Powers of the CJI

- **Master of the Roster:** The CJI **allocates cases to Supreme Court benches** and decides the **composition of benches.**
- **Head of the Collegium System:** The CJI leads the **Supreme Court Collegium**, responsible for **appointing and transferring judges.**
- **Administrative Authority:** The CJI supervises **court administration, staff appointments, and judicial proceedings management.**
- **Judicial Leadership:** The CJI is **first among equals** and **does not hold superior judicial power** over other judges.
- The CJI stands at **Rank 6** in the ceremonial order of precedence in India, alongside the Speaker of the Lok Sabha.

## 6. Advisory jurisdiction

**Context:** President of India has invoked the Supreme Court's advisory jurisdiction under Article 143(1) to clarify whether time limits can be imposed on the President and Governors to act on state legislature Bills.

### What is Advisory jurisdiction?

- The Constitution of India **Article 143** authorises the president to seek the opinion of the **Supreme Court**
- Under the Constitution, the President may seek the Supreme Court's opinion on two types of matters.
  - Any point of **law or public fact** that has arisen or is likely to arise
  - Any **pre-constitutional contract, agreement, covenant, engagement**, or other similar instrument that gives rise to a dispute.

- In the first instance, the Supreme Court may or may not submit its opinion to the President, but in the second situation, it is obligated to do so.
- The Supreme Court's decision is **advisory rather than binding** in both cases. As a result, it does not bind the President; he or she is free to follow or disregard the opinion.
- The Supreme Court is under **no obligation** to provide an opinion. Rather, the Supreme Court may decline to provide an opinion under **Article 143** in instances that it does not think suitable or susceptible to such exercise.
- So far (2019), the president has made **fifteen references** to the supreme court under its **advisory jurisdiction**.
- It is also known as **consultative jurisdiction**.
- References to the Supreme Court under its advisory jurisdiction
  1. **Delhi Laws Act in 1951.**
  2. Kerala Education Bill in 1958
  3. Berubari Union in 1960
  4. Sea Customs Act in 1963
  5. Keshav Singh's case relating to the privileges of the Legislature in 1964
  6. Presidential Election in 1974
  7. Special Courts Bill in 1978
  8. Jammu and Kashmir Resettlement
  9. Cauvery Water Disputes Tribunal in 1992
  10. Rama Janma Bhumi case in 1993
  11. Consultation process to be adopted by the chief justice of India in 1998
  12. Legislative competence of the Centre and States on the subject of natural gas and liquefied natural gas in 2001
  13. The constitutional validity of the Election Commission's decision on deferring the Gujarat Assembly Elections in 2002
  14. Punjab Termination of Agreements Act in 2004
  15. 2G spectrum case verdict and the mandatory auctioning of natural resources across all sectors in 2012

Note: **The advisory jurisdiction of the Supreme Court of India (Article 143) is not inspired by the Privy**

Council of Britain. In fact, Britain does not have a written constitution or an equivalent advisory jurisdiction system like Article 143. The concept is more akin to Canada's Supreme Court, which does have a reference procedure somewhat similar to India's Article 143.

## 7. e-Zero FIR

**Context:** Indian Cybercrime Coordination Centre (I4C) has introduced the new e-Zero FIR initiative to nab any criminal with unprecedented speed.

### About

- **Seamless FIR Registration:** High-value cyber financial crimes (above ₹10 lakh) reported via National Cybercrime Reporting Portal (NCRP) or helpline 1930 will now be **automatically converted into Zero FIRs**, ensuring quicker initiation of investigations.
- **Integrated Digital Framework:** It brings together systems from the Indian Cybercrime Coordination Centre (I4C), Delhi Police's e-FIR, and National Crime Record Bureau's (NCRB's) Crime and Criminal Tracking Network & Systems (CCTNS).
- **Territory-Neutral Action:** Complaints can be filed and processed irrespective of the complainant's location, removing delays due to jurisdictional constraints.
- **Easy Escalation:** Victims can get their Zero FIR converted into a regular FIR by visiting the relevant cybercrime police station within 3 days.
- Initially launched as a **pilot in Delhi**, the system will soon be extended to other States and Union Territories across India.

### Significance

- **Legal Backing from BNSS:** The process is aligned with Sections 173(1) and 1(ii) of the Bhartiya Nagrik Suraksha Sanhita (BNSS), reinforcing the **role of new criminal laws in modernizing policing**.
- **Enhanced FIR Conversion Rate:** The system is expected to significantly improve the conversion

rate of complaints into FIRs, enabling **faster recovery of lost funds and stronger enforcement.**

- **Strengthened Cybercrime Response:** This tech-driven approach bolsters India's overall capability to tackle cybercrime, builds public confidence, and strengthens the digital financial ecosystem.
- Only **high-value cyber financial crimes (₹10 lakh and above)** are auto-converted into Zero FIRs. It is not for any cybercrime complaint.
- The system integrates **I4C, Delhi Police's e-FIR,** and **NCRB's CCTNS** for a unified, territory-neutral digital framework.
- The legal foundation is from **BNSS Sections 173(1) and 1(ii)** — even though it doesn't mandate time-bound FIRs specifically for cybercrime, it supports faster procedures.
- A **Zero FIR** under this system must be escalated to a regular FIR **within 3 days (72 hours)** by visiting the relevant police station.

## 8. Overseas Citizenship of India

**Context:** Union Home Minister launched a revamped **Overseas Citizen of India (OCI)** portal, aimed at enhancing digital accessibility, security, and service delivery.

### Who can be an Overseas Citizenship of India?

- The Central Government may, subject to such conditions and restrictions as may be prescribed, on an application made in this behalf, register as an OCI a foreign national
  - who was a **citizen of India at the time of, or at any time after, 26th January, 1950;**
  - who was **eligible to become a citizen of India** on 26th January, 1950;
  - who **belonged to a territory that became part of India after 15th August, 1947;**
  - who is a **child or a grandchild or a great grandchild of such a citizen;**
  - who is a **minor child** of such persons mentioned above;
  - who is a **minor child** and **whose both parents are citizens of India or one of the parents is a**

**citizen of India-** is eligible for registration as an OCI cardholder.

- Besides, a **spouse of foreign origin of a citizen of India** or a spouse of foreign origin of an **OCI Cardholder** and whose **marriage** has been **registered and subsisted** for a continuous period of **not less than two years** immediately preceding the presentation of the application is also eligible for registration as an OCI cardholder.
- **However, no person who or either of whose parents or grandparents or great-grandparents is or had been a citizen of Pakistan, Bangladesh, or such other country as the Central Government may, by notification in the Official Gazette, specify, shall be eligible for registration as an OCI Cardholder.**
- The foreigner has to be ordinarily resident of India to be eligible to apply for OCI registration in India.
  - '**Ordinarily resident**' will mean a person **staying** in a particular country or in India for a continuous period of 6 months.

### Overseas Citizenship of India Benefits

- **Multi-purpose, multiple entries,** and a **lifelong visa** for visiting India.
- **Exemption from foreigner registration obligation** for any length of stay in India.
- **Equivalence to NRIs in respect of economic, financial, educational fields.** An **exception** in the matter of **acquisition of agricultural and plantation properties.**
- **Equality with NRIs for intercountry adoption.**
- Offer similar domestic airfare charges to OCI cardholders as of a resident Indian national.
- Equality with an Indian national for entry fees to national parks and wildlife sanctuaries.
- The OCI cardholder professionals have the opportunity to **pursue the profession** in pursuance of the provisions contained in the relevant act, **such as Doctors, Dentists, Nurses, Pharmacists, Advocates, Architects** and Chartered Accountants.
  - However, these professionals are **required to appear for the All India Pre-Medical test or any such other relevant test** for eligibility



towards admission in fulfilment of the provisions contained in the applicable act.

### What Are All Overseas Citizenship of India Cardholders Not Entitled to?

- OCI is **not** to be misconstrued as 'dual citizenship'. OCI does **not confer political rights to vote**;
- to be a **member of a Legislative Assembly** or of a **Legislative Council** or of the **Parliament** of India;
- to **hold Indian constitutional posts** such as that of the President, Vice President, Judge of the Supreme Court or High Court etc.;
- He/she **cannot normally hold employment in the Government**;
- to **undertake any Missionary work, Mountaineering and Journalism work without prior permission of the Govt. of India**;
- OCI card holders shall also **require Protected Area Permit (PAP)/Restricted Area Permit (RAP)** to visit any place which falls within the Protected/Restricted Area notified by the Government as in the case of any other foreigner.

### Renunciation of Overseas Citizenship of India

- If any overseas citizen of India of full age and capacity makes in the prescribed manner a declaration renouncing his overseas citizenship of India, the declaration shall be registered by the Central Government, and; upon such registration, that person shall cease to be an OCI.
- Where a person ceases to be an overseas citizen of India under subsection (1), **every minor child of that person** registered as an OCI, shall thereupon **cease to be an OCI**.

### Cancellation of Registration as Overseas Citizenship of India

- The Central Government may, by order, cancel the registration granted under sub-section(1) of section 7A if it is satisfied that
  - The **registration** as an OCI was **obtained by means of fraud, false representation, or the concealment of any material fact**.
  - The OCI has **shown disaffection towards the Constitution** of India as by law established.

- The OCI has, **during any war** in which India may be engaged, **unlawfully traded or communicated with an enemy** or been engaged in, or associated with, any business or commercial activity that was to his knowledge carried on in such a manner as to assist an enemy in that war.
- The OCI has, **within five years after registration**, been sentenced to **imprisonment for a term of not less than two years**.
- It is necessary to do so **in the interest of the sovereignty and integrity of India**, the **security of India**, **friendly relations of India with any foreign country**, or in the interests of the general public.

## 9. NITI Aayog Governing Council

**Context:** Even as Prime Minister Narendra Modi exhorted the States to come together with the Centre to speed up development across the country at the 10th meeting of the NITI Aayog Governing Council on Saturday, several States — such as Tamil Nadu and Punjab — voiced their grievances with the Centre, while others presented plans to boost their growth.

### NITI Aayog Governing Council:

- The Governing Council of NITI Aayog is the apex body responsible for shaping India's national development agenda and fostering cooperative federalism. It provides a platform for the central and state governments to discuss and strategize on inter-sectoral, inter-departmental, and federal issues to accelerate the implementation of national priorities.

### Composition

- **Chairperson:** Prime Minister of India
- **Members:**
  - Chief Ministers of all States
  - Chief Ministers of Union Territories with legislatures (e.g., Delhi, Puducherry, Jammu & Kashmir)

- Lieutenant Governors of other Union Territories (without legislatures)
- Vice Chairperson of NITI Aayog (appointed by the Prime Minister)
- Full-time Members of NITI Aayog
- Ex-Officio Members (up to four Union Ministers nominated by the Prime Minister)
- Special Invitees (domain experts and specialists nominated by the Prime Minister)

### Functions

- Acts as the principal body for evolving a shared vision of national priorities and strategies with the active involvement of States and Union Territories.
- Discusses and resolves inter-sectoral and inter-departmental issues.
- Coordinates the implementation of the national development agenda.
- Fosters cooperative federalism by encouraging structured dialogue between the Centre and States.

### Meetings

- The Governing Council is chaired by the Prime Minister.
- Meetings are held periodically; as of 2024, nine meetings have been conducted.
- These meetings are attended by the Prime Minister, Chief Ministers, Lieutenant Governors, Vice Chairperson, Full-time Members, Ex-Officio Members, and Special Invitees.

### Secretariat and Coordination

- The Governing Council Secretariat organizes meetings, prepares agendas and minutes, and coordinates follow-up actions with Central Ministries, Departments, and State Governments

### Attendees of Governing council meeting:

The NITI Aayog Governing Council meeting is attended by the following:

- The Prime Minister of India (as Chairperson)
- Chief Ministers of all the States

- Chief Ministers of Union Territories with legislatures
- Lieutenant Governors of other Union Territories (those without legislatures)
- Ex-Officio Members of NITI Aayog
- The Vice Chairperson of NITI Aayog
- Full-time Members of NITI Aayog
- Special Invitees (such as Union Ministers, experts, and specialists, nominated by the Prime Minister)

## 10. Panchayat Advancement Index

**Context: The Ministry of Panchayati Raj rolled out Panchayat Advancement Index (PAI) Version 2.0.**

### About Panchayat Advancement Index

- It is a **multi-domain and multi-sectoral index** that is intended to be used to assess the overall **holistic development, performance & progress of Panchayats**.
- **PAI is a multidimensional assessment framework developed by the Ministry of Panchayati Raj to enable performance tracking of over 2.5 lakh Gram Panchayats across nine themes aligned with the Localization of Sustainable Development Goals (LSDGs).**
- It aims to assess and measure the **progress made by grassroots-level institutions** in achieving localized SDGs, thereby contributing to the attainment of SDG 2030.
- The index takes into account various socio-economic indicators and parameters to gauge the well-being and development status of the local communities within the jurisdiction of a Panchayat.
- One of the purposes of the PAI is to **identify the development gaps of the Panchayats** through the scores achieved across various LSDG themes and enable the Panchayat for evidence-based planning at grassroots level.
- It has been compiled based on **435 unique local Indicators** (331 mandatory & 104 optional) consisting of 566 unique data points across **9 themes of LSDGs** (Localization of Sustainable Development Goals) aligned with **National**

**Indicator Framework (NIF)** of the Ministry of Statistics and Programme Implementation (MoSPI).

- The PAI reflects India's commitment to achieving the **SDG 2030 Agenda** through participatory, bottom-up development.
- Based on the PAI scores & thematic Scores achieved by different Gram Panchayats, these GPs are grouped into one of the categories of performance – **Achiever**: (90+), **Front Runner**: (75 to below 90); **Performer**: (60 to below 75); **Aspirant**: (40 to below 60) and **Beginners** (below 40).
- While PAI Version 1.0 served as the baseline and covered data from 2.16 lakh Gram Panchayats across 29 States/UTs, PAI Version 2.0 represents a major leap forward in functionality, efficiency, and usability.
- The transition from PAI 1.0 to 2.0 reflects a focused refinement of the framework, with a sharper and more practical set of indicators and data points to improve usability and reliability while retaining thematic comprehensiveness.

## 11. Emblems and Names (Prevention of Improper Use) Act, 1950

**Context:** The Supreme Court dismissed a petition seeking protection of V.D. Savarkar's name under the Emblems and Names (Prevention of Improper Use) Act, 1950.

**About Emblems and Names (Prevention of Improper Use) Act, 1950:**

**What is It?**

- A regulatory legislation to prevent the commercial or improper use of national emblems, names, and symbols that hold public significance or represent national institutions.
- **Enforced On:** 1st September, 1950, through Gazette notification.
- **Nodal Authority:** Central Government – empowered to amend the Schedule and issue rules under the Act.

**Objectives of the Act:**

- Prohibit misuse of names/emblems associated with national institutions or public trust.
- Protect the dignity of names and symbols associated with the Indian government, historic personalities, and international bodies.
- Maintain decorum in commercial branding, preventing deceptive or misleading affiliations.

**Key Features:**

- Prohibition Clause (Section 3): Disallows the use of specified names/emblems for business, trade, patents, or advertising without Central Government permission.

**Scope (Section 1 & 2):**

- Applies across India and Indian citizens abroad.
- "Name" includes abbreviations, and "emblem" includes flags, seals, and coats of arms.
- Ban on Registrations (Section 4): Authorities cannot register companies, trademarks, or patents bearing protected names/emblems.
- **Penalty (Section 5):** Misuse punishable by fine up to ₹500.
- **Mandatory Sanction (Section 6):** Prior sanction from the Centre is needed before prosecution.
- **Dynamic Schedule:** The Schedule includes protected items such as the Indian National Flag, Mahatma Gandhi's name, Rashtrapati Bhavan, and others.

Symbols/names protected under the **Emblems and Names (Prevention of Improper Use) Act, 1950:**

- **National Flag of India**
- **Name and image of Mahatma Gandhi**
- **Official seal of the President of India**
- **United Nations name and emblem**
- **Ashoka Chakra** (as part of national symbols)
- **WHO emblem** (Protected under international emblems included in the Schedule)

**Symbols/names not protected under this Act:**

- **Indian Rupee symbol (₹):** This is regulated under the **Currency Act** and **other financial laws, not specifically this Act.**

- **IPL Logo:** A trademarked commercial symbol, protected under IPR laws, not the Emblems Act.

## 12. Deputy Speaker of Lok Sabha

**Context:** The position of the Deputy Speaker has been lying vacant for the last six years raising questions on constitutional adherence and democratic resilience.

### Deputy Speaker of Lok Sabha

- The Deputy Speaker serves as the **Second-in-Command Presiding Officer** of the Lower House of Parliament of India – the Lok Sabha.
- **According to Article 95(1), the Deputy Speaker performs the duties of the Speaker if the post is vacant.**
- The Deputy Speaker acts as the Speaker when **the latter is absent from the sitting** of the House.
- The Deputy Speaker **presides over joint sittings** of both Houses of Parliament in case the Speaker is absent from such a sitting.

### Election of Deputy Speaker

- The Deputy Speaker of Lok Sabha is elected by the Lok Sabha itself from amongst its members.
- **Article 93** states that “The House of the People shall, as soon as may be, choose two members of the House to be respectively Speaker and Deputy Speaker”.
- **The election** of Deputy Speaker is governed by **Rule 8 of the Rules of Procedure and Conduct of Business in Lok Sabha**. According to Rule 8, the election “shall be held on such date as the Speaker may fix”.
- Usually, the **Speaker is chosen from the ruling party** or ruling alliance, while the **Deputy Speaker is selected from the opposition party** or opposition alliance.
  - However, there have been exceptions to this convention.
  - The first four Deputy Speakers, from 1952 to 1969, were from the ruling party.
  - **There was no Deputy Speaker for the entire duration of the 17th Lok Sabha (2019-24).**

### Powers and Privileges

- **While performing the duties of or acting as the Speaker of Lok Sabha** (i.e. while presiding over the sitting of Lok Sabha or a Joint Sitting of both the Houses), he/she assumes all the powers of the Speaker of Lok Sabha.
  - Thus, in such times, the Deputy Speaker **cannot vote in the first instance**, rather he/she can only **exercise a Casting Vote** in case of a tie.
- When the Speaker presides over the House, the **Deputy Speaker is like any other Ordinary Member** of the House.
  - Thus, in such times, the **Deputy Speaker can speak in the House, participate in its proceedings, and vote in the first instance** on any question before the House.
- He/she has **one special privilege** -Whenever the Deputy Speaker of Lok Sabha is appointed as a **member of a Parliamentary Committee**, he/she automatically becomes its chairman.

### Removal of Deputy Speaker of Lok Sabha

- **The Deputy Speaker of Lok Sabha can be removed by a resolution passed by the Lok Sabha by an Effective Majority** (i.e. a majority of the total membership of the House excluding the vacant seats).
- A motion of removal of the Deputy Speaker of Lok Sabha can be moved only after giving **14 days' advance notice** to the Speaker.
- When a resolution for removal of the Deputy Speaker is under consideration, **he/she cannot preside at the sitting of the house**, though he may be present.



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**FREE ORIENTATION ON:  
June 8th 2025 (Sunday)**

# STRATEGIC REVISION FOR UPSC CSE MAINS 2025 + MAINS TEST SERIES 2025

Course Mode : ONLINE/OFFLINE

Course Start Date: June 14<sup>th</sup> 2025



**BY EXPERIENCED FACULTY AND MENTORS.  
(WHO ARE UPSC CSE RANKERS/ REACHED  
INTERVIEW STAGE)**

**Free**

## 1 STRATEGIC REVISION FOR MAINS COURSE

### ✓ GS & ESSAY REVISION CLASSES

- 50 Sessions of 2.5 hours each
- Quick revision of high yielding topics



### ✓ IN- CLASS CONCISE NOTES + VALUE ADDITION + CURRENT AFFAIRS



### ✓ IN- CLASS ANSWER WRITING PRACTICE



### ✓ MENTORSHIP



### ✓ TAUGHT BY EXPERIENCED FACULTY AND MENTORS

## 2 MAINS TEST SERIES 2025 WITH EVALUATION

### ✓ 10 Mini Sectionals + 5 Full Length + 5 Simulation Tests

### ✓ Evaluation

## 1 STRATEGIC REVISION FOR MAINS is FREE for Students who cleared CSE PRELIMS 2025

|   |                                                                      |              |
|---|----------------------------------------------------------------------|--------------|
| 1 | FEE                                                                  | ₹ 6000 +GST  |
|   | 10% Off Early Bird offer UNTIL JUNE 12 <sup>TH</sup> 2025            | ₹ 5400 + GST |
|   | 25 % Off to Old CSE PCM + High Impact Revision Students of R.C.Reddy | ₹ 4500 +GST  |

|   |                                                                      |              |
|---|----------------------------------------------------------------------|--------------|
| 2 | FEE                                                                  | ₹ 7000 +GST  |
|   | 10% Off Early Bird offer UNTIL JUNE 12 <sup>TH</sup> 2025            | ₹ 6300 + GST |
|   | 25 % Off to Old CSE PCM + High Impact Revision Students of R.C.Reddy | ₹ 5250 +GST  |

|   |                                                           |               |
|---|-----------------------------------------------------------|---------------|
| 1 | FEE                                                       | ₹ 12,500 +GST |
| 2 | 10% Off Early Bird offer UNTIL JUNE 12 <sup>TH</sup> 2025 | ₹ 11,250 +GST |

25 % Off  
to Old CSE PCM + High  
Impact Revision Students  
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₹ 9375 +GST



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**R.C.REDDY**  
**IAS STUDY CIRCLE**



**FREE ORIENTATION ON:**  
**June 8th 2025 (Sunday)**

# MISSION MAINS UPSC

## CSE 2026

Course Mode : ONLINE/OFFLINE

Course Start Date: June 14<sup>th</sup> 2025

1

### INITIAL INDIVIDUAL ASSESSMENT

Personalized assessment of each student to identify areas of improvement in answer writing and approach to Mains



2

### STRATEGIC REVISION FOR MAINS

#### ✓ GS & ESSAY REVISION CLASSES

- 50 Sessions of 2.5 hours each
- Quick revision of high yielding topics



#### ✓ IN - CLASS CONCISE NOTES + VALUE ADDITION + CURRENT AFFAIRS



#### ✓ IN- CLASS ANSWER WRITING PRACTICE



#### ✓ MENTORSHIP



#### ✓ TAUGHT BY EXPERIENCED FACULTY AND MENTORS

3

### 1 MAINS FULL - LENGTH SIMULATION TEST

One Full length Mains Simulation test after Strategic Revision for Mains course to assess progress and areas of improvement



4

### BENCH MARK INDIVIDUAL ASSESSMENT

Based on the performance in the mains full- length simulation test, personalized benchmark assessment will be done to assess any bottlenecks in preparation and areas of improvement



5

### WELL - SPACED TEST SERIES WITH EVALUATION

3 subject wise mini -sectionals for Essay and each GS paper ,one full length and simulation test



6

### 1:1 MENTORSHIP TILL MAINS 2026

SWOT analysis of the candidate, Accountability & Progress assessment sheets with subject specific targets, weekly targets .



7

### VALUE ADDITION CLASSES FOR MAINS 2026

**FOR: Students aiming to**

- Clear CSE Mains 2026
- Improve Scores in Mains 2026

**BY :**

- Experienced faculty & mentors ( who are UPSC CSE Rankers/ went upto CSE Interview)



| 1                                                                                              | 2 | 3            |
|------------------------------------------------------------------------------------------------|---|--------------|
| FEE                                                                                            |   | ₹ 6000 + GST |
| 10% Off Early Bird offer until June 12th,2025                                                  |   | ₹ 5400 + GST |
| 25 % Off to Old CSE PCM Students + High Impact Revision Students of R.C.Reddy IAS Study Circle |   | ₹ 4500 +GST  |

| 1                                                                                              | TO | 7              |
|------------------------------------------------------------------------------------------------|----|----------------|
| FEE                                                                                            |    | ₹ 19,000 +GST  |
| 10% Off Early Bird offer until June 12th,2025                                                  |    | ₹ 17,100 + GST |
| 25 % Off to Old CSE PCM Students + High Impact Revision Students of R.C.Reddy IAS Study Circle |    | ₹ 14,250 +GST  |



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# ECONOMY

## 1. Orange Economy

**Context:** While addressing the WAVES 2025 summit, Indian Prime Minister Narendra Modi on Thursday (May 1) hailed the rise of India's "Orange Economy". This term refers to economic activities encompassing the creative sectors of music, films, food, gaming, and animation.

### What is Orange Economy?

- The orange economy, also called the creative economy, includes economic activities driven by culture, art, media, innovation, and intellectual property.
- It spans film, music, design, gaming, publishing, performing arts, advertising, and digital content creation.

### Key Features:

- **Culture-Centric:** Builds on a nation's heritage, art, and language.
- **Talent-Driven:** Relies heavily on individual creativity and digital tools.
- **IP-Focused:** Generates revenue through copyrights, trademarks, and digital IP.
- **High Job Creation:** Offers large-scale employment in media, design, and technology.

### Significance:

- **Boosts Soft Power:** Enhances India's cultural influence globally through entertainment and storytelling.
- **Supports GDP Growth:** Global creative economy is valued at over \$2.25 trillion (UNCTAD, 2023); India's M&E sector valued at \$28 billion (2025), with growth projected to \$100 billion.
- **Youth Employment:** Provides dynamic career avenues for India's young workforce.

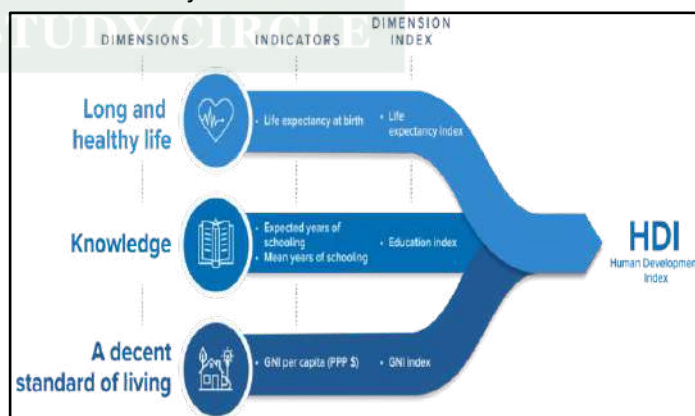
## 2. Human Development Index

**Context:** India has climbed three positions to rank 130 out of 193 countries in the 2023 Human

Development Index (HDI), according to the 2025 Human Development Report by the United Nations Development Programme (UNDP).

### Human Development Index (HDI)

- Pakistani economist **Mahbub ul Haq** created the HDI in 1990 and was further used by **UNDP** in creating a report on the **nation's socio-economic achievement**.
- It evaluates **three key dimensions** and is calculated using a **geometric mean** of these three indices:
  - **Health** is measured by life expectancy at birth (SDG-3).
  - **Education** is assessed through mean years of schooling for adults (SDG-4.4) and expected years of schooling for children (SDG-4.3).
  - **Standard of Living** is evaluated using **Gross National Income (GNI) per capita** (SDG-8.5), adjusted for income distribution.



### Human Development Index: Current Status

- **Iceland** (HDI value of 0.972), ranked at the top of the Index, followed by Norway and Switzerland.
  - South Sudan was at the bottom at 193 with 0.388.
- **India** improved its HDI value from 0.676 in 2022 (133th) to **0.685 in 2023 (130th)**, remaining in the medium human development category.
  - India's HDI value has increased by over 53% since 1990, growing faster than both the global and South Asian averages.

- Among India's neighbours, China (75th), Sri Lanka (78th) and Bhutan (127th) are ranked above India, while **Bangladesh (130th) is ranked at par**.
  - Nepal (145th), Myanmar (149th), Pakistan (168th) are ranked below India.

### Highlights of India's HDI Progress

- **Improved Life Expectancy:** India's life expectancy has risen from 58.6 years in 1990 to 72 years in 2023, marking its highest level since the index began.
  - National health programs like Ayushman Bharat, Janani Suraksha Yojana, and Poshan Abhiyaan have contributed to this growth.
- **Advancements in Education:** The average years of schooling have increased from 8.2 years in 1990 to 13 years in 2023.
  - Policies like the Right to Education Act, Samagra Shiksha Abhiyan, and National Education Policy 2020 have played a crucial role.
- **Economic Growth and Poverty Reduction:** India's Gross National Income (GNI) per capita has risen over four times, from \$2,167 in 1990 to \$9,046 in 2023.
  - 135 million Indians escaped multidimensional poverty between 2015-16 and 2019-21.
- HDI is based on health (life expectancy), education, and income.
- The income dimension is measured using GNI per capita (PPP).
- Standard HDI does **not** adjust for inequality; that's done in the **Inequality-adjusted HDI (IHDI)**.
- Both expected and mean years of schooling are used for the education dimension.

### 3. IMF Quotas

**Context:** India abstained from an IMF vote approving new financial assistance to Pakistan and raised concerns over Pakistan's repeated misuse of IMF funds, and its poor reform record linked to cross-border terrorism risks.

### IMF Quotas:

- IMF quotas are the cornerstone of the International Monetary Fund's financial and governance structure. Each member country is assigned a quota, which broadly reflects its relative position in the world economy. Quotas are denominated in Special Drawing Rights (SDRs), the IMF's unit of account.

### How Quotas Are Determined?

A country's quota is determined by a formula that takes into account several economic indicators:

- **GDP (50%):** Measured as a blend of market exchange rates (60%) and purchasing power parity (PPP, 40%).
- **Openness (30%):** Reflects the country's trade and financial openness.
- **Economic Variability (15%):** Captures the variability of current receipts and net capital flows.
- **International Reserves (5%):** The country's official reserves.
- A "compression factor" is applied to reduce large disparities in calculated quota shares<sup>4</sup>.

### Role and Significance of Quotas

A member's quota determines:

- **Financial Contribution:** The maximum amount the country is obliged to provide to the IMF.
- **Voting Power:** Largely determined by the quota, with each member having basic votes plus one additional vote per SDR 100,000 of quota.
- **Access to Financing:** The amount a country can borrow from the IMF is linked to its quota.
- **Share of SDR Allocations:** The quota affects the country's share in general allocations of SDRs.

### The latest quota of above-mentioned countries:

- **Germany:** ~5.6% (Top 5 globally)
- **Brazil:** ~2.3%
- **Russia:** ~2.0%
- **India:** ~2.75%



#### 4. Extended Fund Facility

**Context:** The IMF Executive Board approved an immediate disbursement of \$1 billion to Pakistan under the Extended Fund Facility (EFF).

**About Extended Fund Facility (EFF):**

- **What is the Extended Fund Facility (EFF)?**
  - EFF is an **IMF lending mechanism** designed to help countries facing **prolonged balance of payments problems** due to deep **structural economic weaknesses**.
- **Key Features:**
  - **Governed by:** International Monetary Fund (IMF), part of Bretton Woods institutions.
  - **Loan Type:** Repayable loan, not a grant or financial aid.
  - **Tenure:** Extended period (3+ years), with longer repayment timelines than standard IMF loans.
  - **Purpose:** Facilitates **medium-term structural reforms** — e.g., improving tax systems, reducing inflation, curbing unsustainable fiscal deficits.
  - **Disbursement:** Tranches released based on **periodic reviews** of policy implementation by the borrowing country.

|   | Financial Assistance Facilities | Purposes                                                                                                             |
|---|---------------------------------|----------------------------------------------------------------------------------------------------------------------|
| 1 | Stand-By Arrangement (SBA)      | <ul style="list-style-type: none"> <li>Addresses short-term to medium-term balance of payments problems</li> </ul>   |
| 2 | Flexible Credit Line (FCL)      | <ul style="list-style-type: none"> <li>Precautionary and immediate liquidity line</li> </ul>                         |
| 3 | Standby Credit Facility (SCF)   | <ul style="list-style-type: none"> <li>Addresses actual or potential short-term balance of payments needs</li> </ul> |
| 4 | Extended Credit Facility (ECF)  | <ul style="list-style-type: none"> <li>Address protracted balance of payments problems</li> </ul>                    |

#### 5. Wholesale Price Index

**Context:** India's WPI inflation eased to a 13-month low of 0.85% in April 2025, sharply down from 2.05% in March, driven by falling fuel and primary article prices.

**About Wholesale Price Index (WPI):**

- WPI measures the **changes in the prices of goods sold and traded in bulk by wholesale businesses** to other businesses.
- It is **calculated and published by the Office of Economic Advisor, Department of Industrial Policy and Promotion in the Ministry of Commerce and Industry**.
  - WPI data is **published monthly**, with the index value representing an estimate of the price level for the month as a whole, rather than a specific date.
- **Analysts use the numbers to track the supply and demand dynamics in industry, manufacturing, and construction.**
- **An upward surge in the WPI indicates inflationary pressure in the economy, and vice versa.**
- The **quantum of rise in the WPI month-after-month is used to measure the level of wholesale inflation in the economy.**
- **Difference between WPI and Consumer Price Inflation (CPI) inflation:**
  - While the **WPI keeps track of the wholesale price of goods**, the **CPI measures the average price that households pay for a basket of different goods and services**.
  - **WPI is restricted to only goods**, while **CPI is for both goods and services**.
  - Even as the **WPI is used as a key measure of inflation in some economies**, the Reserve Bank of India (**RBI**) **no longer uses it** for policy purposes, including setting repo rates. The **RBI currently uses CPI, or retail inflation**, as a key measure of inflation **to set monetary and credit policy**.
- **New series of WPI:** With an aim to align the index with the base year of other important economic



indicators such as GDP and IIP, the base year was **updated to 2011-12** from 2004-05 for the new series of WPI, effective from April 2017.

- **How do you calculate WPI?**

- It is calculated by taking a **weighted average of the prices of a basket of goods**, with each item's weight determined by its share of total wholesale sales.
- The **basket of goods** comprises three major groups:
  - **Primary Articles** (Weight 22.62%)
  - **Fuel and Power** (Weight 13.15%)
  - **Manufactured Products** (Weight 64.23%)
- **The prices of a total of 697 items are tracked under the 2011-12 series of the WPI, which includes 117 primary items, 16 items of fuel and power, and 564 manufactured products.**

## 6. Systematic Investment Plan

**Context:** The number of SIP cancellations more than tripled to 162.3 lakh in April compared with March, creating a perception that market volatility had spooked investors in mutual funds. However, as per The Hindu, this surge in cancellations had more to do with the rules laid out in a SEBI circular rather than fears among investors.

### What is a Systematic Investment Plan (SIP)?

- SIP is an investment methodology offered by mutual funds wherein an **individual saver can invest a fixed amount in a chosen scheme periodically at fixed intervals** - say once a month, instead of making a lump sum investment.
- The SIP instalment amount can be as small as ₹500 per month and **is similar to a recurring deposit**.
- SIPs help to achieve financial goals by investing small sums of money on a monthly basis that eventually leads to accumulating the required corpus for reaching the goal.

### Benefits of SIP:

- SIPs bring in an **investment discipline** for the investor.

- SIPs are done in open-ended funds where the **investors can invest and take out the money anytime**.
- There is **no fixed tenor for running SIP**. Once the SIP tenor is fixed, it can be stopped in between or could be continued even after the tenor by placing the request with the respective mutual fund company.
- **Full and partial withdrawal is possible** during or after the SIP tenor.
- The **SIP amount can be increased or decreased**.
- SIPs **do not guarantee returns**; they are subject to market risks like any other market-linked investment.
- SIPs benefit from **rupee cost averaging**, where more units are bought when prices are low and fewer when prices are high.
- Over time, **volatility can help lower the average cost per unit**, especially in long-term SIPs.
- The **NAV determines the price per unit**; hence, it directly affects the number of units purchased during each SIP instalment.

## 7. Surplus Transfer

**Context:** The RBI may transfer a record ₹2.5 to ₹3 lakh crore as surplus to the government for FY 2024–25. The Central Board reviewed the Economic Capital Framework (ECF) on May 15, 2025, ahead of deciding the transfer amount.

### What is Surplus Transfer?

- The RBI transfers its net profit—i.e., total income minus expenditure—to the Central Government, after making necessary provisions.
- This process is termed as surplus transfer and not dividend payment, since RBI is not a commercial entity.

### Legal Framework:

- Governed by Section 47 of the RBI Act, 1934.
- The Act mandates that, after making provisions for:
  - Bad and doubtful debts,
  - Depreciation in assets,

- Staff benefits and superannuation,
- And other routine banking contingencies, the remaining surplus must be transferred to the Government of India.

#### Major Sources of RBI's Income:

- RBI earns income primarily through:
  - Interest from foreign assets like bonds, treasury bills, and deposits with other central banks.
  - Interest on domestic securities, mainly government bonds.
  - Short-term lending to banks (e.g., repo operations).
  - Commission for managing borrowings of Central and State governments.
  - Service charges for managing the currency and payment systems.

#### Key Expenditures of RBI:

- Printing of currency notes.
- Staff salaries and retirement benefits.
- Commission to banks and primary dealers involved in public debt transactions.

#### The income source of RBI:

Based on the Reserve Bank of India's annual reports and typical breakdown of its income sources, the descending order of contribution (size) to RBI's total income is as follows:

1. **Interest income on foreign securities**
2. **Interest income on domestic government securities**
3. **Exchange gain from foreign currency operations**
4. **Fees and commission income**

#### More:

- The largest share of RBI's income comes from interest earned on its holdings of foreign securities, as the RBI maintains large foreign exchange reserves and invests them in international bonds and securities.

- The next significant source is interest income from domestic government securities, as RBI holds a substantial amount of Indian government bonds.
- Exchange gains from foreign currency operations (arising from the revaluation and sale of forex assets) form a smaller, but still notable, part of the income.
- Fees and commission income (for services like managing government accounts, banking transactions, etc.) are the smallest among these sources.

### 8. World Food Prize

**Context:** Mariangela Hungria, Brazilian microbiologist, won the 2025 World Food Prize for pioneering biological nitrogen fixation and reducing reliance on chemical fertilizers. Her innovations sparked Brazil's 'Micro Green Revolution', significantly boosting crop yields and lowering input costs.

#### About World Food Prize

- It is an international award recognizing the achievements of individuals that have advanced human development by improving the quality, quantity, or availability of food in the world.
- It is also known as the **Nobel Prize for Food and Agriculture**.
- It recognizes contributions in any field involved in the world food supply, such as food and agriculture, science and technology, manufacturing, marketing, nutrition, economics, poverty alleviation, political leadership, and the social sciences.
- The Prize was founded in 1986 by Dr. Norman E. Borlaug, recipient of the 1970 Nobel Peace Prize.
- It is now administered by the World Food Prize Foundation with support from numerous sponsors.
- It is a \$500,000 award formally presented at the Laureate Award Ceremony in mid-October, on or around World Food Day, in conjunction with the Borlaug Dialogue

**international symposium in Des Moines, Iowa, USA.**

- **M.S. Swaminathan** was named the **first World Food Prize Laureate**, receiving the award in **1987** for developing and spearheading the introduction of high-yielding wheat and rice varieties into India during the 1960s.
- The World Food Prize was indeed established by **Dr. Norman Borlaug** (father of the Green Revolution), but it is **not awarded by the FAO**. It is awarded by **The World Food Prize Foundation**, based in Des Moines, Iowa, USA.
- It honours individuals whose work has led to significant improvements in food security, whether through advancements in crop yield, nutritional quality, sustainable production, or accessibility of food for a global population.
- **Dr. M.S. Swaminathan**, a renowned Indian agricultural scientist, was indeed the **first recipient** of the World Food Prize in **1987**. He was recognized for his role in India's Green Revolution.

## 9. Financing Mechanism of UN Peacekeeping Forces

**Context:** India, one of the largest troop contributors to United Nations Peacekeeping missions, has pledged one quick reaction force company, one male armed police or mixed armed police (CRPF) unit, one women-led formed police unit, one counter-explosive ordnance disposal unit, IED/EOD unit, one K9 unit, and a SWAT police unit.

### Financing Mechanism of UN Peacekeeping Forces

- United Nations peacekeeping operations are funded through a well-defined system that ensures all member states share the financial responsibility for maintaining global peace and security.

#### 1. Primary Source: Assessed Contributions

- **Collective Responsibility:**
  - All UN member states are legally obligated to pay their assessed share of the peacekeeping

budget, as determined by the UN General Assembly.

- **Assessment Formula:**

- The contribution of each country is calculated based on its economic capacity, primarily using gross national income (GNI) and other economic indicators. Wealthier countries and the five permanent members of the Security Council pay higher rates due to their greater capacity and special responsibility for maintaining peace.

- **Annual Budget:**

- For the fiscal year 2024–2025, the approved budget for UN peacekeeping operations is approximately \$5.6 billion. This funds 14 missions, two service centres, and headquarters support staff.

- **Top Contributors:**

- The largest contributors for 2024–2025 are the United States (26.95%), China (18.69%), Japan (8.03%), Germany (6.11%), United Kingdom (5.36%), France (5.29%), and others.

#### 2. Voluntary Contributions

- In addition to assessed contributions, some countries provide voluntary support in the form of extra funds, equipment, transportation, supplies, or personnel beyond their required share.

#### 3. Budget Approval and Oversight

- **Security Council:**

- Decides when and where to establish, maintain, or expand peacekeeping operations.

- **General Assembly:**

- Approves the annual peacekeeping budget and assessment rates, ensuring transparency and accountability.

#### 4. Reimbursement to Troop-Contributing Countries

- **How It Works:**

- Countries that contribute troops or police are reimbursed by the UN at a standard rate—currently \$1,428 per person per month. They also receive payments for equipment,

transportation, and mission-related expenses.

- **Verification:**

- Mission leadership verifies that contributing countries have met their obligations before reimbursements are made.

- **Additional Allowances:**

- Mission subsistence allowances (MSAs) cover personal expenses for deployed personnel. Compensation is also provided for injuries or deaths in the line of duty.

## 5. Special Funds and Financial Flexibility

- **Peacekeeping Reserve Fund:**

- Used to address urgent or unforeseen financial needs, such as rapid deployments or unexpected operational challenges.

- **Trust Funds:**

- Established for specific initiatives or operational requirements.

## 10. Global Energy Alliance for People and Planet

**Context:** The Department for Promotion of Industry and Internal Trade (DPIIT) on May 17 said it has inked a pact with Global Energy Alliance for People and Planet (GEAPP) to support early-stage climate-tech start-ups through funding access, and mentorship. As part of the MoU, GEAPP will launch the Energy Transitions Innovation Challenge (ENTICE), a competitive platform offering up to \$5,00,000 in rewards for high-impact solutions, it said.

### Global Energy Alliance for People and Planet (GEAPP):

#### What is GEAPP?

- The **Global Energy Alliance for People and Planet (GEAPP)** is a global coalition of philanthropic organizations, governments, technology innovators, policy experts, and financial partners. Its mission is to accelerate an inclusive and equitable transition to clean energy, particularly in developing and emerging economies, to address both energy poverty and climate change.

### Founding and Partners

- **Founded:** 2021
- **Anchor Partners:** IKEA Foundation, The Rockefeller Foundation, Bezos Earth Fund
- **Investment Partners:** African Development Bank Group, Asian Development Bank, European Investment Bank, Inter-American Development Bank, International Finance Corporation, British International Investment, U.S. International Development Finance Corporation, World Bank
- **Other Partners:** Governments, NGOs, technology firms, and delivery partners in target countries

### Mission and Objectives

GEAPP seeks to:

- Enable a shift to a clean energy, pro-growth model in emerging and developing economies
- Accelerate universal energy access and inclusive economic growth
- Support the global community in meeting critical climate goals in the next decade

### Key 2030 Targets:

- Avoid or avert over **4 gigatons of future carbon emissions**
- Expand clean, reliable energy access to **1 billion underserved people**
- Enable **150 million green jobs** worldwide

### How Does GEAPP Work?

- **Funding Model:** GEAPP was launched with more than \$10 billion in aligned investments, including \$1.5 billion from anchor partners and nearly \$9 billion from investment partners.
- **Blended Finance:** Uses risk-tolerant grant capital and blended finance to de-risk projects and attract commercial investment.
- **Country Focus:** Works directly with governments and local partners to design and implement high-impact clean energy projects.
- **Project Support:** Provides technical expertise, policy support, and capital mobilization for renewable energy deployment, grid modernization, and innovation pilots.



### Major Initiatives and Impact

- **Solar Energy:** Signed a Multi-Donor Trust Fund with the International Solar Alliance to mobilize \$100 million for solar projects.
- **India:** Investments have provided new or improved energy access to over 830,000 people, supported nearly 600,000 jobs, and reduced 102,000+ tons of CO<sub>2</sub> emissions. Notable projects include large-scale rooftop and decentralized solar installations for farmers in Maharashtra.
- **Nigeria:** Programs like the DART initiative have cut solar equipment costs by up to 30% and supported local energy access and job creation.
- **Global Reach:** Active in Africa, Asia, Latin America, and the Caribbean, with a focus on countries most affected by energy poverty and climate vulnerability
- GEAPP was indeed launched at **COP26 (Glasgow, 2021)** to support an **inclusive, green energy transition** in developing countries.
- GEAPP is a partnership between **The Rockefeller Foundation, IKEA Foundation, and Bezos Earth Fund** — **not** the Government of India.
- GEAPP focuses on **renewable energy access** (like solar and decentralized solutions), **not nuclear energy**.

## 11. Alternative Investment Fund

**Context:** RBI has proposed revised guidelines to ease restrictions on investments by regulated entities (REs) in Alternative Investment Funds (AIFs).

### Alternative Investment Fund (AIF)

- Alternative Investment Fund or AIF means any fund established or incorporated in India which is a privately pooled investment vehicle which collects funds from sophisticated investors, whether Indian or foreign, for investing it in accordance with a defined investment policy for the benefit of its investors.
- AIF does not include funds covered under the SEBI (Mutual Funds) Regulations, 1996, SEBI (Collective Investment Schemes) Regulations, 1999 or any

other regulations of the Board to regulate fund management activities.

- AIFs in India are classified into three categories based on their investment strategy, risk profile, and use of leverage.
  - **Category I AIFs** invest in sectors that are considered socially or economically desirable by the government or regulators, such as start-ups, small and medium enterprises (SMEs), infrastructure, and social ventures.
  - **Category II AIFs** comprise funds that do not fall under Category I or III and typically include private equity funds, real estate funds, and distressed asset funds.
  - **Category III AIFs** are designed for high-risk, high-return strategies and are permitted to employ leverage and complex trading strategies, including in listed or unlisted derivatives.

### Followings can be classified as AIF in India:

- Under SEBI (Alternative Investment Funds) Regulations, 2012, AIFs in India exclude mutual funds, REITs, and InvITs, which are regulated separately.
  - Venture Capital Funds – Category I AIF
  - Hedge Funds – Category III AIF
  - Private Equity Funds – Category II AIF
  - Angel Funds – Sub-category under Category I AIF
- While,
  - REITs – Regulated under SEBI (REIT) Regulations, not AIF
  - InvITs – Regulated under SEBI (InvIT) Regulations, not AIF
  - Mutual Funds – Regulated under SEBI (Mutual Funds) Regulations, not AIF

## 12. Offshore Derivative Instruments

**Context:** Sebi has extended the deadline for implementing stricter rules on offshore derivative instruments (ODIs) issued by Foreign Portfolio Investors (FPIs) to November 17, 2025. The framework, initially set for May 17, requires

### additional disclosures from ODI subscribers and FPIs with segregated portfolios.

#### What are Offshore Derivative Instruments (ODIs)?

- Offshore Derivative Instruments (ODIs) are financial instruments issued by Foreign Portfolio Investors (FPIs) or formerly Foreign Institutional Investors (FIIs) registered with the Securities and Exchange Board of India (SEBI). They allow overseas investors to gain exposure to Indian equities, equity derivatives, or other securities without directly registering with SEBI.

#### How ODIs Work

- Overseas investors who are not registered with SEBI approach an FPI/FII that is registered in India.
- The FPI/FII makes investments in Indian securities on behalf of these investors.
- The FPI/FII issues ODIs to the overseas investors, with the Indian securities as the underlying asset.
- The ODI holder is entitled to returns (dividends, capital gains) from the underlying securities but does not own the securities directly.

#### Types of ODIs

- **Participatory Notes (P-notes):** The most common form of ODI, allowing foreign investors to invest in Indian markets without direct registration. Other forms include equity-linked notes, capped return notes, and total return swaps.

#### Key Features

- **Indirect Investment:** Investors do not have to register with SEBI, reducing regulatory hurdles and transaction costs.
- **Transferability:** ODIs, especially P-notes, are transferable, allowing them to be traded between investors, which can obscure the identity of the ultimate beneficial owner.
- **Underlying Assets:** Typically, Indian stocks, equity derivatives, or indices.

#### Regulatory Framework and Recent Changes

- ODIs are regulated by SEBI under the Foreign Portfolio Investors (FPI) Regulations.

- Only regulated entities from certain jurisdictions can subscribe to ODIs, and strict Know Your Client (KYC) norms and disclosure requirements apply.
- SEBI has tightened the ODI framework to address concerns about anonymity, money laundering, and market volatility:
  - FPIs cannot issue ODIs with derivatives as the underlying asset, nor hedge ODI positions with derivatives on Indian exchanges.
  - Existing ODIs with derivatives as the underlying must be redeemed by December 16, 2025.
  - Additional disclosure requirements are effective from May 17, 2025, to align ODI subscribers with direct FPI disclosure norms.
  - KYC reviews for high-risk ODI subscribers are required annually; others, every three years.

#### Participatory Notes:

- **Participatory Notes (P-Notes)** are a type of **Offshore Derivative Instrument (ODI)** issued by **SEBI-registered FPIs** to **unregistered foreign investors**, allowing them **indirect access** to Indian equities and derivatives.
- These investors **do not need to register with SEBI**, making it a preferred route for hedge funds looking for simplified or discreet access.

### 13. Globally Important Agricultural Heritage Systems

**Context:** New sites from China, Brazil, China, Mexico and Spain recognized as Globally Important Agricultural Heritage Systems.

#### Globally Important Agricultural Heritage Systems (GIAHS)

- It was launched by the Food and Agriculture Organization of the United Nations (FAO) in **2002** to address **threats to traditional farming systems**, such as climate change and biodiversity loss.
- It aims to **balance conservation**, sustainable adaptation, and socioeconomic development by

supporting farmers, promoting traditional knowledge, and enhancing market opportunities.

- It welcomes proposals that reflect agricultural and cultural heritage and support global sustainable development and biodiversity goals.
- FAO's worldwide agricultural heritage network now consists of 95 systems in 28 countries around the globe.

#### The latest additions to the Globally Important Agricultural Heritage Systems (GIAHS)

- A traditional agroforestry system cultivating erva-mate in **Brazil**
- Three **Chinese** sites known for **pearl mussels**, white tea, and pears
- An ancestral farming system in **Mexico** that conserves key food crops and biodiversity
- A unique agricultural system set within the volcanic terrain of Spain's Lanzarote island.
- The FAO launched GIAHS in 2002 to recognize and protect traditional farming systems that promote sustainability, food security, and cultural identity.
- The Sikkim Organic Farming System was added as a GIAHS site by FAO in 2023- India's first "state-wide" GIAHS recognition.
- **GIAHS designation is not a legal status** and does **not confer binding international protection** like **UNESCO World Heritage status**. It's a **voluntary, recognition-based initiative**.
- Sites are evaluated on criteria such as **agro-biodiversity, indigenous knowledge, cultural and spiritual values, resilience, and landscape features**.

#### 14. Payments Regulatory Board

**Context:** The Reserve Bank of India (RBI) notified the Payments Regulatory Board Regulations, 2025, under Payment and Settlement Systems Act, 2007

##### More on the news:

- These regulations replace the earlier Board for Regulation and Supervision of Payment and Settlement Systems Regulations, 2008.

#### About Payments Regulatory Board

##### • Composition

- **Chairperson: RBI Governor.**
- Ex-officio Members: Deputy Governor in charge of payment systems, 1 RBI-nominated officer.
- **3 members nominated by Central Government.**
- Board may also invite experts from fields like payments, IT, cybersecurity, law etc.
- **Tenure of Members:** Government-nominated members will have a fixed tenure of 4 years and no re-nomination is allowed.
- **Meetings:** At least twice a year.
- **Quorum:** Minimum of 3 members, including Chairperson or Deputy Governor.
- **Decisions: by majority vote. In case of a tie, Chairperson has a casting vote.**

#### 15. India – 4th Largest Economy in World

**Context:** India surpassed Japan to become the 4th largest economy in the world, as confirmed by NITI Aayog CEO B.V.R. Subrahmanyam citing IMF data.

#### About India – 4th Largest Economy in World:

##### What is it?

- As per the IMF World Economic Outlook (April 2025), India's nominal GDP is projected at \$4.19 trillion, surpassing Japan's GDP of \$4.18 trillion.
- This marks a major shift in global economic order and India's rising influence.

##### India's New Economic Status

- **Current Rank:** 4th largest economy globally
- **Previous Rank (2024):** 5th, behind Japan
- **New Rank Order (2025):** United States, China, Germany, India, and Japan

##### Significance of the Achievement:

- **Global Confidence Boost:** Reinforces India's role as a key global economic power, attracting increased FDI and international partnerships.

- **Domestic Economic Growth:** India's GDP doubled from \$2 trillion (2014) to \$4+ trillion (2025) and per capita income rose from \$1,438 (2014) to \$2,880 (2025).
- **Strategic Manufacturing Hub:** India remains a cost-effective production base despite global reshoring discussions, such as Apple's US manufacturing push.
- **Leadership Impact:** Economic trajectory credited to policy reforms, infrastructure growth, and Digital India & Atmanirbhar Bharat missions.
- **Future Potential:** Projected to overtake Germany in the next 2.5–3 years and become the third-largest economy globally, as per NITI Aayog projections.
- According to various reports (e.g., Times of India, SBI Research), India's nominal GDP in FY2014 (or 2013-14) was around \$2.1 trillion. The International Monetary Fund (IMF) and other projections estimate India's nominal GDP to reach around \$4.19 trillion to \$4.27 trillion in FY2025.
- Reports indicate that India's per capita income in FY2014 (or 2013-14) was approximately \$1,438. Projections for India's nominal GDP per capita in FY2025 are around \$2,880.

## 16. Outward Remittance

**Context:** India's outward remittances under the Liberalised Remittance Scheme (LRS) moderated by 6.85 percent year-on-year (YoY) to \$29.56 billion in FY25, after reaching an all-time high of \$31.73 billion in FY24.

### What is Outward Remittance?

- Outward remittance refers to the **transfer of money in foreign currency** by a resident of India to a person or entity outside India, for purposes such as education, travel, medical treatment, investment, or gifting.

### What is the Liberalised Remittance Scheme (LRS)?

- LRS was introduced in **2004** by the **Reserve Bank of India (RBI)**.

- It allows resident individuals (including minors) to remit up to **\$250,000 per financial year** for permissible current or capital account transactions.
- Initially launched with a \$25,000 limit, later increased to current levels.

### Spending allowed under LRS:

- **Investment in shares and bonds abroad**
- **International education and medical treatment**
- **Gifting to relatives abroad**
- **Purchase of immovable property abroad**

### Spending not allowed under LRS:

- **Purchase of lottery tickets**
- **Margin/margin calls to foreign exchanges**
- **Personal donations to international crowdfunding platforms** (Not allowed unless for charitable/religious purposes through recognized channels)
- **Speculative trading in foreign exchange abroad**

### Key Trends in FY25

- **Travel Remittances** emerged as the largest component, accounting for **\$16.96 billion**, or over **57%** of total outflows.
  - It indicates a growing preference for international travel among Indian residents despite a marginal dip from FY24.
- **Education Remittances** declined 16% year-on-year, from \$3.48 billion in FY24 to **\$2.92 billion in FY25**.
- **Investment Abroad:** The funds remitted by Indians to invest in foreign equity and debt rose by 12.51%, reaching **\$1.699 billion in FY25** compared to \$1.51 billion in FY24.
  - It reflects growing interest in diversifying portfolios and accessing global financial markets.

## 17. Central Apprenticeship Council

**Context:** The Central Apprenticeship Council (CAC), in its 38th meeting, recommended a 36% hike in stipend for apprentices under NAPS and NATS.



**About Central Apprenticeship Council (CAC)**

- **Statutory Body:** The Central Apprenticeship Council (CAC) is a statutory body established under the Apprentices Act, 1961.
- **Primary Role:** It functions as an advisory body to the Government of India on policies and strategies related to apprenticeship training.
- **Chairperson:** The Union Minister for Skill Development serves as the Chairperson of the CAC.
- **Sectoral Representation:** It has members from Public Sector Enterprises, Private Sector Companies, Sector Skill Councils, Government Representatives, Industry Experts, Training Bodies and Boards.

**Key Highlights of the 38th Meeting of the Central Apprenticeship Council**

- **Apprentice Stipends:** The Council proposed a **30% increase in stipends** under National Apprenticeship Promotion Scheme (NAPS) and the National Apprenticeship Training Scheme (NATS).
  - This will raise the stipend range to ₹6,800–₹12,300, aiming to reduce dropout rates and attract more candidates.
- **Sector Coverage:** Recommended replacing the 1987 industry classification with NIC (National Industrial Classification) 2008, enabling inclusion of emerging sectors like IT, telecom, biotechnology, and software services.
- **Reforms:** Called for policy streamlining and strengthening of apprenticeship-integrated education under the Apprenticeship Rules, 1992.
- **Apprenticeship Embedded Education:** Advocated introducing new terms such as “Degree Apprenticeship” and aligning educational curricula with on-the-job training to embed apprenticeship in formal education.
- **Flexible Training Delivery Modes:** Proposed allowing employers to conduct **Basic and Practical Training** via online, virtual, or blended methods, ensuring flexibility while maintaining quality.

- **Persons with Disabilities:** Recommended adding a definition for “Person with Benchmark Disability” in line with the Rights of Persons with Disabilities (RPwD) Act to enhance inclusivity in apprenticeship programmes.

**18. Modified Interest Subvention Scheme**

**Context:** The Union Cabinet has approved the continuation of the Modified Interest Subvention Scheme (MISS) for FY 2025–26, maintaining a 1.5% interest subvention on short-term Agri loans to promote affordable credit access for farmers.

**About Modified Interest Subvention Scheme**

- It is a Central Sector Scheme
- It is aimed at ensuring the availability of short-term credit to farmers at an affordable interest rate through Kisan Credit card (KCC).
- Under the Scheme
  - Farmers received short-term loans of up to Rs.3 lakh through Kisan Credit Cards (KCC) at a subsidized interest rate of 7%, with 1.5% interest subvention provided to eligible lending institutions.
  - Additionally, farmers repaying loans promptly are eligible for an incentive of up to 3% as Prompt Repayment Incentive (PRI) effectively reducing their interest rate on KCC loans to 4%.
  - For loans taken exclusively for animal husbandry or fisheries, the interest benefit is applicable up to Rs.2 lakh.
- No changes have been proposed in the structure or other components of the scheme.
- The scheme is jointly implemented and monitored by the Reserve Bank of India (RBI) and National Bank for Agriculture and Rural Development (NABARD).
- Through Public Sector Banks, Regional Rural Banks (RRBs), Cooperative Banks and Private Sector Banks operating in rural and semi urban areas, they ensure that the interest subvention benefits reach the farmers.

## 19. Quality Council of India

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

### About Quality Council of India

- It is a non-profit autonomous organisation registered under Societies Registration Act XXI of 1860.
- It was set up in 1997 jointly by the Government of India and the Indian Industry represented by the three premier industry associations, i.e., Associated Chambers of Commerce and Industry of India (ASSOCHAM), Confederation of Indian Industry (CII), and Federation of Indian Chambers of Commerce and Industry (FICCI), with Mr. Ratan Tata as its first Chairman.
- It is under the administrative control of the Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry.
- QCI works as the national accreditation body.
- QCI has been established to create a mechanism for independent third-party assessment of products, services, and processes.
- Besides the role of putting in place the accreditation structure, it also promotes the adoption of quality standards relating to Quality Management Systems (ISO 14001 Series), Food Safety Management Systems (ISO 22000 Series), and Product Certification and Inspection Bodies through the accreditation services provided by the National Accreditation Board for Certification Bodies (NABCB).
- It plays a pivotal role at the national level in propagating, adoption, and adherence to quality standards in all important spheres of activities that have significant bearing on improving the quality of life and well-being of the citizens of India.
- It leads a nationwide quality movement in the country through the National Quality Campaign.

- QCI functions through the governing body and other executive bodies (boards/committees) for implementing the strategy, policy, and operational guidelines as set out by its governing council.
- The council comprises 38 members, with equal representation from the Government, Industries and other stakeholders.
- Indian industry is represented in QCI by three premier industry associations, namely ASSOCHAM, CII, and FICCI.
- Boards/Divisions under QCI:
  - National Accreditation Board for Testing & Calibration Laboratories (NABL)
  - National Accreditation Board for Hospitals & Healthcare Providers (NABH)
  - National Accreditation Board for Education & Training (NABET)
  - National Accreditation Board for Certification Bodies (NABCB)
  - National Board for Quality Promotion (NBQP).
- Every board is functionally independent and works within its area of expertise.

## 20. Advance Authorisation Scheme

**Context:** The government decided to ease rules under the Advance Authorisation (AA) Scheme, allowing exporters to claim duty-free benefits even if goods were shipped before licence issuance, provided the Bill of Entry is filed post licence date.

### Advance Authorisation Scheme (AAS)

- **About:**
  - AAS allows duty free import of inputs, which are physically incorporated in an export product.
  - In addition to any inputs, packaging material, fuel, oil, and catalyst which is consumed / utilized in the process of production of export products, is also allowed.
  - The quantity of inputs allowed for a given product is based on specific norms defined for that export product, which considers the

waste generated in the manufacturing process.

- DGFT provides a sector-wise list of **Standard Input-Output Norms** (SION) under which the exporters may choose to apply.
- Alternatively, exporters may apply for **their own ad-hoc norms** in cases where the SION does not suit the exporter.
- Advance Authorisation covers manufacturer exporters or merchant exporters tied to supporting manufacturer(s).
- **Prerequisites for Applying:**
  - To apply for an Advance Authorisation scheme, an **Import-Export Code** (IEC) is required.
  - Other prerequisites are mentioned in the Chapter 4 of Foreign Trade Policy and Handbook of Procedures.

## 21. Non-Convertible Debenture

**Context:** Adani Ports and Special Economic Zone Ltd. (APSEZ), said it has raised ₹5,000 crore through a 15-year Non-Convertible Debenture (NCD). The issue, locked in a competitive coupon rate of 7.75% p.a., was fully subscribed by LIC. The debentures will be listed on the BSE, the firm said. The proceeds will fund a proposed buyback of APSEZ's U.S. dollar bonds.

### Non-Convertible Debenture (NCD):

#### Definition

- A Non-Convertible Debenture (NCD) is a fixed-income instrument issued by companies to raise capital, offering a fixed interest rate over a specified tenure. Unlike convertible debentures, NCDs cannot be converted into equity shares of the issuing company at any point during their tenure.

#### Key Features

- **Fixed Returns:** NCDs provide a predetermined interest rate (coupon rate), paid out at regular

intervals—monthly, quarterly, half-yearly, or annually.

- **No Equity Conversion:** NCDs cannot be converted into company shares, making them purely debt instruments.
- **Maturity:** They have a fixed maturity date, upon which the principal is repaid to investors.
- **Tradability:** NCDs are listed and traded on stock exchanges, offering liquidity to investors.
- **Credit Rating:** Issuers are rated by agencies like CRISIL or CARE, helping investors assess credit risk. Higher-rated NCDs generally offer lower interest rates, reflecting lower risk.
- **Taxation:** Interest earned is taxable as per the investor's income tax slab. However, there is no Tax Deducted at Source (TDS) on interest paid

#### Benefits

- **Higher Returns:** NCDs often offer higher interest rates compared to traditional fixed deposits and government bonds.
- **Liquidity:** Being listed on exchanges, NCDs can be bought or sold before maturity.
- **Diversification:** Investors can diversify their portfolios by investing in NCDs from different sectors.
- **Priority in Repayment:** In case of company liquidation, NCD holders are prioritized over equity shareholders for repayment.

#### Risks & Considerations

- **Credit Risk:** The safety of NCDs depends on the issuer's creditworthiness. Lower-rated NCDs carry higher default risk.
- **Interest Rate Risk:** Fixed interest rates mean returns may not keep up with inflation.
- **No Equity Upside:** NCD holders do not benefit from any appreciation in the company's share price.
- **Issuer Quality:** Some lower-quality companies may issue NCDs with higher rates to attract investors, increasing risk.
- Secured NCDs are backed by a charge on assets of the issuer, providing higher security to investors.

Unsecured NCDs have no backing by assets, and are riskier.

- NCDs **can be listed or unlisted**, and **can be issued through private placement** or public issue, depending on compliance with SEBI norms.

- **Interest income** from NCDs is **taxable** as per the investor's tax slab. There is **no exemption under Section 10** of the Income Tax Act.
- NCDs can be issued with **callable** (issuer can redeem early) or **puttable** (investor can sell back early) features, making them more flexible.



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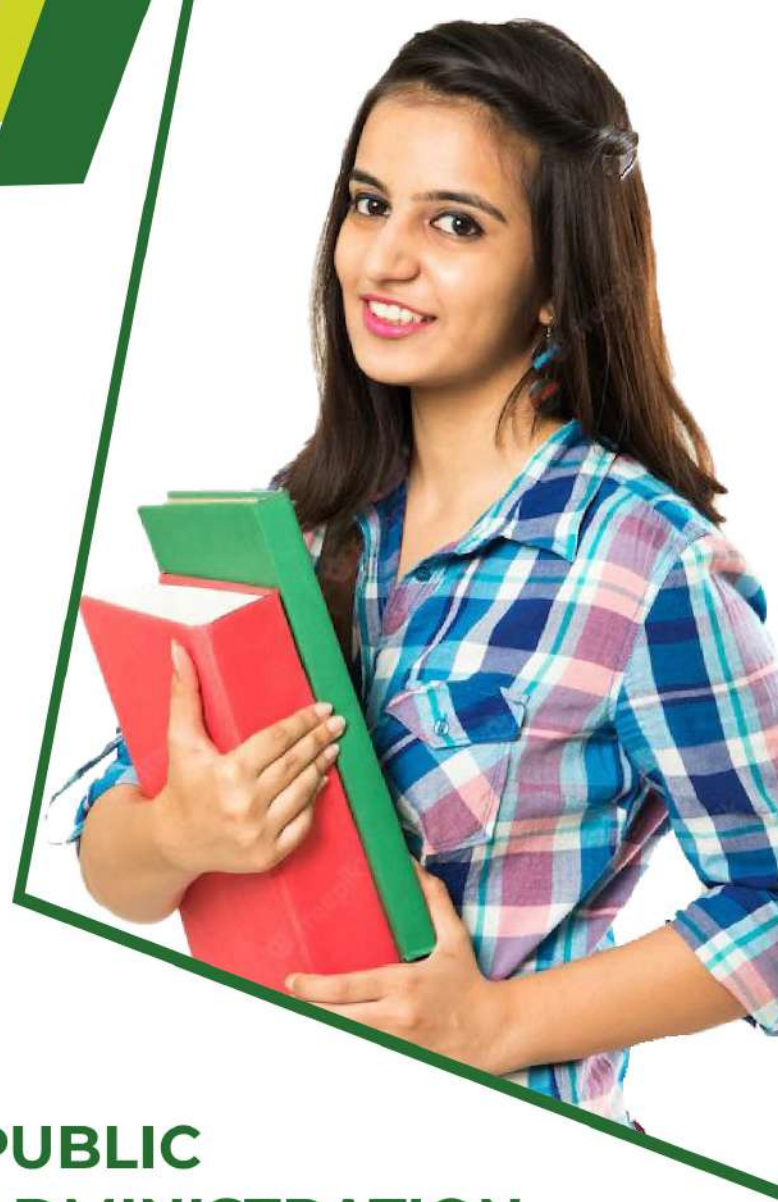
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# INTERNATIONAL RELATION

## 1. Vietnam War

**Context:** The Vietnamese celebrated the 50th anniversary of the end of the Vietnam War.

### The Vietnam War

- **The Vietnam War** — also known as the **Second Indochina War** — was a prolonged conflict from **1955 to 1975** between **North Vietnam (Communist)** and **South Vietnam (anti-Communist)**, with heavy **U.S. involvement on the side of the South**.
- **North Vietnam:** Led by **Ho Chi Minh** and the Communist Party, supported by the Soviet Union, China, and other communist allies.
- **South Vietnam:** Initially led by Ngo Dinh Diem, later by various leaders after multiple coups.
  - Supported by the United States, South Korea, Australia, Thailand, and others.

### Agent Orange

- Agent Orange was a powerful herbicide used by the United States military during the Vietnam War as part of Operation Ranch Hand (1961–1971).
- It became one of the most controversial aspects of the war due to its devastating health and environmental effects.
- The manufacturing process of 2,4,5-T created a dangerous dioxin contaminant called TCDD, one of the most toxic chemicals.
- The U.S. military used Agent Orange to:
  - Defoliate forests and jungles to reduce enemy cover (especially for the Viet Cong).
  - Destroy crops used to feed North Vietnamese forces.
  - Over 20 million gallons of herbicides were sprayed across South Vietnam, particularly in dense jungles and rural farmlands.
- **Aftermath:**
  - Agent Orange remains a symbol of the war's human and moral cost.

- Programs by the Vietnamese Red Cross, USAID, and international NGOs are working to support victims and clean up the environment.
- Many advocates for continued support, justice, and recognition of all those affected.

## 2. USA's strategic military bases across world

**Context:** US President Donald Trump on April 1 claimed that China now occupies the Bagram Airfield, which American forces had vacated weeks before pulling out from Afghanistan in 2021.

### USA's strategic military bases across world:

- **Ramstein Air Base:** Located in **Germany**, serves as a major hub for U.S. Air Forces in Europe and global logistics.
- **Kadena Air Base:** Located in **Okinawa, Japan**, one of the most important U.S. air bases in the Pacific.
- **Camp Humphreys:** Located in **South Korea**, it is the largest U.S. overseas military base.
- **Camp Lemonnier:** Located in **Djibouti**, it is the only permanent U.S. military base in **Africa**, crucial for operations in the Horn of Africa and the Middle East.



## 3. OPEC

**Context:** Oil prices plunge to multi-year low as OPEC+ plans to accelerate production hikes.



**About OPEC**

- The **Organization of the Petroleum Exporting Countries (OPEC)** is an intergovernmental organisation established in 1960 at the **Baghdad Conference** by **Saudi Arabia, Iran, Venezuela, Kuwait and Iraq**.
- Currently, it has **12 members**, viz. Algeria, Congo, Equatorial Guinea, Gabon, Iran, Iraq, Kuwait, Libya, Nigeria, Saudi Arabia, the United Arab Emirates and Venezuela.
- The **objective of the organisation** is to coordinate policies with respect to petroleum demand and supply to ensure fair and stable prices and ensure a steady income to oil producing countries.
- It is **headquartered** in Vienna, Austria, although **Austria is not an OPEC member state**.

**OPEC+**

- **OPEC+ has 22 members**, made up of **10 major oil producing countries** (Russia, Kazakhstan, Azerbaijan, Brunei, Bahrain, Mexico, Oman, South Sudan, Sudan and Malaysia), **along with the 12 OPEC members**.
- The **OPEC+ was formed in 2016** after the adoption of the '**Algiers Accord**' by OPEC countries in September 2016 and signing of the '**Vienna Agreement**' in November 2016 between OPEC and other major oil exporting countries.
- The move was largely a response to sharply falling oil prices caused by a surge in U.S. shale oil production.

**4. Right to Self-Defence under International Law**

**Context:** On May 10, India and Pakistan agreed to halt "all firing and military action" following days of escalating tensions between the two nuclear-armed neighbours. The announcement came after the Indian armed forces conducted 24 precision strikes on May 7, targeting terrorist infrastructure in Pakistan and Pakistan-Occupied Kashmir, in response to the Pahalgam massacre that left 26 dead.

**The Right to Self-Defence under International Law****What is the Right to Self-Defence?**

- The right to self-defence is a fundamental principle in international law, primarily governed by Article 51 of the United Nations (UN) Charter.
- While Article 2(4) of the Charter prohibits member states from threatening or using force against the territorial integrity or political independence of any state, Article 51 creates an exception: it allows a state to use force in self-defence if it is the victim of an armed attack, until the UN Security Council (UNSC) takes measures to maintain or restore international peace and security.

**Procedural Obligations**

- States exercising the right to self-defence must immediately report any military measures taken to the UNSC.
- The UNSC then assumes authority to address the situation and may take further action to maintain or restore peace.

**Self-Defence Against Non-State Actors**

- Traditionally, the UN Charter regulates only the conduct of states. However, the rise of non-state actors (NSAs) in international conflicts, especially after the 9/11 attacks, has led some countries (notably the United States) to argue that Article 51 also permits self-defence against NSAs such as terrorist groups.
  - The International Court of Justice (ICJ) has generally held that an armed attack by NSAs triggers the right to self-defence only if the attack is attributable to a state—meaning the NSA acts "by or on behalf of a state".
  - Some states, including India, support a broader interpretation, asserting the right to self-defence even if the NSA is not directly controlled by a state, especially if the host state is unwilling or unable to address the threat.

**The 'Unwilling or Unable' Doctrine**

This emerging doctrine allows a state to use force in self-defence against NSAs operating from another



state's territory if that state is "unwilling or unable" to neutralize the threat.

- **Proponents:** The United States has invoked this doctrine in operations such as the 2011 raid on Osama bin Laden in Pakistan and airstrikes against ISIS in Syria.
- **Critics:** Countries like China, Mexico, and Russia argue this undermines the sovereignty and territorial integrity of the host state.
- **Legal Status:** The doctrine remains contested and has not yet achieved the level of consistent state practice and legal acceptance required to become customary international law.

### Principles of Necessity and Proportionality

Any use of force in self-defence must adhere to two key principles:

- **Necessity:** Force must be the last resort after all other means have been exhausted.
- **Proportionality:** The response must not exceed the scale and scope of the original armed attack. The force used must be limited to what is necessary to repel or prevent further attacks.

### There are differing views on proportionality:

- A narrow interpretation limits force to what is strictly necessary to stop an ongoing attack.
- A broader view allows for action to prevent reasonably anticipated future attacks.

### Role of the UN Security Council

If hostilities escalate or the ceasefire fails, the UNSC may:

- Call for an immediate cessation of hostilities.
- Adopt resolutions to address violations, which could include sanctions or the deployment of peacekeeping or military forces.
- The passage of such resolutions depends on the consensus among the Council's permanent members, each of whom holds veto power.

## 5. 1267 Sanctions Committee

**Context:** India has decided to send a team to the United Nations Security Council's 1267 Sanctions

**Committee meeting to seek the designation of The Resistance Front (TRF) as a terrorist organisation.**

### 1267 Sanctions Committee

- It is also called the **ISIS and Al-Qaeda Sanctions Committee**, was established under a UNSC resolution in **1999**, to focus on **combating terrorism linked to ISIS, Al-Qaeda, and related groups**.
- **Member States** may at any time submit to the **Committee listing requests** for inclusion of individuals, groups, undertakings and entities.
- The Committee **comprises all 15 members** of the Security Council and makes its **decision by consensus**.
- **Sanctions Measures Include:**
  - **Asset Freeze:** All assets of designated individuals/entities are frozen.
  - **Travel Ban:** Listed individuals are banned from entering or transiting through any member state.
  - **Arms Embargo:** Prohibition on supplying arms or related material.
- Sanctions imposed by the UNSC under **Chapter VII of the UN Charter** are **legally binding on all UN member states**.
- **Any member of the 1267 Committee can block** a listing (or delisting) proposal - this is sometimes referred to as a **technical hold**, and it **does not require justification**.
- The 1267 regime **operates under Chapter VII**, which allows the UNSC to take enforcement measures to maintain or restore international peace and security.
- There is a **provision for review/appeal**. Individuals or entities can submit a request for delisting via the **UN Ombudsperson** (for ISIL/Al-Qaeda listings). This mechanism was created to ensure fairness and due process.

## 6. F-1, M-1, and J-1 visas

**Context:** The Trump administration revoked the Student and Exchange Visitor Program (SEVP), which

## allowed Harvard University to enrol international students.

### About

- This comes amid Harvard and the Trump administration's tussle about key programs.
  - The president has been putting pressure on the college to fall in line with his agenda.
- **SEVP** is a US Department of **Homeland Security (DHS) program**, administered by **Immigration and Customs Enforcement (ICE)**.
- It oversees **international students and exchange visitors** at institutions like Harvard University on F-1 (academic students), M-1 (vocational students), and J-1 (exchange visitors) visas.
- EVP certification allows Harvard to enroll international students, who make up **over 27% of its student body**.
- The program requires Harvard to use the Student and Exchange Visitor Information System (SEVIS) to report data such as **enrollment status, academic progress, and disciplinary records** to ensure visa compliance.

### What is F-1, M-1, and J-1 visas?

- **F-1 Visa** – For academic students pursuing degrees or language training programs in the U.S.
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“ With respect to GS, largely my static knowledge on different topics became stagnated because I have been reading the same thing, so the new thing I have brought in is the value addition, the new data points, the new examples that I felt that will give the extra half mark in each question of each paper and that's where I think R.C. REDDY IAS STUDY CIRCLE material and sessions helped me with respect to Mains Value Addition.”

Mr. N. Sreekanth Reddy - IAS - AIR 151 (CSE 2024)

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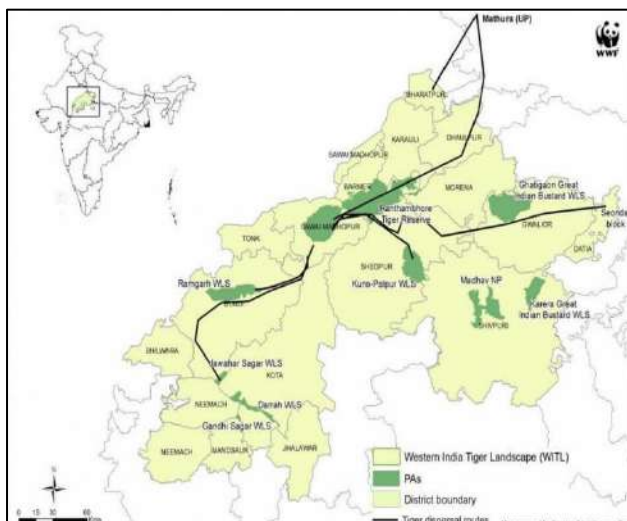
# ENVIRONMENT

## 1. Palamau Tiger Reserve

**Context:** Jharkhand's Jaigir village has become the first village to be fully relocated from the core of Palamau Tiger Reserve (PTR), reducing human pressure on wildlife.

### About Palamau Tiger Reserve (PTR):

- The Palamau Tiger Reserve is in the western side of Latehar district on the **Chhota Nagpur plateau** in Jharkhand.
- This tiger reserve is surrounded by the **Auranga River in the North**.
- It is one of the first 9 tiger reserves created in the country at the inception of 'Project Tiger'.
- It is the first reserve in the world in which a **tiger census** was carried out as a **pugmark count**, as early as 1932 under the supervision of J.W. Nicholson
- This Tiger reserve zone is the watershed area for 3 important **rivers Koel, Burha, and Auranga**.
- Many **aquifers** locally called '**Chuan**' are also present inside the reserve. A sulfur **hot spring 'Tatha'** is present near Barwadih.
- **Flora:** The project area is constituted mainly of **Sal forests, mixed deciduous forests, and bamboo groves**.
- **Fauna:** The keystone species are Tigers, Elephants, Leopards, Grey Wolf, Gaur, Sloth Bear, etc.



## 2. Access and Benefit Sharing

**Context:** The National Biodiversity Authority (NBA) has notified the Biological Diversity (Access to Biological Resources and Knowledge Associated thereto and Fair and Equitable Sharing of Benefits) Regulation, 2025.

### What is Access and Benefit Sharing (ABS)?

- ABS refers to the framework through which benefits arising from the use of biological resources and associated traditional knowledge are **shared fairly and equitably with the communities** that have conserved these resources.
- It is a principle under the **Convention on Biological Diversity (CBD)**.
- India operationalizes ABS through the **Biological Diversity Act, 2002**, and its recent amendment the **Biological Diversity (Amendment) Act, 2023**.

### Key Features of the 2025 Regulation

- **Turnover-Based Benefit Sharing:**
  - **Below ₹5 crore:** Exempt from benefit sharing.
  - **₹5 crore–₹50 crore:** 0.2% of annual gross ex-factory sale price (excluding taxes).
  - **₹50 crore–₹250 crore:** 0.4% of annual turnover.
  - **Above ₹250 crore:** 0.6% of annual turnover.
  - **Entities with turnover above ₹1 crore** must file annual statements on resource usage.
- **Inclusion of Digital Sequence Information (DSI):** DSI now considered part of genetic resources, closing earlier loopholes where only physical materials were covered.
  - It aligns with the outcomes from **COP16** of the **Convention on Biological Diversity in Cali, Colombia**.
- **Cultivated medicinal plants are exempted**, provided they are notified by the Ministry of Environment in consultation with the AYUSH Ministry.

- **High-Value Resources:** For resources of high conservation/economic value (red sanders, sandalwood, agarwood and threatened species), minimum **5%** of proceeds from auction/sale must be shared.
  - This can go up to **20%** in case of commercial exploitation.
- **Intellectual Property Rights (IPR):** Applicants for IPR involving biodiversity must disclose the use of biological resources and share benefits accordingly.
- **Distribution of Benefits:** 10–15% retained by the National Biodiversity Authority.
  - Remaining benefits directed to local communities and claimants through Biodiversity Management Committees (BMCs).

### 3. Vulture Species

**Context:** At least 123 vultures died in South Africa's Kruger National Park after consuming a poisoned elephant carcass left by poachers.

|   | Vulture Species      | IUCN status           |
|---|----------------------|-----------------------|
| 1 | White-rumped Vulture | Critically Endangered |
| 2 | Egyptian Vulture     | Endangered            |
| 3 | Bearded Vulture      | Near Threatened       |
| 4 | Griffon Vulture      | Least Concern         |

### 4. United Nations Forum on Forests

**Context:** India actively participated in United Nations Forum on Forests (UNFF20) held at UN Headquarters, New York, presenting achievements in sustainable forest management.

#### About the United Nations Forum on Forests (UNFF)

- The United Nations Forum on Forests (UNFF) was established in 2000 by the UN Economic and Social Council (ECOSOC) to promote sustainable forest management and conservation worldwide.
- The forum holds **annual sessions at the UN Headquarters (New York)**, alternating between **technical discussions (odd years)** and **policy-level dialogues (even years)**.

- **UNFF has universal membership, including all UN Member States and specialised forest-related agencies.**
- **India is a founding member of the UNFF**, and continues to play a **proactive role in shaping forest-related global policy.**
- The **19th UNFF Session Declaration** aimed to secure **high-level political commitment to forest protection**, with actionable steps to achieve the goals of the **UN Strategic Plan for Forests (UNSPF)**.

### 5. Phayre's Langur

**Context:** The 'Primates in Peril 2023–2025' report has listed Cross River Gorilla and Tapanuli Orangutan among the 25 most endangered primates globally. Two Indian species — Phayre's Langur and Western Hoolock Gibbon — were considered for the final list, highlighting their growing conservation concern.

#### About Phayre's Langur (*Trachypithecus phayrei*):

- **Status:**
  - **IUCN Red List:** Endangered
  - **Distribution:** Northeast India, East Bangladesh, and Western Myanmar
  - **Habitat:** Tropical evergreen, deciduous, and bamboo-dominated forests
- **Features:**
  - **Physical:**
    - Deep bluish-brown coat, **spectacle-like white rings** around eyes
    - Males weigh ~7.9 kg; females ~6.9 kg
    - Tail longer than body, aiding arboreal movement
  - **Biological & Social:**
    - Lives in **arboreal groups**, mainly diurnal and folivorous.
    - Distinct sagittal crest on head; vocal and territorial behavior.
  - **Diet:**
    - Primarily **leaf-eating (colobine)**; also consume fruits and seeds
    - Shows **specialized craniodental adaptations** for seed consumption.



## 6. South Australia Algal Bloom

**Context:** A massive bloom of toxic algae *Karenia mikimotoi* has killed over 200 species of marine life off the southern coast of Australia, affecting biodiversity and coastal tourism.

### About South Australia Algal Bloom:

- *Karenia mikimotoi* is a species of toxic dinoflagellate algae that forms harmful algal blooms (HABs), commonly referred to as red tides.

### Key Features:

- Appears as discoloured, foamy water during warmer months.
- Produces toxins (like gymnocin A & B) with low known toxicity but causes large-scale deaths.
- Creates oxygen-depleted (anoxic) zones and blocks fish gills.
- Affects marine life directly through contact and indirectly through water chemistry alteration.
- Associated with skin irritation, breathing issues, sore eyes in humans near affected beaches.

### Factors behind Algal Bloom:

- Excessive nutrient runoff containing nitrogen and phosphorus
- Warm temperatures and increased sunlight
- Discharge of untreated sewage and industrial effluents
- Stagnant water allows algae to accumulate and flourish.

### While (factors does not contribute in algal bloom),

- Rapid water turnover and high wave turbulence (High turbulence and turnover disperse algae)
- Use of herbicides that kill aquatic weeds (don't promote algae directly)

- Acid rain increasing the pH of water bodies (makes water more acidic hence inhibits algal bloom)
- Presence of invasive filter-feeding species like zebra mussels (it reduces algal bloom)

## 7. Malabar Large-Spotted Civet

**Context:** Tamil Nadu has transferred the management of its ₹50 crore Endangered Species Conservation Fund from the defunct SFDA to the Advanced Institute for Wildlife Conservation (AIWC). This aims to fast-track urgent conservation projects for species like Malabar civet and Salim Ali's fruit bat.

### Malabar Large-Spotted Civet (*Viverra civettina*):

- The **Malabar large-spotted civet** (*Viverra civettina*), also known as the Malabar civet, is a critically endangered small carnivorous mammal endemic to the Western Ghats of India. **It is one of the rarest mammals in the world and is listed as Critically Endangered on the IUCN Red List, with an estimated population of fewer than 250 mature individuals.**

### Physical Description

- **Coloration:** Dusky gray coat with large, pronounced dark spots on the back and sides, two oblique dark lines on the neck, and a white throat and neck.
- **Distinctive Features:** Large transverse dark marks, a mane starting between the shoulders, ringed tail with dark bands, and dark feet. The soles of the feet are notably naked compared to other civets.
- **Size:** Adults can reach 55–76 cm in body length with a tail of 25–33 cm, and weigh between 3–9 kg (some sources mention up to 18–20 lbs).
- **Appearance:** Dog-like in shape, with long legs and a canine-like head.

### Distribution and Habitat

- **Historic Range:** Once widespread along the Malabar coast from Honnavar to Kanyakumari, inhabiting lowland forests and wooded plains of the Western Ghats.

- **Current Status:** Now believed to survive only in small, scattered populations, mainly in degraded lowland forests and thickets within cashew and rubber plantations in Kerala and possibly Karnataka.
- **Habitat Loss:** Extensive deforestation and conversion of forests to plantations have been major drivers of its decline.

#### Ecology and Behavior

- **Activity:** Nocturnal and solitary; hides in thickets during the day and forages at night.
- **Diet:** Carnivorous and omnivorous—feeds on small mammals, birds, reptiles, amphibians, fish, eggs, and plant matter.
- **Reproduction:** Little is known, but females are believed to give birth to 2–4 young per litter.
- **Aggression:** Known to be aggressive towards other civets and prefers a solitary existence.

#### Conservation Status

- **IUCN Red List:** Critically Endangered.
- **Major Threats:**
  - Habitat destruction due to deforestation and agricultural expansion
  - Hunting and poaching outside protected areas
  - Extremely small and fragmented population
- **Recent Sightings:** No confirmed records from camera traps or surveys between 1990 and 2014, raising concerns about possible extinction in the wild.

### 8. 16th Asiatic Lion Census

**Context:** Gujarat Chief Minister announced the completion of the 16th Asiatic Lion Population Census, reporting a population of 891 lions.

#### About 16th Asiatic Lion Census:

- Conducted By: Gujarat Forest Department under the supervision of the State Wildlife Division.
- Total Lion Population: 891 lions, including 196 adult males and rest include females, sub-adults, and cubs.

- Area Coverage: Spanned 35,000 sq km across 58 talukas in 11 districts.

#### Census Methodology:

- Conducted in two phases:
  - Phase 1: Direct Beat Verification
  - Phase 2: Final Enumeration

#### Data Insights:

- Notable range expansion beyond Gir forest.
- Growing habitat connectivity and stable sub-populations outside protected areas.

#### Protected Areas having Asiatic Lions' population in India:

- **Gir National Park, Gujarat:** Yes, this is the primary habitat for Asiatic lions.
- **Kuno National Park, Madhya Pradesh:** No, Kuno National Park was identified as a potential site for the reintroduction of Asiatic lions to establish a second wild population, but currently, it houses African cheetahs and does not have an established Asiatic lion population.
- **Velavadar Blackbuck National Park, Gujarat:** While in Gujarat, Velavadar is known for its blackbuck population and is not a known habitat for Asiatic lions.
- **Satpura Tiger Reserve, Madhya Pradesh:** No, Satpura is a tiger reserve and does not have an Asiatic lion population.
- **Sasan Gir Wildlife Sanctuary, Gujarat:** Yes, this sanctuary is contiguous with Gir National Park and is part of the larger Gir ecosystem where Asiatic lions reside.

### 9. Dugongs

**Context:** World Dugong Day is celebrated on May 28 to raise awareness about dugongs.

#### Dugongs (Dugong dugon)

- They are also called 'Sea Cow' and are one of the four surviving species in the Order Sirenia.
- They are the only herbivorous mammals found in India's marine ecosystems.



- They depend on seagrass meadows for food and habitat, consuming large quantities daily to meet nutritional needs.
- **Distribution:** They resemble a cross between a whale and a seal and are found in shallow Indo-Pacific waters, especially in India's **Gulf of Mannar, Palk Bay, Gulf of Kutch, and the Andaman and Nicobar Islands.**
- **IUCN Red List status:** They are listed as being 'vulnerable' on the IUCN Red List for Threatened Species.
  - In India, they are classified as "regionally endangered".
- **Threats:** Habitat loss due to coastal development, pollution, destructive fishing practices (like mechanized boats, gill nets, and trawl nets), climate change, and accidental entanglement leading to drowning. Illegal hunting and boat collisions also pose risks.
  - their numbers have dwindled to an estimated 200 individuals.
- **Conservation Efforts:** India has taken steps such as creating its first dugong conservation reserve in Palk Bay, Tamil Nadu, protecting key seagrass habitats.
  - NGOs and government bodies have worked on seagrass restoration and monitoring for over a decade.
  - Promoting sustainable fishing, community involvement, awareness campaigns, research support, and alternative livelihoods like eco-tourism are critical for dugong survival.

## 10. Amrabad Tiger Reserve

**Context:** Four men using feral dogs to hunt monitor lizards were caught by forest officials in the Achampet division of Amrabad Tiger Reserve recently.

### About Amrabad Tiger Reserve:

- It is located in the Nagarkurnool and Nalgonda districts in the southern part of **Telangana.**
- It covers a part of the **Nallamala Forest**, which is part of the **Eastern Ghats** chain.

- It covers a total area of 2,611.39 sq.km, with 2,166.37 sq.km designated as the core area.
- It is the **second largest tiger reserve** in the country in terms of core area.
- This expansive reserve was **originally part of the larger Nagarjunsagar-Srisailem Tiger Reserve** before the bifurcation of Andhra Pradesh and Telangana in 2014.
- The reserve is renowned for its rugged terrain, deep valleys, and dense forests.
- Within the reserve lies the historic **Nagalapuram fort.**
- **Major reservoirs** like the **Srisailem Dam** and **Nagarjunsagar Dam** are fed by the river **Krishna** and its several perennial streams that originate in the ATR.
- The **Chenchu tribe** is one of the major tribal communities that live in the ATR.
- **Flora:**
  - Amrabad is characterized by **dry deciduous forests**, primarily made up of **sal, teak, bamboo,** and acacia trees.
  - The forest is rich in **medicinal plants and shrubs**, which have long been used by local tribes for traditional remedies.
- **Fauna:**
  - Major wild animals found are **Tiger, Leopard, Wild dog, Indian Wolf,** Indian fox, Rusty-spotted cat, Small Indian civet, Sloth bear, Honeybadger, Wild boar, etc.
  - Over 303 bird species have been identified in this region. Some important groups include Eagles, Pigeons, Doves, Cuckoos, Woodpeckers, Drongos, etc.



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- N. Sreekanth Reddy IAS, AIR 151, UPSC CSE 2024

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# SCIENCE AND TECHNOLOGY

## 1. Clumpiness of Universe

**Context:** The latest research that suggests the key to revealing the fundamental nature of the universe lies in finding out how clumpy it is.

### Clumpiness of Universe

- The universe was explosively born in a ‘**Big Bang**’ in the void some **13.8 billion years ago**, it expanded, engendering galaxies, star clusters, solar systems, and planets.
- When scientists looked at the **cosmic microwave background (CMB)** — the radiation left over from the Big Bang itself - they saw an **absolutely smooth glow across the sky**.
  - They concluded that the **early universe must have been remarkably uniform** with only small variations in density.

### The S8 Tension

- **The clumpiness of the universe** refers to the **non-uniform distribution of matter**, where matter is concentrated in regions like galaxies and galaxy clusters, while other regions are relatively empty.
- The “clumpiness” is measured by the “**clumpiness factor**,” often denoted as **S8**, which reflects how much matter is clustered together compared to an evenly distributed scenario.
  - A **higher value for S8 indicates more clustering** with a greater amount of matter clumped together, while a lower value indicates a **more uniform distribution of matter**.
- **S8 tension:** A problem arose when cosmologists used **different ways to measure the value of S8 and came up with different estimates**.
  - This lack of agreement has come to be called the ‘S8 tension’ in astrophysics.

### Why Does It Matters?

- If this tension cannot be explained by observational uncertainties it could mean:

- The **Lambda Cold Dark Matter ( $\Lambda$ CDM) model** is incomplete or needs revision.
- Dark matter or dark energy **may behave differently than currently assumed**.
- **New physics could be involved** (e.g., interacting dark energy, modified gravity, or even time-varying fundamental constants).

## 2. Black Hole Bomb

**Context:** Researchers have created the first laboratory analog of the ‘black hole bomb’, a theoretical concept developed by physicists in the 1970s.

### About Black Hole Bomb

- It is a theoretical mechanism where rotational energy of a spinning black hole is extracted and amplified.
- Based on **Penrose process (1971)**, particles in the ergosphere of a rotating black hole can gain energy through frame-dragging.
  - Ergosphere is the region outside the event horizon where frame-dragging occurs.
- **Zel’dovich (1971)** extended the idea to rotating, axially symmetric bodies—predicting energy amplification in a resonance chamber.

### How was it Simulated in the Lab?

- A rotating aluminum cylinder was placed inside magnetic coils generating a rotating magnetic field.
- The cylinder acted as the analog black hole, and the magnetic field represented the wave/particle.
- When the cylinder rotated faster than the magnetic field, the field was amplified, mimicking super radiance.
- Mirror-like coils simulated the reflective boundary to create a feedback loop — the key to the “bomb” effect.
- The “Black Hole Bomb” concept involves waves (such as electromagnetic waves) extracting energy



from a rotating black hole, leading to amplification and potential instability.

- In the recent experiment, scientists used a rotating aluminum cylinder surrounded by magnetic coils to mimic the conditions theorized for a black hole bomb.
- The phenomenon is based on super radiance, where certain waves can extract energy from a rotating object, leading to amplification.
- The laboratory experiment did not create an actual black hole but rather simulated the conditions to study the theoretical predictions.

### 3. 3D computational model of human thermoregulation

**Context:** A 3D computational model of human thermoregulation developed by IIST researchers tracks how heat moves through the body, and accounts for mechanisms like sweating, shivering, and other factors that influence regulation of body heat.

In the microgravity environment of space, several physiological processes behave differently compared to Earth. These include:

- **Altered fluid distribution** (e.g., blood shifts from lower limbs to the upper body and head),
- **Reduced sweating capacity** (about 30% lower),
- **Increased metabolic rate** (around 36% higher in the IIST study),
- **Muscle atrophy and bone density loss**, and
- **Different patterns of heat loss** due to lack of convection (no rising warm air in microgravity).
- These factors make it **more difficult for the body to regulate temperature**, making thermoregulation a serious concern for astronaut safety.
- The IIST team developed a **3D computational model** that incorporates **fluid redistribution, reduced blood volume, changes in metabolism, and altered muscle and bone mass**. Their model shows:
  - **Hands and feet cool down** in microgravity,
  - **Core, abdomen, and head get warmer**, and

- **Body temperature during exercise rises faster** in space than on Earth (possibly reaching ~40°C during intense activity).
- These changes **directly impair the body's usual thermoregulation strategies** (like sweating and shivering), confirming that microgravity disrupts thermal balance.

### 4. Mithridatism

**Context:** Scientists have developed an “unparalleled” antivenom from the blood of a man who deliberately injected himself with snake venom for nearly two decades.

**What is Mithridatism?**

- **Mithridatism** is named after **King Mithridates VI of Pontus**, who was said to have ingested small doses of various poisons throughout his life to build immunity against assassination attempts.
- This concept does **not** apply to **emotional trauma (A), embalming (C), or interrogation techniques (D)**, though the distractors may sound plausible in historical or medical contexts.

### 5. Civil Defence Framework in India

**Context:** The Ministry of Home Affairs (MHA) has directed states to conduct nationwide mock drills to strengthen civil defence preparedness in response to heightened tensions with Pakistan following a terrorist attack in Pahalgam.

**Civil Defence Framework in India**

- The **Civil Defence Act, 1968** was enacted in the aftermath of the **1962 India-China War** and the **1965 India-Pakistan War**.
- It provides for protective measures for people, property, and infrastructure against hostile attacks from air, land, or sea.
- The Act also authorises:
  - Formation of Civil Defence Corps.
  - Framing of rules and regulations for implementation.

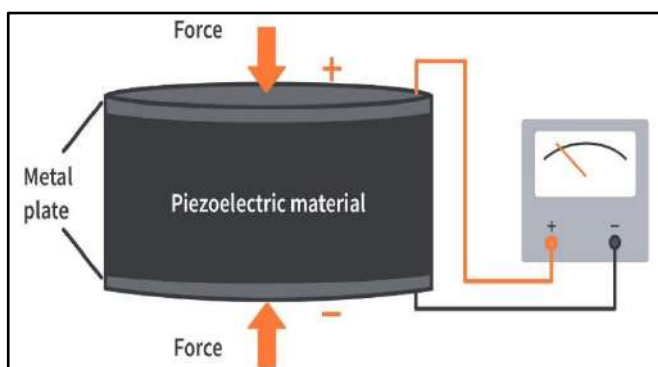
- **Civil Defence Corps consists of trained civilian volunteers, mobilised during war or disaster for relief and support.**
- School, college students, National Cadet Corps (NCC), members from Nehru Yuva Kendra Sangathan (NYKS) will also be involved in the exercise.
- **The MHA is the nodal ministry responsible for policy formulation, planning, and coordination of civil defence activities across India.**

## 6. Piezoelectric Principle

**Context:** Researchers have developed ultrasound-activated piezoelectric nanostickers to boost stem cell regeneration, offering a promising non-invasive treatment to Traumatic Brain Injury (TBI).

### Piezoelectric Principle

- **Principle:** The piezoelectric effect arises from certain materials with **asymmetric crystal structures**.
  - Under mechanical stress, this **asymmetry causes a shift in electric charge distribution**, producing a small electric current.
- Some materials also exhibit the inverse piezoelectric effect, where applying an electric current leads to mechanical deformation.



### What are Piezoelectric Nanostickers?

- Piezoelectric nanostickers are tiny, hybrid materials made of **barium titanate and reduced graphene oxide (BTO/rGO)** that attach to the surface of neural stem cells.

- When stimulated by ultrasound, they generate electrical signals that accelerate the cells' growth and transformation into neurons.

### Application of Piezoelectric principles:

- Ultrasound imaging uses piezoelectric crystals to convert electrical signals into sound waves and vice versa.
- Piezoelectric pickups in electric guitars convert string vibrations into electrical signals.
- Piezoelectric spark generators are used in lighters and gas stoves.

While,

- Solar-powered watches use photovoltaic cells, not piezoelectric materials.
- Thermal energy capture involves thermoelectric effects, not piezoelectricity.

## 7. Atmospheric memory

**Context:** A recent study found that the **atmospheric memory, not just sunlight, drives the onset and retreat of monsoons.**

### What is Atmospheric memory?

- **Atmospheric memory** refers to how **current atmospheric conditions are partially influenced by past events**, such as prolonged droughts or ocean-atmosphere interactions (e.g., El Niño), which can have lingering effects.
- It plays a role in **sub-seasonal to seasonal weather forecasting**, as certain variables (like soil moisture, sea surface temperatures) can "remember" past climate behavior and influence future atmospheric responses.

### Key Findings

- Atmosphere stores physical information in the form of water vapor, thereby controlling the onset and withdrawal of the monsoon.
- Earlier assumption was that this seasonal pattern of monsoon was primarily as an immediate response to changes in solar radiation.

- The state of atmosphere depends on its seasonal history: if it's already raining, the rain persists. But if it has been dry, it is hard to initiate rainfall. This behaviour is called bistability.
- At the same level of solar radiation, the atmosphere can either be dry or rainy, depending on the preceding state.

## 8. Nice Classification for Trademark

**Context:** Reliance Industries has withdrawn its trademark application for "Operation Sindoor", stating that it was an unauthorised filing by a junior employee.

### More on the news:

- The term, seen as a symbol of **national military bravery**, was applied for under **Class 41** of the **Nice Classification**, which covers entertainment and media services.
- **About Nice Classification for Trademark:**
  - An **international classification system** for goods and services used in **trademark registration**.
  - Developed under the **Nice Agreement (1957)** and administered by the **World Intellectual Property Organization (WIPO)**.
- **Objective:**
  - To ensure a **standardised classification** for trademarks across jurisdictions.
  - Facilitates **international trademark searches**, comparisons, and registrations.
- **Structure:**
  - **45 classes total:**
    - **Classes 1–34:** Goods
    - **Classes 35–45:** Services
  - Each class covers a specific domain, e.g., pharmaceuticals, software, education.

### What is Class 41?

- **Class 41** covers:
  - Education and training services
  - Film production, OTT content, live events

- Media, digital publishing, and cultural activities
- Frequently used by **film studios**, **OTT platforms**, and **event organizers**.

## 9. Saola

**Context:** An international team of scientists has successfully mapped the genome of the Saola (*Pseudoryx nghetinhensis*), the world's rarest large land mammal, offering new hope for its conservation through genetic rescue and captive breeding.

### About Saola

- The **Saola (*Pseudoryx nghetinhensis*)** is one of the **rarest large land mammals** in the world and is often dubbed the "**Asian Unicorn**" due to its elusive nature.
- The **Saola was first scientifically discovered in 1992** during a joint expedition by the **Vietnamese Ministry of Forestry and WWF**.
- The animal is characterised by **long, straight, and parallel horns up to 20 inches**, found in both **males and females**, and **striking white facial markings**.
- It is currently listed as **Critically Endangered** on the **IUCN Red List**, with an estimated population of only **50 to 300 individuals** as per the **2015 assessment**.

### Habitat and Distribution

- The **Saola is found exclusively in the mist-covered evergreen forests** of the **Annamite Mountains** along the **Vietnam–Laos border**.
- These forests have **little or no dry season** and are known for their dense canopy and unique biodiversity.

### Major Threats

- The species is threatened by **widespread snaring, illegal hunting, and deforestation due to human activities** such as **agriculture and burning**.



- Its **habitat fragmentation** and **low reproductive numbers** make it particularly vulnerable to **extinction**.

#### Importance of Genome Sequencing:

- **Genome of 26 individuals** sequenced from remains found in hunter households.
- Revealed **population split** occurred **5,000–20,000 years ago**, likely due to climate and human-induced habitat change.
- Genetic data shows **complementary diversity** between populations, suggesting they can be **combined for a stronger gene pool**.
- Paves the way for **captive breeding programs** and **future reintroduction efforts**.
- Offers scientific tools to **prevent extinction** through **targeted conservation**.

### 10. HAROP drones

**Context:** India reportedly used HAROP drones to target multiple Air Defence systems in Pakistan.

#### About

- It is developed by **IAI (Israel Aerospace Industries)** and is the **second-generation system following the HARPY platform**.
- They cause **destruction by crashing into their targets** with the explosive payload that they carry, earning names such as “**suicide drones**” and “**kamikaze drones**”.
- **Dual-Role Capability:** Acts both as a surveillance drone and a precision strike missile.
- **Features:**
  - Endurance Up to 9 hours.
  - Operational Range up to 1,000 km, enabling deep-strike operations without frontline exposure.
  - Fully autonomous search and tracking.
  - Two-way data link allows operators to make real-time targeting decisions and abort missions if needed.

- Attack can be cancelled mid-flight, allowing re-loitering — reducing collateral damage risks.
- **Effective against:** Radars, Missile systems, Mobile units, Enemy bunkers/hideouts.

#### Loitering munitions/kamikaze drones:

**Loitering munitions**, also known as kamikaze drones, are a class of aerial weapons that hover (or "loiter") in the air after launch and strike once a target is identified. They blend characteristics of drones and missiles. The following systems are all examples of loitering munitions:

- **Switchblade:** Developed by the U.S., these are small, portable drones that can be launched from a tube and are designed for precision strikes on personnel or light vehicles.
- **Lancet:** A Russian loitering munition used in recent conflicts for targeting military infrastructure and vehicles.
- **Harop:** An Israeli kamikaze drone developed by Israel Aerospace Industries (IAI), capable of autonomous target acquisition.
- **Nagastra:** An Indian-developed loitering munition by Solar Industries and Economic Explosives Ltd., designed for precision strikes with minimal collateral damage.

### 11. Light-microscopy-based Connectomics

**Context:** Scientists have developed a way to map how brain cells are connected using light microscopes in a technique called **LICONN**. It allows researchers to see structures in the brain that are smaller than what normal light microscopes can detect.

#### Light-microscopy-based Connectomics (LICONN):

- **Light-microscopy-based Connectomics (LICONN)** is an emerging technique in the field of **neuroscience** aimed at mapping the **connectome**—the complete map of neural connections in the brain—using **light microscopy**

instead of the more conventional and labor-intensive **electron microscopy (EM)**.

### What is Connectomics?

**Connectomics** is the study of the wiring diagram of the brain. Understanding how neurons are connected helps scientists decode brain function, cognition, and neurological disorders. Traditional connectomics often relies on **electron microscopy**, which provides extremely high resolution but is:

- **Time-consuming**
- **Data-intensive**
- **Expensive**
- Difficult to scale for large brains (like those of mammals)

### What is LICONN?

**LICONN** stands for **Light-microscopy-based Connectomics**. It was developed to overcome some of the core challenges of EM-based connectomics.

### Key Features of LICONN:

- Utilizes **light microscopy** rather than electron microscopy.
- Allows **faster imaging** over **larger brain volumes**.
- Enables easier integration with other optical techniques like fluorescent labeling.
- Designed as a **cost-effective, scalable, and less labor-intensive** method.

### Accuracy and Resolution

- While LICONN does **not match the nanometer-level resolution** of EM, it provides **sufficient spatial resolution** to trace axonal pathways and neuron projections at a **micron-scale**.
- It is especially effective in **meso-scale connectomics**, i.e., mapping **regional and long-range neural circuits** across large brain volumes, such as in mouse brains.
- LICONN is indeed based on light microscopy, as an alternative to the more resource-intensive electron microscopy traditionally used in brain connectome studies.
- While LICONN provides micron-scale resolution over large volumes, it does not achieve

nanometer-scale resolution in real time. That level of detail is still the domain of electron microscopy.

- One of the main goals of LICONN is to be scalable, faster, and more affordable, making large-scale brain mapping more feasible for research labs.

## 12. Earth's magnetic field

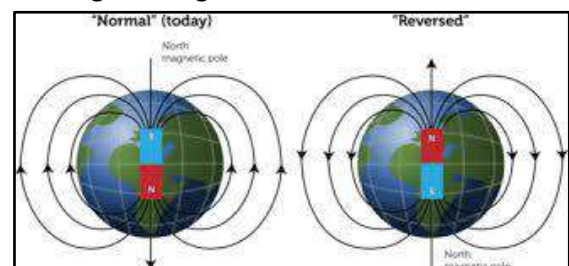
**Context:** Recent studies indicate that **Earth's magnetic field is weakening and shifting, raising concerns over possible magnetic excursions or even a full-scale polarity reversal.**

### Earth's magnetic field

- It is generated by the complex flow of molten metallic material in the outer core of the planet.
- The flow of this material is affected both by the rotation of Earth and the presence of a solid iron core, which results in a **dipolar magnetic field** where the axis roughly aligns with the rotational axis of the planet.

### Cause of magnetic field reversal

- **Short-term variations** (milliseconds to days) are caused by solar activity and interaction with charged particles in space.
- **Long-term changes**, such as **reversals and excursions**, result from turbulent flows in the outer core, driven by heat released from the inner core and modulated by planetary rotation.
- A reversal happens when the flow of molten material in the core changes direction—for instance, from clockwise to anticlockwise—altering the magnetic field's orientation.



### Magnetic Reversals and Excursions

- **Magnetic reversal** is a phenomenon where the magnetic north and south poles swap places. It occurred 183 times in the past **83 million** years.

- The last major reversal was the **Brunhes-Matuyama reversal**, about **780,000 years ago**.
- It can take thousands of years to complete, estimated at 22,000 years.
- **Magnetic excursions** are temporary and incomplete shifts in the magnetic field direction. It occurs **10 times** more frequently than full reversals. **The examples are as:**
  - Norwegian-Greenland Sea event (64,500 years ago),
  - Laschamps and Mono Lake (34,500 years ago),
  - Bagwalipokar excursions (Uttarakhand): researchers found evidence of two excursions—15,500–14,700 years ago and 8,000–2,850 years ago.

**Likely Impacts:**

- **Increased radiation exposure at high latitudes** – A weaker magnetic field during reversal allows more cosmic and solar radiation to reach Earth, especially near the poles.
- **Temporary weakening of the geomagnetic field** – Well-documented during past reversals; can last for thousands of years.
- **Migration disruption in certain animal species** – Many species (like birds, whales, turtles) navigate using Earth's magnetic field. A shift may confuse their navigation temporarily.
- **Increased vulnerability of satellites to solar storms** – With a weaker magnetosphere, satellites and electrical infrastructure are more exposed to space weather effects.

**While,**

- **Complete shutdown of the global climate system** – **No evidence** supports this; climate is largely driven by oceanic and atmospheric systems, not the magnetic field.
- **Sudden melting of polar ice caps** – Magnetic reversal has **no direct thermal effect** on Earth's surface or ice sheets.

- **Shift in tectonic plate movement due to magnetic change** – Plate tectonics is driven by mantle convection and internal heat, **not by magnetic polarity**.

**13. Quantum Key Distribution**

**Context:** The Centre for Development of Telematics (C-DOT) signed an MoU with Synergy Quantum India to jointly develop drone-based Quantum Key Distribution (QKD) systems.

**What is Quantum Key Distribution (QKD)?**

- QKD is a **secure method of key exchange** that uses **quantum mechanics** instead of mathematical encryption algorithms to share cryptographic keys.

**How QKD Works?**

- **Photons** (light particles) with random quantum states are transmitted over a channel.
- The **no-cloning theorem** and **measurement disturbance principle** ensure any eavesdropping is detectable.
- After transmission, both parties compare a subset to detect errors or interception.
- Final keys are extracted after **error correction** and **privacy amplification**.

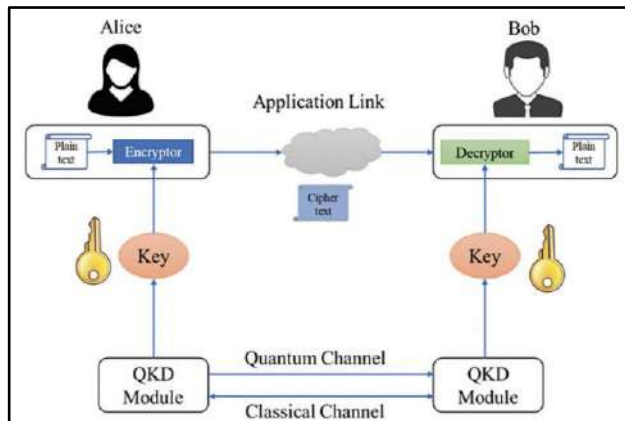
**Uses of QKD:**

- **Secure communication in defense networks** – QKD ensures unbreakable encryption using quantum mechanics.
- **Protecting financial transactions** – As future quantum computers could break traditional encryption, QKD offers **quantum-resilient security**.
- **Securing government communication infrastructure** – Many governments are exploring QKD for **critical infrastructure protection**.
- **Preventing eavesdropping in satellite communication** – QKD has been successfully tested via satellites (e.g., China's Micius satellite) to **ensure eavesdrop-proof communication**.



While,

- **Enhancing weather forecasting models** – QKD is not related to **numerical weather prediction or data modeling**.
- **Increasing processing speed in quantum computers** – QKD deals with **secure communication, not computing performance or speed**.



#### 14. World Anti-Doping Agency

**Context:** National Anti-Doping Agency (NADA) India with support from the Ministry of Youth Affairs & Sports, hosted the World Anti-Doping Agency (WADA) Intelligence & Investigations (I&I) Workshop in New Delhi.

**More on the news:**

- This workshop was part of the Capability and Capacity Building Project; a key initiative focused on strengthening WADA's Global Anti-Doping Intelligence and Investigations Network (GAIIN).
- It brought together intelligence and investigations experts from across the globe to share knowledge, strengthen cooperation, and enhance the global anti-doping system.

**About World Anti-Doping Agency (WADA):**

- WADA was established in 1999 as an international independent agency to lead a collaborative worldwide movement for doping-free sport.
- WADA's governance and funding are based on an equal partnership between the sport movement and governments of the world.

- WADA's primary role is to **develop, harmonize, and coordinate anti-doping rules** and policies across all sports and countries.
- Its key activities include **scientific research, education**, the development of anti-doping capacities, and **monitoring the World Anti-Doping Code (Code)**, the document harmonizing anti-doping policies in all sports and all countries.
- **Formation:**
  - After the events that shook the world of cycling in the summer of 1998, the International Olympic Committee (IOC) decided to convene a World Conference on Doping.
  - The **First World Conference on Doping in Sport** held in **Lausanne, Switzerland**, on February 2-4, **1999**, produced the **Lausanne Declaration on Doping in Sport**.
  - It **provided** for the creation of an **independent international anti-doping agency** to be operational for the Games of the XXVII Olympiad in Sydney in 2000.
  - Pursuant to the terms of the **Lausanne Declaration**, the WADA was established on **November 10, 1999**, in Lausanne to promote and coordinate the fight against doping in sport internationally.
- WADA is a Swiss private law, not-for-profit foundation.
- Its seat is in **Lausanne, Switzerland**, and its headquarters are in **Montreal, Canada**.
- **Governance Structure:**
  - A **42-member Foundation Board (Board)**, the agency's highest policy-making body, is jointly composed of **representatives of the Olympic Movement (the IOC, National Olympic Committees, International Sports Federations, and athletes)** and **representatives of governments** from all five continents.
  - A 16-member Executive Committee (ExCo), to which the Board delegates the management and running of the agency, including the performance of all its activities and the administration of its assets.

## 15. Space Observatories & Locations

**Context:** The department of posts released a commemorative stamp marking the 125th anniversary of Kodaikanal Solar Observatory.

|   | Space observatories                                                                      | Locations               |
|---|------------------------------------------------------------------------------------------|-------------------------|
| 1 | <ul style="list-style-type: none"> <li>Indian Astronomical Observatory (IAO)</li> </ul>  | Hanle, Ladakh           |
| 2 | <ul style="list-style-type: none"> <li>Vainu Bappu Observatory (VBO)</li> </ul>          | Kavalur, Tamil Nadu     |
| 3 | <ul style="list-style-type: none"> <li>Giant Metrewave Radio Telescope (GMRT)</li> </ul> | Khodad, Maharashtra     |
| 4 | <ul style="list-style-type: none"> <li>Gauribidanur Radio Observatory</li> </ul>         | Gauribidanur, Karnataka |

## 16. Bird-Wing Event

**Context:** A massive solar flare event, named the “bird-wing” eruption, was observed on the Sun’s northern hemisphere and is expected to impact Earth.

**What is the “Bird-Wing” Event?**

- A visually dramatic solar eruption with plasma shaped like wings, observed by NASA satellites.
- The ejected plasma stream spanned over 1 million km, twice the Earth-Moon distance.

**Features of the Event:**

- Involved both a solar flare and a coronal mass ejection (CME).
- Plasma ejection occurred on the Sun’s northern hemisphere.
- Radiation already caused radio blackouts across parts of Asia, Africa, Europe, and the Americas.

**What Are Solar Flares?**

- Solar flares are intense bursts of electromagnetic radiation released due to reconnection of magnetic field lines.
- Often accompanied by CMEs, which are explosive outflows of charged solar plasma.

- **Speed:** Flares travel at light speed, CMEs take 1–3 days to reach Earth (speed: 250–3000 km/s).

**Impact on Earth:**

- **Geomagnetic Storms:** Disrupt satellite operations, GPS systems, radio communication, and power grids.
- **Auroras:** Enhanced Northern/Southern Lights activity possible at lower latitudes.
- **Space Weather Alerts:** Agencies on high alert for further space-based disruptions.

## 17. Rare earth magnets

**Context:** China has imposed curbs on rare earth magnets.

**About**

- **Rare earth magnets**, especially **neodymium-iron-boron (NdFeB) magnets**, are crucial for **Electric Vehicle (EV) manufacturing**, particularly in electric motors.
- They provide the **strong magnetic fields** needed for **efficient and powerful electric motors**, including traction motors that drive EVs.
  - These magnets also play a **major role in other EV components** like power steering systems, wiper motors, and braking systems.
- **China** has a near monopoly over these rare earth magnets.
  - **US and India** are heavily dependent on Chinese exports of these metals.

**Note:** **Neodymium-Iron-Boron (NdFeB)** and **Samarium-Cobalt (SmCo)** are true rare earth magnets, made using rare earth elements. **Ferrite (Ceramic) Magnets** are not rare earth magnets; they are made from iron oxide and ceramic materials. **Alnico Magnets** are made from aluminum (Al), nickel (Ni), and cobalt (Co)—not rare earth elements.

## 18. New generation barcodes

**Context:** GS1 (the global standards organization) is planning to introduce next-generation QR codes by 2027 to enhance transparency, traceability, and consumer protection.

**New generation barcodes**

- These QR codes, currently being tested in countries like Australia, will be introduced in **India based on how ready manufacturers are.**
- Initially, both traditional barcodes and QR codes will appear on product packaging to support retailers still upgrading their systems.
- Full transition to QR codes will depend on retailers' readiness in each country.

**Significance**

- The initiative aligns with GS1's Vision 2030, which focuses on digital transformation, supply chain resilience, sustainability, and consumer and patient safety
- GS1 leaders emphasized India's growing importance, both economically and digitally, and are hosting their General Assembly in India for the first time, highlighting the country's strategic role in this global shift.
- 1D barcodes store data in one dimension (left to right), while 2D barcodes store it in two dimensions (left-right and top-down), increasing capacity.
- PDF417 is a stacked 2D barcode capable of encoding large volumes of data, used in government-issued IDs, transport, etc.
- **Laser scanners** are mainly suited for 1D barcodes. Reading **2D barcodes** typically requires **image-based scanners** (like CCD or camera-based systems).

**19. Trachoma**

**Context:** India has officially received the WHO Certificate of Elimination of Trachoma as a Public Health Problem at the 78th World Health Assembly in Geneva. India is now the third country in WHO South-East Asia Region (after Nepal and Myanmar) to eliminate trachoma.

**About Trachoma:**

- Trachoma is a chronic, infectious eye disease caused by the bacterium *Chlamydia trachomatis*. It is the leading infectious cause of blindness

worldwide, particularly affecting people in impoverished, rural, and remote communities with limited access to water and sanitation.

**Causes and Transmission**

- **Causative Agent:** *Chlamydia trachomatis* (not the same strains that cause sexually transmitted chlamydia).
- **Transmission:** The infection spreads through:
  - **Direct contact with eye, nose, or throat secretions of infected individuals.**
  - **Indirect contact via contaminated hands, clothing, towels, bedding, or surfaces.**
  - **Eye-seeking flies that have been in contact with infected discharge.**
- **Risk Factors:** Crowded living conditions, poor sanitation, lack of clean water, and close contact with infected children increase risk.

**Symptoms and Disease Progression**

Trachoma typically begins in childhood and progresses slowly. The disease affects both eyes and advances through several stages:

- **Early Symptoms:**
  - Mild itching and irritation of the eyes and eyelids
  - Eye discharge (mucus or pus)
  - Swollen eyelids
  - Light sensitivity (photophobia)
  - Eye redness
- **Advanced Disease:**
  - **Repeated infections cause scarring of the inner eyelid (trachomatous conjunctival scarring).**
  - **Eyelids may turn inward (entropion), causing eyelashes to rub against the eyeball (trichiasis).**
  - This leads to pain, corneal damage, and eventual clouding (opacity) of the cornea.
  - Untreated, this process can result in irreversible blindness



**Prevention and Control**

**The World Health Organization (WHO) recommends the SAFE strategy for trachoma control:**

- **Surgery:** To correct in-turned eyelids (trichiasis) and prevent blindness.
- **Antibiotics:** Mass drug administration, mainly azithromycin, to treat active infection.
- **Facial cleanliness:** Promoting hygiene to reduce transmission.
- **Environmental improvement:** Ensuring access to clean water and improved sanitation to reduce disease spread

**Note:** Approximately 1.9 million people are blind or visually impaired due to trachoma. Currently, Trachoma is the leading cause of infectious blindness worldwide.

**20. Jarosite**

**Context:** Jarosite has been found to potentially serve as a natural geological clock on Mars.

**Jarosite**

- It is a **potassium-iron hydrosulphate mineral** commonly found in acidic environments, such as acid sulphate soils (ASS) and acid mine drainage environments.
- It is a **yellow-brown mineral** that contains potassium, iron, and sulphate.
- It plays an important role as a scavenger of trace and major elements in ASS, as well as in other natural and engineered systems.

**Recent Research**

- Researchers in India analysed jarosite veins from Gujarat, whose environment resembles that of Mars.
- By studying the mineral's luminescence — the light it emits due to stored radiation — they discovered that jarosite could survive heating from a rover's drill without losing its ability to luminesce.
- Given Mars' natural radiation rate, jarosite can record events from the past 25,000 years.

**Importance**

- As jarosite is common on Mars, durable, and easily analyzed with small heaters and LEDs, it could be

used by future rovers to date dust storms, flood deposits, and volcanic ash.

**21. INSV Kaundinya**

**Context:** The Indian Navy formally inducted INSV Kaundinya, a stitched sail ship inspired by 5th-century Ajanta cave paintings, at Karwar Naval Base. The ship will undertake a transoceanic voyage from Gujarat to Oman later this year, reviving India's ancient maritime heritage.

**About INSV Kaundinya**

- This initiative was launched in July 2023 under a tripartite agreement involving the **Ministry of Culture**, the **Indian Navy**, and **Hodi Innovations**.
- The Ministry of Culture funded the ship as a **symbol of India's ancient shipbuilding tradition** and to promote **maritime heritage awareness**.
- INSV Kaundinya is scheduled to sail along the **ancient maritime trade route** from Gujarat to Oman later in 2025.

**Traditional Shipbuilding Techniques**

- The ship was **constructed using ancient "stitched ship" techniques**, where **wooden planks are joined using coir ropes, coconut fibres, and natural resin, without metal nails**.
- The design was based on a **5th-century maritime scene** depicted in the **Ajanta mural paintings**.
- As there are **no surviving blueprints**, the design process involved **interpreting 2D artistic representations** through **archaeological, naval architectural, and hydrodynamic analysis**.

**Symbolism and Cultural Integration**

- The **sails** feature motifs such as the **'Gandabherunda' (mythical two-headed eagle)** and the **Sun**, symbolizing **strength and vitality**.
- The **bow** is adorned with a **'Simha Yali' (mythical lion-like figure)**, reflecting **traditional South Indian maritime iconography**.

- A **Harappan-style stone anchor** on the deck connects the ship to India's **Indus Valley maritime legacy**.
- Named after **Kaundinya**, a legendary Indian sailor who reached **Southeast Asia**, the ship highlights India's role in **ancient transoceanic trade** and **cultural exchange**.

## 22. Twistronics

**Context:** Researchers at Rutgers University–New Brunswick have discovered a new class of materials called intercrystals, which possess unique electronic properties that could drive future technologies.

### What is Twistronics?

- **Twistronics** is a field of condensed matter physics that studies how the **electronic properties of two-dimensional materials** (like graphene) change when **one layer is twisted relative to another** at a small “magic angle” (e.g.,  $\sim 1.1^\circ$ ). This can result in **unusual phenomena** like **superconductivity** and **strongly correlated electron behavior**.

### What are Intercrystals?

- **Intercrystals** are created by **stacking two layers of twisted graphene** atop **hexagonal boron nitride (h-BN)**, resulting in **moiré patterns** that significantly alter electron behaviour.
- The material is based on the principle of “**twistronics**”, where **ultrathin atomic layers** are **rotated at small angles** to form **moiré superlattices**.
- The **misalignment of layers** causes **new electronic phases**, not found in regular crystals.
- This approach builds upon earlier work by the same team, who in **2009** **first showed** that **twisted graphene** displays unusual **electronic properties**.

### Structural Properties of Intercrystals

- **Regular crystals** possess **repeating atomic arrangements** and show **symmetry** under specific translations or rotations.

- **Quasicrystals**, discovered in 1982, are **ordered but non-repeating**, defying traditional crystallography.
- **Intercrystals** combine traits of both:
  - They exhibit **non-repeating atomic patterns** (like quasicrystals),
  - But retain certain **crystalline symmetries**.
- The structure creates **geometric frustration**, enabling **new quantum phases**.

### Unique Electronic Characteristics

- In intercrystals, **electronic properties change dramatically** with **minor structural variations**, unlike conventional materials.
- These materials exhibit **novel quantum behaviours**, including: **Superconductivity** (zero-resistance current), **Magnetism**, and other **quantum electronic states**.

## 23. Cell Press hydrogel

**Context:** Scientists have reported in Cell Press hydrogel contact lenses that allow humans to see near-infrared light.

- Scientists have indeed developed hydrogel contact lenses that allow the perception of NIR light.
- some nanoparticles can emit visible light in response to light exposure, **but it is not the mechanism used in this specific case**.
- These lenses use **nanoparticles that perform photon upconversion**—absorbing low-energy (NIR) photons and emitting higher-energy visible light (primary colours), thus making the NIR light visible to the human eye.
- They use nanoparticles that absorb photons of lower energy and release one at higher energy, upconverting 808 nm, 980 nm, and 1,532 nm light into the primary colours. The material is biocompatible. The team said it will allow first-responders to track victims during disasters. Light of 800-1,600 nm also penetrates water-rich tissue allowing clinicians to observe subsurface features sans cameras or scopes.

## 24. Forever Chemicals

**Context:** A novel ultrasound technique enables efficient recycling of fuel cells by separating precious catalysts from harmful PFAS membranes, offering a sustainable leap forward in clean energy technology.

### More on the news:

- A new technique that uses sound waves to separate materials for recycling could help prevent harmful chemicals from leaching into the environment.
- Researchers at the University of Leicester have reached a major breakthrough in fuel cell recycling by developing a method to efficiently separate valuable catalyst materials and fluorinated polymer membranes (PFAS) from catalyst-coated membranes (CCMs).

### What Are Forever Chemicals?

- **Forever chemicals** is a common term for **PFAS** (per- and polyfluoroalkyl substances), a large group of synthetic chemicals—numbering in the thousands—that are highly resistant to breaking down in the environment and in living organisms. These chemicals are called "forever" because their strong carbon-fluorine bonds make them extremely persistent, meaning they can remain in soil, water, air, and living bodies for many years without degrading.

### Key Characteristics

- **Persistence:** PFAS do not break down easily, accumulating in the environment and in human and animal bodies.
- **Widespread Use:** They are used in a vast array of consumer and industrial products, including:
  - Non-stick cookware (like Teflon)
  - Water-, stain-, and grease-resistant fabrics and carpets
  - Food packaging (e.g., microwave popcorn bags)
  - Firefighting foams
  - Cosmetics and personal care products
  - Paints, cleaning products, and more.

- **Bioaccumulation:** PFAS have been detected in blood and breast milk of people and wildlife globally, as well as in rainwater and drinking water.

### Health and Environmental Concerns

- **Health Risks:** Exposure to certain PFAS is linked to serious health effects, including some cancers, immune system effects (especially in children), weight gain, and other problems.
- **Environmental Impact:** Their persistence leads to widespread contamination of soil, water, and air, making cleanup and regulation challenging.

### Why Are They Called "Forever Chemicals"?

- The term highlights their extreme durability—PFAS are among the most persistent chemicals ever created, and even tiny amounts can remain in the environment and living organisms for years or decades

## 25. Bharat Forecasting System

**Context:** The Ministry of Earth Sciences has launched the Bharat Forecasting System (BFS).

### About Bharat Forecasting System

- It is an **indigenously built advanced weather forecasting system**.
- It was developed by the Pune-based Indian Institute of Tropical Meteorology (IITM).
- It will provide forecasts with a 6 km resolution — the highest in the world — that would allow forecasters to predict small-scale weather features more accurately.
- This resolution is advanced in comparison to the previous 12-km Global Forecast System (GFS) used in India so far.
- This **finer resolution** will help in more precise predictions of localised weather events like heavy rainfall and cyclones.
- It is **powered by the Arka supercomputer**. This supercomputer has 11.77 petaflops (a unit to measure computer processing speed) and 33

petabytes (a petabyte is 1,000 terabytes (TB)) of storage.

- The supercomputer is **located at IITM**, Pune, and will massively **reduce forecasting time compared to the older Pratyush** supercomputer.
- **Data from a network of 40 Doppler Weather Radars** from across the country will be **used to run the BFS** model that would enable the weather office to **issue more localised forecasts as well as nowcasts — weather forecasts for the next two hours**.
  - **Gradually**, the number of **Doppler radars will increase to 100**, which would allow the weather office to issue nowcasts across the country.
- The BFS can **provide 6 km resolution forecasts** for the tropical region that falls **between 30 degrees South and 30 degrees North Latitudes**. The Indian mainland extends between 8.4 degrees north and 37.6 degrees north latitudes.
- BFS is **primarily a numerical weather prediction (NWP) model**, but recently **integrated AI and machine learning (ML)** to enhance its working.
- Unlike most of the global models, BFS data will remain accessible to researchers worldwide, fostering collaborative advancements in meteorological science.

## 26. Dark Patterns

**Context:** Union Food and Consumer Affairs Minister will hold a high-level meeting with major e-commerce stakeholders to address concerns regarding dark patterns—a growing digital consumer rights issue.

**What are Dark Patterns?**

- Dark patterns are deceptive interface designs used in websites or apps to trick or manipulate users into making decisions they would not have made otherwise.

### Key Features of Dark Patterns:

- **False Urgency:** Creating fake time pressure (e.g., “Only 1 seat left!”).
- **Basket Sneaking:** Adding extra products/services at checkout without consent.
- **Confirm Shaming:** Guilt-tripping users into agreeing (e.g., “No, I don’t want to save money”).
- **Forced Action:** Compelling users to perform unrelated tasks to proceed.
- **Subscription Trap:** Making it easy to subscribe but hard to cancel.
- **Interface Interference:** Deliberately hiding important info or buttons.
- **Bait and Switch:** Promoting one offer, then switching to another.
- **The Roach Model:** The **Roach Motel** dark pattern describes a situation where **getting into a service is easy, but getting out is deliberately made difficult**. In this case, the free trial lures users in, but the cancellation process is intentionally complex, often leading users to stay subscribed longer than they intend.

## 27. Pea Breeding Improvement

**Context:** A global team mapped pea genomic diversity, advancing breeding research, revisiting Mendel’s traits, and boosting sustainable agriculture.

**About**

- The research, which appears in the journal Nature, is built on a collaboration between the John Innes Centre (JIC) and the Chinese Academy of Agricultural Sciences (CAAS), together with other research groups in China, the UK, USA, and France.
- The research has connected **more than 70 agronomic traits to corresponding genomic locations**.
  - **The many different genetic markers** at each of these locations can be used **to accelerate pea improvement**.



- Their work has uncovered **new insights into the traits** that Mendel famously studied and revealed **valuable genetic diversity**.

### Significance of the Study

- The expanded gene bank and genomic resources now available to researchers and breeders worldwide have the **potential to transform pea breeding** and advance research into this environmentally vital legume.
- The study comes at a time when **peas and other legumes** are being called upon as a **source of plant protein**, and as sustainable crops which can fix their own nitrogen.
- It will pave the way for **more predictive breeding** – such as using AI models which can select combinations of genes to deliver better yielding, disease resistant, agronomically viable pea plants.

### Mendel's Experiments

| Pea trait           | Dominant trait                                                                               | Recessive trait                                                                                 | Numbers in second generation (F <sub>2</sub> ) | Ratio  |
|---------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|------------------------------------------------|--------|
| <b>Seeds</b>        |                                                                                              |                                                                                                 |                                                |        |
| Seed shape          | Round     | Wrinkled     | 5474:1850                                      | 2.96:1 |
| Seed colour         | Yellow    | Green        | 6002:2001                                      | 2.99:1 |
| <b>Whole plants</b> |                                                                                              |                                                                                                 |                                                |        |
| Flower colour       | Purple    | White        | 705:224                                        | 3.15:1 |
| Flower position     | Axial     | Terminal     | 651:207                                        | 3.14:1 |
| Plant height        | Tall      | Short        | 787:277                                        | 2.84:1 |
| Pod shape           | Inflated  | Constricted  | 882:299                                        | 2.95:1 |
| Pod colour          | Green     | Yellow       | 428:152                                        | 2.82:1 |

- Mendel is known as the **father of genetics** because of his ground-breaking work on **inheritance in pea plants 150 years ago**.
- He **focused on seven traits**: pea seed shape (round or wrinkled), pea seed colour (green or yellow), pod shape (constricted or inflated), pod colour (green or yellow), flower colour (purple or white), plant size (tall or dwarf) and position of flowers (axial or terminal).

- **Mendel chose pea plants** because they have easily observable traits (e.g., flower color, seed shape), grow quickly, and can be self- or cross-pollinated.
- Over many years of experiments, involving thousands of plants, he established **fundamental rules of inheritance**, how characteristics are passed down through the generations, and single-handedly **laid the groundwork for the science of genetics**.

### Mendel's Laws of Inheritance

- **Law of Segregation**: Each individual has two alleles for a trait, but only one allele is passed on to the offspring during gamete formation.
  - Traits are determined by pairs of alleles.
  - During meiosis, the two alleles segregate (separate), so each gamete receives only one allele.
- **Law of Independent Assortment**: Genes for different traits assort independently of one another during gamete formation.
  - The inheritance of one trait (e.g., plant height) does not affect the inheritance of another trait (e.g., seed color), assuming the genes are on different chromosomes.
  - This explains the variety in traits among offspring.
- **Law of Dominance**: When two different alleles are present in a pair, one (the dominant allele) masks the expression of the other (the recessive allele).
  - In a heterozygous condition (e.g., Tt), the dominant trait (tallness) is expressed, and the recessive trait (shortness) is hidden.
- The **Law of Segregation** explains that alleles separate during gamete formation and do not mix.
- The **Law of Independent Assortment** holds true **only if genes are on different chromosomes** (i.e., unlinked).
- The **dominant allele masks the recessive only in heterozygous condition, not in homozygous** (as in AA or aa).
- Mendel worked with **pea plants (Pisum sativum)**, not fruit flies.

## 28. Biostimulants

**Context:** In a move to boost India's agri-input industry, the Government has registered 34 new biostimulants.

### About Biostimulants

- Biostimulants are substances or microorganisms that **enhance plant growth, yield, and stress tolerance**, but do not directly provide nutrients like traditional fertilisers.
- Various types of biostimulants are seaweed extracts, humic and fulvic acids, amino acids & certain beneficial fungi and bacteria.
- They are incorporated under the **Fertiliser Control Order (FCO)** in 2021 as a distinct category of fertilisers.

### Examples of biostimulants:

- **Seaweed extracts** – Rich in bioactive compounds; widely used as biostimulants.
- **Humic and fulvic acids** – Improve soil structure and nutrient availability.
- **Protein hydrolysates and amino acids** – Help in stress tolerance and metabolic activation.
- **Mycorrhizal fungi** – Beneficial microbes that enhance nutrient absorption.

### While,

- **Glyphosate** – A **herbicide**, not a biostimulant.
- **Nitrogen fertilizers** – **Traditional fertilizers**, not biostimulants.
- **Gibberellic acid** – A **plant hormone (PGR)**; not typically classified as a biostimulant under regulatory definitions.



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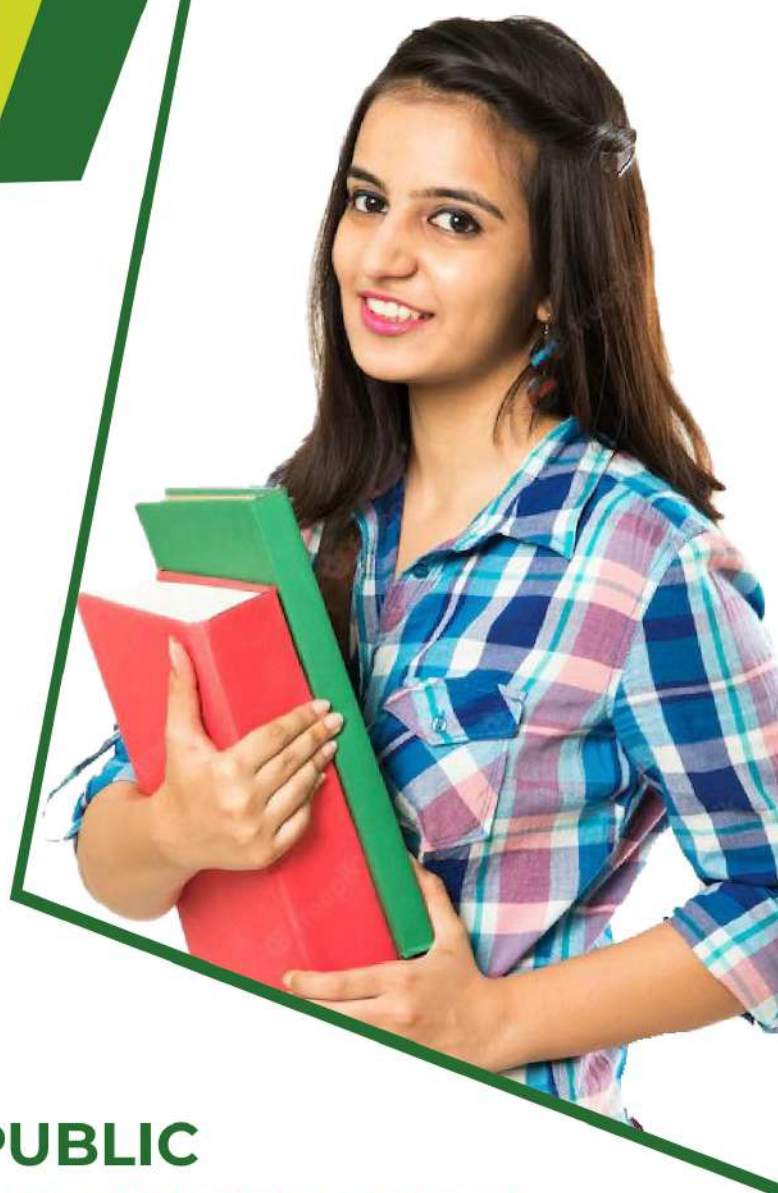
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# GEOGRAPHY AND MAPPING

## 1. Western Disturbance

**Context:** A strong Western Disturbance triggered heavy rainfall and storms across Delhi, North and South India, causing floods, hail, and airport disruption.

### What is Western Disturbance?

- Western Disturbances (WDs) are eastward-moving extra-tropical cyclones that bring rain and snow to northern India, particularly in winter.
- They originate over the Mediterranean, Caspian, and Black Seas, picking up moisture before reaching the Indian subcontinent.

### How it forms?

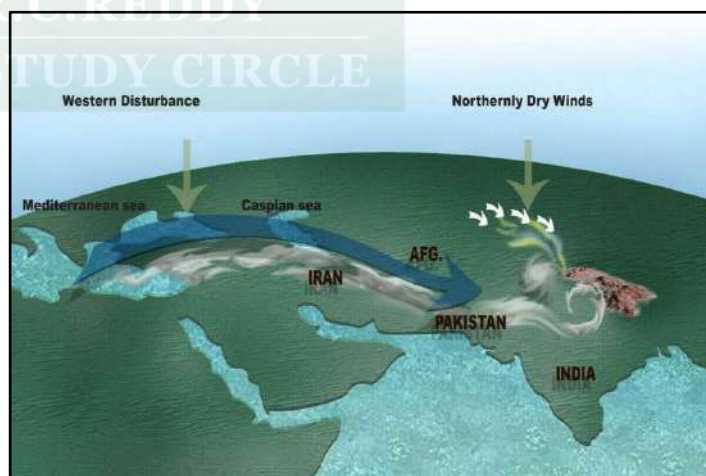
- WDs form due to interactions between polar and tropical air masses and travel along the subtropical westerly jet stream over the Himalayas.
- These systems are embedded in high-altitude winds and often accompanied by low-pressure areas.

### Impact of Western Disturbances on India:

- Winter Rainfall & Snow:** Primary source of winter precipitation in North India, crucial for Rabi crops in Punjab, Haryana, and western UP.
- Moderates Heatwaves:** Frequent WDs reduce summer heat intensity across northwest and central India.
- Triggers Extreme Weather:** Causes hailstorms, flash floods, and landslides, especially in Himalayan states like J&K and Himachal.
- Affects Aviation & Transport:** Leads to flight delays, road blockages, and urban flooding, especially in metro cities like Delhi.
- Alters Monsoon Behaviour:** Overlapping WDs during pre-monsoon and monsoon months disrupt rainfall patterns and intensify precipitation.
- Western Disturbances are **extratropical cyclones** formed in the **upper and middle troposphere**,

embedded in **mid-latitude westerlies**, and they travel eastward toward the Indian subcontinent.

- They **do not weaken the subtropical jet stream**; in fact, the **subtropical westerly jet stream** plays a major role in **transporting these disturbances** toward India. Strengthening of easterlies is more associated with **monsoon dynamics**, not Western Disturbances.
- These systems bring crucial **winter rainfall**, particularly in **Punjab, Haryana, and western UP**, which is essential for **Rabi crops** like wheat. **Too little or too much rainfall** from WDs can severely impact yields.
- While Western Disturbances are commonly associated with **stratiform clouds** and light to moderate rain, **they can also trigger convective activity**, including **thunderstorms and hailstorms**, especially when interacting with local topography or moisture-laden air masses.



## 2. Submarine Canyon & Locations

**Context:** A study in ACS Environmental Science & Technology has reported the first direct evidence of turbidity currents, a.k.a. submarine avalanches, in underwater canyons transporting microplastics en masse into the deep sea. Researchers used hydrodynamic monitoring and sediment sampling in the Whittard Canyon off Ireland to find that even canyons not fed by rivers could transport pollutants

to depths of more than 3 km.

|   | Submarine canyons | Locations   |
|---|-------------------|-------------|
| 1 | Nazaré Canyon     | Portugal    |
| 2 | Whittard Canyon   | Ireland     |
| 3 | Hudson Canyon     | USA         |
| 4 | Kaikōura Canyon   | New Zealand |

### 3. Singapore

**Context:** Singapore's ruling party has notched a resounding win in general elections, giving Prime Minister Lawrence Wong the clear mandate he sought from voters. Mr. Wong's long-ruling People's Action Party crossed the threshold of 49 seats to form a majority government in the wealthy city-state's 97-seat unicameral legislature.

- Singapore is **not volcanic** and has **no geothermal activity**.
- Singapore has **significant land reclamation projects** (e.g., Jurong Island). It lacks **major rivers**, instead relying on **reservoirs and water catchment areas**. **Bukit Timah Hill** (about 163 m) is the **highest natural point** in Singapore.
- Singapore is a **small equatorial country**, with a **uniform tropical rainforest climate**.
- Singapore has **maritime boundaries with Malaysia and Indonesia**, not the Philippines.



### 4. Rivers & Origin

**Context:** The Gomti River in Lucknow is at risk of becoming ecologically dead due to rising untreated sewage, declining oxygen levels, and increasing faecal coliform levels.

|   | Name of Rivers | Origin points                  |
|---|----------------|--------------------------------|
| 1 | Chambal        | Janapav Hills (Vindhyan Range) |
| 2 | Gomti          | Gomat Taal/Fulhar Jheel        |
| 3 | Ghaghara       | Karnali (Mapchachungo Glacier) |
| 4 | Mahananda      | Mahaldiram Hill                |

### 5. Tapti River

**Context:** In a significant move towards regional water security, the governments of Madhya Pradesh and Maharashtra on Saturday signed a memorandum of understanding (MoU) to jointly implement the Tapti Basin Mega Recharge Project.

**More on the news:**

- The agreement, aimed at addressing the water needs of select regions in both States, was finalised following a meeting of the Madhya Pradesh-Maharashtra Inter-State Control Board held in Bhopal.
- Under the proposed project, water from the Tapti river — which originates in Madhya Pradesh's Betul district — will be diverted to cater to the drinking water needs of northeastern Maharashtra, including Nagpur, and provide irrigation support to southern and southeastern districts of Madhya Pradesh such as Burhanpur and Khandwa.
- Notably, the river is known as the Tapi in Maharashtra.

**About Tapti River:**

- The Tapti (also known as Tapi) River is one of the major west-flowing rivers in Peninsular India. It originates in the Satpura Range in Madhya Pradesh and flows westward before emptying into the Arabian Sea through the Gulf of Khambhat (Cambay) in Gujarat.

| Bank  | Major Tributaries                                                       |
|-------|-------------------------------------------------------------------------|
| Right | Vaki, Gomai, Arunavati, Aner                                            |
| Left  | Nesu, Amravati, Buray, Panjhra, Bori, Girna, Vaghur, Purna, Mona, Sipna |

## 6. Tribes & Hills

**Context:** In the Niyamgiri Hills of Odisha, the indigenous tribe of Dongria Kondh lives in quiet harmony with nature, preserving ancient traditions, worshipping mountain spirits and nurturing the land.

|   | Name of tribes      | Hills/mountains |
|---|---------------------|-----------------|
| 1 | Lepcha Tribe        | Kangchenjunga   |
| 2 | Kota Tribe          | Nilgiri Hills   |
| 3 | Chenchu Tribe       | Nallamala Hills |
| 4 | Dongria Kondh Tribe | Niyamgiri Hills |

## 7. Chambal River

**Context:** Illegal sand mining is rampant in the Chambal River region across states, threatening biodiversity and endangering officials and journalists.

### About Chambal River:

- It originates from Bhadakla Falls near Janapav Hills (843 m elevation), Indore district, Madhya Pradesh. It has an approx. length of 1,024 km.
- It confluences with the Yamuna River in Jalaun district, Uttar Pradesh.
- It flows through Madhya Pradesh, Rajasthan, and Uttar Pradesh
- Major Tributaries:
  - Right Bank: Banas, Kali Sindh, Parbati, Shipra
  - Other Tributaries: Kuno, Seep, Kuwari, Mej, Gambhir, etc.
- Chambal is a Tributary of: Yamuna River, hence part of the Ganga drainage system.

**Note: Son:** Major tributary of the Ganga, flows through MP, Chhattisgarh, Bihar, and **Betwa** – Tributary of the Yamuna, not the Chambal.

## 8. Yala glaciers

**Context:** Glaciologists and local communities mourned the loss of Nepal's Yala glacier, believed to be the first Nepalese glacier to be declared "dead".

### About Yala glaciers:

- **Location:** It is situated in Langtang National Park, in Nepal's Himalayan region.
- **Altitude:** It lies at an elevation of about **5,000 meters** above sea level.
- **Type:** It is a small plateau glacier often used as a training site for glaciological studies and mountaineering.
- **Size:** It has shrunk by **66%** and retreated **784 meters** since the 1970s. It is expected to vanish completely by **2040**.

### Glaciers Lost Earlier:

- **Lemthang Glacier, Bhutan:** Vanished after a glacial lake outburst flood in 2017.
- **OK Glacier in Iceland (2019):** First glacier in the world to be declared "dead."
- **Pizol Glacier, Switzerland (2019):** The glacier had lost more than 80% of its volume since 2006.
- **Ayoloco Glacier, Mexico, 2021**
- **Basòdino Glacier, Switzerland, 2021.**

## 9. Kirana Hills

**Context:** The International Atomic Energy Agency (IAEA) confirmed no radiation leak occurred from any nuclear facility in Pakistan, following media reports suggesting a potential incident at Kirana Hills amid India's Operation Sindoor airstrikes.

### Kirana Hills

#### Location:

- **Kirana Hills** are a small rocky mountain range located near the city of **Sargodha**, in **Punjab province, Pakistan**.
- Geographically, they are situated in the **north-central region of Pakistan** and form part of the **Salt Range system**.



**Strategic & Military Significance:****1. Nuclear Weapons Development Site:**

- Kirana Hills gained **strategic prominence** in the 1980s and 1990s due to their association with **Pakistan's nuclear weapons program**.
- The area was reportedly used by **Pakistan Atomic Energy Commission (PAEC)** and military authorities for **subcritical nuclear testing and storage**.
- **More than 24 tunnels** were reportedly dug in the Kirana Hills for **nuclear research, testing, and storage**.

**2. Air Force Installations:**

- The area hosts **sensitive military and radar installations** used by the **Pakistan Air Force (PAF)**.
- The **PAF's Central Ammunition Depot** is located nearby, indicating the strategic military use of the region.

**Historical Context:**

- During the **1980s**, under the leadership of **Dr. Abdul Qadeer Khan**, Kirana Hills was used as a **covert nuclear testing site**, especially after the Indian nuclear test in 1974.
- Unlike India's Pokhran site, Pakistan kept its tests **low-yield or subcritical**, making them harder to detect through seismic activity.

**Note:** Pakistan conducted its nuclear explosion tests in Chagai Hills, Baluchistan in 1998 and not in Kirana Hills.

**10. Ardennes Region**

**Context:** Belgium on May 15 officially abandoned plans to phase out nuclear power, with Parliament voting to scrap a two-decades-old pledge and to allow for the construction of new reactors.

**The Ardennes Region****Geographical Overview**

The **Ardennes** is a **hilly and forested region** located in **western Europe**, primarily stretching across:

- **Southern Belgium** (Wallonia region)

- **Luxembourg**

- **Northern France** (notably the Ardennes department in Grand Est region)

Though sometimes loosely associated with neighbouring parts of **Germany**, the core Ardennes lies within the three countries mentioned above.

**Key Geographic Features:**

- Part of the **Rhenish Massif**, an ancient geological formation.
- Dominated by **rolling uplands**, deep **river valleys** (e.g., the Meuse and Semois), and **rocky ridges**.
- Elevation typically ranges between **300–700 meters** above sea level.

**Ecology: Flora and Fauna****Flora:**

- Home to **dense mixed forests**, with both **broadleaf** (oak, beech) and **coniferous** (spruce, fir) species.
- Rich in **mosses, ferns**, and seasonal **wildflowers**.
- Forests are vital for carbon capture and biodiversity.

**Fauna:**

- The region supports a healthy population of:
  - **Red deer**
  - **Wild boar**
  - **European badgers**
  - **Foxes**
  - Numerous bird species (woodpeckers, owls, raptors)
- Rivers and streams host **trout, salmon**, and various amphibians.

**Climate**

- Classified as **temperate oceanic (Cfb)** under the Köppen system.
- **Mild summers** and **cool to cold winters**.
- Receives **ample precipitation year-round**, often in the form of mist or light rain.
- Snowfall is common in winter, especially in higher elevations.

## Historical Significance

### Military History:

- The Ardennes' **rugged terrain and dense forests** have played a pivotal role in European military history.
- Most famously used in:
  - **World War I** – Seen as a barrier and buffer zone.
  - **World War II** – Central to the **German invasions of France** (1940 Blitzkrieg and 1944 Battle of the Bulge).
- Historically seen as "**impassable for large armies**", which led to it being a route for **surprise offensives**.



## 11. Sikkim

**Context:** Prime Minister Narendra Modi extended his wishes on the occasion of the 50th anniversary of Sikkim's statehood.

### About

- Sikkim became the **22nd state of India** on **May 16, 1975**, under the leadership of **Lhendup Dorjee Khangsarpa**, the state's first Chief Minister.
  - Sikkim was earlier referred to as the **Chogyal Kingdom**, ruled by Chogyals.
- **Location:** Sikkim is located in the **northeastern part of the country**, in the eastern Himalayas.
  - It is bordered by the Tibet Autonomous Region of China to the north and northeast, by Bhutan to the southeast, by the Indian

state of West Bengal to the south, and by Nepal to the west.

- **Kangchenjunga**, the highest peak of India is situated in Sikkim.
- **The People of Sikkim consist of three ethnic groups**, that is, Lepcha, Bhutia and Nepali.
- **The official languages of the state** are English, Nepali, Sikkimese (Bhutia) and Lepcha.
- **State Animal:** Red Panda
- Sikkim became the 22nd state of India on 16 May 1975, after a referendum ended the monarchy. It was the last princely state (or protected territory) to formally join the Indian Union. While others merged shortly after independence, Sikkim's integration happened much later.
- Arunachal Pradesh, Tripura, and even Manipur received railway connectivity before Sikkim. Sikkim's first railway station (Rangpo) is still under construction (as of 2024–2025). Sikkim remains one of the few Indian states without functional railway connectivity.
- Sikkim (West Bengal) with Meghalaya (Assam) are the two states, that share land border with only one Indian state.

## 12. Cauvery Water Management Authority

**Context:** The Cauvery Water Management Authority (CWMA) reviewed the storage position of all the reservoirs in the Cauvery river basin.

### About

- The Cauvery Water Management Authority (CWMA) was constituted in **2018**, under Section 6A of the **Inter-State River Water Disputes Act, 1956**, following the **Supreme Court judgment on the Cauvery Water Dispute 2018**.
- **Purpose:** The distribution of Cauvery waters among the states of **Karnataka, Tamil Nadu, Kerala, and the Union Territory of Puducherry**.
- **Parent Ministry:** Ministry of Jal Shakti.
- **Functions of CWMA include:**
  - Ensuring implementation of the Tribunal's and Supreme Court's award.

- Monitoring storage, release, and inflow data of major reservoirs on the Cauvery.
- Supervising reservoir operations and regulating water releases as per schedules.
- Adjudicating or managing disputes related to water releases among the basin states.

#### About the Kaveri River:

##### 1. Origin:

- The Kaveri River originates at **Talakaveri** (or Talacauvery) in the Brahmagiri hills of the Western Ghats, in the Kodagu (Coorg) district of **Karnataka**, at an elevation of about 1,341 meters above sea level.

##### 2. Course and States it Flows Through:

- The Kaveri flows generally in a south-easterly direction.
- It primarily flows through the states of **Karnataka** and **Tamil Nadu**.
- Its basin, however, extends into **Kerala** and the Union Territory of **Puducherry** (specifically the Karaikal region).

##### 3. Length:

- The total length of the Kaveri River from its source to its outfall into the Bay of Bengal is approximately **800 kilometers (around 497 miles)**.
  - Approximately 320 km are in Karnataka.
  - Approximately 416 km are in Tamil Nadu.
  - Approximately 64 km form the common boundary between Karnataka and Tamil Nadu, or flow through Kerala and Puducherry.

##### 4. Basin Area:

- The Kaveri basin extends over an area of about **81,155 square kilometers (around 31,334 sq mi)**. This represents approximately 2.7% of India's total geographical area.
  - Roughly 55.44% of the basin lies in Tamil Nadu.
  - Approximately 41.23% lies in Karnataka.
  - Around 3.33% lies in Kerala and Puducherry.

- 5. **Tributaries:** The Kaveri River has numerous important tributaries. Some of the notable ones include:

- **Left Bank Tributaries:** Harangi, Hemavati, Shimsha, and Arkavathi
- **Right Bank Tributaries:** Lakshmana Tirtha, Kabini, Suvarnavati, Bhavani, Noyyal, Amaravati, and Moyar

### 13. India's Coastline Length

**Context:** The Ministry of Home Affairs, in its 2023–24 report, updated India's coastline length to 11,099 km, up from 7,516.6 km. The change stems not from land gain but due to better mapping precision, highlighting the coastline paradox.

#### About Updated India's Coastline Length:

##### India's Coastline Length:

- **Previous Length:** 7,516.6 km (based on 1970s maps at 1:4,500,000 scale).
- **Revised Length:** 11,098.8 km (as of Dec 2024).
- **States Involved:** 11 coastal States + 2 UTs (Andaman & Nicobar, Lakshadweep).
- **Key Feature:** Longest coastline among Indian states — Gujarat (~1,600 km).
- **No New Land Added:** No change in national borders or geological expansion.

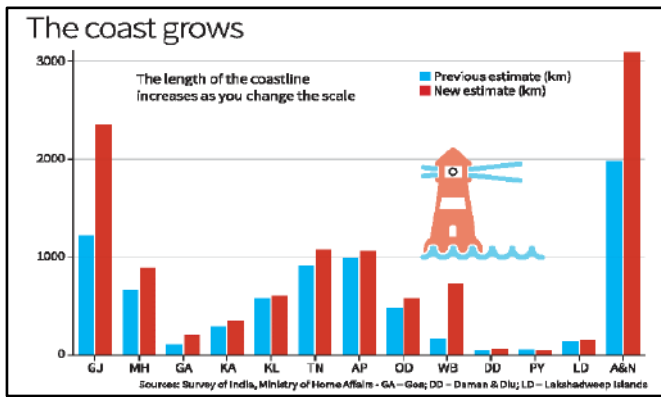
##### Measurement Methodology:

- **Agencies Involved:** National Hydrographic Office (NHO) and Survey of India.
- **Technology Used:**
- **Scale:** 1:250,000 electronic navigation charts.
- **Tools:** GIS, LIDAR-GPS mapping, drone imaging, satellite altimetry.
- **Reference Line:** Highwater line from 2011 data, closing river mouths at standard inland points.
- **Mapped Features:** Tidal creeks, estuaries, sandbars, low-tide islands.

##### Approximate coastline lengths of mainland states:

1. **Gujarat** – ~1,600 km
2. **Andhra Pradesh** – ~970 km
3. **Tamil Nadu** – ~910 km
4. **Maharashtra** – ~720 km
5. **Odisha** – ~480 km





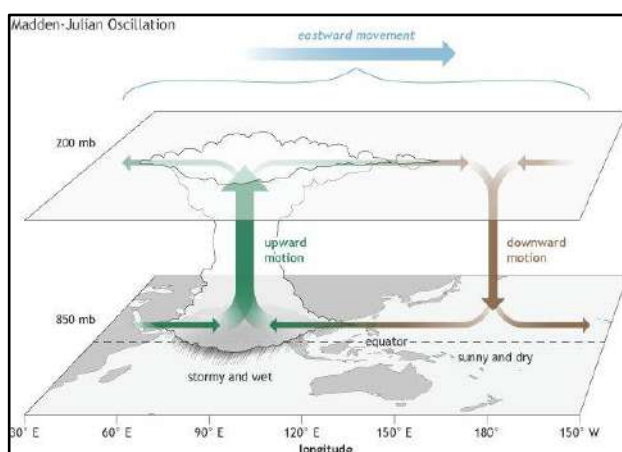
## 14. Madden-Julian Oscillation

**Context:** The Madden-Julian Oscillation (MJO) played a key role in triggering the early onset of the southwest monsoon in Kerala and Mumbai.

### Madden-Julian Oscillation (MJO):

- It is an oceanic-atmospheric phenomenon which affects weather activities across the globe. It brings major fluctuation in tropical weather on weekly to monthly timescales.
- The MJO can be defined as an eastward moving 'pulse' of clouds, rainfall, winds and pressure near the equator that typically recurs every 30 to 60 days.
- It's a **traversing phenomenon** and is most prominent over the Indian and Pacific Oceans.

### Phases of Madden-Julian Oscillation



- The MJO consists of two parts or phases. Strong MJO activity often dissects the planet into halves. One half within the enhanced convective phase and the other half in the suppressed convective phase.

- Enhanced rainfall (or convective) phase:** winds at the surface converge, and the air is pushed up throughout the atmosphere. At the top of the atmosphere, the winds reverse (i.e., diverge). Such rising air motion in the atmosphere tends to increase condensation and rainfall.
  - Suppressed rainfall phase:** winds converge at the top of the atmosphere, forcing air to sink and, later, to diverge at the surface. As air sinks from high altitudes, it warms and dries, which suppresses rainfall.
- It is this entire dipole structure, that moves west to east with time in the Tropics, causing more cloudiness, rainfall, and even storminess in the enhanced convective phase, and more sunshine and dryness in the suppressed convective phase.

### How Does MJO Affect Indian Monsoon?

- The Indian Ocean Dipole (IOD), El Nino and MJO are all oceanic and atmospheric phenomena, which affect weather on a large scale. IOD only pertains to the Indian Ocean, but the other two affect weather on a global scale-up to the mid-latitudes.
- IOD and El Nino remain over their respective positions, while MJO is a **traversing phenomenon**.
- The journey of MJO goes through **eight phases**.
  - When it is over the Indian Ocean during the Monsoon season, **it brings good rainfall over the Indian subcontinent**.
  - On the other hand, when it witnesses a **longer cycle and stays over the Pacific Ocean**, MJO brings bad news for the Indian Monsoon.
- It is linked with enhanced and suppressed rainfall activity in the tropics and is very important for the Indian monsoonal rainfall.
- Periodicity of MJO:**
  - If it is nearly 30 days then it brings **good rainfall** during the Monsoon season.
  - If it is above 40 days then MJO **doesn't give good showers** and could even lead to a dry Monsoon.

- Shorter the cycle of MJO, better the Indian Monsoon. Simply because it then visits the Indian Ocean more often during the four-month-long period.
- Presence of MJO over the Pacific Ocean along with an El Nino is detrimental for Monsoon rains.
- The **MJO can trigger westerly wind bursts**, which are known to **initiate or enhance ENSO events** by promoting eastward movement of warm ocean waters.
- The MJO is **not a standing wave**; it is a **propagating system** that **moves eastward**, mainly from the Indian Ocean to the western Pacific.
- The MJO can induce **atmospheric teleconnections** affecting **jet streams** and **storm tracks** over **North America, Europe**, and elsewhere.
- The MJO signal is typically **stronger in boreal winter**, not summer. It is a major source of **intra-seasonal variability** during this time.

### 15. 7 Summits challenge

**Context:** Hyderabad teenager Vishwanath Karthikey Padakanti has become the youngest Indian and the second youngest person in the world to complete the legendary 7 Summits challenge.

#### About

- The **Seven Summits** are defined as the **highest peaks on each of the seven continents**; it ranks among the **most prestigious in global mountaineering**.
- The **seven mountain peaks** are Mt. Everest (Asia), Mt. Kilimanjaro (Africa), Mt. Elbrus (Europe), Mt. Aconcagua (South America), Mount Kosciuszko (Australia), Mt. Vinson (Antarctica) and Mt. Denali (North America).
  - Some people define 'continent' differently leading to an **alternate 'seventh summit'** i.e. **Australia: Mount Kosciuszko or Australasia: Carstenz Pyramid**.
- **Mount Everest in Asia is the tallest** of the seven, while **Mount Kosciuszko in Australia is the shortest**.
  - **The Descending order of Summits:** Mount Everest, Aconcagua, Denali, Mount

Kilimanjaro, Mount Elbrus, Vinson Massif, Carstenz Pyramid and Mount Kosciuszko.

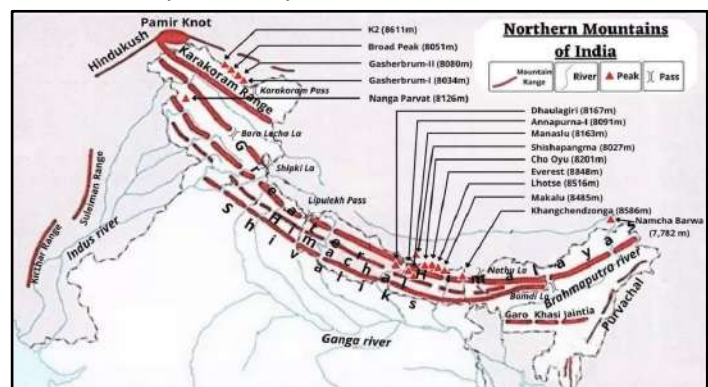


### 16. Peaks & Location

**Context:** The Indo-Tibetan Border Police (ITBP) successfully climbed Mt. Makalu (8,485 m) during its first-ever twin summit expedition to Mt. Makalu and Mt. Annapurna, both in Nepal.

**Location so above-mentioned peaks/mountains:**

- Kamet: Uttarakhand, India
- Kangto: Arunachal Pradesh, India (on the border with Tibet)
- Nun: Ladakh, India (part of the Nun-Kun massif)
- Makalu: On the Nepal–Tibet border
- Manaslu: Nepal
- Annapurna: Nepal



### 17. Celtic Sea

**Context:** Ireland's Data Protection Commission sanctioned TikTok for not being transparent with users about where their personal data was being sent and ordered the company to comply with the rules within six months.

**Celtic Sea:**

- The **Celtic Sea** is located **to the south of Ireland** and **to the southwest of England and Wales** (which are part of the UK).
- It is bordered by:
  - **Ireland** to the north,
  - **England and Wales (UK)** to the east,
  - **Brittany (France)** to the southeast,
  - and it opens into the Atlantic Ocean to the south and west.

The name “Celtic” reflects the cultural ties between the Celtic regions of **Ireland, Wales, Cornwall, and Brittany**.

**18. Torres Strait**

**Context:** Anthony Albanese claimed victory as the first Australian Prime Minister to clinch a second consecutive three-year term in 21 years on Saturday and suggested his government had increased its majority in the next Parliament by not modelling itself on U.S. President Donald Trump's administration.

- The **Torres Strait** lies between **Cape York Peninsula** (northern tip of Queensland, Australia) and **Papua New Guinea**. It is a **narrow waterway**, important geographically and politically.
- The **Bass Strait** separates **mainland Australia** (Victoria) from the island of **Tasmania**, not New

Zealand. **New Zealand** is much farther east across the **Tasman Sea**, not separated by any strait from Australia.

**19. Angola**

**Context:** Prime Minister of India held bilateral talks with Angolan President João Lourenço in New Delhi, offering a \$200 million defence credit line and expanding ties in infrastructure, defence, and space technology.

Angola is bordered by **four countries** and the **Atlantic Ocean**:

1. **Democratic Republic of the Congo (DRC)** – to the north and northeast
2. **Zambia** – to the east
3. **Namibia** – to the south
4. **Republic of the Congo (Congo-Brazzaville)** – to the northwest (via the Cabinda exclave)





## 20. Indian Border with Myanmar

**Context:** The United Naga Council (UNC) has urged the reinstatement of the Free Movement Regime (FMR) along the India-Myanmar border.

**Indian states border length with Myanmar:**

- The India-Myanmar border runs along the States of Arunachal Pradesh (520 km), Nagaland (215 km), Manipur (398 km) and Mizoram (510 km).



## 21. Neighbours of Romania

**Context:** George Simion, a nationalist and vocal supporter of the U.S. President Donald Trump, won Romania's first-round presidential election redo by a landslide after capitalising on widespread anti-establishment sentiment.

**Neighbours of Romania:**



Romania is located in **Southeastern Europe** and shares borders with **five countries** and the **Black Sea**.

- Ukraine** – to the north and northeast
- Moldova** – to the northeast (including the breakaway region of **Transnistria**, internationally recognized as part of Moldova)
- Hungary** – to the northwest
- Serbia** – to the southwest
- Bulgaria** – to the south

## 22. Anak Krakatau Volcano

**Context:** A new study reveals that Indonesia's Anak Krakatau volcano, which collapsed catastrophically in 2018 causing a deadly tsunami, showed warning signs years in advance.

**About Anak Krakatau Volcano:**

- Location:** Anak Krakatau ("Child of Krakatoa") is located in the Sunda Strait, between Java and Sumatra in Indonesia. Sunda Strait lies immediate east to the volcano, and Indian Ocean to its immediate West.
- Volcano Type:** Stratovolcano
- Tectonic Context:** Situated at the convergent boundary between the Indo-Australian and Eurasian plates.
- It is part of the Pacific Ring of Fire, a seismically active zone encircling the Pacific Ocean.
- 2018 Disaster:** In December 2018, its southwest flank collapsed into the sea during an eruption, generating a tsunami that killed over 400 people and injured thousands more.



### 23. Disputed islands in Asia

**Context:** A man was apprehended in Tokyo after an alleged knife attack on the subway system on Wednesday that injured several people. The Tokyo Metro's Namboku line was suspended after the incident. Several people had been injured, although the severity of their wounds was not immediately clear.

**Disputed islands in Asia:**

- **Senkaku Islands** – Disputed between **Japan and China** (and Taiwan); located in the East China Sea.
- **Takeshima Island (also called Dokdo)** – Disputed between **Japan and South Korea**.
- **Kuril Islands** – Disputed between **Japan and Russia**, especially the southernmost islands.

These disputes are often tied to **sovereignty claims**, **exclusive economic zones (EEZs)**, **fishing rights**, and **potential energy resources**.



### 24. New Zealand

**Context:** The vast number of sheep in New Zealand relative to the country's scant human population has long been the subject of jokes aimed at New Zealanders abroad. It's true: The country is one of a handful in the world that's still home to more sheep than people.

- New Zealand lies on the tectonic boundary between the Pacific Plate and the Indo-Australian Plate, making it highly prone to earthquakes and volcanic activity.
- The Southern Alps are located on the South Island, not the North Island. They are a major mountain range running along much of the South Island's length.



### 25. Mutual Defence Clause

**Context:** France and Poland have signed a landmark cooperation and friendship treaty, including a mutual defence clause, aimed at reinforcing bilateral ties amid heightened security threats in Europe.

**About**

- **Mutual Defence Clause:** The treaty states that “in the event of armed aggression on their territories, the parties shall provide mutual assistance, including by military means.”
- The treaty is in addition to, and not a substitute for, **NATO and EU** defence commitments.
- The treaty is the first that France has signed with a central European country after a series of pacts with **Italy, Spain and Germany**.

**Carpathian Mountains:**

- The **Carpathian Mountains** stretch across Central and Eastern Europe, passing through countries like **Czech Republic, Slovakia, Poland, Ukraine, Romania, and Serbia**.



- A prominent segment forms the **natural border between Poland and Slovakia**, particularly in the **Tatra Mountains** region.



## 26. Neighbours of Mauritania

Context: The Mehariste National Guard patrols Mauritania's Hodh Ech Chargui desert, securing the porous borders with Mali against jihadist threats.

### Neighbours of Mauritania:

Mauritania shares land borders with the following countries:

- **Algeria** (northeast)
- **Mali** (east and southeast)
- **Senegal** (southwest)
- **Western Sahara** (northwest — disputed territory controlled mostly by Morocco)



## 27. Lakes Located in Uganda

Context: Meridah Nandudu envisioned a coffee sisterhood in Uganda, and the strategy for expanding it was simple: Pay a higher price per kilogram when a female grower took the beans to a collection point.

### Lakes Located in Uganda:

- **Lake Albert** – Shared by Uganda and DRC
- **Lake Edward** – Also shared by Uganda and DRC
- **Lake Kyoga** – Lies entirely within Uganda

### Lakes that are not located in Uganda:

- **Lake Rukwa** – In southwestern Tanzania
- **Lake Tanganyika** – Shared by Tanzania, DRC, Burundi, and Zambia, not Uganda
- **Lake Malawi** – Shared by Malawi, Mozambique, and Tanzania, not Uganda



## 28. Neighbours of Albania

Context: Albanians headed to the polls on May 11 to decide whether to give Prime Minister Edi Rama a fourth term or side with his longstanding rival in an election seen as crucial for the country's European Union ambitions. Albania, the most pro-EU country in the region, waited 13 years before accession talks officially started in July 2022.



**Neighbours of Albania:**

Albania, a country in Southeastern Europe, shares land borders with four neighbouring countries:

- **Montenegro** to the northwest
- **Kosovo** to the northeast
- **North Macedonia** to the east
- **Greece** to the southeast and south

**29. Indonesia' Island**

**Context:** Thirteen people died in a blast during a disposal of expired military ammunition in Indonesia's West Java on May 12, army officials told local media, the second incident involving expired ammunition in the country in little over a year.

**Indonesia' Island position from west to East:**

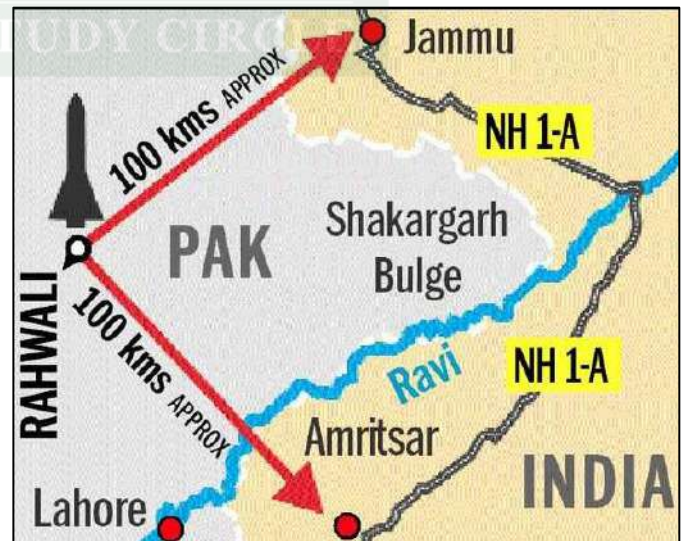
1. **Sumatra** – Westernmost major island
2. **Java** – East of Sumatra
3. **Bali** – Just east of Java
4. **Lombok** – Next in line after Bali
5. **Sulawesi** – Lies northeast of Lombok

**30. Shakargarh Bulge**

**Context:** Following the Pahalgam terror attack, Pakistan has amassed troops, tanks, and artillery near the Shakargarh Bulge, triggering heightened military alertness along the western front.

**About Shakargarh Bulge:**

- The Shakargarh Bulge is a protruding landmass in Pakistan's Sialkot district, bordered by the Ravi and Chenab Rivers.
- This flat terrain with access to road and rail corridors offers strategic depth for offensive manoeuvres.
- This strategic place matters to India and Pakistan:
  - **For India:** Protecting the Jammu–Pathankot axis was vital to maintain land connectivity with Jammu & Kashmir.
  - **For Pakistan:** Capturing it could have cut off Indian forces from the Kashmir region, giving it leverages on the western front.
- The region became the site of one of the largest post-WWII tank battles.

**31. Neighbours of Slovenia**

**Context:** Eighty years after World War II, Slovenia continues to grapple with the legacy of mass killings of Slovene home guards who collaborated with Nazis.

**Neighbours of Slovenia:**

Slovenia shares land borders with **four countries**:

- **Austria** – to the north
- **Hungary** – to the northeast
- **Croatia** – to the south and southeast
- **Italy** – to the west

**32. Belt and Road Initiative**

**Context:** Colombia formally agreed to join China's Belt and Road infrastructure initiative.

**About Belt and Road Initiative**

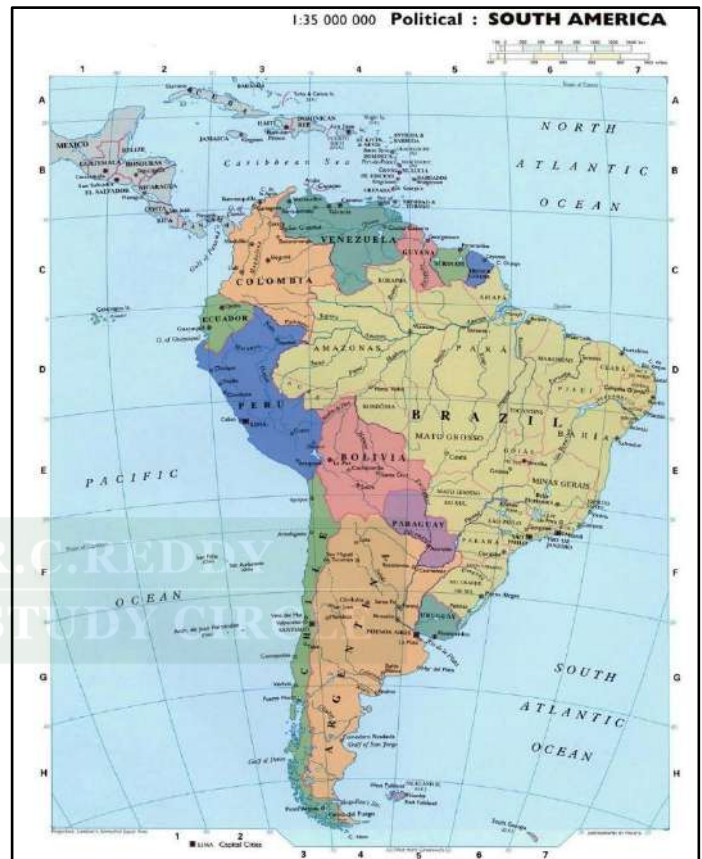
- **Genesis:** Launched in 2013 by Chinese President Xi Jinping under the initial name One Belt One Road (OBOR).
- **Aim:** To enhance regional integration, boost trade, and stimulate economic growth by developing infrastructure and connectivity across Asia, Africa, and Europe.
- **Key Components:**
  - **Silk Road Economic Belt:** Overland routes connecting China to Central Asia, Europe, and the Middle East.
  - **21st Century Maritime Silk Road:** Sea routes connecting China's eastern coast to

Southeast Asia, South Asia, Africa, and Europe.

**Equator and South American continent:**

The Equator passes through these three South American countries:

1. Ecuador
2. Colombia
3. Brazil

**33. Uruguay River**

**Context:** Uruguay began bidding farewell to its former leader Jose "Pepe" Mujica, a former leftist guerrilla fighter who won global fame for his humility as the so-called "world's poorest President." The 89-year-old, who spent a dozen years behind bars for revolutionary activity, lost a year-long battle against cancer on May 13.

**Uruguay River:** This river forms the northern part of the border between the two countries. It flows south, separating the Argentine provinces of Misiones, Corrientes, and Entre Ríos from the Uruguayan departments to its east.







### 36. New Caledonia

**Context:** Talks over a new political status for New Caledonia broke down on May 8, 2025, after loyalist factions rejected France's proposal for "sovereignty in partnership".

- New Caledonia is indeed located in the Pacific Ocean. However, it is geographically part of Melanesia, not Polynesia. Melanesia includes islands like Fiji, Solomon Islands, Papua New Guinea, and Vanuatu, characterized by their distinct geological and cultural features. Polynesia includes islands like Hawaii, New Zealand, and Tahiti.
- New Caledonia is not a British Overseas Territory. It is a special collectivity of France. It has indeed had several referendums on independence from France, not the United Kingdom, with the most recent one in December 2021 resulting in a vote against independence. There have been ongoing discussions and some unrest regarding its political future.



### 37. Danube River

**Context:** Romania's centrist Bucharest mayor, Nicusor Dan, appeared on course to win the presidency on May 18 in a shock upset over a hard-right rival who had pledged to put Romania on a path inspired by U.S. President Donald Trump's politics.

The Danube River forms a natural boundary between Romania and:

- **Serbia** (to the west and south-west)
- **Bulgaria** (to the south)



### 38. India-Turkey

**Context:** India's trade relations with Türkiye and Azerbaijan are expected to come under strain due to Ankara and Baku backing Islamabad and condemning India's recent strikes on terror camps in Pakistan.

#### More on the news:

- India launched **Operation Sindoor** on May 7 to destroy nine terror infrastructures in Pakistan and Pakistan-occupied-Kashmir in retaliation for the Kashmir's Pahalgam terror attack on April 22.
  - All subsequent retaliations for Pakistani offensives were carried out under 'Operation Sindoor'.
  - During the conflict, Pakistan used Turkish drones in its failed attempt to target Indian military installations.
- India and Pakistan announced reaching an understanding to stop all firings and military actions on land, air and sea.

#### About Aras River:

- The **Aras River** forms a **major portion of the southern border** of Azerbaijan, especially with

Iran, and is vital for irrigation and water-sharing treaties.



### 39. Portugal

Context: Portugal's Prime Minister Luis Montenegro prepared to lead a new minority government after the upstart far-right Chega party tied for second place in snap elections. Results showed that Montenegro's Democratic Alliance (AD) had boosted its tally in the 230-seat parliament to 89, short of the 116 seats required for a majority.

The geographical territories located inside Portugal's territory:

- **Azores** – An autonomous region of Portugal, located in the mid-Atlantic.
- **Madeira** – Also an autonomous Portuguese archipelago in the North Atlantic.
- **Alentejo** – A historical and geographical region in mainland Portugal.

While,

- **Canary Islands** – Belong to Spain, though located closer to the African coast.
- **Galicia** – A region in northwestern Spain, not part of Portugal.



### 40. Mount Lewotobi

Context: Mount Lewotobi Laki-laki in Indonesia erupted multiple times over the weekend and again on Monday, prompting the government to raise the alert level to the highest tier.

Since the flights are taking straight paths, hence the flight from HO Chi Minh City (Vietnam) to Darwin (Australia) would fly over the volcano, and will be impacted by its eruption.





## 41. Benin

**Context:** The artefact is a “Benin Bronze”, a priceless cultural object looted from modern-day Nigeria more than 120 years ago, now being removed from display and returned to its rightful home.

Benin is a West African country bordered by four nations:

- Nigeria to the east
- Togo to the west
- Burkina Faso to the northwest/north
- Niger to the northeast/north



## 42. Limpopo River

**Context:** Donald Trump ambushed South African President Cyril Ramaphosa by playing him a video that he claimed proved genocide is being committed against white people, driving farmers to flee to the U.S. The unexpected stunt turned the Oval Office into a stage for Mr. Trump’s claim that white South Africans are being persecuted.



## The Limpopo River:

The Limpopo River flows through **four** countries:

1. South Africa
2. Botswana
3. Zimbabwe
4. Mozambique

## 43. Chagos Islands

**Context:** The United Kingdom has officially agreed to transfer sovereignty of the Chagos Islands to Mauritius, ending decades of British control.

### About Chagos Islands:

#### Location:

- The Chagos Archipelago consists of over 60 small islands located in the central Indian Ocean, south of the Maldives, and east of Seychelles.
- The largest island, Diego Garcia, hosts a key US-UK military base.

#### Previous Control:

- The islands were under British rule since 1814, ceded by France.
- In 1965, the UK separated Chagos from Mauritius, forming the British Indian Ocean Territory (BIOT) before Mauritius gained independence in 1968.

#### Strategic Significance:

- Diego Garcia has served as a critical logistics and intelligence base for US military operations in West Asia, South Asia, and East Africa.
- It has hosted over 2,500 personnel, nuclear-capable aircraft, and surveillance systems.

### About UK–Mauritius Chagos Sovereignty Deal (2025):

- After a UK High Court ruling, England Prime Minister signed a treaty handing sovereignty of the Chagos Islands to Mauritius.
- The deal includes a 99-year lease of Diego Garcia to the UK and US for continued military use.
- The UK will pay Mauritius approximately £101 million/year, totalling billions over the lease period.





#### 44. New Development Bank

**Context:** The New Development Bank (NDB) has admitted Algeria as a new member, further expanding its global membership base.

##### About New Development Bank (NDB)

- **Genesis:** Founded by BRICS nations (Brazil, Russia, India, China, South Africa). Established during the 6th BRICS Summit in Fortaleza, Brazil (2014) and operational since 2015.
- **Objectives:** To mobilize resources for infrastructure and sustainable development projects in BRICS and other emerging economies.
- **Membership:** Initially limited to BRICS, now includes Bangladesh, Egypt, UAE, Uruguay, and Algeria.
- **Capital Structure:** Its initial authorized capital is USD 100 billion, with an initial subscribed capital of USD 50 billion equally distributed among the founding members.
  - It has equal shareholding among BRICS countries ensures no single country has veto power.
- **Headquarters:** Shanghai, China.

##### African continent and Tropics of Cancer:

- The **Tropic of Cancer** (approximately 23.5° North latitude) passes through the following **African countries**:
  - Western Sahara
  - Mauritania
  - Mali
  - Algeria
  - Niger
  - Libya
  - Egypt



#### 45. Rhine River

**Context:** A knife attack at the main station in the Germany's Hamburg left at least 12 people injured with six of them in a life-threatening condition. The suspect was apprehended by the responding forces. The station in downtown Hamburg, Germany's second-biggest city, is a major hub for local, regional and long-distance trains.

##### The Rhine River:

- The **Rhine River** is one of the major rivers of Europe. It originates in the **Swiss Alps**, flows through **Liechtenstein**, forms part of the border between **Germany and France**, and eventually flows into the **North Sea via the Netherlands**.

##### Key countries it flows through or borders:

- **Switzerland**
- **Liechtenstein** (border region)
- **Austria** (very minor proximity through tributaries, often confused)
- **Germany**
- **France**
- **Netherlands**



## 46. Rivers that Empty into the Yellow Sea

**Context:** South Korea has voiced concerns to China over its establishment of a “no-sail zone” in a shared area of the Yellow Sea, Seoul’s Foreign Ministry said on May 24.

### Rivers that Empty into the Yellow Sea:

1. **Huang He (Yellow River):** It empties into the **Bohai Sea**, which is considered a part of the greater **Yellow Sea system**.
2. **Amnok River (also known as Yalu River):** It forms the border between North Korea and China and flows into the **Yellow Sea**.
3. **Han River:** It flows through Seoul and empties into the **Yellow Sea**.

### Rivers that Do NOT Empty into the Yellow Sea:

1. **Yangtze River:** It flows into the **East China Sea**.
2. **Amur River:** It flows into the **Sea of Okhotsk** (Far East Russia).
3. **Salween River:** It flows into the **Andaman Sea** through Myanmar.



## 47. Persian Gulf

**Context:** US President Donald Trump’s now-aborted move to rename the Persian Gulf as the ‘Arabian Gulf’ or ‘Gulf of Arabia’ stirred sharp condemnation from Iranian officials.

### Persian Gulf

- The Persian Gulf is a strategically important and economically vital body of water in **Western Asia**.
  - A gulf is a large part of the ocean or sea that is **partially enclosed by land**, typically with a **narrow opening to the sea**.
- It opens into the **Gulf of Oman and the Arabian Sea** via the Strait of Hormuz.
- The countries that surround the Persian Gulf are **Iran, Iraq, Kuwait, Saudi Arabia, Bahrain, Qatar, and UAE**.
  - All these nations, except Iran, use the names ‘**Arabian Gulf**’ or just ‘**Gulf**’ to refer to the body of water, and have debated for long that it must be renamed.

### Ports located in the Persian Gulf:

- **Port of Jebel Ali (UAE)** – Major commercial hub in the Persian Gulf
- **Port of Basra (Iraq)** – Key Iraqi port on the Shatt al-Arab, draining into the Persian Gulf
- **Port of Bandar Abbas (Iran)** – Strategically located on the Strait of Hormuz, considered part of the Persian Gulf maritime area
- **Port of Kuwait** – On the northwestern edge of the Persian Gulf

### Ports that are not located in the Persian Gulf:

- **Port of Chabahar (Iran)** – Located on the Gulf of Oman, **outside** the Persian Gulf
- **Port of Duqm (Oman)** – Also on the **Arabian Sea/Gulf of Oman**, **not** in the Persian Gulf



## 48. North Korea

**Context:** North Korea detained three shipyard officials over the recent failed launch of a naval destroyer, an incident that leader Kim Jong-un said was caused by criminal negligence. The 5,000-tonne-class destroyer was damaged on May 21 when a transport cradle on the ship's stern detached early during the launch ceremony.

- The **Amnok River** (also known as **Yalu River**) forms the **boundary between North Korea and China, not South Korea.**
- The **Imjin River** flows within the Korean Peninsula and crosses the **Demilitarized Zone (DMZ)** between **North and South Korea, not Russia.** The river forming the **North Korea–Russia border** is the **Tumen River**, near the tri-junction of **North Korea, China, and Russia.**



## 49. Frisian Islands

**Context:** Far-right Dutch lawmaker Geert Wilders announced a 10-point plan on Monday that aims to radically slash migration, including using the Army to guard land borders and turning away all asylum-seekers. The proposals put further strain on the fractious four-party ruling coalition that was cobbled together after Mr. Wilders' Party for Freedom swept to victory in a 2023 Dutch election on a platform pledging to slash migration.

**Frisian Islands:**

- The **Frisian Islands**, also known as the **Wadden Islands** or **Wadden Sea Islands**, are a long chain of

low-lying islands and sandbanks located in the southeastern part of the North Sea in northwestern Europe. They stretch from the northwest of the Netherlands, through Germany, and up to the west of Denmark.



## 50. Cardamom Mountains

**Context:** A Cambodian soldier was killed after a brief exchange of gunfire with Thai soldiers at a disputed border area between the neighbours. The incident took place early on May 28 at a border area between Cambodia's Preah Vihear province and Thailand's Ubon Ratchathani province.

**Cardamom Mountains:**

- The Cardamom Mountains, also known as the Krâvanh Mountains, are a prominent mountain range in southwest Cambodia and extend into eastern Thailand. They are one of the largest and most ecologically rich jungle habitats in mainland Southeast Asia, renowned for their biodiversity, cultural history, and relative remoteness.

**Geography**

- **Location:** The range stretches along a southeast-northwest axis from Chanthaburi Province in Thailand and Koh Kong Province in Cambodia on the Gulf of Thailand, to the Veal Veang District in Pursat Province, Cambodia.



- **Dimensions:** Approximately 300 km (190 mi) long and 70 km (43 mi) wide.
- **Highest Peak:** Phnom Aural at 1,813 m (5,949 ft), which is also the highest point in Cambodia.
- **Other Peaks:** Phnom Samkos (1,717 m), Phnom Tumpor (1,516 m), and Phnom Kmoch (1,220 m) in Cambodia; Khao Sa Bap (673 m), Khao Soi Dao Tai (1,675 m), and Khao Chamao (1,024 m) in Thailand.
- **Climate:** The western slopes receive heavy rainfall (3,800–5,000 mm annually), supporting dense tropical rainforests, while the eastern slopes are drier due to the rain shadow effect.

### Ecology and Biodiversity

Family group of Asian elephants ("Elephas maximus indicus"), including adults and a calf, surrounded by dense jungle foliage

- **Rainforests:** The Cardamom Mountains are covered in some of the most species-rich tropical rainforests in Southeast Asia, forming the Cardamom Mountains Rain Forests ecoregion.
- **Flora:** The region is home to evergreen rainforests, dwarf conifer forests, and unique species such as Hopea pierrei, Anisoptera costata, and various pines and palms.
- **Fauna:** Over 500 species inhabit the Cardamoms, including more than 50 threatened species such as the Asian elephant, clouded leopard, Siamese crocodile, Sunda pangolin, and pileated gibbon.
- **Conservation:** Over 95% of the Central Cardamom Mountains' forests remain intact, making it one of Cambodia's least deforested areas. The region is crucial for carbon storage and serves as a vital watershed for downstream communities.

### Human History and Culture

- **Archaeological Sites:** The Cardamom Mountains contain unique archaeological features, notably ancient jar burials and rock art sites such as Kanam, which depict elephants, deer, banteng, buffalo, and humans riding elephants in red ochre paint.
- **Historical Refuge:** The mountains served as a stronghold for the Khmer Rouge during the

Cambodian-Vietnamese War in the late 1980s, offering sanctuary due to their inaccessibility.

- **Indigenous Communities:** The region supports nearly 4,000 members of the Chourng and Por Indigenous communities, who rely on the forest for their livelihoods.



## 51. Amazon Rain Forests

**Context:** The recent release of the book “How to Save the Amazon”, completed posthumously in honour of British journalist Dom Phillips, brings renewed global attention to the significance and fragility of the Amazon Rainforest.

### Amazon Rain Forests

- **Location:** The region belongs to **nine nations** of the **South American** continent.
  - It is bounded by the **Guiana Highlands** to the north, the **Andes Mountains** to the west, the **Brazilian central plateau** to the south, and the **Atlantic Ocean** to the east.
- **Area Covered:** The majority of the forest, 60%, is in **Brazil**, followed by **Peru** with 13%, **Colombia** with 10%, and with minor amounts in **Bolivia**, **Ecuador**, **French Guiana**, **Guyana**, **Suriname** and **Venezuela**.
- **Climate:** Hot and humid climate with temperatures of **26-30°C** throughout the year.

- There are no periodic seasons. The precipitation ranges from 2,000 mm to 10,920 mm annually.
- **Tribes:** Yanomamo, Kayapo, Akuntsu, Matses, Tupi etc.
- **Fauna:** Anaconda, Jesus lizard, howler monkey, golden lion tamarin, jaguar, sloth, spider monkey, Amazon River dolphin, toucan and the scarlet macaw, poison dart frog and the glass frog.
- **Flora:** Moist broadleaf tropical rainforest like myrtle, laurel, palm, acacia, rosewood, Brazil nut, rubber tree, mahogany and Amazonian cedar.

**Note:** the rain forest does not touch Chile, Argentina and Paraguay.



## 52. Kenya

**Context:** Ngũgĩ wa Thiong'o, the revered Kenyan man of letters and voice of dissent who in dozens of fiction and non-fiction books traced his country's history from British imperialism to home-ruled tyranny and challenged not only the stories told but the language used to tell them, died on May 28 at 87.

- Kenya does have Rift Valley lakes, such as:
  - Lake Nakuru
  - Lake Naivasha
  - Lake Bogoria
  - Lake Baringo

- Lake Turkana (partly)
- These are well-known Rift Valley lakes located in Kenya, and are part of the Eastern Rift system.
- The Equator passes through Kenya, approximately dividing the country into northern and southern halves. Major towns like Nanyuki lie almost on the Equator.



## 53. Lonza Valley

**Context:** A massive glacier collapse in Switzerland's Loetschental valley on May 28, 2025, buried Blatten village under ice and rock debris, triggering flood fears as River Lonza's flow is blocked.

**About Lonza Valley:**

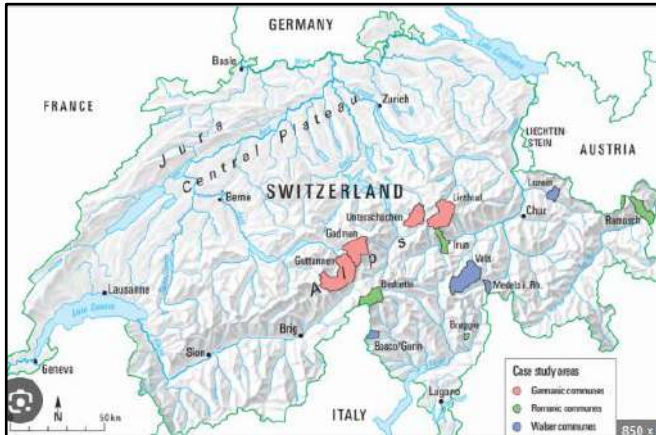
- **Location:** Loetschental (Lonza) Valley is located in the canton of Valais, in southern Switzerland, within the Alpine region.
- **Country Involved:** Switzerland is directly affected, with international attention on climate-induced glacial hazards.

**Key Features:**

- River Lonza flows through the valley, fed by Alpine glaciers.
- The valley is part of a fragile high-altitude ecosystem highly sensitive to global warming.



- It houses small Alpine settlements like Blatten, known for their proximity to glaciers and scenic landscapes.
- It is vulnerable to glacial retreat, permafrost thawing, and associated hazards like landslides and flash floods.



## 54. Saudi Arabia

**Context:** Saudi Arabia is ramping up a crackdown on unregistered worshippers at next week's Hajj pilgrimage, a year after hundreds perished in scorching conditions.

- With Yemen, at 1,307 km, Saudi Arabia's has the longest land border. Kuwait, at 221 km, is not the smallest. Qatar, at 87 km, has a significantly shorter land border.

- Saudi Arabia's oil reserves are predominantly found in its Eastern Province. This Eastern Province borders the Persian Gulf. Key fields like Ghawar (the world's largest onshore oil field) are located in the Eastern Province. Safaniya, the world's largest offshore oil field, is located in Saudi Arabia's territorial waters of the Persian Gulf. Other major fields like Marjan, Zuluf, and Berri are also located off the northeastern coast (Persian Gulf).



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Course Start Date: June 14<sup>th</sup> 2025



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|------------------------------------------------------------------------------------------------|----------------|
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# ART AND CULTURE

## 1. Satavahana Dynasty

**Context:** Archaeological Survey of India (ASI) discovered 11 Satavahana-era inscriptions in the Gundaram Forest of Telangana's Peddapalli district. Among them, two inscriptions reveal links to the Chutu dynasty and Satavahana prince Kumāra Hakusiri, highlighting early Brahmi script and religious-political symbolism.

### Satavahana Dynasty:

- The Satavahana dynasty, also known in ancient texts as the Andhras, was a prominent South Asian dynasty that ruled large parts of the Deccan and central India from approximately the late 1st century BCE to the early 3rd century CE. They are recognized as one of the earliest and most influential post-Mauryan dynasties in Indian history.

### Key Facts

#### Founding and Early History:

- The dynasty's founder was Simuka, who established Satavahana power after the decline of the Mauryan Empire. The Satavahanas initially emerged in the western Deccan, with early inscriptions found in Maharashtra.

#### Capitals:

- The Satavahana kingdom had multiple capitals over time, notably Pratishthana (Paithan) on the Godavari River and Amaravati (Dharanikota) in Andhra Pradesh.

#### Territorial Extent:

- At their zenith, the Satavahanas controlled regions of modern Andhra Pradesh, Telangana, Maharashtra, and at times parts of Gujarat, Madhya Pradesh, and Karnataka.

### Language and Culture:

- The Satavahanas patronized Prakrit over Sanskrit, with coin legends and inscriptions primarily in Prakrit, though some coins were bilingual (Prakrit and Tamil). They supported both Hinduism and Buddhism, making land grants to Brahmins and Buddhist monks, and contributed to the development of art and architecture, especially at sites like Amaravati and Nagarjunakonda.

### Coinage:

- They were among the first Indian dynasties to issue coins bearing the portraits of their rulers, a practice started by Gautamiputra Satakarni

### Art, Architecture, and Culture

#### • Art and Architecture:

- The Satavahanas are credited with significant contributions to early Indian sculpture and architecture, particularly at Buddhist sites like Amaravati, Nagarjunakonda, Bhaja, and Karla caves.

#### • Literature:

- They patronized Prakrit literature and promoted cultural exchanges across the Deccan and southern India

## 2. Lakkundi Nanneshwara Temple

**Context:** Lakkundi temples are set to be finalised for UNESCO tentative listing as World Heritage Sites.

### Historical Background

- The Nanneshwara (Nannesvara) Temple is one of the most significant monuments in the historic town of Lakkundi, Karnataka. Built in the early 11th century, it is notable as the earliest known imperial-style temple of the Kalyana Chalukyas, showcasing a synthesis of North and South Indian architectural influences. Lakkundi, historically known as Lakkigundi, rose to prominence after the Chalukyas of Kalyana established their rule,



becoming a major center for religious, cultural, and architectural development in the Deccan.

### Architectural Features

- **Platform (Jagati):** The temple stands on a raised platform, a hallmark of Chalukyan temple construction.
- **Layout:**
  - **Ranga-mandapa:** Large, open pillared hall for devotees.
  - **Gudha-mandapa:** Closed assembly hall.
  - **Garbhagriha:** Sanctum housing a Shiva linga.
- **Pillars:** The open mandapa features lathe-turned pillars with various decorative styles (Srikara, Vardhamana, Indrakanta), and an inscription records the donation of pillars by a local woman named Devalabbe.
- **Exterior Decoration:**
  - The outer walls are adorned with pilasters and devakosthas (miniature shrine motifs), some topped with a prominent kirtimukha (demon face) motif<sup>7</sup>.
  - The door jambs are intricately carved, and the temple's doors are especially notable for their decoration.
- **Superstructure (Vimana):**
  - The vimana is three-tiered (tritala), blending Nagara (North Indian) and Dravidian (South Indian) styles.
  - Features include karna and bhadra projections, Shekhari-Nagara and Latina shikhara motifs, and a North Indian-style kalasha crowning the superstructure<sup>1</sup>.
  - The design also integrates elements from Kalinga (Odisha) temple architecture.

### Significance

- **Earliest Imperial Chalukya Example:** The Nanneshwara Temple is recognized as the prototype for later, more elaborate Chalukyan temples, influencing the development of Deccan temple architecture.
- **Artistic Innovation:** The temple's use of soapstone as a building material was an architectural

innovation that gained popularity in subsequent Chalukya and Hoysala constructions.

- **Cultural Synthesis:** The temple's design harmoniously blends architectural traditions from across India, reflecting the cosmopolitan character of Lakkundi as a medieval religious and cultural hub



## 3. Tribes & States

**Context:** In January 2023, a group of former civil servants had written to the President of India, pointing out how the Indian government is out to destroy the pristine habitat, which is home to various rare and endemic species.

|   | Tribes   | States/UTs                           |
|---|----------|--------------------------------------|
| 1 | Yenadis  | Andhra Pradesh                       |
| 2 | Shompens | Andaman and Nicobar Islands          |
| 3 | Singpho  | Arunachal Pradesh, Assam             |
| 4 | Gaddi    | Jammu and Kashmir, Himanchal Pradesh |

## 4. Chenab River

**Context:** India has restricted the flow of waters of Chenab at the Baglihar and Salal hydro-electric dams in Jammu and Kashmir after the Indus Treaty suspension.

### About Chenab River

- **Origin:** It is formed by the confluence of two rivers, Chandra and Bhaga, at Tandi in the Lahaul and Spiti district of Himachal Pradesh.
  - Known as **Chandra-Bhaga** in upper reaches, it becomes Chenab downstream.
- **Course:** It flows then through the Jammu region of Jammu and Kashmir, joins the Sutlej River to form

the Panjnad in Pakistan, which ultimately flows into the Indus River at Mithankot.

- **Tributaries: Right Bank:** Marusudar (largest tributary), Miyar Nalla, Bhut Nalla, and Kalnai
- **Left Bank:** Niru, Tawi, Neeru, and Lidrar
- **Major Hydroelectric Projects on Chenab River:** Salal Hydroelectric Project (at Reasi), Baglihar Hydroelectric Power Project (at Ramban), Dul Hasti Hydroelectric Plant (Kishtwar district) & Ratle Hydroelectric Plant (Drabshalla in the Kishtwar district).

## 5. Piprahwa Relics

**Context:** India has issued a legal notice to Sotheby's auction house and the Peppé family, demanding the immediate halt of an auction of ancient relics from Piprahwa Stupa, believed to be linked to Lord Buddha's cremated remains.

### What are Piprahwa Relics?

- The Piprahwa relics comprise:
  - Bone fragments believed to be those of Lord Buddha
  - Crystal and soapstone caskets, a sandstone coffer
  - Adornments like gold ornaments, pearls, rubies, topaz, and sapphires
- Excavated in 1898 by William Claxton Peppé in Piprahwa, Siddharthnagar district, Uttar Pradesh, near the Nepal border.
- The Site was identified as part of ancient Kapilavastu, capital of the Shakya republic, the clan of Prince Siddhartha (Buddha).

### Piprahwa Buddhist Site

- Piprahwa is a significant archaeological site located in the Terai region of northern India, near the border with Nepal. It is renowned for its ancient Buddhist stupa and its association with the relics of the historical Buddha, Siddhartha Gautama.

### Historical Significance

- Piprahwa is believed to be the burial place of a portion of the Buddha's ashes, specifically the share given to his own Sakya clan after his cremation, as described in Buddhist texts like the Mahaparinirvana Sutra.
- The Sakyas constructed a stupa to enshrine their share of the Buddha's relics, which later became the focus of archaeological interest.

### Excavations and Discoveries

#### Discovery by William Claxton Peppé (1898-1899)

- In 1898, British landowner William Claxton Peppé excavated a large mound at Piprahwa, uncovering a stone coffer containing five small vases with bone fragments, gold ornaments, jewelry, and over 1,800 gemstones and semi-precious stones.
- One of the vases bore an inscription, which most scholars interpret as indicating that it contained the relics of the Buddha, making it a relic stupa of exceptional importance.
- The discovery was widely publicized, and the relics were eventually distributed to Buddhist communities in Thailand, Myanmar, and Sri Lanka.

#### Further Excavations by the Archaeological Survey of India (1971-1975)

- Led by K.M. Srivastava, these excavations revealed additional relic chambers below the earlier finds, with soapstone caskets containing bone fragments and Northern Black Polished Ware pottery, dating to around 400-500 BCE, consistent with the Buddha's era.
- Srivastava concluded that the stupa was constructed in three distinct phases:
  - **First Phase:** Shortly after the Buddha's death, a simple mud stupa was built by the Sakyas.
  - **Second Phase:** During or after Ashoka's reign (3rd century BCE), the stupa was rebuilt with fired bricks and enlarged, reflecting Mauryan craftsmanship.
  - **Third Phase:** In the Kushan period (1st-2nd century CE), the stupa was further enlarged and monastic buildings were added around it.

### Architectural and Archaeological Features

- The original stupa was a circular mud structure, about 62 feet in diameter and 12 feet high.
- The Asokan phase saw the stupa expanded to a base of 116 feet in diameter and 22 feet in height, with concentric circles of well-fired bricks.
- The Kushan phase raised the height further, squared the base, and added monastic complexes, including the large Eastern Monastery and several other monastic structures.
- Terracotta sealings and pots bearing the legend “Of the community of the monks of great Kapilavastu” were found, suggesting Piprahwa's link to the ancient city of Kapilavastu, the Buddha's childhood home.

### Distribution of Relics

- After their discovery, the Buddha's relics from Piprahwa were distributed to Buddhist communities in Thailand, Myanmar, and Sri Lanka, and some are displayed in the National Museum in Delhi.
- The distribution was seen as a gesture of goodwill and helped strengthen ties between India and Buddhist-majority countries.

## 6. Ayurvedic Manuscripts

**Context:** The Central Council for Research in Ayurvedic Sciences (CCRAS) under the Ministry of AYUSH has revived two rare Ayurvedic manuscripts: Dravyaratnākara Nighaṇṭu and Dravyanamākara Nighaṇṭu.

### What are Ayurvedic Manuscripts?

- Ancient manuscripts in Ayurveda serve as **textual repositories of medicinal knowledge** including plant names, therapeutic uses, formulations, and pharmacological actions.
- **Nighaṇṭus** are traditional lexicons in Ayurveda that list and explain the **properties of medicinal substances**, drawn from plant, mineral, and animal sources.

### About Dravyaratnākara Nighaṇṭu:

- It was composed by Mudgala Paṇḍita in 1480 AD.
- **Key Features:**
  - Contains 18 chapters offering deep insights into drug synonyms, actions, and compositions.
  - Draws references from Dhanvantari and Raja Nighaṇṭus.
  - Introduces novel therapeutic substances used across classical Ayurvedic disciplines.
  - Widely referenced in Maharashtra till the 19th century.
  - Revived and edited by Dr. S.D. Kamat, a noted Ayurveda scholar.

### About Dravyanamākara Nighaṇṭu:

- It is attributed to Bhisma Vaidya. It is undated, considered a post-Dhanvantari supplement
- **Key Features:**
  - Acts as a specialised appendix to the Dhanvantari Nighaṇṭu.
  - Comprises 182 verses, dealing specifically with homonyms in drug names.
  - Valuable for disciplines like Rasashastra and Bhaishajya Kalpana.
  - Offers clarity on complex naming overlaps, vital for Ayurvedic pharmacology.
  - Edited and annotated by Dr. S.D. Kamat, known for reviving other Nighaṇṭus as well.

## 7. Buddha Purnima

**Context:** This year the Vaishakh Buddha Purnima is being celebrated on 12th May.

### Buddha Purnima

- Buddha Purnima is the **most sacred festival** for Buddhists, observed on the full moon day of Vaishakh (**April-May**).
  - The festival acts as a reminder to live a life of **kindness, non-violence and wisdom**.
- In India and other South and Southeast Asian nations, Buddha Purnima is celebrated as the “**thrice-blessed day**.” It marks the three major life events in the life of Gautama Buddha:



- **Birth** at Lumbini
- **Enlightenment** (Nirvana) at Bodh Gaya
- **Mahaparinirvana** (Death) at Kushinagar
- However, in other parts of the world, the day signifies the birth of the Buddha while his spiritual awakening and death are honoured on separate occasions.
- Since **1999** it has also been recognized by the United Nations as the '**UN Day of Vesak**'.

## 8. Jnanpith Award

**Context:** President of India presented the 58th Jnanpith Award to Jagadguru Rambhadracharya (Sanskrit) in New Delhi. Renowned poet Gulzar (Urdu poet) also received the award but could not attend due to health reasons.

### About Jnanpith Award

- It is the **highest literary honour of India**, given to writers who have excelled in literature in different Indian languages.
- It is given every year to an author for his/her **outstanding contribution towards Indian literature through creative writing in any of the Indian languages mentioned in Schedule VIII of the Indian Constitution and English**.
- It was **instituted in 1961**.
- The prize carries a **cash award, a citation, and a bronze replica of Vagdevi** (Saraswati), the goddess of learning.
- It is **sponsored by the cultural organization Bharatiya Jnanpith**
  - Bharatiya Jnanpith is one of the **premier literary organisations** of India, which is nurturing literature and culture through its literary endeavors, which include awards, publication, fellowship, and research, for the last several decades.
  - The organisation was established in 1944.
- The **first recipient** of the award was **Malayalam poet G. Sankara Kurup**, who received the award in **1965** for his collection of **poems Odakkuzhal**.

- **Only those creative writers who are alive and are Indian citizens, can be proposed for the Award.**
- **A language which receives the Award in a particular year is not eligible for consideration for the next two years.**
- **A writer who receives the Award once will not be considered again.**
- **The Award may not be given in a particular year if the Jnanpith Award Selection Board feels that there is no suitable name which comes up to the expected standard of the Award.**

## 9. Ancient Nalanda University

**Context:** Eminent economist Sachin Chaturvedi, took charge as the Vice-Chancellor of Nalanda University in Bihar.

### Ancient Nalanda University

- The ancient **Nalanda University** was established in the **5th century** by the Gupta ruler **Kumaragupta I**.
- It includes **stupas, shrines, viharas** (residential and educational buildings) and important art works in stucco, stone and metal.
- It was patronized by various rulers including King **Harshavardhana of Kannauj** (7th century CE) and the **Pala rulers** (8th – 12th century CE).
- It flourished for 800 years before it was burnt down by **Bakhtiar Khilji** in the **12th century**.
- The site after its decline was first discovered by **Sir Francis Buchanan** and was systematically excavated and consolidated by the Archaeological Survey of India.

### Scholars associated with Nalanda:

- **Xuanzang (Hiuen Tsang):** Chinese monk who studied and taught at Nalanda in the 7th century.
- **Atisha Dipankara:** Bengali Buddhist scholar who studied at Nalanda before traveling to Tibet.
- **Aryabhata:** Often linked with Nalanda as a student and scholar (lived during the Gupta period when Nalanda was flourishing).
- **Harshavardhana:** Patron of Nalanda; supported its growth during his reign in the 7th century.

- **Dharmapala:** Eminent abbot and scholar of Nalanda in the 8th century.

#### Scholars not associated with Nalanda:

- **Nagarjuna:** Lived before Nalanda's founding (2nd–3rd century CE); associated with **Nalanda-like** traditions but not the university itself.
- **Vasubandhu:** A 4th-century Buddhist philosopher, significant to Mahayana thought but not linked directly to Nalanda.
- **Chanakya (Kautilya):** Lived in the 4th century BCE and was associated with **Takshashila**, not Nalanda.

## 10. Acharya Charaka

**Context:** The Vice-President of India inaugurated statues of Acharya Charaka and Sage Sushruta at Goa's Raj Bhavan, as part of an initiative to promote India's ancient medical heritage.

#### About Acharya Charaka:

- Charaka (c. 100 BCE–200 CE) was a legendary Ayurvedic physician regarded as the Father of Indian Medicine. Flourished in the region of Taxila under the patronage of the Kushan ruler Kanishka.
- **Key Contribution – Charaka Samhita:**
  - One of the foundational Ayurvedic texts, focusing on internal medicine (Kayachikitsa).
  - Classified Ayurveda into **Ashtanga Ayurveda** and detailed the science of embryology (Garbha Vigyan), disease pathology, and holistic health.
  - Explained the **three doshas**: Vata, Pitta, and Kapha—the basis of diagnosis and treatment.
  - Advocated preventive healthcare through lifestyle practices and environmental harmony.
  - Emphasised ethical duties of a physician, such as confidentiality, non-maleficence, and devotion to healing.
  - His thoughts align with the modern principles of patient rights and evidence-based medicine.

#### The five sections of Charak Samhita:

- The five "**Sthanas**" (**sections**) are structural divisions of the **Charaka Samhita**, one of the core texts of **Ayurveda**, dealing with topics such as:
  - **Sutra Sthana** – foundational principles
  - **Nidana Sthana** – diagnosis of diseases
  - **Sharira Sthana** – human anatomy and embryology
  - **Chikitsa Sthana** – treatment protocols
  - **Kalpa Sthana** – pharmaceutical preparations and antidotes

## 11. Gond Art

**Context:** Artists of Madhubani and Gond art met President Droupadi Murmu under the Artists-in-Residence Programme – Kala Utsav at Rashtrapati Bhavan.

#### About Gond Art:

- **Region:** Practiced by Pardhan Gond tribes of Madhya Pradesh and adjoining Central Indian states.

#### What It Is?

- Tribal art form with roots in oral storytelling and ritualistic practices.
- Initially drawn on walls of homes to depict folk tales and nature.

#### Key Features:

- **Mythical Narratives:** Depicts divine stories, village folklore, and animist beliefs.
- **Pattern Work:** Fills motifs with fine dots and lines to create visual rhythm.
- **Nature Connection:** Harmonious coexistence of humans, flora, and fauna.
- **Colour Use:** Bright, bold colour schemes with creative compositions.
- **Global Reach:** Popularized internationally through works like "The Night Life of Trees" by Tara Books.

## 12. Njattadi Festival

**Context:** Kerala's Agriculture Minister inaugurated the 'Njattadi festival' (sapling festival).

### About

- Njattadi Festival is a **traditional agricultural festival celebrated in Kerala**, particularly among the farming communities.
- The term "Njattadi" comes from the **Malayalam word "Njattuvela"**, which refers to a period in the Malayalam calendar that is **considered ideal for sowing paddy (rice) seeds**.
- The festival marks the **beginning of the paddy cultivation season**.
- Njattadi often features **folk songs (Vanchipattu, Njattu Pattu) and traditional dances**.



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June 14<sup>th</sup> 2025



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# MISCELLANEOUS

## 1. Risk Society

**Context:** In a risk society shaped by modern crises, women disproportionately bear the burden due to existing gender inequalities and caregiving roles.

### What is Risk Society?

- The term 'risk society' describes a **shift from an industrial society to one increasingly shaped by uncertainty and hazards** created by technological and environmental developments.
- Industrial societies brought prosperity but also created complex, global risks—like climate change and pandemics—that stem from human progress rather than natural causes.
- The term risk society was **coined** by German sociologist **Ulrich Beck** in his 1986 book Risk Society: Towards a New Modernity.

### Key features of a risk society include:

- **Man-made risks:** Unlike traditional societies, where risks often came from natural forces, modern risks are often the unintended side effects of progress.
- **Global impact:** Many risks are no longer local; they affect the entire world.
- **Uncertainty and complexity:** Modern risks are harder to predict, understand, and control.
- **Public concern and reflexivity:** Society becomes more aware and critical of the risks it creates, leading to debates over regulation, ethics, and safety.

## 2. GNAFCC

**Context:** Kozhikode city has been honoured with a membership in the WHO's GNAFCC.

### About GNAFCC

- **Established:** 2010.
- **Members:** 1300 members from 51 countries.

- **Aim:** To connect cities, communities and organizations worldwide with the common vision of making their communities great places to grow older in.

### Objectives:

- Inspire change by showing what can be done and how.
- Connect cities and communities worldwide to facilitate the exchange of information, knowledge and experience.
- Support cities and communities to find appropriate innovative and evidence-based solutions.

## 3. Operation Sindoor

**Context:** Operation Sindoor marks a shift in India's approach to naming military actions, moving from traditional displays of power to a more emotional tribute. Unlike earlier operations with conventional or mythological names like Riddle, Meghdoot, and Bandar, this name reflects a more human-centric narrative.

|   | Military operations   | Wars/Conflicts       |
|---|-----------------------|----------------------|
| 1 | Operation Riddle      | 1965 Indo-Pak War    |
| 2 | Operation Cactus Lily | 1971 Indo-Pak War    |
| 3 | Operation Meghdoot    | Siachen conflict     |
| 4 | Operation Safed Sagar | 1999 Kargil conflict |

## 4. National Days & Events

**Context:** May 11 marked the 27th National Technological Day of India. This year's theme is "YANTRA", which signifies transformation through advanced research and technological acceleration.

|   | National Days   | Events                                                    |
|---|-----------------|-----------------------------------------------------------|
| 1 | Indian Navy Day | Attack on Karachi harbour during the Indo-Pak War of 1971 |
| 2 | National        | Birth anniversary of Prof.                                |



|   |                         |                                    |
|---|-------------------------|------------------------------------|
|   | Statistics Day          | Prasanta Chandra Mahalanobis       |
| 3 | Anti-Terrorism Day      | Death anniversary of Rajiv Gandhi, |
| 4 | National Technology Day | Pokhran-II nuclear tests           |

## 5. Territorial Army

**Context:** Rule 33 empowers the Central Government to authorize the Chief of the Army Staff (COAS) to call out the Territorial Army (TA). This provision can be invoked to provide essential guard duties or to supplement and support the regular Indian Army.

### What is the Territorial Army (TA)?

- It is a **volunteer force** that acts as a **second line of defence** after the regular Indian Army. Unlike full-time soldiers, TA members are **civilians who take time out of their regular jobs** (doctors, engineers, business owners, and more) to train and serve the country in times of need.
- The genesis of the Territorial Army in India can be traced back to the **first war of Independence in 1857**, when a Volunteer Force was raised. The TA in its current form came into being when the **Territorial Army Act** was enacted on **Aug 18, 1948**.
- It comprises officers, junior commissioned officers (JCOs), non-commissioned officers (NCOs), and other ranks — all holding **ranks identical to the regular Indian Army**.
- The TA currently has a strength of over **40,000 personnel** organised into **32 infantry battalions** and various engineer and departmental units.
- The force is nicknamed the 'Terriers' and operates under the motto 'Savdhani Va Shoorta' (Vigilance and Valour).
- It is commanded by a **Director General of Territorial Army**, a **Lieutenant General-ranked officer** deputed from the Indian Army, and falls under the Chief of Defence Staff through the Department of Military Affairs in the **Ministry of Defence**.

- The **Territorial Army** is a **part-time, volunteer reserve force** of **citizen-soldiers** who assist the regular Indian Army during times of need (e.g., emergencies, natural disasters, or wartime).
- The TA is **not limited to ex-regular army personnel**. Civilians (both men and women) can apply, subject to eligibility criteria. However, **Ex-servicemen can also join under a separate category**.
- As with the rest of the armed forces, the **President of India is the Supreme Commander** of the Territorial Army.
- TA personnel do receive military training during their annual training camps and are expected to maintain basic operational readiness.

## 6. Global Weather Balloon Programme

**Context:** In the wake of budget cuts by the USA, a **Silicon Valley startup** will soon start to replace the **National Oceanic and Atmospheric Administration's (NOAA's) weather balloons** with **AI-powered alternatives**.

### Global Weather Balloon Programme

- Currently, around **900 weather stations** worldwide, including India's **56 radiosonde stations**, launch balloons twice a day in a coordinated international effort.
- These provide:**
  - Critical **upper-air data** for weather forecasts,
  - Inputs for **numerical weather prediction (NWP)** models,
  - Insights for **climate monitoring** and **disaster preparedness**.
- Weather balloons carry radiosondes that measure **temperature, pressure, humidity**, and wind speed/direction as they ascend.
- The **WMO** coordinates a **global programme**, where weather balloons are launched **twice daily at over 900 sites worldwide**, providing standardized and synchronized upper-air data.
- Weather balloons typically reach the **stratosphere** (about 30–35 km above the Earth). The

**mesosphere** starts around 50 km, which is beyond the reach of standard weather balloons.

- The upper-air data collected is essential for **numerical weather prediction (NWP) models**, which rely on 3D atmospheric observations to forecast weather accurately.

## 7. Land Customs Stations (LCS) and Integrated Check Posts (ICP)

**Context:** Bangladesh will no longer be allowed to use Indian land ports to export ready-made garments to India. A notification from the Directorate General of Foreign Trade issued in this regard on May 17 will come into immediate effect, officials here said.

**More about Land Customs Stations (LCS) and Integrated Check Posts (ICP):**

- India shares long land borders with countries like **Bangladesh, Nepal, Bhutan, Myanmar, Pakistan, and China**, leading to numerous points of **cross-border trade and transit**. To manage and facilitate this trade, the government operates two major types of border trade infrastructure:
- **Land Customs Stations (LCS)**
- **Integrated Check Posts (ICP)**

**Land Customs Stations (LCS)**

**Definition:**

- A **Land Customs Station (LCS)** is a designated entry/exit point at land borders for the **movement of goods**, where the **Customs Department** is authorized to clear cargo.

**Key Features:**

- Primarily concerned with **customs clearance of import and export goods**.
- May lack infrastructure for **immigration, quarantine, or other allied services**.
- Can be **seasonal or permanent**, depending on trade patterns.
- Managed by the **Central Board of Indirect Taxes and Customs (CBIC)**.
- Often lacks modern integrated facilities.

**Legal Backing:**

Notified under the **Customs Act, 1962** by the **CBIC**, Ministry of Finance.

**Integrated Check Posts (ICP)**

**Definition:**

- An **Integrated Check Post (ICP)** is a modern border infrastructure facility that brings **all border-related agencies under one roof**, facilitating both **cargo and passenger movement**.

**Key Features:**

- Houses **Customs, Immigration, Border Security Forces, Quarantine, Plant and Animal Inspection, Warehousing**, etc.
- Provides **single-window clearance** for trade and travel.
- Managed and developed by the **Land Ports Authority of India (LPAI)** under the **Ministry of Home Affairs**.
- Equipped with **modern infrastructure**, CCTV, IT systems, etc.
- Offers **logistics support** such as warehousing, parking, and cargo handling.

**Legal Backing:**

Established under the **Land Ports Authority of India Act, 2010**.

- **All ICPs are designated LCSs**, but many LCSs lack the full-scale infrastructure of ICPs. So, this hierarchical relationship is accurate.
- **ICPs** are meant to provide **integrated services** including **immigration, customs, border security, animal/plant quarantine, and logistics**. LCSs, by contrast, are mostly limited to **customs-related functions**.
- The **Land Ports Authority of India (LPAI)** manages **ICPs**, but **not all LCSs** fall under its jurisdiction. Many LCSs are managed by the **Customs Department** or **state-level authorities**.



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## 8. International Booker Prize

**Context:** Banu Mushtaq, Kannada author and activist, has won the International Booker Prize 2025 for her short story collection *Heart Lamp*, translated into English by Deepa Bhashti.

### International Booker Prize

- The International Booker Prize is a prestigious literary award that recognizes outstanding works of fiction from around the world, specifically those translated into English and published in the United Kingdom or Ireland. It aims to celebrate the finest global fiction and promote the art of literary translation.

### History

- Established:** 2005, originally as the Man Booker International Prize.
- Original Format (2005–2015):** Awarded biennially to a living author of any nationality for their entire body of work available in English or English translation. The prize recognized an author's overall contribution to world fiction, similar to the Nobel Prize for Literature.
- Revised Format (2016–present):** The prize shifted to an annual award for a single book (novel or short story collection) translated into English and published in the UK or Ireland. The £50,000 prize is split equally between the author and the translator.
- Sponsorship:** Initially sponsored by the Man Group (2005–2019), then by Crankstart from 2019, at which point the prize was renamed the International Booker Prize.

### Purpose and Eligibility

- Purpose:** To highlight and reward the best fiction from around the world, making it accessible to English-speaking readers.
- Eligibility:** Open to any author whose work is translated into English and published in the UK or Ireland. Both novels and short story collections are eligible.
- Prize:** £50,000, shared equally between the author and the translator.

### Key Facts

- The prize is distinct from the Booker Prize, which is awarded to works originally written in English.
- Both the author and translator are recognized, emphasizing the importance of translation in global literature.
- The award has helped many international authors and translators gain wider recognition and readership in the English-speaking world.
- Since 2016, the International Booker Prize has been awarded annually for a single book translated into English and published in the UK or Ireland.
- In 2025, *Heart Lamp* by Banu Mushtaq, translated from Kannada by Deepa Bhashti, won the prize. It was the first Kannada-language work and the first short story collection to receive the award.
- Initially, from 2005 to 2015, the prize (then known as the Man Booker International Prize) was awarded biennially for a body of work, not a single book. The format changed in 2016 to focus on individual works.

## 9. Battery Aadhaar Initiative

**Context:** At the Battery Summit 2025, Tata Elxsi, in partnership with Tata Motors, Tata AutoComp, and IIT Kharagpur, unveiled the Battery Aadhaar initiative to key government stakeholders.

### About Battery Aadhaar Initiative

- It aims to provide batteries with **secure, digital identities, facilitating traceability** and improving lifecycle transparency.
- This system would assign a **unique digital identity to each battery pack**, enabling the tracking of manufacturing origin, battery chemistry, safety certifications and lifecycle performance.
- The initiative seeks to prevent **unsafe reuse and mitigate environmental risks**.
- This approach ensures compliance with regulatory **standards and promotes sustainable practices** within the battery industry.
- It is supported by a **UNEP-led programme named 'Electrifying Mobility in Cities'**, coordinated by



NITI Aayog and the Department of Science & Technology, Government of India.

- Key features include **Digital Product Passport creation, lifecycle mapping**, public and private data access, **role-based dashboards**, and **real-time battery analytics** such as health prediction and residual life estimation.
- It is **built on blockchain, MOBIUS+** ensures transparent data flows and tamper-proof audit trails.
- This support highlights the initiative's alignment with India's broader sustainable mobility goals and efforts to establish circular energy systems.

## 10. Maya Civilization

**Context:** Archaeologists recently unearthed the remains of a Maya city nearly 3,000 years old in northern Guatemala, with pyramids and monuments that point to its significance as an important ceremonial site.

### About Maya Civilization

- The term "Maya" refers to both a modern-day group of people who live across the globe and their ancestors who built an ancient civilization that stretched across much of Central America.
- The Maya are probably the **best-known of the classical civilizations of Mesoamerica**.
- Before the Spanish conquest of Mexico and Central America, the Maya possessed one of the greatest civilizations of the Western Hemisphere.
- **Originating in the Yucatán peninsula around 2600 B.C., they rose to prominence around A.D. 250 in present-day southern Mexico, Guatemala, northern Belize, and western Honduras.**
- Building on the inherited inventions and ideas of earlier civilizations, the Maya **developed astronomy, calendrical systems, and hieroglyphic writing** (a system that employs **characters in the form of pictures**).
  - The Mayans **developed a precise and sophisticated calendar** that **followed the movement of the sun, moon, and stars**. The Mayan calendar is so precise that it even **includes a leap day**

**adjustment** to keep the calendar synchronized with the solar year.

- The Mayans created a system of hieroglyphic writing that includes more than **800 different glyphs**. This writing was **used to record the history, astronomy, mathematics, and religion** of the Maya culture.

|   | Ancient civilisations | Locations                                                             |
|---|-----------------------|-----------------------------------------------------------------------|
| 1 | Sumerian              | Iraq, Turkey, Syria, Iran                                             |
| 2 | Minoan                | Greece, Turkey, Italy                                                 |
| 3 | Aztec                 | Mexico                                                                |
| 4 | Inca                  | Peru, Ecuador, Bolivia, northern Chile, northwest Argentina, Colombia |

## 11. Druze Community

**Context:** Deadly clashes between Islamist armed factions, security forces and fighters from the Druze religious minority near Damascus are another sign of the continuing fragility of the security situation in Syria after the overthrow of Bashar al-Assad.

### Druze Community

- The Druze are an Arabic-speaking ethnoreligious minority whose faith emerged from Ismaili Shia Islam in the 11th century in Egypt. The Druze religion is unique, incorporating elements from Islam, Christianity, Judaism, Hinduism, and Greek philosophy, and is characterized by its closed nature-conversion is not permitted, and membership is restricted to those born to Druze parents.

### Religious Beliefs and Practices

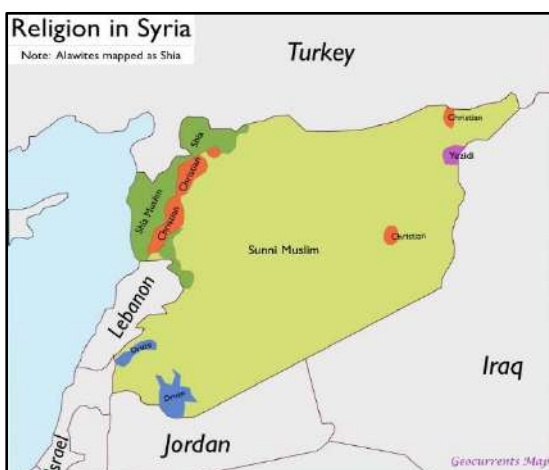
- The Druze faith is monotheistic and includes the belief in reincarnation.
- The community venerates figures from several major religions, but maintains a distinct religious identity.
- Since the 11th century, the Druze have not accepted new converts, and interfaith marriage is discouraged.
- The name "Druze" derives from Muhammad bin Ismail Nashtakin ad-Darazi, one of the early proponents of the faith.

### Geographic Distribution

The Druze population is estimated at around 1 to 1.5 million worldwide, with the vast majority living in the Middle East:

- **Syria:** The largest Druze community, constituting about 3–4% of the population, mainly in Jabal al-Druze (Jabal al-Arab) in the southwest, with smaller communities near Aleppo and Damascus.
- **Lebanon:** Nearly 300,000 Druze live mainly along the western Lebanon Mountains and southeastern regions. They represent about 5.2% of Lebanon's population, concentrated in areas such as Hasbaya, Rashaya, Chouf, Aley, and Marjeyoun.
- **Israel:** About 150,000 Druze live in Israel, making up roughly 2% of the population. Most reside in the Galilee, Carmel, and Golan Heights regions. The Druze community in Israel is officially recognized as a separate religious group with its own courts and spiritual leadership.
- **Jordan:** There are smaller Druze communities, mainly descendants of those who migrated from Syria.
- **Diaspora:** Significant Druze communities exist in Venezuela (about 60,000), the United States (30,000–50,000), Canada, Australia, and other parts of Latin America.

### Historical and Political Role:



- The Druze have played important roles in the history of the Levant, particularly during the Crusades, when they acted as warriors and local rulers in Lebanon.

- In Lebanon, the Druze have wielded considerable political influence, with notable families like the Jumblatts and Arslans often acting as kingmakers and holding key government positions.
- In Israel, the Druze community is distinguished by its service in the Israel Defense Forces and active participation in public life. The Druze opted out of mainstream Arab nationalism in 1948 and have since integrated into Israeli society while maintaining their unique identity.

## 12. The Pantanal

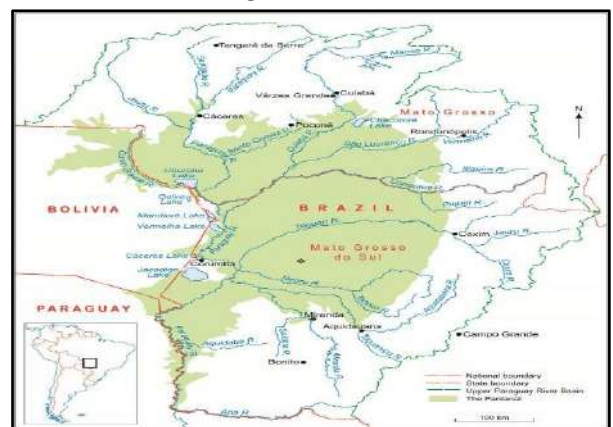
**Context:** The world's oldest person and oldest nun Inah Canabarro Lucas has died at age 116 years and 326 days.

### The Pantanal:

- The **Pantanal** is one of the **largest tropical wetlands in the world** and one of the most biologically rich ecosystems on Earth. It is a **floodplain** located primarily in **South America**, mainly within **Brazil**, but extending into parts of **Bolivia** and **Paraguay**.

### Geographical Location

- **Brazil:** ~80% of the Pantanal lies in the Brazilian states of **Mato Grosso** and **Mato Grosso do Sul**.
- **Bolivia:** The region spills over into eastern Bolivia.
- **Paraguay:** Smaller portions extend into western Paraguay.
- It spans an area estimated between **140,000 to 195,000 square kilometers**, depending on seasonal flooding.





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