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Prelims Fact Sheet

Your Monthly Guidance for UPSC Prelims



- Current Affairs Deep Dive
- History & Culture
- Environment & Ecology
- Polity & Economy
- Science & Technology

50+ Key Facts I Segregated Section wise

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Polity & Governance

1.1. Anti-Defection Law and Rajya Sabha Defections

Context:

The recent defection of several Rajya Sabha MPs from one political party to another has reignited debate over the interpretation of the **Anti-Defection Law** under the **Tenth Schedule** of the Constitution. The controversy intensified after the **Rajya Sabha Chairman accepted the merger claim**, raising questions about the distinction between a **legislative party** and a **political party**, and the scope of the merger provision.

Background:

Anti-Defection Law:

- Added through the **52nd Constitutional Amendment Act, 1985**.
- Incorporated in the **Tenth Schedule** of the Constitution.
- Intended to curb **political defections** and ensure **stability of governments**.

Grounds for Disqualification:

A member can be disqualified if:

- He/she **voluntarily gives up membership** of the political party.
- Votes or abstains contrary to the **party whip** without permission.
- An independent member joins a political party after election.

Merger Provision under Tenth Schedule:

- **Paragraph 4** of the Tenth Schedule provides exemption from disqualification in case of a **merger**.
- A merger is considered valid if **not less than two-thirds members of the legislative party** agree to merge with another party.

Legislative Party vs Political Party Debate:

Legislative Party:

- Refers to the group of elected MPs/MLAs belonging to a political party inside a legislature.
- In Rajya Sabha context, it means party MPs in the House.

Political Party:

- Refers to the original party organization registered with the **Election Commission of India (ECI)**.

Core Debate: Debate over whether MPs can claim merger protection (Paragraph 4 of Tenth Schedule) without their parent party merging is legally contentious, with experts and Supreme Court precedents indicating that a valid merger requires the parent party to merge, not just a legislature faction. Legal opinion holds that only the original party's merger protects MPs. Supporters of the merger claim argue that once two-thirds of the legislative party supports merger, protection under Paragraph 4 applies.

Key details regarding this legal debate:

- **Legal Position:** According to former Lok Sabha Secretary-General PDT Achary, MPs cannot merge alone; a merger must occur between two political parties.
- **Merger vs. Defection:** The 2023 Supreme Court ruling in *Subhash Desai vs Principal Secretary Governor of Maharashtra* clarifies that a legislature party cannot claim protection on its own, and the merger must be initiated by the original political party.
- **Current Case Study:** In this case, seven Aam Aadmi Party (AAP) Rajya Sabha MPs claimed to merge with the BJP, sparking arguments that this is a "mass defection" rather than a legal merger, as the parent party (Original AAP) did not merge.
- **2/3 Requirement:** For a merger to be valid, 2/3 of the party's legislators must agree to the merger of the original political party.
- **Consequences:** If the parent party has not merged, the MPs could face disqualification under Paragraph 2 of the Tenth Schedule for voluntarily giving up party membership.
- The Supreme Court has emphasized that the legislative party and the original political party are distinct, preventing legislature parties from initiating mergers independently.

Role of the Chairman:

- Under the Tenth Schedule, the **Chairman of Rajya Sabha** acts as the authority to decide disqualification petitions concerning Rajya Sabha MPs.
- In the present case, the **Rajya Sabha Chairman accepted the merger claim**, effectively granting protection from disqualification under the merger provision. This raised concerns about neutrality.
- In **Kihoto Hollohan v. Zachillhu (1992),** Supreme Court already held that decisions of Speaker/Chairman are subject to **judicial review**. Hence, this decision might be challenged in Court.

1.2. Proposed Pesticide Management Bill and Industry Concerns

Context:

The government plans to introduce a new Pesticide Management Bill to replace the Insecticides Act, 1968, but industry bodies have raised concerns over delays in access to new technologies and lack of regulatory clarity. Stakeholders have suggested reforms such as time-bound data protection and faster approvals.

Explanation:

- Pesticides are chemical or biological substances used to control pests affecting crops, storage, public health, and industry.
- The existing legal framework is the Insecticides Act, 1968, which regulates import, manufacture, sale, transport, and use of pesticides in India.
- **The proposed Pesticide Management Bill aims to modernize regulation by focusing on safety, efficacy, environmental impact, and farmer access.**
- It proposes establishment of a Central Pesticides Board to advise the government on manufacturing standards, safe disposal, and research on alternatives.
- **Registration of pesticides is mandatory before manufacture or import**, ensuring evaluation of safety and effectiveness.
- Licensing for sale and distribution is handled by State governments, reflecting the federal structure of regulation.
- A key issue is **the absence of Regulatory Data Protection (RDP)**, which protects the data generated by companies for new pesticide approvals for a limited period.
- Lack of RDP may discourage innovation, as new entrants can use existing data without investing in research.
- **Delays in approval of new pesticides lead to continued use of older chemicals**, increasing pest resistance and reducing effectiveness.
- Balancing farmer needs for affordable inputs, industry incentives for innovation, and environmental safety remains a key policy challenge.

1.3. Online Gaming Rules and Regulatory Framework in India

Context:

The government has operationalised the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021 (as amended) to regulate online gaming, expanding compliance requirements while allowing flexibility for esports and non-real-money games.

Explanation:

- Online gaming in India is governed under the Information Technology Act, 2000, with rules notified under it to regulate intermediaries and digital platforms.
- The amended IT Rules introduce a structured framework for online real money games (RMGs), distinguishing them from casual or free-to-play games and esports.
- The framework does not mandate universal pre-registration of all games; instead, it adopts a selective "determination and registration" approach based on factors like stakes involved and risk level.
- A key institutional feature is the proposed Online Gaming Authority of India (OGAI), which will act as a regulator with powers to classify games, enforce compliance, and issue directions.
- Games are categorized into online real money games (involving stakes), online social games (no stakes), and esports (skill-based competitive gaming).

- The rules expand compliance to intermediaries such as payment gateways, banks, and hosting platforms, requiring them to block or restrict transactions related to illegal gaming activities.
- This effectively makes the payments layer a critical enforcement mechanism, reducing the need for direct bans on platforms.
- The framework introduces a two-tier grievance redressal system, requiring platforms to first address user complaints internally, followed by an appellate mechanism within the government.
- Data localisation provisions require certain categories of gaming platforms to store data in India, especially those offering real money games or handling sensitive user data.
- The rules mandate user safety measures such as age verification, parental controls, limits on deposits and playtime, and safeguards against addiction.
- The framework aims to address concerns like fraud, addiction, and regulatory arbitrage arising from inconsistent state-level laws.

1.4. Right to Vote vs Right to Contest: Supreme Court Clarification

Context:
The Supreme Court recently clarified that the right to vote and the right to contest elections are distinct, while hearing petitions related to voter deletion under the Special Intensive Revision (SIR) process. The Court held that exclusion from electoral rolls affects eligibility but does not automatically disqualify a candidate.

Explanation:

- Right to vote is a statutory right provided under the Representation of the People Act, 1950 and 1951, not a fundamental right.
- Right to contest elections is also a statutory right subject to eligibility conditions and disqualifications prescribed by law.
- Supreme Court in **Jyoti Basu v. Debi Ghosal (1982)** held that right to contest elections is not a fundamental right but a statutory right.
- In **K. Krishna Murthy v. Union of India (2010)**, the Court reiterated that electoral rights are statutory in nature.

Key Legal Interpretation by the Court:

- The Court introduced the concept of **"eligibility threshold"**:
  - Being enrolled as a voter is a **basic qualifying condition** to contest elections
  - If a person's name is deleted from electoral rolls:
    - It does not amount to disqualification
    - But it makes the person **ineligible to contest temporarily**
- **Thus:**
  - **Eligibility (threshold condition)** is different from
  - **Disqualification (legal prohibition)**

1.5. Punjab's Sacrilege Bill and Its Implications

Context:
The Punjab Assembly has unanimously passed the Jagtar Singh Guru Granth Sahib Satkar (Amendment) Bill, 2026, proposing stringent punishment - including life imprisonment - for sacrilege-related offences.

- **Sacrilege** is the violation, desecration, or disrespectful treatment of a person, place, or object that is held sacred or holy. E.g Damaging a holy book of a religion.
- Sacrilege has remained a highly emotive issue in the state of Punjab, particularly after the 2015 incidents involving the Guru Granth Sahib, the holy book of sikhs.
- The new bill **expands the definition of sacrilege** beyond physical acts (burning, tearing, theft) to include: Spoken expressions, Written or symbolic representations, Digital or electronic content hurting religious sentiments
- The provision to punish acts that "hurt sentiments" raises concerns about **freedom of speech under Article 19(1)(a)** and potential misuse.
- The debate highlights a broader constitutional tension between: **Freedom of expression (vs) Maintenance of public order and respect for religion.**
- The Bill also raises questions about **federal dynamics**, as earlier similar Bills required **Presidential assent** due to conflict with central laws (IPC provisions on religious offences like Sections 295–298)

1.6. PMAY Housing on Forest Land and Safeguards under Forest Rights Act.

Context:

The Union government has informed the Supreme Court about safeguards under the Forest Rights Act (FRA), 2006 for constructing PMAY-G houses on forest land.

Explanation:

- Previously it was alleged that granting of house by Govt to Tribals on Forest land under PMAY is a violation of FRA 2006 and Forest (Conservation) Act, 1980 (FCA 1980).
- **The Forest Rights Act (FRA), 2006** recognizes and vests forest rights and occupation in **forest-dwelling Scheduled Tribes (FDSTs) and Other Traditional Forest Dwellers (OTFDs).**
- FRA aims to correct historical injustices caused by colonial and post-colonial forest laws that denied land and livelihood rights to forest dwellers.
- Titles granted under FRA are generally non-transferable and heritable, ensuring livelihood security.
- **The Forest (Conservation) Act, 1980** regulates diversion of forest land for non-forest purposes and requires prior approval of the central government.
- PMAY-G (Pradhan Mantri Awas Yojana–Gramin) is a rural housing scheme aimed at providing pucca houses to the rural poor.
- Construction on forest land requires compliance with FRA provisions, including recognition of rights before diversion or use.

1.7. Resignation of Allahabad High Court Judge Amid Inquiry Proceedings

Context:

Justice Yashwant Varma resigned from his position and submitted his resignation to Droupadi Murmu amid a pending parliamentary motion for removal. The resignation follows an inquiry initiated under the Judges (Inquiry) Act, 1968 regarding serious allegations.

CORE CONCEPTS:

- **Article 161**: Governor can grant pardon, reprieve, respite, remission, or commute sentences for state offences.
- Based on parliamentary system, Governor acts on aid and advice of Council of Ministers (**Article 163**).
- Supreme Court (Maru Ram v. Union of India, 1980): Governor's clemency powers are not discretionary; must follow Cabinet advice.
- **Remission**: Reduction of sentence without changing its nature.
- Distinction: President (Article 72) exercises similar powers at Union level.
- Judicial review allowed if mala fide, arbitrary, or extraneous considerations are involved.
- **Council of Ministers:** Executive body headed by the Chief Minister at the state level; real decision-making authority in a parliamentary system.

1.8. Withholding of TRP Ratings for News Channels

Context:

Government has extended its directive to withhold Television Rating Points (TRPs) for TV news channels by 4 weeks to curb sensationalism and speculative reporting during the West Asia conflict. The order was issued by the Ministry of Information and Broadcasting to BARC.

Explanation:

- **TRP (Television Rating Points)** measures viewership of TV channels and programs, influencing advertising revenue.
- Higher TRPs often incentivize sensational or dramatic content to attract viewers.
- **BARC (Broadcast Audience Research Council):** Industry body established in 2015, headquartered in Mumbai, responsible for measuring TV viewership in India using statistical sampling techniques.
- News broadcasting is regulated through guidelines under the Cable Television Networks (Regulation) Act, 1995.
- Ethical concerns include misinformation, sensationalism, and impact on public opinion.
- Government intervention aims to promote responsible journalism during sensitive events.

1.9. New Rajya Sabha members sworn in

Context:
19 newly elected members took oath in the Rajya Sabha. The oath was administered by the Chairman of the House.
Explanation:

- **Rajya Sabha:** Upper House of Parliament; represents states.
- Members of the Rajya Sabha are elected indirectly by the elected members of the Legislative Assemblies of States and Union Territories (MLAs).
- This election uses a system of proportional representation through a single transferable vote.
- Additionally, 12 members are nominated by the President of India.
- **Term:** 6 years; one-third members retire every 2 years (permanent house).
- **Vice-President of India:** Ex-officio Chairman of Rajya Sabha (Article 64).

1.10. Governor Bound by Council of Ministers' Advice in Remission Powers

Context:
The Madras High Court held that the Governor is constitutionally bound by the advice of the Council of Ministers while exercising remission powers under Article 161. The ruling resolves conflicting High Court decisions and reinforces established constitutional principles.
CORE CONCEPTS:

- **Article 161**: Governor can grant pardon, reprieve, respite, remission, or commute sentences for state offences.
- Based on parliamentary system, Governor acts on aid and advice of Council of Ministers (**Article 163**).
- Supreme Court (Maru Ram v. Union of India, 1980): Governor's clemency powers are not discretionary; must follow Cabinet advice.
- **Remission**: Reduction of sentence without changing its nature.
- Distinction: President (Article 72) exercises similar powers at Union level.
- Judicial review allowed if mala fide, arbitrary, or extraneous considerations are involved.
- **Council of Ministers:** Executive body headed by the Chief Minister at the state level; real decision-making authority in a parliamentary system.

1.11. NCERT Declared Deemed-to-be University

Context:
The Ministry of Education has granted deemed-to-be university status to The **National Council of Educational Research and Training (NCERT),** enabling it to offer degree programmes and initiate doctoral research while expanding its role beyond curriculum development.
BACKGROUND:

- **Deemed-to-be University** status is granted under Section 3 of the UGC Act, 1956 to institutions of high academic standards.
- Such institutions enjoy autonomy in designing courses, admissions, and research programmes.
- **NCERT (established 1961)** is an autonomous body under the Ministry of Education, Government of India. Its headquarters is at New Delhi.
- The objective of NCERT is to design and support a common system of education for the country that is national in character.
- Its main functions include developing national curricula, publishing textbooks, conducting educational research, training teachers, and advising central/state governments.
- Deemed University status transforms NCERT from an advisory body into a full-fledged research university. This autonomy allows NCERT to launch new courses and programmes that are relevant to the changing needs and demands of the education sector without having to seek approval from any other authority.
- Deemed universities must adhere to UGC regulations and maintain academic quality through accreditation.

1.12. Living Will

Context:
The concept of a **Living Will** is being discussed in relation to ensuring **dignified end-of-life care**.
About Living Will:

- **Definition:** A **legal document** specifying a person's **medical treatment preferences** if they become incapable of decision-making. Also known as: **Advance Directive**.
- Used in cases of **terminal illness, irreversible conditions, or persistent vegetative state (PVS)**.
- **Scope:** Covers decisions on **life-support, ventilators, artificial feeding, and CPR**.
- **Legal status (India):** Recognised by **Supreme Court (Common Cause case, 2018)** under **Article 21 (Right to life with dignity)**.
- **Purpose:** Ensures **patient autonomy** and avoids **unnecessary medical intervention**.
- **Nature:** Allows **withholding/withdrawal of life support**; does **not permit euthanasia**.

1.13. Supreme Court Push for Disability-Friendly Prisons

Context:
The Supreme Court has directed a high-powered committee to prepare a comprehensive plan to make prisons across India disability-friendly, ensuring humane conditions and safeguarding fundamental rights of prisoners with disabilities.
Explanation:

- **Prisoners retain fundamental rights except those restricted by incarceration; Articles 14 (equality) and 21 (right to life with dignity) apply to them.**
- The **Rights of Persons with Disabilities Act, 2016** mandates accessibility, non-discrimination, and reasonable accommodation for persons with disabilities.
- **Indian prisons are governed by the Prisons Act, 1894 and Model Prison Manual, 2016**, which emphasize reformative justice but lack adequate disability-specific provisions.
- Accessibility includes assistive devices, barrier-free infrastructure, mobility aids, and healthcare support tailored to specific disabilities.
- The concept of "reasonable accommodation" requires necessary modifications to ensure equal participation without imposing disproportionate burden.
- **The National Legal Services Authority (NALSA)** plays a role in safeguarding prisoners' legal rights, including vulnerable groups.
- Issues like overcrowding, poor healthcare, and lack of trained staff exacerbate challenges for disabled inmates.
- Judicial interventions have increasingly emphasized a rights-based approach in prison reforms, shifting from punitive to rehabilitative frameworks.
- The committee includes representatives from key ministries and state authorities, reflecting cooperative federalism in **prison administration (state subject under List II)**.
- The move aligns with international standards like **the UN Standard Minimum Rules for the Treatment of Prisoners (Nelson Mandela Rules), which stress dignity and non-discrimination.**

1.14. Privilege Motion and MCC: Testing Constitutional Boundaries in Elections

Context:
The Indian National Congress has moved a **privilege notice against the Prime Minister**, alleging that his public remarks undermined the dignity and integrity of Members of Parliament.
Explanation:

- A privilege notice is a formal complaint raised in the legislature when the **rights, privileges, or authority of the House or its members are violated**.
- Parliamentary privileges are derived from **Articles 105 and 194 of the Constitution**, granting special protections to ensure independent functioning of legislatures.
- These include **freedom of speech within the House and immunity from legal action** for statements made during proceedings.

- A **breach of privilege** occurs when any action obstructs legislative functioning or lowers the authority of the House.
- Such matters are examined by the **Presiding Officer (Speaker/Chairman)** and may be referred to the Privileges Committee for investigation.
- Simultaneously, complaints have been filed before the Election Commission of India alleging that the Prime Minister's address violated the **Model Code of Conduct (MCC)**.
- The MCC is a set of **non-statutory guidelines issued by the Election Commission under Article 324** to ensure free and fair elections.
- It comes into force once the **election schedule is announced** and applies to political parties, candidates, and governments.
- The MCC prohibits the **misuse of official machinery, public funds, and government platforms** for electoral advantage.
- Concerns arise when **government communication platforms**, such as official broadcasts or advertisements, are used to indirectly promote political leaders or parties.
- The Supreme Court in Common Cause v Union of India (2015) laid down guidelines to prevent **political glorification through public-funded advertisements**.
- Such misuse can distort the **level playing field**, which is essential for democratic elections.
- A related issue is the balance between **public communication and political messaging**, especially during election periods.
- Governments are expected to communicate welfare schemes and public information, but **not engage in partisan promotion using state resources**.
- Another dimension arises from a case where a comedian was questioned by a legislature's Privileges Committee, highlighting tensions between **legislative privileges and freedom of speech under Article 19(1)(a)**.
- This raises concerns about whether privilege powers may sometimes **conflict with democratic freedoms and dissent**.
- Overall, the situation reflects an institutional overlap where **legislature, executive, and Election Commission intersect**, creating grey areas.
- It highlights the need for clearer boundaries to ensure **accountability, neutrality of the state, and protection of democratic values**.

1.15. Election of Rajya Sabha Deputy Chairman

Context:

Shri Harivansh has been elected unopposed as the **Deputy Chairman of the Rajya Sabha** for a third consecutive term. This makes him **the first nominated member** to hold this position.

Deputy Chairman of Rajya Sabha: Role and Election:

- The **Deputy Chairman of the Rajya Sabha** is elected by the members of the Rajya Sabha from among themselves under **Article 89(2)** of the Constitution.
- The **Vice President of India** acts as the **ex-officio Chairman of the Rajya Sabha**, while the Deputy Chairman presides in their absence.
- The Deputy Chairman performs functions such as **presiding over proceedings, maintaining order, deciding procedural matters, and ensuring smooth functioning of the House**.
- The Deputy Chairman can be **removed by a resolution passed by a majority of all the then members of the Rajya Sabha**, with **14 days' notice**.
- A **nominated member of Rajya Sabha** (nominated by the President under **Article 80**) can also hold the office of Deputy Chairman, as seen in this case.
- The election being **unopposed** reflects political consensus, which is significant for **parliamentary functioning and legislative cooperation**.
- The role is crucial in ensuring **parliamentary democracy, neutrality of the chair, and adherence to rules of procedure**.

1.16. Supreme Court Collegium Recommends Judges for Kerala and Karnataka High Courts

Context:

The Supreme Court Collegium has recommended appointments of new judges to the Kerala and Karnataka High Courts, with a notable representation of women advocates and judicial officers. These recommendations are part of the ongoing judicial appointment process in higher judiciary.

Explanation:

- Collegium system is the mechanism for appointment and transfer of judges in the higher judiciary (Supreme Court and High Courts).
- It is not mentioned in the Constitution but evolved through Supreme Court judgments (Second Judges Case, 1993; Third Judges Case, 1998).
- Supreme Court Collegium comprises the Chief Justice of India (CJI) and four senior-most Supreme Court judges.
- High Court Collegium consists of the Chief Justice of the High Court and two senior-most judges of that High Court.
- Their recommendations are then reviewed by the Supreme Court Collegium (CJI + 4 senior-most judges) before final appointment by the President of India under Article 217.
- Articles 124 and 217 of the Constitution deal with appointment of Supreme Court and High Court judges respectively.
- Judges of High Courts are appointed by the President in consultation with the CJI, Governor of the State, and Chief Justice of the concerned High Court.
- Collegium recommends names, which are sent to the Government for approval; the executive can seek reconsideration once.
- If the Collegium reiterates the recommendation, the government is bound to accept it.
- National Judicial Appointments Commission (NJAC) Act, 2014 sought to replace the Collegium but was struck down by the Supreme Court in 2015 as unconstitutional.
- Increasing representation of women in judiciary is seen as a positive step toward diversity and inclusivity.

1.17. Film Piracy

Context:

The leak of the Tamil movie *Jana Nayagan* before its theatrical release has highlighted the issue of film piracy and the stringent legal consequences under recent amendments to Indian laws.

Explanation:

- Film piracy refers to unauthorized copying, distribution, or sharing of copyrighted content such as movies, violating intellectual property rights.
- The **Copyright Act, 1957** governs protection of literary, artistic, and cinematographic works in India.
- The **Cinematograph Act, 1952**, amended in 2023, introduces stricter provisions against unauthorized recording and transmission of films.
- Pirated content is often distributed through messaging apps (e.g., Telegram) and torrent websites, making enforcement difficult.
- Law enforcement agencies like State Cyber Crime Wings investigate such cases.
- Courts can issue dynamic injunctions to block websites hosting pirated content.

1.18. Karnataka law on right to choose partner

Context:

Karnataka passed a law protecting adults' right to marry by choice and preventing honour-based crimes. It awaits the Governor's assent.

Explanation:

- **Right to marry:** Part of Right to Life and Personal Liberty (**Article 21**).
- Honour crimes: Violence against couples for marrying against caste/religion norms.
- Constitution ensures equality (Article 14) and freedom (Article 19).
- **Lata Singh vs State of UP (2006)** is a landmark Supreme Court of India case that upheld the right of major adults to marry of their own free will, regardless of caste or religion.
- The law removes need for parental consent for adult marriage.
- Provides legal protection and penalties for harassment or violence.

1.19. Right to be Considered for Promotion in Public Employment

Context:
A recent judgment by the Punjab and Haryana High Court reiterated that government employees have a fundamental right to be considered for promotion. The case highlighted administrative delays and misinterpretation of rules that denied timely promotion consideration.

Core Concepts:

- Articles **14 and 16(1)** of the Constitution guarantee equality before law and equality of opportunity in public employment.
- **The right to promotion is not fundamental, but the right to be considered for promotion is a fundamental right.**
- Supreme Court (Ajit Singh case, 1999) clarified that eligible employees must be fairly considered.
- Promotion depends on service rules, seniority, and eligibility criteria.
- Administrative delays or arbitrary denial of consideration violate constitutional rights.

1.20. SC on Electoral Roll Exclusion and Voting Rights

Context:
The Supreme Court held that voters excluded from electoral rolls during SIR do not permanently lose their voting rights. It emphasized completion of the adjudication and appeal process to ensure justice for affected voters.

Explanation:

- Electoral rolls are lists of eligible voters prepared under the Representation of the People Act, 1950.
- Special Intensive Revision (SIR) is conducted to update rolls by removing duplicates, dead voters, or ineligible names.
- Article 326 provides for universal adult suffrage (18+ years). Election Commission ensures free and fair elections under Article 324.
- Voter exclusion can be challenged through claims and objections process. Tribunals or designated authorities handle appeals against exclusion decisions.

1.21. Jan Vishwas (Amendment of Provisions) Bill, 2026 Passed by Lok Sabha

Context:
The Lok Sabha passed the Jan Vishwas (Amendment of Provisions) Bill, 2026 to decriminalise minor offences and improve ease of doing business and living by rationalising outdated provisions across multiple Central laws.

Background / Core Concepts:

- Historically, India's regulatory framework burdened businesses with thousands of compliances, nearly 40% of which carried imprisonment clauses.
- To replace this "culture of fear" with trust, the Jan Vishwas Act, 2023 was notified on 11 August 2023, decriminalising 183 provisions across 42 Central Acts.
- By shifting minor procedural lapses from criminal courts to monetary penalties, the Act primarily benefits MSMEs, entrepreneurs, and common citizens by enhancing the Ease of Doing Business and Living.
- Decriminalisation means removing criminal penalties and replacing them with civil penalties like fines.
- The Bill amends provisions of several Central Acts to reduce compliance burden.
- Rationalisation includes removal of obsolete and redundant laws.

1.22. Hate Speech in Elections

Context:
Supreme Court of India held that hate speech arises from an "us versus them" mindset and undermines the constitutional value of fraternity. While recognizing its serious impact on society, the Court refused to mandate new laws, instead stressing better enforcement of existing legal provisions. separately, The Kerala High Court directed the Election Commission of India to decide within two months on a complaint regarding communal remarks by a candidate, questioning enforcement during the Model Code of Conduct (MCC).

About Legal Framework on Hate Speech:

- Constitutional basis: **Article 324** vests ECI with **superintendence, direction, and control of elections** (plenary/residual powers).
- **Bharatiya Nyaya Sanhita (BNS)** provisions deal with **enmity, religious insult, and public mischief.**
- **Representation of the People Act, 1951 (RPA 1951): Section 123(3)** (religious appeal) and **123(3A)** (promotion of enmity) are **corrupt practices**, while **Section 125** provides **penal punishment for promoting enmity during elections.**
- MCC rules: Prohibits **hate speech, communal appeals, and use of religion for votes.**
- Nature of MCC: **Non-statutory**, enforced via **ECI's Article 324 powers.**
- ECI powers: Can issue **notices, censure, campaign bans, and order FIRs; disqualification is decided by President/Governor on ECI advice.**

1.23. IVFRT Scheme

Context:

The **Union Cabinet** has approved a **5-year extension (2026–2031)** of the **Immigration, Visa, Foreigners Registration & Tracking (IVFRT) Scheme** with an outlay of **₹1,800 crore.**

About IVFRT Scheme:

- **Objective:** To create a **modern, secure, integrated system** for **immigration, visa issuance, and foreigner tracking,** enhancing **immigration control and service efficiency.**
- Implemented under the **Ministry of Home Affairs (MHA).**
- **Coverage:** Includes **Immigration Posts, FRROs (Foreigners Regional Registration Offices), and FROs** across India.
- **Key feature:** Enables **100% contactless visa processing** with online application, scheduling, and payments.
- **Efficiency:** Over **91% e-visa applications cleared within 72 hours.**
- **Legal backing:** Strengthened by the **Immigration and Foreigners Act, 2025.**
- **Purpose:** Enhances **immigration control, national security, and service delivery efficiency.**

1.24. Disturbed Areas Act (Amendment) Bill, 2026 – Gujarat

Context:

The **Gujarat Assembly** has passed the **Disturbed Areas Act (Amendment) Bill, 2026**, expanding regulation of **property transactions in notified areas.**

About Disturbed Areas Act (Amendment):

- **Original Act:** Enacted in **1991** to prevent **distress sale of property during communal tensions.**
- **Terminology change:** Replaces **"disturbed area"** with **"specified area".**
- **Declaration criteria:** Includes areas **likely to face communal disturbance**, not just those already affected.
- **Collector powers:** Allows **suo motu inquiry** and **possession of property** if transfers are found objectionable.
- **Property regulation:** Requires **prior approval** for property transactions in notified areas.
- **Aggrieved person:** Definition expanded to include more stakeholders.
- **Institutional mechanism:** Provides for a **monitoring and advisory committee.**
- **Objective:** Prevent **involuntary transfer of property** and protect **community interests.**

2. International Relations

2.1. Al-Aqsa Mosque Visit Rekindles Jerusalem Tensions

Context:
Israel's National Security Minister Itamar Ben-Gvir visited the Al-Aqsa Mosque compound in Jerusalem, sparking controversy and criticism from Jordan, which termed it a violation of the status quo.

Explanation:
- Al-Aqsa Mosque compound, also known as Haram al-Sharif (Noble Sanctuary), is located in East Jerusalem and is one of the holiest sites in Islam.
- The site is also sacred to Jews as the Temple Mount, believed to be the location of the First and Second Jewish Temples.
- Jerusalem is a contested city, claimed by both Israel and Palestine, with East Jerusalem considered occupied territory under international law.
- The "status quo" arrangement governs access and worship rights at the site, allowing Muslims to pray while non-Muslims can visit under certain restrictions.
- Jordan retains a special custodial role over Islamic holy sites in Jerusalem, as recognized in agreements with Israel.
- The issue is central to the broader Israel-Palestine conflict, involving questions of sovereignty, religious rights, and territorial control.
- The Old City of Jerusalem, including the Al-Aqsa compound, is a UNESCO World Heritage Site.

2.2. Myanmar Junta Chief Becomes President Amid Ongoing Military Rule

Context:
Min Aung Hlaing, head of Myanmar's military junta, has been sworn in as President, continuing his rule five years after the 2021 military coup. The move is seen as a transition from direct military rule to a civilian façade amid ongoing political instability.

Explanation:
- A **junta** is a government led by military leaders who have seized power, usually by force.
- Myanmar (formerly Burma) is a Southeast Asian country with its capital at **Naypyidaw** has experienced prolonged military rule with brief democratic phases, especially under Aung San Suu Kyi **and the National League for Democracy (NLD).**
- In **February 2021**, the military led by Min Aung Hlaing carried out a coup, citing electoral fraud and detaining elected leaders.
- The coup triggered mass protests, global sanctions, and an ongoing **civil conflict involving ethnic armed groups**.
- The recent elections were criticized as farce and the current transition is seen as an effort to **legitimize military rule through a controlled civilian framework**.
- Myanmar shares borders with **India, China, Bangladesh, Thailand, and Laos**, making it geopolitically significant for India's **Act East Policy** and regional security concerns.

2.3. China's Draft Regulations on Digital Humans and AI Governance

Context:
China has issued draft regulations to regulate "digital humans" (AI-generated virtual beings), mandating clear labeling and restricting misuse such as identity fraud and harmful content. The move aims to strengthen control over emerging AI technologies.

Core Concepts:
- **Digital Humans** are AI-generated virtual avatars that mimic human appearance, speech, and behavior.
- Growth of **Artificial Intelligence (AI)** raises concerns about misinformation, deepfakes, and identity misuse.
- Governments globally are framing **AI governance frameworks** to ensure ethical use and accountability.
- Key concerns include **data privacy, child protection, and content regulation**.
- Reflects broader trend of **regulating generative AI technologies** like deepfakes and virtual influencers.

2.4. India Condemns Attacks on UNIFIL Peacekeepers in Lebanon

Context:
India condemned recent attacks on UN peacekeepers deployed under UNIFIL in Lebanon, calling for accountability and urging all parties to ensure the safety and inviolability of UN missions in conflict zones.

BACKGROUND:

- The United Nations Interim Force in Lebanon (UNIFIL) exists to maintain stability in southern Lebanon, authorized by the UN Security Council in 1978 after Israeli invasions.
- It monitors the "Blue Line" border, prevents hostilities between Lebanon and Israel, ensures the area is free of illegal weapons, and supports the Lebanese Armed Forces.
- UN Security Council Resolution 2589 (2021) emphasises accountability for crimes against peacekeepers.
- UN Peacekeepers (called Blue Helmets) operate under principles of neutrality, consent of parties, and limited use of force.
- India is one of the largest contributors to UN peacekeeping missions globally.
- **UN Peacekeeping Operations**: Conducted by the United Nations since 1948; aim to maintain ceasefires, protect civilians, and support political processes in conflict zones.

2.5. Group of Seven (G7)

Context:
G7 Foreign Ministers issued the **Vaux-de-Cernay Statement (March 2026)** under the **France Presidency** amid escalating **West Asia tensions**.

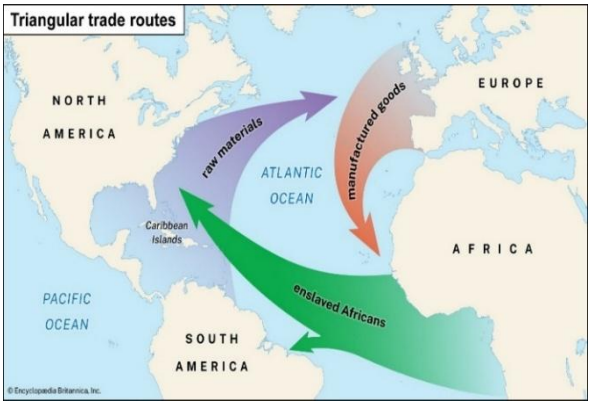
About G7:

- **Nature:** An **informal grouping of advanced economies** focusing on **global economic governance and security**.
- **Members: United States, United Kingdom, France, Germany, Italy, Canada, and Japan.**
- **Origin:** Formed as **G6 (1975)**; became G7 (1976); expanded to **G8 (1998–2014)** with **Russia**, later reverted after the **Annexation of Crimea**.
- **2026 Summit:** Scheduled in **June 2026 (15–17 June)** at **Évian-les-Bains, France**.
- **Key Focus Areas: Global economy, geopolitics, energy security, climate change.**
- **Vaux-de-Cernay Statement:** Called for **de-escalation in West Asia**, protection of **civilians & infrastructure**, and **freedom of navigation (Strait of Hormuz)**.
- **Nature of Decisions: Non-binding**, based on **consensus coordination**.
- **India's Role:** Participates as an **Outreach/Guest country**, reflecting **Global South engagement**.

2.6. Transatlantic African Slave Trade

Context:
The **UN General Assembly (UNGA)** has designated the **transatlantic African slave trade** as the **"gravest crime against humanity."**

About Transatlantic African Slave Trade:



- Involved **forced transportation of Africans** to the Americas between the **16th–19th centuries**.
- Millions were subjected to **slavery, exploitation, and dehumanisation**.
- Operated via the **Triangular Trade** linking **Africa, Europe, and the Americas**.
- **Legal status:** "**Crime against humanity**" under **international criminal law**; includes acts like **slavery, genocide, and deportation**.
- **UNGA resolution:** Adopted by **majority vote**; **non-binding in nature**.
- **Voting pattern: 123 in favour, 3 against (USA, Israel, Argentina), 52 abstentions.**
- **Significance:** Strengthens calls for **historical justice and reparations**.

2.7. Nuclear Non-Proliferation Treaty (NPT)

Context:

Iran is reviewing a possible exit from the **Nuclear Non-Proliferation Treaty (NPT)** amid escalating geopolitical tensions.

About NPT:

- It is a **global treaty** to prevent **spread of nuclear weapons** and promote **peaceful nuclear use**. Adopted in **1968**; entered into force in **1970**.
- **Three Pillars:** Non-proliferation, disarmament, and peaceful use of nuclear energy.
- **Nuclear Weapon States:** Recognises **5 states (P5 Countries** - US, Russia, UK, France, China**)** based on **1967 cut-off.**
- **Withdrawal Clause: Article X** allows exit with **3-month notice** if **supreme national interests are threatened**.
- **Non-Members & Withdrawal: India, Pakistan, Israel** are non-signatories; **North Korea** withdrew in **2003**.
- **India not a member of** non-proliferation treaty (NPT), Comprehensive Test-ban Treaty (CTBT), Nuclear Suppliers Group (NSG).

2.8. Iran's Nuclear Programme: Security Implications

Context:

Concerns are rising over Iran's nuclear capabilities, with estimates suggesting it is close to weapons-grade uranium enrichment. The debate centres on how quickly Iran could convert enriched uranium into a nuclear weapon and the implications for regional and global security.

BACKGROUND:

- Uranium enrichment refers to the process of increasing the proportion of the U-235 isotope in uranium, typically to about 3–5% for use in nuclear reactors and up to around 90% for use in nuclear weapons.
- Nuclear weaponisation: Beyond enrichment, requires conversion to metal, warhead design, and delivery systems.

CORE ANALYSIS:

- **Present capability:** Iran reportedly possesses 500 kg of uranium enriched up to 60%, significantly reducing the time needed to reach weapons-grade (90%).
- **Timeline dynamics:** Enrichment from 60% to 90% could take weeks. Weaponisation (metal conversion, core design) may take months to over a year depending on expertise and infrastructure.
- **Technical barriers:** Making a nuclear weapon requires specialised equipment such as centrifuges, furnaces, and precision machining tools. Warhead miniaturisation and missile integration remain complex challenges.
- **Strategic implications:** Even latent capability enhances deterrence and bargaining power. Raises proliferation risks in West Asia, possibly triggering a regional arms race (e.g., Saudi Arabia, Israel concerns).

Uncertainty factors:

- Extent of damage to Iranian facilities (e.g., Natanz) affects timelines.
- Lack of transparency and limited IAEA access complicate verification.
- Diplomatic efforts through past nuclear pact revival attempts have stalled.
- Sanctions and monitoring continue, but enforcement gaps persist.

CONCLUSION:

Diplomatic negotiations must restore nuclear constraints and verification. Promoting regional security dialogue to prevent arms race is the way.

3. ECONOMY

3.1. Insolvency and Bankruptcy Code (Amendment) Act, 2026

Context:
The government has passed the **Insolvency and Bankruptcy Code (IBC) Amendment Act, 2026** to strengthen insolvency resolution and preserve **going concern value** of viable firms.

About IBC (Amendment) Act, 2026:

- Moves from **debt recovery** to **resolution & revival**, focusing on **business continuity (going concern)**.
- Introduces **Creditor-Initiated Insolvency Resolution Process (CIIRP)** enabling **out-of-court initiation**, reducing burden on **NCLT**.
- **CoC Empowerment:** Expands powers of **Committee of Creditors (CoC)** to **appoint/remove liquidator** and supervise liquidation.
- **Procedural Reforms:** Simplifies **claims admission** and standardises **valuation**, reducing delays in **CIRP**.

About IBC, 2016:

- Introduced a **time-bound insolvency framework** with **creditor-in-control model**.
- Established Corporate Insolvency Resolution Process **(CIRP)**, with **180 days (extendable to 330 days)** resolution timeline.
- Institutional framework includes **IBBI, IPs, IUs, and CoC**; adjudication by **NCLT/DRT**.

3.2. RBI Cancels Licence of Paytm Payments Bank

Context:
The Reserve Bank of India (RBI) has cancelled the banking licence of Paytm Payments Bank under the Banking Regulation Act, 1949 due to persistent non-compliance with regulatory conditions. The move highlights stricter enforcement in the payments banking sector.

Explanation:

- Payments Banks are a special category of banks introduced on the recommendation of the Nachiket Mor Committee to promote financial inclusion, especially in rural and underserved areas.
- They are licensed under Section 22 of the Banking Regulation Act, 1949 and regulated by the RBI.
- Their primary objective is to provide basic banking services such as deposits, remittances, and digital payments to low-income groups and small businesses.
- Payments Banks can accept demand deposits up to a specified limit (currently ₹2 lakh per customer).
- They cannot lend money or issue credit cards, as they are not allowed to undertake credit risk.
- They can offer services like ATM/debit cards, mobile payments, fund transfers, and remittance facilities.
- A key prudential requirement is that at least 75% of their deposit balances must be invested in safe government securities with short maturity.
- The remaining funds are maintained with scheduled commercial banks for liquidity and operational purposes.
- Payment Banks must maintain a Cash Reserve Ratio (CRR) with RBI and at least 75% of their demand deposit balances must be invested in SLR-eligible Government Securities or Treasury Bills to ensure safety.
- Eligible promoters include individuals, NBFCs, telecom companies, and other entities, subject to RBI guidelines.
- They are governed by multiple laws including the RBI Act, 1934, Banking Regulation Act, 1949, FEMA, 1999, and Payment and Settlement Systems Act, 2007.

3.3. ₹5,000 Crore Incentive Scheme for Mining Sector Reforms

Context:
The Ministry of Mines has launched a ₹5,000 crore incentive scheme under the Scheme for **Special Assistance to States for Capital Investment (SASCI) for FY 2026–27**. It aims to encourage States to accelerate mine auctions, improve governance, and boost mineral production.

Explanation:

- Mining in India is governed by the Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act), with States responsible for granting mineral concessions.
- The sector follows an auction-based allocation system for mineral blocks to ensure transparency and revenue maximization.
- The Scheme for Special Assistance to States for Capital Investment (SASCI) is a Central initiative that provides financial support to States for capital expenditure and structural reforms.
- The ₹5,000 crore incentive component specifically targets reforms in the mining sector to improve efficiency and output.
- A key focus is faster operationalisation of mines, reducing delays between auction and actual production.
- States are incentivised to integrate with a Unified Mining Portal, enabling digital monitoring, transparency, and real-time data sharing.
- Institutional mechanisms such as Pre-Auction Committees and State-level Coordination Committees are promoted to address land, regulatory, and administrative issues.
- Adoption of technology to prevent mineral grade misclassification ensures fair pricing and reduces revenue loss.
- Pre-embedded clearances (environmental and forest approvals before auction) help reduce project delays and improve investor confidence.
- States are encouraged to operationalise a minimum percentage of previously auctioned mines to ensure timely production.
- The scheme also uses the State Mining Readiness Index (SMRI) to rank and reward States based on performance and reforms.

3.4. IRDAI Directs Insurers to Eliminate Dark Patterns

Context:

The Insurance Regulatory and Development Authority of India (IRDAI) has asked insurers selling products on digital platforms to assess compliance with guidelines on dark patterns and submit corrective action plans for any violations.

CORE CONCEPTS:

- **Dark patterns** are deceptive UI (User Interface) and UX (User Experience) designs that manipulate users into unintended actions such as hidden costs, forced consent, or misleading choices.
- Consumer Protection Act, 2019 empowers authorities to prevent unfair trade practices in digital markets.
- Central Consumer Protection Authority (CCPA) issued guidelines (in 2023) to regulate dark patterns.
- Increasing digitisation of financial services raises risks of consumer exploitation.
- Regulators like IRDAI ensure transparency, fairness, and informed consent in insurance products.
- **IRDAI (Insurance Regulatory and Development Authority of India):** Statutory body established in 1999 under IRDA Act; headquartered in Hyderabad. It regulates and promotes the insurance sector and protects policyholders' interests.

3.5. Port of Refuge (PoR)

Context:

Adani Ports and Special Economic Zone Ltd. operationalised India's first **Port of Refuge (PoR)** to handle **maritime emergencies and distressed vessels**.

About Port of Refuge (PoR):

- Definition: As per International Maritime Organization, a PoR is a **designated place where ships in distress can seek shelter**.
- Purpose: Enables **stabilisation of vessels, protection of life, and prevention of marine pollution**.
- Services: Provides **salvage, firefighting, wreck removal, pollution control, and emergency coordination**.
- Locations: **Dighi Port (Maharashtra)** and **Gopalpur Port (Odisha)** covering major sea routes.

3.6. Bond Yields

Context:

India's **10-year government bond yield** rose to **6.94%** amid rising **inflation concerns** and expectations of **monetary tightening**.

About Bond Yields:

- **Definition:** Bond yield is the **return earned on a bond investment**, expressed as a percentage of its price.
- **Benchmark:** The **10-year Government Security (G-Sec) yield** acts as the **benchmark interest rate** in the economy.
- **Core relationship: Bond prices and yields are inversely related; interest rates and bond prices are also inversely related → Interest rates ↑ → Bond prices ↓ → Yields ↑ (and vice versa).**
- **Inflation link:** Higher **inflation expectations** lead investors to demand **higher yields** to preserve real returns.
- **Monetary policy:** Expectations of **repo rate hikes or tighter liquidity** push yields upward.
- **External factors:** Rising **crude oil prices** increase inflation, thereby raising yields.
- **Fiscal/currency factors:** Higher **government borrowing** and **rupee depreciation** can further increase yields.

3.7. Twin Inflation Threat: Oil Shock and El Niño

Context:

Rising geopolitical tensions in West Asia and the possibility of an El Niño event are creating dual inflationary pressures for India. The key concern is how oil price shocks and climate disruptions could push inflation beyond the RBI's comfort zone.

Key Points:

- **First factor – Oil prices:** Higher crude prices raise fuel, transport, and manufacturing costs, leading to cost-push inflation. Sustained high prices can widen current account deficit and weaken the rupee, further increasing imported inflation.
- **Second factor – El Niño:** El Niño is a climate phenomenon characterized by the periodic warming of sea surface temperatures in the central and eastern equatorial Pacific Ocean, occurring every 2–7 years. In India, it generally weakens the Southwest monsoon (June-September), leading to lower-than-normal rainfall, higher temperatures, increased drought risk, and reduced agricultural output. Weak monsoon reduces agricultural output, especially food grains, increasing food inflation. Severe El Niño can disrupt rural incomes and demand, amplifying economic stress.
- **Combined impact:** Even moderate El Niño with crude at $100/barrel may push inflation beyond RBI's 6% upper limit. Extreme scenarios (high oil + severe El Niño) could push inflation close to 8–9%.
- **Policy implications:** RBI may be forced to raise interest rates, affecting growth and borrowing costs. Government may need to cut fuel taxes or release buffer stocks to control prices.

Challenges:

- Limited control over global oil prices.
- Climate unpredictability complicates inflation forecasting.

WAY FORWARD:

- Diversify energy sources and accelerate renewable transition to reduce oil dependence.
- Strengthen agricultural resilience through irrigation and climate-adaptive practices.
- Maintain buffer stocks and improve supply chain efficiency.
- Use calibrated monetary policy to balance inflation and growth.
- Enhance data-driven forecasting for better policy response.

3.8. CERC's Market Coupling Plan for "One Grid, One Price" in Power Sector

Context:

The Central Electricity Regulatory Commission (CERC) has proposed draft regulations to implement market coupling in electricity trading, designating Grid India as the Market Coupling Operator to enable uniform price discovery across power exchanges.

Explanation:

- Electricity markets in India operate through power exchanges like IEX, PXIL, and HPX where prices are discovered based on demand and supply.
- Currently, each exchange determines its own price, leading to price differences for the same electricity across platforms. Example: If the same electricity is sold at ₹5/unit in IEX and ₹6/unit in PXIL at the same time, it creates inefficiency.
- Market coupling refers to a mechanism where bids from all exchanges are aggregated to determine a single uniform market-clearing price.
- The concept is governed under the Electricity Act, 2003 and regulated by CERC through Power Market Regulations.

- Grid Controller of India (Grid India) manages real-time grid operations and is proposed to act as the central Market Coupling Operator (MCO).
- The market-clearing price is determined at the equilibrium of aggregated demand and supply curves, improving efficiency and transparency.
- Power Purchase Agreements (PPAs) are long-term contracts (often 25 years), while exchanges handle short-term electricity trade.
- Market coupling aims to maximise economic surplus (sum of consumer and producer surplus) and optimise resource allocation.

3.9. Global Decline in Fossil Power & Rise of Clean Energy in India

Context:

According to the ***Global Electricity Review 2025*** released by **Ember (a global energy think tank)**, fossil fuel-based electricity generation declined globally in 2025, driven by India and China, while India recorded a sharp rise in clean energy generation.

Explanation:

- Electricity generation sources include fossil fuels (coal, oil, gas) and renewables (solar, wind, hydro, biomass); coal dominates India's power mix.
- Fossil fuels are major contributors to greenhouse gas emissions, particularly CO_2, driving climate change.
- Renewable energy is cleaner and sustainable; India targets 500 GW non-fossil fuel capacity by 2030 under its climate commitments (Panchamrit).
- India is the world's third-largest electricity producer and a major coal-dependent economy.
- Solar and wind energy are variable (intermittent), requiring grid management, storage, and balancing mechanisms.
- Hydropower acts as a flexible source supporting renewable integration.
- Global energy transitions are tracked through reports like Ember's Global Electricity Review.
- A decline in fossil-based generation indicates progress in decarbonisation but may be temporary due to factors like weather (monsoon, rainfall).
- India added significant renewable capacity (solar, wind), surpassing some developed countries in annual additions.
- Electricity demand is influenced by climate (heatwaves, monsoon), economic growth, and irrigation needs.
- Institutions like CEA (Central Electricity Authority) and agencies like IREDA support planning and financing of renewable energy in India.

3.10. GIFT City Grants First Family Office Permit

Context:

Gujarat International Finance Tec-City has issued its first license for a Family Investment Fund (FIF). The move aims to position GIFT City as a global hub for private wealth and family offices.

Explanation:

- GIFT City has allowed a private entity to set up a **family investment structure** within its regulatory framework.
- This marks a shift towards attracting global high-net-worth individuals (HNIs) and wealth management activities to India.
- The initiative supports India's ambition to compete with financial centres like Singapore and Dubai.
- A **Family Investment Fund (FIF)** or **Family Investment Company (FIC)** is a **private vehicle to manage and grow wealth of a single family**.
- It acts like a holding entity, investing in assets such as stocks, real estate, and businesses.
- It is typically structured as a company, trust, or LLP.
- Gujarat International Finance Tec-City (GIFT City) is a planned business district in the state of Gujarat, India, designed to serve as a global financial and information technology hub.
- Positioned between Ahmedabad and Gandhinagar, it aims to rival international financial centers by offering world-class infrastructure and regulatory frameworks.

3.11. India Approves Maritime Insurance Pool to Safeguard Trade

Context:

India has approved a **₹129.8 billion ($1.4 billion) guarantee-backed Maritime Insurance Pool** to provide insurance cover for shipping risks amid wars, sanctions, and geopolitical tensions. The move aims to ensure continuity of maritime trade and reduce dependence on foreign insurers/reinsurers.

Explanation:

- **Marine/Maritime Insurance** provides financial protection against losses involving **ships, cargo, ports, terminals, and sea transport.**
- It covers risks such as **collision, piracy, fire, sinking, cargo damage, war risks, and natural disasters.**
- A **Maritime Insurance Pool** is a group arrangement where multiple insurers jointly share large or risky liabilities. It is useful when private global insurers withdraw from high-risk regions.
- India's pool is backed by a **government guarantee**, improving confidence and claim-paying capacity. It will run for **10 years**, extendable by **5 more years.**
- This became necessary because global conflicts and sanctions have led many insurers/reinsurers to either **withdraw cover or sharply raise premiums.**
- **Reinsurance** means insurance for insurance companies. It helps insurers spread risk. India's major reinsurer is **GIC Re (General Insurance Corporation of India).**
- **Importance for India:**
- Nearly **95% of India's trade by volume** moves through sea routes.
- Critical imports like **crude oil, LNG, fertilizers, coal** depend on maritime transport.
- Insurance disruptions can increase freight cost and inflation.

3.12. ANMI Urges Faster Roll-out of Co-location in Commodity Markets

Context:

The Association of NSE Members of India (ANMI) has called for expedited implementation of co-location facilities in commodity markets and broader financial sector reforms. It has also urged regulatory coordination among the Ministry of Finance, SEBI, and RBI to enhance market efficiency and investor protection.

Commodity Markets in India: Regulation and Concerns:

- **Commodity markets** involve trading of **physical goods (like gold, crude oil, agricultural products)** and their derivatives (futures and options).
- In India, commodity derivatives are regulated by **SEBI (Securities and Exchange Board of India)** after the merger of FMC with SEBI in 2015.

What is co-location?

- Co-location means allowing traders (usually large brokers or firms) to place their computers **physically close to the stock exchange's servers.** This reduces delay (latency) in receiving market data and executing trades. *Example:* If two traders place the same order, the one whose system is closer to the exchange server executes faster—like standing nearer to a ticket counter.
- **Why is co-location important in commodity markets?**
  Commodity derivatives (like trading in gold, oil, wheat futures) are **less developed compared to stock (equity) markets.** Faster systems can attract more participants, improve liquidity, and make prices more efficient.

What reforms are being suggested?

- Faster rollout of co-location in commodity exchanges.
- Fixing optimal weekly expiry days for derivatives.
- Rationalising taxes like **Securities Transaction Tax (STT)** and **Commodity Transaction Tax (CTT).**
- Preventing misuse of **dormant demat accounts** (inactive investor accounts).
- **Why concern about dormant demat accounts?**
  These accounts can be misused for fraud or illegal trading if not properly monitored.

- **What is the broader issue?**
  Market participation is uneven:
  - Equity brokers ≈ 4,936
  - Commodity brokers ≈ 2,012
    This shows that **commodity markets are underdeveloped**.

Overall implication:

- The reforms aim to make commodity markets **more competitive, secure, and attractive**, leading to better price discovery and wider investor participation.

3.13. Assam & Meghalaya Refuse Costly Power from Subansiri Hydel Project

Context:

Assam and Meghalaya have **refused to purchase additional power** from the Subansiri Lower Hydroelectric Project. Similar concerns were earlier raised by Punjab, indicating a **broader issue of rising hydropower costs**.

What is the Subansiri Project?

- The Subansiri Lower Hydroelectric Project is a **2000 MW hydropower project** on the Subansiri River. It is one of India's **largest hydropower projects**.
- It is located on the **Arunachal Pradesh–Assam border** and is developed by **NHPC**.

Why are States Refusing Power?

- The project has faced **significant cost overruns** due to delays, environmental concerns, and local protests.
- The tariff has increased sharply from around **₹3/unit (initial estimate)** to about **₹7–8/unit**.
- States fear that purchasing costly power will **increase the financial burden on DISCOMs and consumers**.
- Assam and Meghalaya have also stated that they **already have sufficient power arrangements** for their needs.

Key Institutional Mechanism:

- The issue was discussed in the **North Eastern Regional Power Committee (NERPC)**.
- NERPC is a **regional coordination body under the Electricity Act, 2003**, responsible for planning and operation of power systems in the Northeast.

Why is this Significant?

- It reflects the **economic viability challenges of large hydropower projects**.
- It highlights the **tension between infrastructure development and cost affordability**.
- It may impact future investments in the hydropower sector.

Conclusion:

- The decision underscores that **high tariffs and cost overruns can undermine the acceptance of major infrastructure projects**, even when they enhance energy capacity.

3.14. PM-KUSUM (Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan)

Context:

The Centre is planning **PM-KUSUM 2.0** with addition of **battery energy storage** to address solar supply mismatch in agriculture.

About PM-KUSUM:

- Launched in **2019**; implemented by **Ministry of New and Renewable Energy (MNRE)**.
- **Objective:** Promote **solarisation of agriculture**, reduce **diesel dependence**, and enhance **farmers' income**.
- **Components:**
  - **Component A:** Decentralised solar power plants
  - **Component B:** Standalone solar pumps
  - **Component C:** Solarisation of grid-connected pumps
- **Agrivoltaics Target:** Promotes **co-location of solar panels with crops** with a target of ~**10 GW capacity** under Component A.
- **Key Issue: Solar supply–demand mismatch** (peak generation at midday vs demand in morning/evening).
- **PM-KUSUM 2.0 Proposal:** Introduction of **Battery Energy Storage Systems (BESS)** to store surplus solar energy and supply during demand hours.

3.15. ASUSE, 2025

Context:
The **MoSPI** released **Annual Survey of Unincorporated Sector Enterprises (ASUSE), 2025** highlighting trends in India's **informal (unincorporated) sector**.
About ASUSE:

- **Definition:** Covers **unincorporated non-agricultural enterprises** in the **informal sector**.
- **Annual survey** conducted by Ministry of Statistics and Programme Implementation **(MoSPI)** to track informal sector performance.
- **Enterprises:** Increased to **~7.92 crore (2025)** from **~7.34 crore (2023–24)**.
- **Employment:** Around **12.8 crore workers** with addition of **~74.5 lakh jobs**.
- **Productivity: GVA per worker (~₹1.56 lakh)** grew modestly (**~4.5%**).
- **Income trend: Earnings growth slowed (~3.9%)**, indicating weak job quality.
- **Significance:** Key input for **GDP estimation and MSME/informal sector policymaking**.

3.16. PNGRB Advances Bidding for LPG Pipeline Infrastructure

Context:
The Petroleum and Natural Gas Regulatory Board (PNGRB) is close to finalising bids for four major LPG pipeline projects aimed at strengthening gas infrastructure. The initiative aligns with the goal of reducing road transport of bulk LPG and improving efficiency and safety by 2030
Explanation:

- The **Petroleum and Natural Gas Regulatory Board (PNGRB)** is a **statutory body established under the PNGRB Act, 2006** to regulate refining, processing, storage, transportation, distribution, marketing, and sale of petroleum and natural gas.
- **LPG (Liquefied Petroleum Gas)** is a **mixture of propane and butane**, used primarily for **domestic cooking and industrial purposes**, and is a key component of India's energy mix.
- **Pipeline transportation** is considered safer and more efficient than road transport as it reduces **accident risks, transportation costs, and greenhouse gas emissions**.
- The move aligns with India's target to increase the share of **natural gas in the energy mix to ~15% by 2030** (from around 6-7% currently).
- The pipeline network expansion is part of the broader push towards a **gas-based economy**, including initiatives like:
  - **Pradhan Mantri Ujjwala Yojana (PMUY)** - LPG access to households
  - **City Gas Distribution (CGD) networks** - piped natural gas (PNG)

3.17. Regulation of Digital Lending Apps in India

Context:
A recent case of a student suicide in Kerala has been linked to harassment by loan recovery agents of digital lending apps. The incident has highlighted regulatory gaps and rising complaints related to predatory lending practices despite RBI guidelines.
Explanation:

- Digital lending apps provide instant small-ticket loans using mobile platforms, often targeting financially vulnerable users such as students and informal workers
- These apps typically access sensitive user data such as contacts, photos, and location, raising concerns about privacy and misuse
- Many apps are not directly regulated by the RBI as they operate through unregistered entities or partner with Non-Banking Financial Companies (NBFCs)
- RBI regulates banks and NBFCs under the RBI Act, 1934 and Banking Regulation Act, but app-layer intermediaries often escape direct oversight
- RBI issued Digital Lending Guidelines (2022) mandating transparency in interest rates, prohibition of automatic credit limits, and direct disbursal to borrower accounts

- Despite guidelines, predatory practices persist such as high interest rates, hidden charges, and coercive recovery methods including harassment and reputational threats
- Cybersecurity and data protection concerns arise as data is often stored on foreign servers, beyond Indian jurisdiction
- Legal provisions applicable include Information Technology Act, 2000 (data misuse), IPC provisions on extortion and harassment, and Consumer Protection Act, 2019

3.18. RBI Draft Norms for NBFC Upper Layer Classification

Context:

Reserve Bank of India (RBI) has issued draft guidelines to revise the methodology for identifying NBFC-Upper Layer (NBFC-UL) entities and invited public comments. The proposal aims to simplify classification using asset-size criteria and may include government-owned NBFCs under stricter regulatory oversight.

Explanation:

- **Non-Banking Financial Companies (NBFCs)** are financial institutions registered under the Companies Act, 1956/2013, providing banking-like services - loans, investments, and leasing - without holding a full banking license.
- Regulated by the RBI, they focus on niche markets, infrastructure financing, and microfinance, filling credit gaps where traditional banks may not reach.
- NBFCs play a major role in credit delivery, especially to MSMEs, infrastructure, and informal sectors, making them systemically important.
- **RBI introduced the Scale-Based Regulation (SBR) framework in 2021**, classifying NBFCs into **Base Layer (NBFC-BL), Middle Layer (NBFC-ML), Upper Layer (NBFC-UL), and Top Layer (NBFC-TL) based on size, activity, and perceived riskiness.**
- NBFC-UL includes large entities with higher systemic risk and is subjected to bank-like regulations such as stricter capital norms and governance requirements.
- The objective is to ensure financial stability, reduce systemic risk, and strengthen oversight of large shadow banking institutions.

4. Science and Technology

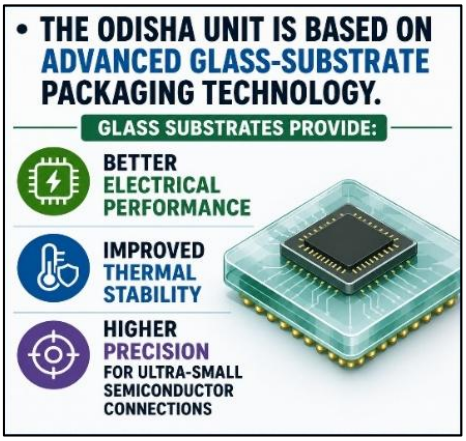
4.1. Odisha Launches India's First 3D Chip Packaging Plant

Context:

Odisha has initiated India's first advanced 3D semiconductor chip packaging facility in Bhubaneswar under the India Semiconductor Mission. The project introduces advanced glass-substrate semiconductor packaging technology and is expected to strengthen India's semiconductor manufacturing ecosystem, especially in AI, defence, 5G, aerospace, and data centres.

Explanation:

- Semiconductor chips are the "brains" of modern electronic devices such as smartphones, computers, satellites, electric vehicles, and AI systems.
- Traditional chips are mostly built in a flat, horizontal structure called 2D architecture. In contrast, 3D semiconductor chips stack multiple chip layers vertically to improve efficiency and performance.
- In 3D chips, different semiconductor layers are connected using microscopic vertical pathways called Through-Silicon Vias (TSVs) or hybrid bonding technology.
- Because the layers are stacked closely together, electrical signals travel shorter distances, resulting in:
  - Faster processing speed
  - Lower latency
  - Better energy efficiency



- 3D semiconductor technology can reduce power consumption by nearly 40–50%, making it highly useful for AI servers, smartphones, defence electronics, and high-performance computing.
- The technology also reduces the physical size of chips, allowing compact yet powerful devices.
- One major challenge of 3D chips is heat management. Since many layers are packed tightly together, heat density increases, making cooling more difficult.

FEATURE	TRADITIONAL 2D CHIPS	3D SEMICONDUCTOR CHIPS
DIE LAYOUT	FLAT (HORIZONTAL)	STACKED (VERTICAL)
INTERCONNECTS	LONG, HORIZONTAL WIRING	SHORT, VERTICAL TSVs/HYBRID BONDING
PERFORMANCE	LOWER DUE TO DISTANCE	HIGH (FASTER, LOWER LATENCY)
POWER CONSUMPTION	HIGHER	LOWER (APPROX. 40-50% REDUCTION)
FOOTPRINT	LARGER	SMALLER (BETTER FOR MOBILE/AI)
THERMAL ISSUES	MANAGEABLE	CHALLENGING (HIGHER HEAT DENSITY)

- The plant will manufacture advanced heterogeneous integration modules. Heterogeneous integration means combining different types of chips (memory, processor, sensors, AI accelerators) into a single package for better efficiency.
- The facility has an estimated investment of about ₹1,943 crore and an annual production capacity of nearly 50 million packaged semiconductor units.
- Odisha has become the first Indian state to host both:
  - A compound semiconductor fabrication unit
  - An advanced 3D chip packaging unit
- The project supports the broader objectives of:
  - Atmanirbhar Bharat
  - India Semiconductor Mission
  - Reducing dependence on imported semiconductor technologies

4.2. INS Aridaman

Context:

India's induction of INS Aridaman, its third nuclear-powered ballistic missile submarine (SSBN), marks a major step in strengthening its nuclear deterrence and completing the operationalization of a credible nuclear triad.

What is a Submarine?

A submarine is a naval vessel capable of operating underwater for long durations.

It is used for:

- Stealth Operations
- Surveillance
- Warfare (Conventional & Nuclear)

Types of Submarines Based on Purpose

Attack Submarines (SSN / Diesel)

- Target enemy ships & submarines

Ballistic Missile Submarines (SSBN)

- Carry nuclear missiles (Strategic Role)

Types of Submarines Based on Propulsion

Diesel-Electric Submarines

- Need to Surface Frequently
- Limited Endurance

Nuclear-Powered Submarines

- Use Nuclear Reactor
- Stay Underwater for Months
- Greater Speed & Endurance

What is Nuclear Triad?

Ability to Launch Nuclear Weapons from:

- **Land** (ICBMs)
- **Air** (Fighter Jets / Bombers)
- **Sea** (Submarines)

Why Countries Need Nuclear Triad?

- Ensures Credible Deterrence
- Guarantees Second-Strike Capability
- Prevents Enemy from Neutralising All Nuclear Forces in One Attack

7. India's Nuclear Triad

- Land: Agni Series Missiles
- Air: Rafale, Su-30 MKI (Nuclear-Capable)
- Sea: Arihant-Class Submarines

8. Countries with Nuclear Triad

- USA
- Russia
- China
- France
- India

☞ India follows "No First Use" policy, so second-strike capability is critical.

9. India's Submarine Fleet (Overview)

Nuclear Submarines

- INS Arihant (SSBN)
- INS Arighaat (SSBN)
- INS Aridhaman (SSBN)
- Chakra (Leased SSN from Russia - Earlier)

Conventional Submarines

- Kalvari-Class (Scorpene)
- Shishumar-Class
- Kilo-Class (Sindhughosh)

CORE ANALYSIS:

- Development: Induction of INS Aridaman increases India's SSBN **(Ship Submersible Ballistic Nuclear)** fleet to three, enabling continuous at-sea deterrence. Its improved reactor, larger displacement (~7000 tonnes), and more launch tubes enhance strike capability.

Strategic significance:

- Strengthens nuclear triad, reducing vulnerability of land and air-based assets.
- Enhances deterrence credibility against nuclear adversaries like China and Pakistan.

Technological progress:

- Indigenous development involving DRDO and Indian shipyards reflects progress in nuclear propulsion, missile integration, and stealth capabilities.
- Ability to deploy longer-range K-4 SLBMs expands operational reach.

Challenges:

- Limited number of SSBNs compared to major powers like the US and China.
- High cost and technological complexity of nuclear submarines.
- Need for secure communication and command systems for underwater assets.

Policy and future plans:

- Expansion of SSBN fleet and parallel development of SSN (attack submarines).
- Leasing of nuclear submarines (e.g., from Russia) to bridge capability gaps.
- Strengthening naval infrastructure and maritime surveillance.

4.3. Hidden Burden of Liver Disease in Type 2 Diabetes

Context:

Recent studies highlight that a significant proportion of people with type 2 diabetes develop fatty liver disease, often without noticeable symptoms. Many cases remain undiagnosed until advanced stages, raising concerns about silent progression to severe liver damage.

Explanation:

- Diabetes is a long-term condition in which the body has high levels of sugar in the blood due to problems in how insulin works or is produced.
- The main types include Type 1 diabetes, Type 2 diabetes, and diabetes during pregnancy. Among these, Type 2 diabetes is the most common and is often linked with lifestyle factors such as poor diet, lack of exercise, and obesity.
- In Type 2 diabetes, the body does not use insulin properly, which leads to increased fat buildup in different organs, including the liver.
- This fat accumulation in the liver is called NAFL (Non-Alcoholic Fatty Liver), which occurs without alcohol consumption and is considered the early stage of liver disease.
- NAFL may not show any symptoms in the beginning, which makes it difficult to detect at an early stage.
- Over time, if not managed, this condition can worsen and damage the liver permanently.
- Common risk factors include obesity, unhealthy eating habits, lack of physical activity, and high blood sugar levels over a long period.
- Doctors usually identify the condition through basic blood tests and imaging methods.
- The early stage of NAFL can often be reversed by simple lifestyle changes such as weight loss, a balanced diet, and regular exercise.
- However, if the condition progresses, the damage may become permanent and lead to serious health complications.
- Managing diabetes effectively plays a key role in preventing or controlling NAFL.
- The issue highlights the growing link between lifestyle diseases and organ damage, emphasizing the importance of early detection and preventive healthcare.

4.4. Gaganyaan Progress: Air Drop Test & Mission MITRA

Context:

Indian Space Research Organisation has conducted key validation exercises, including the Integrated Air Drop Test and Mission MITRA, marking significant progress in India's first human spaceflight programme. These efforts underline India's focus on both technological reliability and astronaut preparedness.

Background:

- Gaganyaan Mission aims to send Indian astronauts (Gagannauts) into Low Earth Orbit at an altitude of about 400 km for a short-duration mission.
- The mission will use the LVM3, capable of carrying the crew module safely into space.
- The Crew Module is a pressurized capsule designed to ensure life support, safety, and controlled re-entry into Earth's atmosphere.
- The Integrated Air Drop Test (IADT) is conducted to validate parachute-based recovery systems under simulated conditions.
- Mission MITRA is an Earth-based simulation to study human endurance and performance under space-like conditions.

Technological Validation (Air Drop Test):

- The Integrated Air Drop Test evaluates the effectiveness of the parachute deployment sequence, ensuring safe deceleration and splashdown of the crew module.
- Sequential deployment of pilot, drogue, and main parachutes reduces velocity in stages, minimizing risk during landing.
- The successful IADT-02 indicates improved reliability of recovery systems, which are critical for astronaut safety during re-entry.

Human Factors & Preparedness (Mission MITRA):

- Mission MITRA simulates extreme conditions such as hypoxia, isolation, and low temperatures in high-altitude regions like Ladakh.
- It studies physiological responses, psychological resilience, and operational efficiency of astronauts under stress.
- The findings help enhance crew endurance, teamwork, and decision-making capabilities during space missions.

Implications:

- These developments strengthen India's capability to independently conduct human spaceflight missions.
- Successful execution would place India among leading spacefaring nations with human spaceflight capability.
- It enhances technological self-reliance and boosts India's standing in global space research and exploration.

Challenges / Issues:

- Ensuring absolute reliability of life-support and recovery systems remains a critical challenge due to high-risk human involvement.
- Human spaceflight missions require extensive testing, leading to high costs and longer timelines.
- Managing psychological stress and long-duration human endurance in space remains complex.

Opportunities:

- The mission can stimulate advancements in space medicine, materials science, and aerospace engineering.
- It opens avenues for international collaboration in human space exploration.
- It supports future ambitions such as space stations and deep-space missions.

Government / Global Measures:

- India is investing in indigenous space technologies under ISRO to reduce dependency on foreign systems.
- Global precedents from countries like United States, Russia, and China provide benchmarks in human spaceflight capabilities.

Way Forward:

- Continued iterative testing of safety systems is essential before crewed missions.
- Strengthening astronaut training programs using analog missions like MITRA will improve mission success rates.
- Advancements in life-support systems and re-entry technologies should be prioritized.
- Expanding public-private partnerships can accelerate innovation and reduce mission costs.

Additional Dimensions:

Space Medicine:

- Studies focus on human adaptation to microgravity, radiation exposure, and isolation.
- Insights from Mission MITRA contribute to developing countermeasures for health risks in space.
- It is critical for long-duration missions such as space stations and interplanetary travel.

Re-entry and Recovery Systems:

- Safe re-entry requires precise thermal protection and deceleration mechanisms.
- Parachute systems remain a key component for controlled landing in crewed missions.
- Continuous testing ensures reliability under varying atmospheric conditions.

Conclusion:

India's progress in Gaganyaan through technological tests and human-centric studies reflects a balanced and strategic approach to human spaceflight. It strengthens the foundation for safe, reliable, and self-reliant space exploration.

4.5. Light-driven Enzyme Reactions in Microbes

Context:
Researchers have demonstrated that visible light can activate enzymes in microbes, speeding up biochemical reactions and enabling efficient production of useful chemicals and drugs through photobiocatalysis.

Explanation:

- Enzymes are biological catalysts present in living organisms that speed up chemical reactions without being consumed in the process.
- Traditionally, enzyme activity depends on natural conditions, but scientists have discovered that light can also be used to control and accelerate these reactions.
- This leads to photobiocatalysis, a technique in which light energy is used to activate enzymes and drive specific chemical reactions.
- The idea is inspired by photosynthesis, where plants use sunlight (400–700 nm range) to convert carbon dioxide into glucose, showing how light can power biochemical processes.
- Scientists apply similar principles artificially by using microbial biotechnology, where microbes like bacteria and yeast act as tiny factories to produce useful substances.
- Among these, E. coli is widely used because it grows quickly, is easy to modify genetically, and can produce a wide range of chemicals and proteins.
- Through gene transfer techniques, scientists insert specific genes into microbes, enabling them to produce desired compounds such as medicines or industrial materials.
- As a result, this approach enables the light-driven production of pharmaceuticals (including anti-cancer drugs), polymers, and other industrial chemicals, making manufacturing more efficient and sustainable.

4.6. Extracellular RNA (exRNA)

Context:
A recent study reports that **extracellular RNA (exRNA)** from bacteria can persist in **disinfected drinking water**, aiding analysis of microbial activity.

About Extracellular RNA (exRNA):

- **Definition:** RNA present **outside cells**, found in body fluids like **blood, saliva, urine, and cerebrospinal fluid**.
- **Transport Mechanism:** Carried in **extracellular vesicles (exosomes)** or bound to **proteins/lipoproteins**, which protect it from degradation.
- **Key Feature:** Exhibits **relative stability outside cells** due to protective packaging.
- **Function:** Acts as an **intercellular communication molecule**, influencing **gene expression and cell behaviour**.
- **Medical Significance:** Serves as a **non-invasive biomarker** (basis of **liquid biopsy**) for diseases like **cancer and cardiovascular disorders**.
- **Scientific Insight:** Demonstrates that cells can **actively export RNA**, challenging the earlier view of RNA as purely intracellular.
- Helps track **bacterial activity in water systems**, though its role in gene transfer remains **under investigation**.

4.7. Hubble Tension and Measurement of Universe Expansion

Context:
Astronomers continue to face disagreement over the rate at which the universe is expanding, known as the Hubble tension. Recent observations have refined local measurements but the mismatch with early-universe estimates persists, raising questions about possible new physics.

Explanation:

- **Hubble constant** (H_0) measures the rate of expansion of the universe, expressed in km/s per megaparsec.
- The concept originates from Edwin Hubble's discovery that galaxies are moving away, indicating an expanding universe.
- Two primary methods are used to measure expansion: the cosmic distance ladder (local universe) and cosmic microwave background (early universe).
- Local measurements estimate expansion rate at around 73 km/s/Mpc.

- Cosmic microwave background (CMB) is relic radiation from the Big Bang, studied using satellites like Planck.
- CMB-based calculations predict a lower expansion rate of about 67 km/s/Mpc.
- **The difference between these two values is called the Hubble tension.**
- The discrepancy suggests either measurement errors or gaps in the standard model of cosmology.
- **Dark energy, an unknown force believed to be driving this accelerated expansion, is central to this debate.**

4.8. Bemnifosbuvir

In News:
Scientists in Germany have identified a drug, bemnifosbuvir (currently under trial for hepatitis C), that can block replication of the hepatitis E virus. If trials succeed, it may become the first effective treatment for hepatitis E infections.
Explanation:
- Bemnifosbuvir is an antiviral drug originally developed for the treatment of hepatitis C virus (HCV) infection.
- It belongs to the class of nucleotide analogues, which mimic natural building blocks of viral genetic material.
- By disrupting the virus's genetic machinery, it prevents the virus from multiplying inside host cells.
- Recent studies show that it can also block replication of the Hepatitis E virus (HEV), indicating potential for repurposing.
- It has demonstrated strong efficacy in animal studies without damaging healthy cells, suggesting a favorable safety profile.
- The concept of drug repurposing (using existing drugs for new diseases) helps reduce time and cost in drug development.
- If clinical trials are successful, it could become the first specific antiviral treatment for Hepatitis E, which currently lacks targeted therapy.

4.9. High Antimicrobial Resistance in Eye Infection Pathogens

Context:
Researchers from CSIR-CCMB have reported high levels of **Anti-Microbial Resistance (AMR)** in bacteria causing eye infections in India, with over 45% samples showing multidrug resistance.
Explanation:
- **Anti-Microbial Resistance (AMR)** occurs when microbes evolve to resist the effects of drugs, making infections harder to treat.
- Multidrug resistance (MDR) refers to resistance to multiple antibiotics, while XDR indicates resistance to most available drugs.
- Empirical therapy involves starting treatment before identifying the exact pathogen, often contributing to AMR.
- Whole-genome sequencing helps identify resistance genes and mutations in pathogens.
- AMR is a major global health threat, recognized by WHO, affecting treatment outcomes and increasing mortality.

4.10. Double Burden of Malnutrition

Context:
Recent analysis highlights that India's nutrition system, historically focused on **undernutrition**, must now address rising **overweight and obesity**.
About Double Burden of Malnutrition:
- Definition: Refers to the coexistence of **undernutrition and overnutrition (obesity)** within the same population.
- Trend: Childhood overweight increased by **over 120%** in the last 15 years.
- Causes: Increased consumption of **ultra-processed, calorie-dense foods** and **sedentary lifestyles**.
- Income pattern: Poor face **undernutrition (low diet diversity)**, while middle-income groups shift to **processed foods → obesity**.
- Health impact: Obesity is a major driver of **Non-Communicable Diseases (NCDs)** such as **diabetes, hypertension, cardiovascular diseases**.

Key Terms:
- Wasting: **Low weight-for-height**, indicating **acute undernutrition**.
- Stunting: **Low height-for-age**, indicating **chronic undernutrition**.
- Overweight: **Excess weight-for-height**, reflecting **excess calorie intake**.

4.11. S-400 Air Defence System

Context:
India is expediting delivery of remaining **S-400 systems from Russia**, strengthening its **air defence capability**.
About S-400:

- **Type:** **Long-range Surface-to-Air Missile (SAM) system** developed by **Russia (Almaz-Antey)**; NATO name **SA-21 Growler**. **Indian name 'Sudarshan Chakra'**.
- **Capability:** Provides **layered air defence** using multiple missile types (**40–400 km range**).
- **Targets:** Can intercept **aircraft, drones, cruise missiles, and ballistic missiles**.
- **Radar & tracking:** Can detect targets up to **~600 km** and track **~300 targets simultaneously**.
- **Speed:** Interceptor missiles can reach up to **Mach 14**.
- **S-500:** Next-generation Russian system with **~500–600 km range**, capable of **intercepting hypersonic missiles and low-earth orbit satellites**.

4.12. Antiproton Transport Experiment

Context:
Scientists at **CERN** successfully conducted a **road transport of antiprotons**, demonstrating safe movement of antimatter outside laboratory conditions.
About Antiproton Transport:

- **Antimatter concept:** Every particle has an **antiparticle with same mass and opposite charge** (e.g., **proton–antiproton**).
- **Nature: Matter - antimatter interaction** leads to **annihilation** releasing large energy.
- **Experiment:** About **100 antiprotons** were transported via a **specially designed truck** in Geneva.
- **Storage:** Maintained in a **vacuum chamber** at **~–269°C** using **superconducting magnetic fields**.
- **Challenge:** Preventing contact with matter is critical to **avoid annihilation**.
- **Significance:** Enables **transfer of antimatter** for experiments beyond CERN.
- **Application:** Helps study **fundamental physics** including matter–antimatter asymmetry.

5. Environment

5.1. India Withdraws Bid to Host COP33 (2028)

Context:

India has withdrawn its bid to host the 33rd Conference of Parties (COP33) in 2028 under the UNFCCC. The decision follows a review of India's climate commitments despite earlier interest at COP28 (Dubai, 2023).

The move comes even after international support and internal preparations for hosting the summit.

Background:



- Conference of Parties (COP) is the supreme decision-making body of the UNFCCC where countries negotiate climate policies annually.
- UNFCCC (1992) is a global treaty aimed at stabilizing greenhouse gas concentrations to prevent dangerous climate change (HQ: Bonn, Germany).
- COP hosting follows a rotation system among UN regional groups; India belongs to the Asia-Pacific group.
- The Paris Agreement (2015) is a legally binding framework under UNFCCC to limit global warming to well below 2°C above pre-industrial levels.
- Nationally Determined Contributions (NDCs) are country-specific targets for reducing emissions and adapting to climate change.
- COP30,2025 was held in Brazil, COP31 will be hosted jointly by Türkiye and Australia, and COP32 is scheduled in Ethiopia.

Explanation:

- The reason cited for withdrawal is a "review of its commitments for 2028," indicating reassessment of priorities and obligations.
- With India's exit, South Korea has emerged as a key contender for hosting COP33.
- India has hosted COP only once earlier in 2002 (COP8), which was a relatively low-profile event.
- India recently updated its NDCs, committing to achieve 60% electricity capacity from non-fossil sources by 2035.
- It also aims to reduce emissions intensity of GDP by 47% and enhance carbon sink capacity by 3.5–4 billion tonnes of CO_2 equivalent.

5.2. EU Expands Scope of Carbon Border Adjustment Mechanism (CBAM)

Context:

The European Union plans to include 180 additional products under its Carbon Border Adjustment Mechanism from 2028, which may raise carbon-related costs on exports from countries like India.

Carbon Border Adjustment Mechanism (CBAM):

- CBAM is a policy of the European Union that puts a carbon cost on imports (like steel, cement, aluminium) based on how much carbon was emitted during their production, to prevent "carbon leakage" and protect its climate goals.
- **Example:** If Indian steel is produced using coal-intensive methods, the EU may impose an additional carbon charge on that steel when it is exported to Europe, making it costlier.
- Carbon leakage occurs when industries shift production to countries with lax emission norms to avoid strict regulations.
- **CBAM initially covers sectors like** steel, cement, aluminium, fertilisers, electricity, and hydrogen.
- It aligns with the EU Emissions Trading System (ETS), where domestic industries pay for carbon emissions.
- **The CBAM transition phase runs from 2023 to 2025,** with full implementation expected from 2026 onwards.
- **Expansion to more products is proposed by the European** Commission and supported by the European Parliament committees.
- **CBAM may act like a carbon tax** on imports, affecting export competitiveness of developing countries.
- **India's exports, especially in energy-intensive sectors,** may face higher compliance costs and reporting requirements.

5.3. Blending Non-Petroleum Fuels with Aviation Turbine Fuel (ATF)

Context:

The Petroleum Ministry has amended norms to allow blending of Aviation Turbine Fuel (ATF) with synthesised hydrocarbons from non-petroleum sources, promoting Sustainable Aviation Fuel (SAF) and reducing dependence on crude oil.

- Aviation Turbine Fuel (ATF) is the primary fuel used in aircraft, consisting of refined petroleum hydrocarbons meeting IS 1571 standards.
- The new norms allow blending with synthetic hydrocarbons (IS 17081) derived from non-petroleum sources like biomass, natural gas, or waste.
- Example: Fuel made from agricultural waste or used cooking oil can now be blended with conventional jet fuel.
- This aligns with the concept of Sustainable Aviation Fuel (SAF), which reduces lifecycle carbon emissions compared to fossil fuels.
- SAF is considered a drop-in fuel, meaning it can be used in existing aircraft engines without major modifications.
- Blending helps reduce carbon emissions from aviation, a hard-to-decarbonise sector.
- It also enhances energy security by diversifying fuel sources beyond crude oil imports.
- The move gains importance amid global oil supply disruptions and geopolitical tensions affecting fuel prices.
- Feedstocks for synthetic fuels include biomass, municipal waste, and natural gas, processed through chemical conversion technologies.
- Globally, aviation bodies like ICAO promote SAF under mechanisms such as CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation).
- India's push for SAF aligns with climate commitments and long-term goals of net-zero emissions by 2070.

5.4. Green Biofuel from Sugarcane Waste: CSIR-IICT Innovation

Context:

Scientists at CSIR-IICT have developed a greener method to convert sugarcane bagasse into high-quality bio-oil. The approach uses Hydrothermal Liquefaction (HTL) with Deep Eutectic Solvents (DES), improving efficiency and sustainability.

EXPLANATION:

- **Bagasse:** fibrous residue left after extracting juice from sugarcane (agro-waste rich in cellulose, hemicellulose, lignin). India generates ~90–100 million tonnes annually.
- **Current use:** mostly burnt in sugar mills for heat/electricity (low-value, emission-intensive).
- **Problem:** underutilisation; limited conversion into high-value fuels/chemicals.
- **Change:** converts bagasse into **liquid biofuel (bio-oil)** with higher energy value, cleaner fuel, better economic returns.

HYDROTHERMAL LIQUEFACTION (HTL):

- Converts **wet biomass (like bagasse with moisture)** into crude-like bio-oil using high temperature & pressure in water.
- **"No drying needed"** = **no need to remove moisture from biomass before processing**, saving energy.
- Outputs: bio-oil + gas + char + aqueous phase.

DEEP EUTECTIC SOLVENTS (DES):

- Green solvents made by mixing natural compounds → act as **eco-friendly catalysts/solvents**.
- Non-toxic, biodegradable, low-cost.

HOW HTL + DES WERE USED SMARTLY:

- DES used **inside HTL as both catalyst + solvent**.
- Improves breakdown of biomass → higher yield (~52.8%).
- Enhances fuel quality (higher heating value, better composition).
- **Reduces energy use and environmental impact simultaneously.**

5.5. Sundarbans Carbon Cycle Under Threat: Microplastics Disrupt Blue Carbon

Context:

A study by Indian Institute of Science Education and Research finds that microplastics are altering the carbon dynamics of the Sundarbans. The findings highlight risks to one of the world's largest mangrove-based "blue carbon" ecosystems.

- Blue carbon is organic carbon captured and stored by coastal and marine ecosystems - specifically mangroves, salt marshes, and seagrass meadows.
- The Sundarbans is the world's largest contiguous mangrove forest and a major carbon sink (absorbs more carbon from the atmosphere than it releases).
- Large rivers like the Ganga and Brahmaputra bring plastic waste into this delta.
- These plastics break down into microplastics (tiny particles).
- Plastics are rich in carbon (~90%), so when they break down, part of this carbon leaks into water (called ***Dissolved Organic Carbon*** (DOC))
- This DOC becomes an easily available food source for bacteria and microbes, unlike natural carbon which is often locked in complex plant material.
- As microbes consume this DOC, they grow rapidly and respire more, releasing CO_2 back into the water and atmosphere.
- This process increases microbial respiration, which converts stored carbon into atmospheric carbon, weakening the function of Sunderbans as carbon sinks.
- Thus, instead of storing carbon, the system begins to recycle and release more CO_2, disturbing the natural carbon balance.
- **Biogenic carbon** refers to carbon produced by living organisms such as microbes, algae, and plants.

In this case, microbes feeding on plastic-derived DOC grow rapidly and generate more Biogen carbon (biologically produced carbon compounds)

5.6. India's Forest Carbon Storage May Nearly Double by 2100

CONTEXT:

A study published in Environmental Research: Climate estimates that India's forests could store almost twice the current carbon by the end of the century. The projections are based on climate-driven changes such as rising CO_2 levels and rainfall patterns

EXPLANATION:

- India's forests currently act as major carbon sinks by absorbing atmospheric CO_2 through photosynthesis and storing it as biomass in trees and soil.
- Official estimates by Forest Survey of India provide baseline carbon stock data used for planning and reporting.
- The study projects that vegetation carbon could increase by 35% under low emissions and up to 97% under high emissions by 2100.
- This increase is driven by higher rainfall, which improves soil moisture, and rising atmospheric CO_2 levels.
- Higher CO_2 enhances plant growth through the **CO_2 fertilisation effect**, where plants photosynthesise more efficiently, use water more effectively, and accumulate greater biomass over time.
- The study changes the conventional view by showing that forest carbon storage is not static but dynamically influenced by climate variables.

REGIONAL PATTERN:

- Desert and semi-arid regions such as Rajasthan, Gujarat, and parts of Madhya Pradesh are expected to witness the highest relative increase in vegetation carbon.
- The Trans-Himalayan region, Gangetic plains, and Deccan Plateau are likely to experience moderate gains.
- The Western Ghats and Himalayan forests are projected to see relatively smaller increases due to ecological saturation and climatic constraints.

LIMITATIONS (OF STUDY/MODELS):

- Models may not fully capture deforestation, fires, pests, and land-use change.
- Forest response is slow and often delayed by 2–4 years.

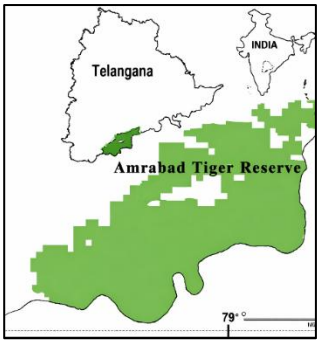
Extreme events may destabilise forests and release stored carbon.

5.7. Chenchu Tribe Protests Relocation from Amrabad Tiger Reserve

Context:

Members of the **Chenchu tribe** have opposed the proposed relocation from villages inside the **Amrabad Tiger Reserve** in Telangana, alleging pressure from forest authorities. They argue that relocation would disrupt their traditional forest-based livelihood, culture, and habitation rights.

Explanation:

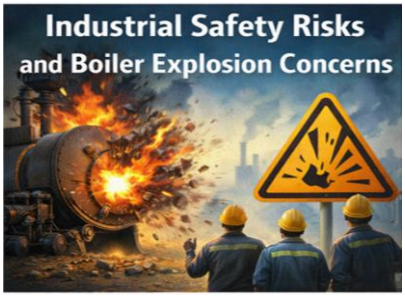


- **Chenchus** are a **Particularly Vulnerable Tribal Group (PVTG)** mainly found in **Telangana, Andhra Pradesh, and parts of Odisha/Karnataka**.
- They are traditionally hunter-gatherers and foragers, closely dependent on forests for food, honey, roots, fruits, medicinal plants, and minor forest produce.
- Chenchus often practice seasonal movement and establish temporary settlements, reflecting a **semi-nomadic forest lifestyle**.
- Their major habitat lies in the **Nallamala Hills**, spread across the **Eastern Ghats**.
- Chenchu tribals have been asked to relocate from the core areas of the Amrabad Tiger Reserve in Telangana (formerly part of the Nagarjunasagar-Srisailam Tiger Reserve).
- Forest officials have cited the increasing tiger population in the reserve as a reason for the relocation to minimize human-wildlife conflict and maintain an "inviolate" space for tigers.
- **Amrabad Tiger Reserve is** one of India's largest tiger habitats and is known for **tigers, leopards, sloth bears, deer, wild dogs, and rich biodiversity**.
- **Tiger Reserves** in India are governed under **Project Tiger (1973)**, now implemented through the **National Tiger Conservation Authority (NTCA)** under the **Wild Life (Protection) Act, 1972**.
- Relocation from core tiger habitats is allowed only on a **voluntary basis** and with informed consent, rehabilitation package, and livelihood safeguards. **Forced relocation is not legally justified.**
- **Forest Rights Act, 2006 (FRA)** recognizes rights of forest-dwelling Scheduled Tribes over:
  - **Habitation and cultivation land**
  - **Minor Forest Produce**
  - **Community forest resources**
  - Traditional cultural rights
- **Gram Sabha** consent is important in matters affecting forest communities.
- **Major issue in such conflicts:** balancing **wildlife conservation** with **tribal rights and livelihood security**

5.8. Industrial Safety Risks and Boiler Explosion Concerns

Context:

Recent industrial accidents such as boiler explosions have highlighted systemic safety failures in India, driven by inadequate regulation, poor enforcement, and neglect of risks accumulating over time.



- **A boiler is a closed vessel** in which water is heated to produce steam or hot water under pressure, **used for energy and industrial processes. Example:** In thermal power plants, boilers generate steam to run turbines and produce electricity.
- **Applications of Boilers:** Boilers are widely used in power generation, manufacturing industries (textiles, chemicals, steel), food processing, and heating systems.
- Boiler explosions occur due to excessive pressure, poor maintenance, scaling, or mismanagement of water levels leading to structural failure.
- Industrial safety is governed by laws **such as the Factories Act, 1948 and Occupational Safety, Health and Working Conditions (OSH) Code, 2020**.
- Boiler inspection systems are regulated at national and state levels, but certification is often periodic and not continuous.
- Ease of Doing Business reforms have promoted self-certification and reduced inspections, impacting regulatory oversight.
- Third-party audits are used instead of government inspections but may lack strict accountability.
- **Industrial accidents like Visakhapatnam gas leak (2020) and Neyveli blast (2020)** highlight recurring safety lapses.
- **Contract labour system** increases vulnerability due to lack of training, accountability, and safety awareness.
- **Migrant workers often face** language barriers, leading to poor understanding of safety protocols and chemical hazards

5.9. Chimpanzees

Context:

Scientists say 200 wild chimpanzees in Uganda have been locked in a violent 'civil war' for eight years.

Explanation:



- Chimpanzee is one of the closest living relatives of humans and is **native to the forests and savannahs of tropical Africa.**
- They share a common ancestor with humans that lived about 7–8 million years ago.
- There are four recognized subspecies: Central, Western, Nigeria-Cameroon, and Eastern chimpanzees.
- Chimpanzees are classified as **Endangered** on the IUCN Red List, while the **Western chimpanzee is Critically Endangered** due to habitat loss and hunting.
- They have an omnivorous diet, feeding on fruits, leaves, nuts, insects, and occasionally small animals.
- In harsh environments, they adapt by using caves for shelter and consuming alternative food sources like mangrove leaves.
- Chimpanzees are highly intelligent and are known for using tools, such as sticks to extract termites and stones to crack nuts.

They live in complex social groups, show emotions like empathy, practice grooming for bonding, and even exhibit cultural behaviors that vary across regions.

5.10. Ritual Practices and River Pollution: Legal and Ecological Concerns

Context:

Recent concerns have emerged over large-scale ritual offerings and immersions in rivers like the Narmada, which significantly increase pollution levels. The issue raises questions about balancing religious practices with environmental protection and legal enforcement.

- Ritual offerings and idol immersions introduce organic matter, chemicals, and synthetic materials into rivers, increasing pollution load.
- Central Pollution Control Board (CPCB) monitors river water quality across India and reports high pollution levels in several stretches.
- CPCB data shows many river stretches exceeding safe BOD limits (>3 mg/l), indicating severe pollution.
- National Green Tribunal (NGT) enforces environmental laws and has issued guidelines on idol immersion and river pollution.
- Water (Prevention and Control of Pollution) Act, 1974 provides the legal framework to control water pollution.
- Environment Protection Act, 1986 empowers the government to regulate activities impacting the environment.
- Religious freedom under Article 25 is subject to public order, health, and environmental considerations.
- Empirical studies show festivals like Kumbh Mela, Durga Puja, and Ganesh Utsav significantly raise BOD and solid waste levels.

Sustainable alternatives include eco-friendly idols, regulated offerings, and improved waste management systems.

5.11. Plastic Waste Rules Amended: Compliance Eased with Credit Mechanism

Context:

The government has amended Plastic Waste Management Rules, allowing companies to carry forward unmet recycling targets for up to three years and meet obligations through tradable credits, easing compliance under the Extended Producer Responsibility (EPR) framework. (Compliance eased for managing plastic waste.)

BACKGROUND / CORE CONCEPTS:

- The Plastic Waste Management Rules, 2016, were notified by the Ministry of Environment, Forest and Climate Change under the Environment (Protection) Act, 1986 regulate plastic use, recycling, and disposal in India.
- **Extended Producer Responsibility (EPR) concept:** Producers are responsible for collection and recycling of plastic they introduce.

- 2022 amendments to the Rules introduced mandatory recycling targets and reporting.
- **Categories of plastic:** Category I: rigid (easy to recycle), Category II: flexible, and Category III: multi-layered (hardest to recycle).
- India aims for 100% plastic waste processing, though implementation gaps persist.

Tradable Credits: Market-based mechanism allowing companies to buy credits from others who exceed recycling targets to meet compliance obligations.

5.12. Rice's Whale and U.S. Offshore Drilling Conflict

Context:

The U.S. government has pushed for expanded offshore oil drilling in the Gulf of Mexico, overlapping with the habitat of the critically endangered Rice's whale, raising environmental and conservation concerns.



- Rice's whale is one of the rarest whale species (Marine mammals), found **only in the Gulf of Mexico.**
- It is classified as **Critically Endangered** due to very low population (100 individuals).
- Threats include **oil spills, ship strikes, noise pollution, and climate change.**
- **Offshore drilling** involves extraction of petroleum beneath the seabed, often impacting marine ecosystems.
- **Endangered Species Act (ESA), 1973** protects species at risk of extinction in the U.S
- Environmental clearances are required to balance development and conservation.

5.13. Radiative Forcing Accounting (RFA)

Context:

A recent study has highlighted limitations of current **global warming measurement methods** and proposed **Radiative Forcing Accounting (RFA)** as an improved approach.

About Global Warming Measurement & RFA:

- **Current Method:** Uses **CO_2-equivalent (CO_2e)** based on **Global Warming Potential (GWP-100)**, averaging warming impact over **100 years.**
- **Limitation:** Underestimates **short-lived high-impact gases (e.g., methane)** compared to **long-lived CO_2.**
- **RFA Concept:** Based on **Radiative Forcing (RF)**, which measures the **energy imbalance between incoming solar radiation and outgoing heat**, giving a direct measure of warming.
- **Approach:** Tracks **actual warming over time** by considering **gas lifetime and timing of emissions**, capturing both **short-term impact (e.g., methane)** and **long-term impact (e.g., CO_2).**
- **Significance:** Provides **more accurate warming representation**, especially for **short-term climate effects.**

5.14. Jungle Cat

Context:

A recent study highlights that the **jungle cat** depends on **agro-pastoral landscapes outside protected areas**, exposing it to multiple threats.

About Jungle Cat:

- **Scientific Name:** ***Felis chaus*****; also called reed cat and swamp cat; a small wild cat widely distributed across South and Southeast Asia.**
- **Habitat:** Found in **wetlands, grasslands, scrublands, and agricultural landscapes**; prefers **open habitats.**
- **Type: Habitat generalist**; avoids dense forests and highly urbanised areas.
- **Distribution:** Found across **South & Southeast Asia and Middle East**; in India, widespread in **plains, wetlands, and agro-pastoral landscapes.**
- **Ecological Role:** Acts as a **natural pest controller** by regulating **rodent populations.**
- **Conservation Status: IUCN – Least Concern**; listed under **Schedule II (Part II)** of the Wildlife Protection Act, 1972.
- **CITES Status: Appendix II** (regulated international trade).
- **Threats:** Habitat fragmentation, road mortality, hybridisation with domestic cats, and disease transmission.

5.15. Species in News – Polar Bear



Conservation Status:
IUCN Red List: Vulnerable (VU) CITES: Appendix II

- **Polar bears are the largest carnivorous land mammals, highly adapted to Arctic conditions.**
- They are classified as marine mammals as they depend on sea ice for hunting, breeding, and movement.
- Their white-appearing fur (due to light reflection) and help in camouflage and heat absorption (below the fur is a black skin).
- A thick fat layer provides insulation and energy storage.
- They are found across the Arctic (Alaska, Canada, Russia, Greenland, Svalbard) and are absent in Antarctica.
- Sea ice is essential for hunting seals, their primary food source.
- They are apex predators and keystone species, maintaining ecological balance.
- Strong swimmers, they can travel long distances; mostly solitary in nature.
- Climate change and melting sea ice threaten their survival by reducing hunting grounds.

5.16. Nationally Determined Contributions (NDC)

Context:
India has proposed **updated climate targets**, including achieving **60% non-fossil fuel power capacity by 2035** under its revised **NDC.**

About NDC:

- **Reporting:** Submitted to **UNFCCC** as part of climate action plans under the **Paris Agreement.**
- Commitments are **non-binding, nationally determined.** Revised **every ~5 years.**

Key Target Comparison

Goal Category	2030 Earlier Target (2022 Update)	2035 Updated Target (2026 Update)
Non-Fossil Power Capacity	50% of cumulative installed capacity	60% of cumulative installed capacity
Emission Intensity Reduction	45% reduction from 2005 levels	47% reduction from 2005 levels
Carbon Sink Creation	2.5 to 3 billion tonnes of CO_2 equivalent	3.5 to 4 billion tonnes of CO_2 equivalent

6. History

6.1. Vande Mataram

Context:

The **Ministry of Home Affairs (2026)** issued guidelines on the **performance of Vande Mataram**, while the Supreme Court clarified that these are **advisory and non-binding**.

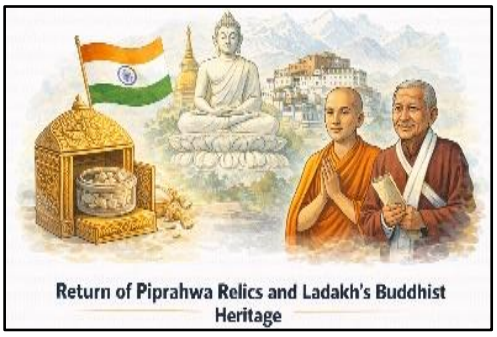
About Vande Mataram:

- **Status:** Recognised as the **National Song of India**; **first two stanzas officially adopted (1950)**, while **all six stanzas prescribed for ceremonial rendition (2026 guidelines)**.
- **Author:** Composed by **Bankim Chandra Chattopadhyay** in the **1870s**.
- **Source:** Included in ***Anandamath* (1882)** set during the **Sanyasi Rebellion**.
- **Language:** Written in **Sanskritised Bengali**.
- **Historical role:** Became a slogan during the **Swadeshi Movement (1905)** against the **Partition of Bengal**.
- **First rendition:** Sung by **Rabindranath Tagore** at the **1896 INC session**.
- **2026 guidelines:** Provide **~3 min 10 sec official version**, prescribe **ceremonial occasions**, and state that it may be played **before the National Anthem**.
- **Legal position: No mandatory compulsion** to sing; advisory carries **no penal consequences**

6.2. Return of Piprahwa relics and Ladakh's Buddhist heritage

Context:

Sacred Piprahwa relics linked to the Buddha are being brought to Leh, highlighting Ladakh's historical role in spreading Buddhism and India's cultural diplomacy.


Return of Piprahwa Relics and Ladakh's Buddhist Heritage

- **Piprahwa relics:** Discovered in 1898 (Uttar Pradesh), linked to Buddha and Sakya clan.
- These relics include bone fragments, reliquary caskets, crystals, ornaments, and other funerary objects associated with the Buddha.
- Buddhist expansion: Spread from India to Central Asia, China via trade routes.
- Ladakh: Key corridor connecting India with Central Asia and Silk Route networks.
- Cultural diplomacy: Using shared heritage (like Buddhism) to strengthen international ties.
- Archaeological evidence: Stupas, inscriptions, monasteries show deep Buddhist roots in Ladakh.
- Repatriation: Return of cultural artefacts to their country of origin.
- Piprahwa (UP): Archaeological site where relics of Buddha were found; linked to ancient Kapilavastu.
- Sakya clan: Clan of Gautama Buddha; relics associated with them hold high religious value.

6.3. Raja Ravi Varma

Context:

Raja Ravi Varma's painting 'Yashoda and Krishna' has become the most expensive work of modern Indian art ever sold at auction, fetching a record-shattering ₹167.2 crore.



- Raja Ravi Varma (1848–1906) was a pioneering Indian painter, widely regarded as the father of modern Indian art.
- He was born into an aristocratic family in the princely state of Travancore (present-day Kerala) and trained himself in European-style oil painting and realism.
- He became famous for blending European academic techniques such as perspective and chiaroscuro with Indian mythological and social themes.
- In 1894, he set up a lithographic press to mass-produce affordable oleographs of his paintings.

- This innovation democratized art by bringing sacred imagery and high-quality visuals into ordinary Indian homes for the first time.
- His depictions of Hindu deities standardized their popular visual forms, influencing calendar art and mass culture.
- Some of his most notable works include ***Shakuntala, Yashoda and Krishna, Saraswati, Lakshmi,*** and ***Nair Lady Adorning Her Hair.***

His works are considered national treasures, and he played a crucial role in bridging traditional Indian art with modern artistic practices, influencing generations of artists and even Indian cinema.

6.4. 1,500-Year-Old Stepped Reservoir Unearthed at Elephanta Island

Context:

Archaeologists from the Archaeological Survey of India (ASI) have discovered a **1,500-year-old stepped reservoir** on Elephanta Island near Mumbai. The reservoir was designed to **store rainwater efficiently on a rocky island terrain.**



Why is this Significant?

- The excavation reveals a **well-planned water storage system**, along with artefacts indicating **ancient trade and cultural links.**
- The finding highlights **advanced water management practices in early historic India.**
- It provides evidence of **maritime trade networks and cultural exchanges.**
- It enriches understanding of **early historic urban planning and resource management.**

Associated Findings:

- Artefacts such as **amphorae (storage jars), terracotta items, beads, and coins** have been found.
- Some artefacts indicate **contacts with West Asia and Mediterranean regions.**
- Coins from the **Kalachuri dynasty (6th century CE)** have also been identified.

Conclusion:

The discovery highlights that **ancient Indian societies possessed sophisticated engineering and global connections,** especially in water conservation and trade.

6.5. Balirajgarh

Context:

The Archaeological Survey of India is conducting excavations at **Balirajgarh (Bihar)** to study its link with **ancient Mithila civilisation.**

About Balirajgarh:

- **Location & Extent:** Located in **Madhubani district (Bihar);** spread over ~**176 acres** in the **Gangetic plains.**
- **Archaeological Features:** Contains **massive brick fortifications;** indicates a **large urban settlement.**
- **Cultural Phases & Significance:** Continuous habitation across Mauryan, Shunga, Kushan, Gupta, and Pala; linked to **Mithila civilisation** and early urbanisation.

Archaeological Survey of India (ASI):

- **Established: 1861** by **Alexander Cunningham.**
- **Ministry:** Functions under the **Ministry of Culture.**
- **Role:** Responsible for **archaeological research, excavation, conservation, and protection of monuments.**
- **Legal Basis:** Administers the **Ancient Monuments and Archaeological Sites and Remains Act, 1958 (AMASR Act).**
- **Key Functions:** Excavations and surveys, conservation of heritage sites, epigraphy and numismatics studies

6.6. Jyotirao Phule and His Constitutional Vision

Context:

The bicentenary of birth of Mahatma Jyotirao Phule highlights his contributions as a social reformer whose ideas anticipated constitutional values like equality, dignity, and social justice. His work is being reinterpreted as a foundational influence on India's constitutional imagination

- **Jyotirao Phule** (1827–1890) was a social reformer from Maharashtra who fought against caste discrimination and social inequality.
- He pioneered women's education in India, starting schools for girls and marginalized communities.
- His work **Gulamgiri (1873)** critiqued caste oppression and drew parallels with slavery in the USA.
- He advocated compulsory primary education and state support for marginalized groups.
- His ideas influenced Dr. B.R. Ambedkar and later constitutional provisions on equality and social justice.
- **Core principles**: anti-caste ideology, social justice, redistribution of power, and dignity for all.
- **Satyashodhak Samaj**: Founded by Jyotirao Phule in 1873 in Pune to promote equality, oppose caste hierarchy, and ensure social rights for lower castes.

Constitutional Morality: Concept emphasized by Dr. B.R. Ambedkar, referring to adherence to constitutional values like liberty, equality, and fraternity over social prejudices (inspired from Jyothirao phule)

6.7. Basava Jayanti



Context: Basava Jayanti celebrated in Karnataka on April 20.

- Basava Jayanti is a major festival in Karnataka and neighboring states, celebrating the birth anniversary of the **12th-century poet-philosopher and social reformer, Basavanna, who founded the Lingayat tradition**.
- It falls on the third day of the Vaisakha month (April/May), with 2026 celebrations occurring on April 20th.
- Basavanna (1131–1167 AD) advocated for an egalitarian society, opposing the caste system, gender inequality, and ritualistic practices.

6.8. Harvest Festivals in India

Context:

The President of India extended greetings on the eve of several **regional harvest festivals such as Baisakhi, Vishu, Bohag Bihu, Poila Boishakh, Meshadi, Vaishakhadi, and Puthandu, highlighting their cultural and agricultural significance**. These festivals are being celebrated across India on April 2026.

- These festivals mark the **harvest season** and the **regional New Year** in different parts of India.
- **Baisakhi** is celebrated mainly in **Punjab and Haryana**, associated with the **harvest of rabi crops** and also has religious significance for Sikhs (formation of Khalsa in 1699).
- **Vishu** is celebrated in **Kerala**, marking the Malayalam New Year and associated with rituals like **Vishukkani**.
- **Vishuv** is observed in **Odisha**, linked to the Odia New Year.
- **Bohag Bihu (Rongali Bihu)** is celebrated in **Assam**, marking the Assamese New Year and the onset of the agricultural cycle.
- **Poila Boishakh** is the **Bengali New Year**, celebrated in **West Bengal and Bangladesh**.
- **Puthandu** marks the **Tamil New Year** in Tamil Nadu.
- **Meshadi and Vaishakhadi** are regional solar New Year observances in parts of **Punjab, Himachal Pradesh, and other northern regions**.
- They reflect India's **agrarian economy**, celebrating the harvest and expressing gratitude to **Mother Earth and farmers (Annadata)**.

They promote **cultural diversity, unity, and traditional practices**, showcasing regional variations within a common seasonal theme

7. Society and Social Justice

7.1. Social Media Addiction Trial

Context:

A Los Angeles jury in the United States held Big Tech companies Meta (Instagram & Facebook) and Google (YouTube) responsible for creating addictive platform designs that caused harm to a young user. The companies were found negligent, with the jury also citing malice and fraudulent conduct. A total of $6 million in damages was awarded, with Meta bearing 70% of the liability and YouTube 30%.



WHAT IS THE CORE ISSUE:

- The central issue is whether social media platforms are merely neutral intermediaries or deliberately designed systems that can cause harm.
- Traditionally, platforms like Meta and YouTube were treated as passive carriers of user-generated content. Under this view, they were not responsible for what users posted.
- However, this case challenges that idea. The argument is that these platforms are actively designed to maximise user engagement. Features such as infinite scrolling, personalised recommendations and constant notifications are built to keep users hooked for longer durations.
- This design creates behavioural addiction. Users, especially children, are repeatedly drawn back to the platform, which can negatively affect their mental health. The court accepted that the harm was not accidental but linked to conscious design choices made by companies.
- Thus, the issue is shifting from content responsibility to design responsibility. The question is no longer only about what users see, but about how platforms shape user behaviour.

LEGAL SHIFT:

Earlier, companies were protected under intermediary liability laws. Now, courts are beginning to treat platforms as products whose design can be defective and harmful. This brings them under product liability principles.

INDIA'S REGULATORY FRAMEWORK:

- India already has multiple laws to protect children in the digital space.
- The Digital Personal Data Protection Act, 2023 requires parental consent for children and restricts tracking and targeted advertising.
- The Information Technology Act, 2000 penalises online offences such as child sexual abuse material.
- The POCSO Act, 2012 addresses online exploitation and grooming of children.
- The Juvenile Justice Act provides broader protection against child exploitation.

KEY GAP IN INDIA:

The Indian framework focuses mainly on content regulation and data protection. It does not adequately address addictive platform design. Enforcement is also weak, and children can easily bypass safeguards by misrepresenting their age.

FINAL TAKEAWAY:

The global debate is moving towards regulating how platforms are designed, not just what content they host. India may also need to shift in this direction.

7.2. Rising burden of childhood cancer in India

Context:

A recent "**Global Burden of Disease (GBD) 2023" study by "the Lancet Oncology"** highlights that childhood cancer cases in India are high, with gaps in diagnosis, treatment, and data systems. Survival rates remain uneven despite many cancers being treatable.

- **Paediatric cancer:** Cancer occurring in children (0–14 years), e.g., leukemia, brain tumors.
- **India reports 50,000–75,000 new cases annually, but data is underreported.**
- Early diagnosis improves survival, but awareness and facilities are limited.
- Health infrastructure is uneven; rural areas lack specialised care.
- National cancer control mainly focuses on adults.

- Financial and logistical barriers lead to delayed or incomplete treatment.
- Strengthening primary healthcare and cancer registries is crucial.
- WHO Childhood Cancer Initiative: Launched in 2018 to improve survival rates globally; aims for 60% survival by 2030.

National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS): Under Ministry of Health, focuses on cancer control but largely adult-centric.

7.3. INDIA AND MATERNAL MORTALITY TARGETS (SDG 2030)

Context:

A recent study (Lancet, WHO data) shows that while India has significantly reduced Maternal Mortality Ratio (MMR), it is likely to miss the SDG target of reducing MMR below 70 per 1 lakh live births by 2030, with progress slowing in recent years.

Explanation:

- **Maternal Mortality Ratio (MMR)** refers to the number of women who die due to pregnancy-related causes per 1 lakh live births. India has reduced MMR sharply from about 508 (in 1990) to around 116 (in 2023), showing major improvement due to better healthcare access, institutional deliveries, and government interventions.
- However, challenges remain. A large number of maternal deaths are still caused by preventable factors such as haemorrhage and hypertension. Regional disparities persist, with states like Assam and Uttar Pradesh pulling down the national average. Additionally, slower improvements in recent years and issues in healthcare access, especially in poorer regions, are affecting progress.
- Another concern is that although fertility rates are declining, which usually reduces maternal deaths, gaps in healthcare delivery and quality of care continue to limit further gains.
- India has made significant progress in reducing maternal mortality, but achieving SDG targets requires addressing regional disparities, improving quality healthcare, and tackling preventable causes of maternal deaths.

8. Geography

8.1. Extreme Heat Threat to Global Food Systems

Context:
A joint report by the Food and Agriculture Organization (FAO) and World Meteorological Organization (WMO) warns that increasing extreme heat events are disrupting agriculture, livestock, and fisheries, posing risks to global food security.

- Extreme heat refers to prolonged periods of abnormally high temperatures, often linked to climate change and global warming.
- Heat acts as a risk multiplier, intensifying droughts, wildfires, and pest outbreaks, thereby affecting food production systems. Example: Heatwaves during crop growth can reduce yields of staples like wheat, rice, and maize.
- Crops have critical temperature thresholds; beyond this, processes like pollination fail, leading to yield loss. Example: High temperatures during flowering can cause empty grains in rice or maize.
- Night-time temperatures are equally important; high night heat increases plant respiration, reducing growth and productivity.
- Livestock are affected through heat stress, reducing milk production and increasing mortality in extreme cases. Example: Dairy cattle can see 15–25% drop in milk yield during heat stress conditions.
- Fisheries are impacted as marine heatwaves reduce oxygen levels in water, affecting fish survival.

The concept of **thermal humidity index (THI)** is used to assess heat stress in animals by combining temperature and humidity.

Places in News:

8.2. RWANDA

Context:
Rwanda is in the news for rising diplomatic tension with the U.S. following fresh US sanctions. The U.S. sanctioned the Rwanda Defence Force (RDF) and four senior officers in March 2026 for supporting the M23 rebel group in the Democratic Republic of Congo (DRC).



Rwanda: (**Capital:** Kigali)

- It is a landlocked country located south of the equator in east-central Africa. It is part of the **Great Rift Valley region of Africa**.
- It is often referred to as the **"land of a thousand hills", Rwanda's** landscape is mostly hilly and mountainous.
- **Borders:** It shares a border with the four nations of Burundi, Tanzania, Uganda, and the Democratic Republic of the Congo. Lake Kivu, one of the African Great Lakes, lies on the border between the Democratic Republic of the Congo and Rwanda (west side).
- **Population:** The Hutu and Tutsi ethnic groups make up most of the country's population.

Major Moutain Ranges: Albertine Rift and Virunga. **Highest Peak:** Mount Karisimbi which is 4,507 m tall

8.3. Spain

Context:
Spain officially closed its airspace to United States military aircraft involved in the war against Iran.



About Spain:
Location: It is located on the Iberian Peninsula in southwestern Europe.

- **Bordering Countries:** Spain shares its borders with Portugal (to the west**), France and Andorra (to the northeast),** and the British Overseas Territory of Gibraltar (to the south).

- **Maritime borders**: Spain is bounded by the Mediterranean Sea (to the southeast and east), the Bay of Biscay (to the north), and the Atlantic Ocean (to the northwest and southwest).
- **Capital City:** Madrid

8.4. Bab el-Mandab Strait

Context:

The Bab el-Mandeb Strait is in the news because it has become a critical flashpoint in the escalating 2026 Iran-Israel-US war.

- **The** Bab el-Mandab Strait is located at the southern tip of the Red Sea.
- It lies between **Yemen on one side and the Horn of Africa on the other.** It connects the **Red Sea with the Gulf of Aden,** and further with the Indian Ocean.
- It is one of the world's most important maritime chokepoints.

8.5. ANDAMAN SEA



Context:

The Andaman Sea is a marginal sea of the northeastern Indian Ocean bounded by the coastlines of Myanmar and Thailand along the Gulf of Martaban and the west side of the Malay Peninsula, and separated from the Bay of Bengal to its west by the Andaman Islands and the Nicobar Islands.

8.6. Ust-Luga Port

Context:

A Ukrainian drone attack damaged **Ust-Luga Port** in **Russia**, a key **energy export hub** on the Baltic coast.



About Ust-Luga Port:

- **Location:** Situated on **Luga Bay (Gulf of Finland)** along the **Baltic Sea**, near **St. Petersburg**.
- **Connectivity:** Terminus of the **Baltic Pipeline System-2 (BPS-2)** linking inland oil fields to export markets.
- **Cargo Profile:** Handles **crude oil, naphtha, gas condensate, coal, fertilizers, and LPG**.
- Critical node in Russia's **energy export network** along with **Primorsk (Baltic Sea)** and **Novorossiysk (Black Sea)**.

8.7. Persian Gulf

Context:

The **Persian Gulf's ecology** is under stress due to **oil extraction, shipping, and coastal development**

About Persian Gulf:

- Shallow, semi-enclosed sea **connected to the Arabian Sea via Strait of Hormuz.**
- **Gulf:** A large inlet of the sea/ocean partly enclosed by land, with a narrow opening to the main water body.
- Formed ~3,000–6,000 years ago **by flooding of the Arabian basin.** ~2.26 lakh sq km; average depth ~30 m.
- Conditions: High salinity (44–70 ppt), high temperature, and high evaporation.
- Ecology: Supports **mangroves, coral reefs**, seagrass beds, **dugongs**, and sea turtles.
- Human pressure: Intense oil transport **(~20% global oil flow)** and coastal urbanisation.
- Desalination: Hosts **~50% of global desalination plants**, discharging saline effluents.
- Threats: Oil spills, coral bleaching, habitat loss, and pollution.
- **8 Countries: Iran, Iraq, Kuwait, Saudi Arabia, Bahrain, Qatar, UAE, Oman. Only non-Arab country: Iran. Only island country: Bahrain**



8.8. Global Warming Weakens Sea-Land Breeze in Coastal Cities

Context:

A recent study published in **Nature Climate Change** has found that rising ocean temperatures due to global warming are weakening the **sea-land breeze system** in many coastal cities. This can worsen **urban heat stress, humidity, and air pollution**, affecting habitability of coastal regions.

Sea – Land Breeze Circulation:



- **Sea Breeze** is a local wind that blows **from sea to land during daytime** because land heats faster than water. Warm air over land rises, and cooler air from the sea moves inland.
- **Land Breeze** blows **from land to sea at night** because land cools faster than water, reversing the pressure gradient.
- Together, they form the **Sea-Land Breeze Circulation**, an example of **local convectional winds**.
- The primary driver is **thermal contrast** (temperature difference) between land and sea surfaces. Greater contrast = stronger breeze.
- Due to **global warming**, oceans are warming significantly, reducing the temperature gap between land and sea. This weakens the pressure gradient and lowers wind intensity.
- Study findings indicate that historical ocean warming has reduced **breeze days by around 3%** in several coastal cities.
- If carbon emissions remain high, weakening of sea breeze may accelerate by **2050**

8.9. Baltic Sea

Context:

Recently NATO intercepted a Russian military aircraft flying over the Baltic Sea.

The Baltic Sea is a large, semi-enclosed, and shallow brackish inland sea in Northern Europe, connected to the Atlantic Ocean via the Danish straits. Bordered by nine countries—Sweden, Finland, Russia, Estonia, Latvia, Lithuania, Poland, Germany, and Denmark—it is known for its low salinity, extensive amber deposits, and freezing during cold winters.



8.10. Italy



Context:

Italian voters rejected a judicial reform proposal in a referendum, dealing a setback to Prime Minister Giorgia Meloni.

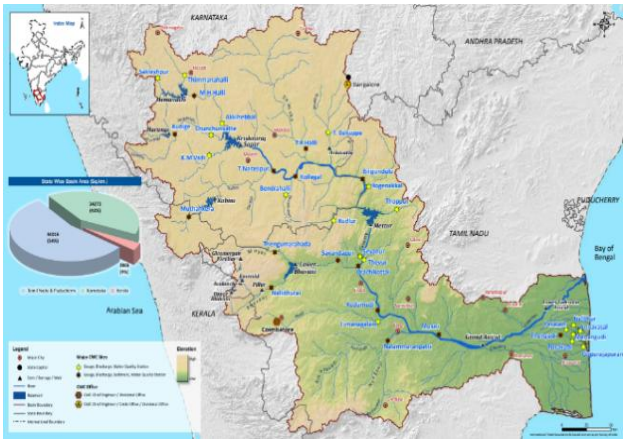
About Italy:

- Southern Europe; **Mediterranean peninsula**; capital: **Rome**
- Parliamentary republic; **bicameral Parliament** (Chamber of Deputies & Senate)
- Currency: **Euro (€)**; member of **EU, G7, NATO, OECD**
- Borders: France, Switzerland, Austria, Slovenia; encloses **Vatican City & San Marino**
- Geography: **Alps (north), Apennines (spine), Po (longest) & Tiber rivers**
- Islands: **Sicily, Sardinia**; volcanoes: **Etna, Vesuvius, Stromboli**

8.11. Cauvery River

Context:

A recent study indicates that the **Cauvery basin may witness declining river flows until 2050** due to climate change impacts.



About Cauvery River:

- **Origin:** **Talakaveri**, **Brahmagiri Range**, **Western Ghats** (Kodagu, Karnataka) at ~**1,341 m**.
- **Length:** Approximately **800 km**.
- **Basin spread: Tamil Nadu (~56%), Karnataka (~41%), Kerala & Puducherry (~3%).**
- **Mouth:** Drains into the **Bay of Bengal** at **Poompuhar** (Tamil Nadu).
- **Tributaries:**
  - **Left bank: Harangi, Hemavati, Shimsha, Arkavati**
  - **Right bank: Kabini, Bhavani, Amaravati, Noyyal**
- **Major dams: Krishna Raja Sagara (KRS)** (Karnataka) and **Mettur Dam** (Tamil Nadu – **Stanley Reservoir**).
- **Key features:** Forms River islands (**Srirangapatna, Shivanasamudra, Srirangam**) and hosts **Shivanasamudra & Hogenakkal Falls.**