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FEBRUARY 2026

FOR UPSC AND OTHER STATE GOVT. EXAMS

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POLITY, CONSTITUTION & GOVERNANCE

Topic: Indian Constitution - historical underpinnings, evolution, features, amendments, significant provisions and basic structure.

Uniform Civil Code (UCC)

Meaning of UCC

- UCC proposes a **single civil law applicable equally to all citizens** of India.
- It covers personal matters like **marriage, divorce, inheritance, adoption, and succession**.
- It aims to **replace religion-based personal laws** with a uniform legal framework.
- The core objective is ensuring **equal legal rights regardless of religion, gender, or community**.

Historical Background

- **Pre-Independence Developments**
  - **Lex Loci Report (1840)** recommended uniform **codification of laws** on offences, evidence, and contracts.
  - Importantly, it **excluded Hindu and Muslim personal laws** from the proposed codification.
  - **B.N. Rau Committee (1941)** proposed reforms to codify Hindu law and **grant equal rights to women**.
- **Post-Independence Developments**
  - **Special Marriage Act, 1954** enabled civil marriages irrespective of religion, including for interfaith couples and Indians abroad.
  - **Four landmark Hindu law** enactments systematically reformed personal laws:
    - Hindu Marriage Act, 1955
    - Hindu Succession Act, 1956
    - Hindu Minority and Guardianship Act, 1956
    - Hindu Adoption and Maintenance Act, 1956
  - These reforms showed that **gradual codification of personal laws** is both possible and constitutional.

Constitutional Provisions

- **Article 44** (Directive Principles) directs the State to secure a **Uniform Civil Code** for citizens.
- **Article 25** guarantees freedom of religion, thus creating a **fundamental tension** that UCC must carefully navigate.
- **Article 15** prohibits discrimination on grounds of religion, race, caste, sex, or place of birth.
- UCC falls under **Entry 5 of the Concurrent List** i.e. both Parliament and State Legislatures can legislate.
- The **Supreme Court** has repeatedly urged Parliament to consider enacting UCC, most notably in ***Shah Bano (1985)*** **and** ***Sarla Mudgal (1995).***

Arguments in Favour of UCC

- **Article 44** of the Constitution explicitly mandates UCC as a directive principle of state policy.
- UCC promotes **true secularism** by separating religion from civil law in personal matters.
- A common civil law **strengthens national unity** and reinforces a shared sense of citizenship.
- UCC ensures **gender justice** by removing discriminatory practices embedded in personal laws.
- It **simplifies legal procedures** in family disputes, making justice more accessible to ordinary citizens.
- Legal codification **reduces arbitrariness** and improves consistency in dispute resolution across communities.

Arguments Against UCC

- A forcibly imposed UCC may **threaten religious freedom** guaranteed under Article 25 of the Constitution.
- It risks **undermining the rich cultural and community diversity** that defines India's pluralistic identity.
- **Absence of consensus** among religious communities makes implementation politically and socially sensitive.
- Concerns exist about **federalism** i.e. personal laws fall partly under Entry 5 of the State List, raising legislative jurisdiction questions.
- Critics argue UCC debates are often **driven by political motives** rather than genuine concern for gender justice.

Way Forward

- **Broad stakeholder consultations** must precede any legislation i.e. communities must feel heard, not imposed upon.
- Implementation must remain **politically neutral, inclusive, and sensitive** to India's diversity.
- **Public awareness campaigns** must educate citizens on the benefits of legal uniformity and gender equality.
- **Gradual reform** aligning existing personal laws with **constitutional equality principles** is more sustainable than a sudden overhaul.
- The experience of **Goa's Common Civil Code**, which has functioned since colonial times, offers valuable lessons for national implementation.

Judicial Review in Religious Affairs

Context

- Recent **Madras High Court rulings** addressed ritual rights and sect-based worship disputes in Thiruparankundram and Kanchipuram temples.
- These judgments reaffirm the **judiciary's active role** in adjudicating religious disputes, challenging the notion that temples are purely private spaces.

Historical Evolution of Temple Jurisprudence

- In **Sankaralinga Nadan vs Raja Rajeswara Dorai (1908)**, temple entry rights were formally contested, establishing early judicial precedent.
- **The Madras Hindu Religious Endowments Act, 1927,** enabled temple committees, financial audits, and colonial supervisory authority over religious endowments.
- Adoption of the **Constitution in 1950** fundamentally transformed religious dispute adjudication, thus courts moved from a **civil rights view** to a **constitutional rights framework.**

Constitutional Framework

- **Article 25** guarantees every individual **freedom of conscience** and the **right to practise** religion freely.
- **Article 26** grants religious denominations the right to **manage their own religious affairs** independently.
- Both rights are subject to **public order, health, and morality,** thus creating legitimate space for state regulation.
- Courts balanced **religious freedom with constitutional equality principles**, developing jurisprudence on temple entry and priest appointments.

Essential Religious Practice Test and Constitutional Morality

- The Supreme Court evolved the **ERP test** to determine whether a custom is truly integral to a religion.
- Practices deemed **non-essential are treated as secular** and therefore regulatable by the state.
- The ERP test was significantly refined in the landmark **Sabarimala case (2018)** and even **essential practices** remain subject to **constitutional scrutiny.**
- **Constitutional morality**, rooted in justice, liberty, equality, and fraternity, prevails over popular or social morality. Thus, no religious practice can **shield itself from fundamental rights scrutiny** simply by claiming religious sanctity.

Significance and Way Forward

- Judicial review ensures **religion evolves in alignment with constitutional morality**, not against it. Temple jurisprudence reflects India's **deepening constitutional engagement** with questions of faith and equality.
- As religious litigation rises, the need for **clear, principled, and consistent judicial standards** becomes increasingly urgent. Courts remain central in **balancing religious autonomy with individual constitutional rights**, a task only growing in complexity.

Topic: Legislature

Freedom of Speech in Parliament

Context and Constitutional Foundation

- **Article 105** guarantees freedom of speech to Members of Parliament, essential for fearless legislative debate and democratic accountability.
- Parliamentary privileges exist to ensure the **effective functioning of the Legislature**, not executive comfort or political convenience.
- The Supreme Court has repeatedly held that **restrictions on parliamentary speech must not destroy the right itself**, rules cannot override constitutional guarantees.
- Increasing restrictions on Opposition leaders and the **weaponisation of procedural rules** raise serious contemporary concerns about democratic space.

Scope and Limits of Parliamentary Speech

- **Constitutional Restrictions**
  - **Article 121** prohibits discussion on conduct of judges except during impeachment proceedings.
  - Members cannot misuse privilege to **violate constitutional boundaries** or target individuals arbitrarily.
- **Procedural Restrictions**
  - Restrictions exist on **sub judice matters, personal allegations without prior notice**, and questioning the bona fides of fellow members.
  - **Rule 380** allows expunction of words that are unparliamentary, indecent, or undignified from official proceedings.
- **The Expunction Controversy**
  - Expunction allows removal of **only offending words and not entire paragraphs or speeches**.
  - Arbitrary deletion of large portions **distorts the meaning of speeches** and compromises the constitutional right of members.
  - If a speech becomes **incoherent after expunction**, the member's fundamental parliamentary right is effectively nullified.
  - Parliamentary records are **preserved for posterity and democratic memory** — their integrity must be protected.

Emerging Democratic Concerns

- Attempts to silence or disqualify Opposition critics **threaten the institutional balance** essential to parliamentary democracy.
- Parliament has **no power to arbitrarily disqualify members** beyond what constitutional provisions explicitly permit.
- Breakdown of trust between government and Opposition **weakens deliberative democracy**, the very foundation of parliamentary governance.
- As Ivor Jennings observed, **the duty of the Opposition is to criticise**, democracy survives only when the majority governs and the minority critiques freely.

Way Forward

- Presiding officers must exercise **expunction powers judiciously and proportionately**, not as tools of political management.
- Rules must **regulate decorum without diluting substantive debate** thus form must never silence substance.
- Government and opposition must **restore the mutual respect and institutional trust** that a healthy parliamentary democracy requires.
- **Constitutional morality**, not political expediency, must guide parliamentary practice and procedural decisions.

Topic: Federalism

Fiscal Federalism

Table 1: Criteria for horizontal devolution amongst States

Criteria	13th FC 2010-15	14th FC 2015-20	15th FC 2020-26	16th FC 2026-31
Income distance	47.5	50	45	42.5
Population (1971)	25	17.5	-	
Population (2011)	-	10	15	17.5
Area	10	15	15	10
Forests	-	7.5	10	10
Fiscal discipline	17.5	-	-	
Demographic performance	-	-	12.5	10
Tax effort	-	-	2.5	
State's contribution to GDP				10
Total	**100**	**100**	**100**	**100**

Context

- The **16th Finance Commission**, chaired by **Dr. Arvind Panagariya**, submitted its report for the

2026–31 period, and the Union government has accepted its tax devolution recommendations.
- **States** demanded an **increase in their share** from **41% to 50%**, citing constrained fiscal space under the GST regime and a **growing mismatch** between **expenditure responsibilities and revenue streams.**

Constitutional Framework of Tax Devolution
- **Article 270** governs the **distribution of net tax proceeds** between the Centre and States, covering corporation tax, income tax, CGST, and the Centre's IGST share.
- **Distribution** is based on **Finance Commission** recommendations under **Article 280**.
- The divisible pool forms about **81% of gross tax revenue** in 2025-26.
- **Cesses and surcharges are excluded** from the divisible pool, and it is a structural concern that shrinks the effective pool available to states.

Key Recommendations of the 16th Finance Commission
- **Vertical Devolution**
  - States' share in the divisible tax pool **retained at 41%** for 2026-31, citing Union needs for **defence and infrastructure** spending.
  - The Commission acknowledged that **centrally sponsored schemes** ultimately **benefit states**, using it to **justify the status quo** on devolution.
  - No recommendation made to **include cesses and surcharges** within the divisible pool, despite persistent demands from 18 states.
- **Horizontal Devolution**
  - The **"tax effort" criterion** was restructured into a **"contribution to GDP"** performance indicator, with its weight raised sharply from **2.5% under FC-15 to 10%**.
  - This rewards **productive and efficient states** through outcome-linked transfers; thus, **southern and western** states saw marginal share increases while **northern and central states** witnessed marginal decline.
  - Weight for **demographic performance reduced** to avoid penalising states with higher population growth, reflecting India nearing its **demographic dividend peak.**

Structural Concerns and Criticisms
- About **₹1.2 lakh crore i.e. nearly 42% of total transfers**, is routed through Centrally Sponsored Schemes, reinforcing a model where **states primarily implement Centre's priorities** rather than exercising genuine fiscal autonomy.
- The Commission recognised **financial stress in state budgets** without proposing structural corrections or a phased roadmap for raising states' share to 45% or higher.
- **Cesses and surcharges**, which are excluded from the divisible pool, continue to shrink the effective resources available to states, a constitutionally and federally problematic trend.
- States increasingly rely on **market borrowings as the primary fiscal adjustment mechanism**, reflecting deepening vertical imbalance between revenue and expenditure responsibilities.

Way Forward
- The Centre must **progressively reduce reliance on cesses and surcharges** and work towards including them in the divisible pool to restore genuine federal fiscal balance.
- A **phased roadmap** for raising states' vertical share **towards 45% by 2031** must be considered to match the growing expenditure responsibilities of states.
- States must **rationalise subsidies and power sector finances** to improve their own fiscal health and reduce dependence on Central transfers.
- The dominance of **Centrally Sponsored Schemes** must be reviewed to **allow states greater discretionary** fiscal space aligned with local development priorities.
- Both levels of government must pursue **public sector enterprise reforms** to expand the overall tax base and strengthen the divisible pool.

Double-Engine Government and Growth

Context: Prime Minister Narendra Modi advocated **"double-engine government"** during southern visits.

Meaning of Double-Engine Government
- It is often associated with BJP-led **National Democratic Alliance rule** and refers to **political alignment** between Union and State governments.
- It suggests governance synergy improves development outcomes and presented as mechanism for faster project execution.

Advantages of Double-Engine Government

- Alignment may enable smoother **Centre-State coordination**.
- Politically aligned States may face lower **Union interference**.
- Discretionary fund flows may operate with fewer frictions.
- Administrative clearances may move faster under alignment.
- Claimed to enhance **development delivery efficiency**.

Challenges Associated

- **Federal Accommodation Issues**
  - Narrative seen as undermining **federal pluralism** while **India's federalism** accommodates diverse political mandates.
- **Efficiency vs Democracy Debate**
  - Suggests **multi-party federalism** reduces governance efficiency but risks framing democracy as **administrative inefficiency.**
  - It pits **political symmetry** against **representative federalism.**
- **Partisan Bias Concerns**
  - Greater discretion exists in **Centrally Sponsored Schemes (CSS)** while the opposition states allege delays in fund releases.
  - Allegations arise regarding role of **central agencies**.
- **Centralisation Risks**
  - May legitimise expansion of **Union political control** and weakens culture of **federal restraint**.

Way Forward

- Strengthen **cooperative federalism** over political alignment narratives.
- Ensure rule-based, transparent **fiscal transfers**.
- Reduce CSS conditionalities causing administrative delays.
- Protect States' **fiscal autonomy** amid GST regime constraints.
- Recognise diverse **State-specific development pathways**.

Topic: Local Government

Grants to Urban Local Governments

Context

- The **16th Finance Commission** recommended a record **₹3.5 lakh crore allocation for Urban Local Governments** for 2026–31. This marks a **230% increase** over the 15th Finance Commission's allocation of **₹1.5 lakh crore for 2021–26.**

Key Features of Urban Grants

- The Commission allocated **45% of total local government grants to urban bodies**, up from 36% under the previous Commission, signalling greater policy emphasis on **urban governance.**
- A dedicated **₹10,000 crore urbanisation premium grant** has been recommended to incentivise **rural-to-urban transition** and support towns experiencing rapid demographic and spatial expansion.
- Over **60% of grants are classified as basic grants**; tied grants support sanitation and water supply, while **untied grants address location-specific needs**, excluding salaries and establishment costs.
- **Inter-State Variations**
  - **Kerala recorded the highest increase**, exceeding **400% in urban allocations**, reflecting its advanced urbanisation trajectory.
  - **Himachal Pradesh experienced a decline of nearly 50%**, reflecting differential urbanisation patterns and fiscal criteria used in distribution.
  - Variations across states reflect the **Commission's attempt to align grants**

with actual urbanisation levels and fiscal capacity.

Significance and Way Forward

- The scale of allocation presents a historic opportunity to **strengthen urban local governance,** but **only if municipalities** have the **institutional capacity** to absorb and utilise funds effectively.
- **Untied grants** give cities genuine **flexibility** to address local priorities and this must be protected from being converted into tied transfers over time.
- States must ensure **timely devolution of grants to municipalities** and avoid the common pattern of funds being held back at the state level.
- Urban bodies must be empowered with **own-source revenue mechanisms** alongside grants to build long-term fiscal sustainability.

Topic: Judiciary and other dispute redressal mechanisms

Judicial Accountability

Context

- The office of the **Chief Justice of India (CJI)** received **8,630 complaints** against sitting judges between 2016 and 2025. The complaints pertained to allegations of **corruption, misconduct, and ethical impropriety.**

Institutional Mechanisms of Judicial Accountability

- **Constitutional Removal Mechanism**
  - Judges of the higher judiciary may be removed through **impeachment**.
  - Constitutional provisions exist under **Article 124(4)** and **Article 217**. The removal requires proof of **misbehaviour or incapacity**.
  - No judge has been successfully impeached to date.
- **Statutory Inquiry Framework**
  - The **Judges (Inquiry) Act, 1968** regulates investigative procedures.
  - It provides mechanisms to **examine allegations** against judges.
  - However, the process remains procedurally complex and rarely invoked successfully.
- **In-House Accountability Procedure**
  - Adopted through a Supreme Court resolution in 1999.
  - Complaints are examined by a **three-judge inquiry committee**.
  - Serious findings may lead to resignation or removal recommendation.
  - However, the procedure lacks statutory backing and operates with limited transparency.
- **Ethical Standards: Judicial Conduct Norms**

Judicial Pronouncements Shaping Accountability

- **S. P. Gupta v. Union of India**: Affirmed the judiciary's accountability to the public.
- **C. Ravichandran Iyer v. Justice A.M. Bhattacharjee**: Validated peer review mechanisms.
- **K. Veeraswami v. Union of India**: Criminal investigation requires CJI sanction.

These rulings attempted to balance **judicial independence with institutional accountability**.

Structural Issues and Accountability Deficits

- **Ineffective Impeachment Process**: High parliamentary threshold renders removal impractical.
- **Opacity in In-House Inquiries**: Lack of statutory status and public disclosure weakens credibility.
- **Transparency Constraints**: Limited RTI disclosure restricts public scrutiny.
- **Judicial Pendency Pressures**: Over **four crore pending cases** raise performance concerns.
- **Opaque Appointments Process**: Collegium's functioning lacks external oversight.
- **Weak Anti-Corruption Enforcement**: Prior approval requirements hinder investigations.
- **Absence of Independent Oversight Body**: No external complaints authority exists.
- **Institutional Reporting Gap**: The judiciary is not mandated to publish annual performance reports.

Way Forward

- **Institutional Oversight Reform**
  - Establish an independent **National Judicial Oversight Committee**.
  - Ensure impartial investigation of judicial misconduct.
- **Impeachment and Inquiry Reforms**
  - Introduce **time-bound investigative procedures**.
  - Enhance procedural transparency and accessibility.
- **Transparency and Disclosure Measures**
  - Mandate annual **asset declarations** by judges.
  - Expand RTI coverage over administrative functioning.
- **Administrative and Performance Reforms**
  - Strengthen **e-Courts systems** and case management tools.
  - Monitor pendency through public data platforms.
- **Structural Accountability Enhancements**
  - Consider the inclusion of the judiciary under the **Lokpal jurisdiction**.
  - Mandate publication of **annual judicial reports**.
  - Review the Contempt of Courts provisions to enable constructive scrutiny.

Conclusion

- Judicial accountability is integral to sustaining the **rule of law**. An independent judiciary commands legitimacy only when accompanied by **Ethical integrity, Institutional transparency, Public trust, and procedural fairness**. Accountability mechanisms must therefore strengthen and not undermine judicial independence.

Diversity In Judiciary

Context

- A Private Member's Bill was introduced by **Rajya Sabha MP P. Wilson**. The Bill proposes **constitutional amendments** to **enhance diversity** in higher judicial appointments.
- It also recommends establishing **regional benches** of the Supreme Court. The bill thus seeks to **institutionalise inclusivity** alongside preservation of **judicial independence.**

Constitutional Provisions Related to Judicial Independence

- **Article 124** provides for **the appointment of Supreme Court judges** by the President.
  - The President appoints judges after consulting the **Chief Justice of India**.
- **Article 217** governs the appointment of judges to High Courts.
  - The consultations include the **CJI, State Governor**, and the concerned **High Court Chief Justice.**
- **Article 130** designates Delhi as the permanent seat of the Supreme Court. The Court may sit elsewhere with CJI approval and consent of the Union government.

Challenges Faced by the Judiciary

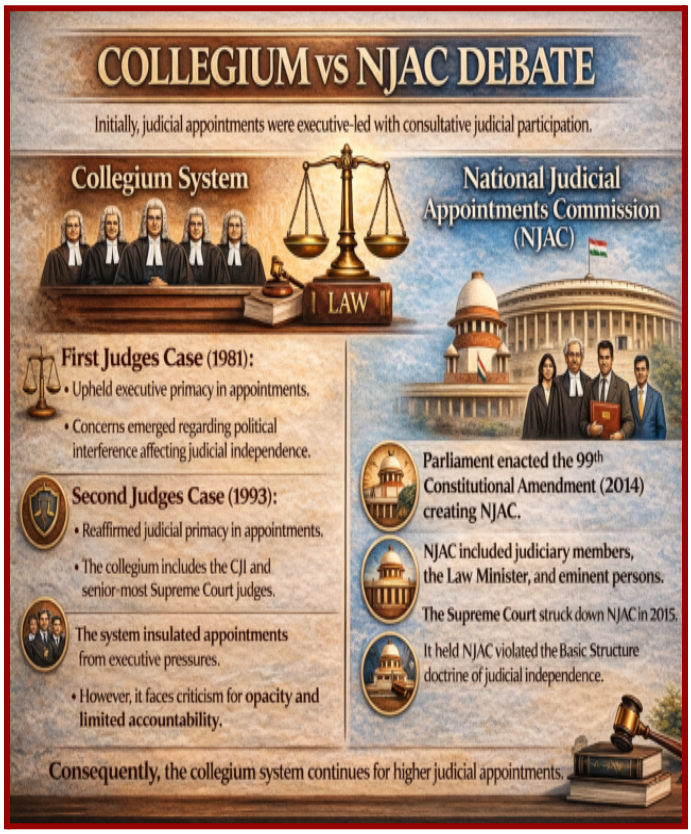
- **Diversity Deficit in the Higher Judiciary**
  - Higher judiciary appointments **insufficiently** reflect India's vast **social diversity.**
  - Between 2018 and 2024, only **around 20% judges** belonged to SC, ST, and OBC communities.

- Representation of **women remained below 15%** in higher judicial appointments.
- Religious minorities constituted **less than 5%** of judges in the higher judiciary.

- **Accessibility and Structural Constraints**
  - The Supreme Court currently functions only from **New Delhi**. Thus, the geographical centralisation **restricts physical access** for distant litigants.
  - **High travel and litigation costs** deter economically weaker citizens.
  - Further, the Case pendency exceeds **90,000 matters as of January 2026**.
  - Centralised functioning burdens **judicial efficiency** and **timely justice delivery.**

Way Forward

- **Institutionalising Judicial Diversity**
  - Diversity must be **consciously prioritised** within collegium recommendations.
  - **Constitutional backing** can institutionalise **inclusive judicial representation.**
  - **Reviving NJAC** with broader stakeholder participation remains a reform option.
  - Comparative models from **South Africa and the United Kingdom** offer institutional lessons.
  - Inclusion of Bar, academia, and civil society can broaden consultations.
- **Enhancing Access to Justice**
  - **Regional benches** can significantly enhance access to justice.
  - **Decentralisation** may reduce litigation costs and pendency burdens.
  - **Parliamentary Committees and the Law Commission** have supported such reforms.
  - The Court may begin with **one regional bench** initially and **gradual expansion** can follow administrative feasibility assessments.



Topic: Constitutional and Non-Constitutional Bodies

Independence of the Election Commission of India

Significance of Free and Fair Elections

- Free and fair elections form part of the **Basic Structure doctrine**, firmly established in ***Indira Gandhi vs Raj Narain (1975) case.***
- **Adult franchise under Article 326** is the bedrock of Indian democracy and any procedural impropriety in voter rolls directly undermines democratic participation.
- The **Election Commission under Article 324** holds **supervisory powers over elections** to the President, Vice-President, Parliament, and State Legislatures, making its independence foundational to constitutional governance.
- Electoral credibility determines the **legitimacy of representative government**, without an independent EC, the entire democratic framework is weakened.

Issues Regarding the Election Commission

- **Constitutional Safeguards**
  - The CEC holds office for **six years or until age 65**, whichever is earlier, providing security of tenure against political pressure.
  - Under **Article 324(5)**, the CEC can be removed only like a Supreme Court judge thus requiring proof of misbehaviour or incapacity under Article 124(4).
  - **Conditions of service cannot be altered** to the CEC's disadvantage during tenure, protecting institutional independence.
  - The EC became a **permanent multi-member body in 1993**, upheld in the *T.N. Seshan Case (1995)* and with the CEC acting as Chairman ensuring consensus-based decision-making.
- **Removal Procedure**
  - Removal requires a **quasi-judicial parliamentary process**, a motion needs signatures of 100 Lok Sabha or 50 Rajya Sabha members.
  - A **three-member committee** investigates allegations, comprising a Supreme Court judge, High Court Chief Justice, and a distinguished jurist.
  - The CEC is guaranteed **opportunity for defence** under the Doctrine of Natural Justice thus ensuring procedural fairness even in removal proceedings.

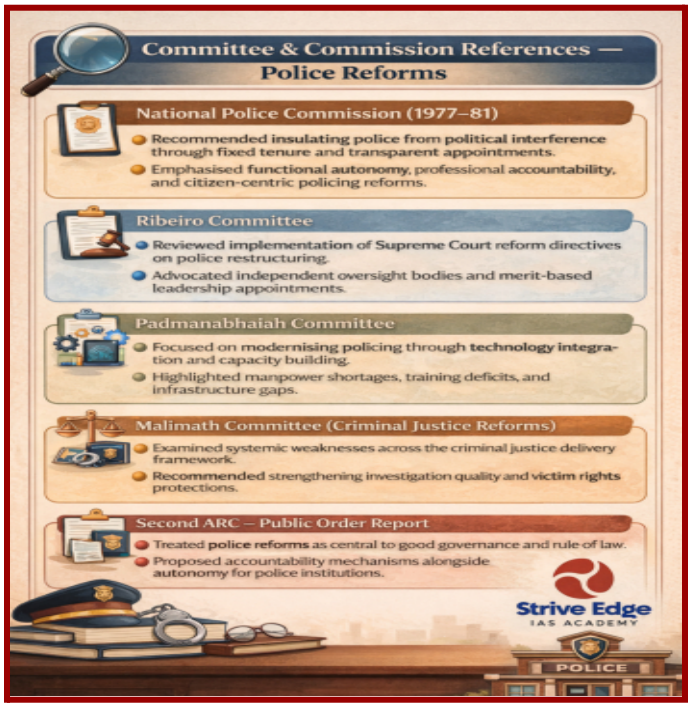
Issues with Recent Changes

- **Appointment Controversy**
  - The **Chief Election Commissioner and ECs Act, 2023** replaced the 1991 law, with appointments now made by a committee comprising the **Prime Minister, a Union Minister, and Leader of Opposition**.
  - The Act **excluded the Chief Justice of India**, contrary to the Supreme Court's recommendation in ***Anoop Baranwal Case (2023)***, which had specifically stressed judicial inclusion to ensure neutrality.
  - The Act is currently challenged in ***Jaya Thakur vs Union of India (2024)***, with critics arguing exclusion of the judiciary compromises **perceived institutional independence**.
- **Electoral Roll Concerns**
  - Allegations of **"vote theft"** emerged during the Special Intensive Revision exercise in Bihar, where approximately **65 lakh voter names were reportedly deleted**.
  - Such large-scale deletions raise serious concerns about **procedural propriety and the sanctity of adult franchise** under Article 326.
  - Dilution of institutional safeguards risks **destabilising democratic accountability**, the integrity of electoral rolls is as important as the integrity of elections themselves.

Conclusion: The **independence of the Election Commission** is central to ensuring **free and fair elections** in India. While constitutional safeguards are robust, preserving **institutional credibility and public trust** is equally essential. Democracy ultimately survives on the integrity of its electoral institutions.

Topics: Acts and Policies

Police Reforms ("Reform Begins at Police Station, Not in Court")



Context

- The **Supreme Court criticised states** for delaying police reforms despite long-pending directives, expressing concern over **non-implementation even after two decades**.

- States continue **ad-hoc appointments of DGPs**, undermining institutional autonomy and professional competence.
- The core problem **colonial Police Act of 1861** prioritised **regime control over citizen service**, a legacy that continues to shape policing attitudes today.

Key Challenges

- **Workforce and Capacity**
  - India has only **154.84 police personnel per 1,00,000 people** against the **UN norm of 222.**
  - Around **24% personnel work beyond 16 hours daily** and 44% work more than 12 hours regularly.
  - India has only **0.33 forensic scientists per 1,00,000 people** compared to 20–50 globally thus severely weakening **investigation quality.**
- **Institutional Failures**
  - Nearly **30% of personnel justified third-degree methods** even for minor offences per Status of Policing in India Report 2025.
  - A 2019 study found **72% officers faced pressure** in sensitive investigations, reflecting deep political interference.
  - Poor investigative capacity results in **wrongful arrests and weak conviction rates**.
- **Public Trust Deficit**
  - Marginalised communities perceive policing through **discrimination and fear**, eroding community intelligence mechanisms.
  - Successful community policing models like **Janamaithri (Kerala) and Mohalla Committees (Maharashtra)** remain isolated exceptions rather than the national norm.

Reform Imperatives and Way Forward

- **Implement Judicial Directives**
  - Full implementation of **Prakash Singh directives (2006)** including independent **State Security Commissions** and statutory **Police Complaints Authorities** remains the most urgent reform.
  - **Police Establishment Boards** must regulate transfers and postings transparently, insulating police from political interference.
- **Functional and Institutional Reforms**
  - **Separation of investigation and law-and-order functions** is essential to improve professional specialisation.
  - Dedicated units for **cybercrime, narcotics, and organised crime** must be expanded nationwide.
  - **NATGRID integration** can enhance counter-terror intelligence coordination across agencies.
- **Community and Accountability Reforms**
  - **Police-as-service model** must replace the colonial control-oriented approach through citizens' charters and public satisfaction audits.
  - Structured **police-public partnerships** can improve local intelligence and rebuild community trust.

Digital Personal Data Protection (DPDP) Act, 2023

Context

- The **DPDP Act, 2023** was enacted following the Supreme Court's landmark **Puttaswamy judgment (2017)**, which declared the **right to privacy** a fundamental right under **Article 21.**
- The Court had directed the government to establish a data protection regime, leading to the **Justice B.N. Sri Krishna Committee (2018)** and eventually the **DPDP Act, 2023.**

Key Provisions of the DPDP Act, 2023

- The Act establishes a **legal framework** for the protection and lawful processing of **digital personal data** collected within India, including non-digital data that is later digitised.
- Personal data may be processed **only for lawful purposes after obtaining valid consent**; data principals retain the right to withdraw consent at any time.
- **Data fiduciaries** must ensure accuracy, security safeguards, breach notification, and erasure of data once its purpose is fulfilled.
- The Act establishes the **Data Protection Board of India** for compliance; appeals lie before the **Telecom Disputes Settlement and Appellate Tribunal**.
- Consent is not required for **specified legitimate uses,** including government benefits and national

emergencies; notably, the state can process citizen data without consent under Section 7.

How DPDP Act Contradicts RTI Act

- **Section 44(3) of the DPDP Act** amended **Section 8(1)(j) of the RTI Act**, replacing a balanced exemption with a **blanket prohibition** on personal information disclosure, with no exceptions, even in larger public interest.
- Earlier, personal information of public servants could be disclosed **if public interest justified it**, a proportionate balance between privacy and transparency has now been removed.
- **Assets and liabilities** of public servants, **procurement records, audit reports, and public spending details** can now be rejected outright as "personal information."
- This effectively **shields public officials from accountability** under the garb of privacy protection, a serious democratic concern.
- A dangerous asymmetry emerges. **Section 7 allows the state to process citizen data without consent**, yet citizens cannot seek equivalent transparency from the government.
- Non-compliance penalties for journalists **up to ₹250 crore** risk creating a **chilling effect on investigative journalism** and press freedom.
- The statement of objects and reasons of the DPDP Bill is **silent about the intent** behind this RTI amendment, raising legislative transparency concerns.
- The amendment has been challenged as **ultra vires the Constitution** creating tension between **Article 19 (freedom of speech and information) and Article 21 (right to privacy)**.

Way Forward

- The Constitution Bench must **clearly define the scope of "personal information"** to prevent its misuse as a shield against public accountability.
- The **public interest override** within **Section 8(1)(j) of the RTI Act** must be restored to maintain democratic transparency.
- Privacy laws must be designed to **protect citizens from state surveillance** , not protect the state from citizen scrutiny.
- **Explicit protections for journalism** must be provided within the data protection framework to safeguard press freedom.
- India must draw lessons from the **EU's GDPR**, which successfully balances privacy protection with robust transparency safeguards.

Women's Reservation Act, 2023

Constitutional Framework

- The **Constitution (106th Amendment) Act, 2023**, popularly known as **Nari Shakti Vandan Adhiniyam**, provides one-third reservation for women.
- The Act inserts
  - **Article 330A**, reserving **one-third seats for women** in the Lok Sabha.
  - **Article 332A**, reserving **one-third seats** for women in **State Assemblies**.
  - **Article 239AA** was amended to extend a one-third reservation to the **Delhi Legislative Assembly**.
- The reservations will begin only after the next **delimitation exercise** conducted after **2026**.
- The Act includes a **15-year sunset clause**, extendable by Parliament through legislation.

Significance of the Act

- The Act is hailed as a milestone for **gender justice and political inclusion**.
- It ends a legislative struggle that began with the **1996 Women's Reservation Bill**.
- Women's representation strengthens **democratic legitimacy and accountability**.
- Greater participation may improve focus on **health, education, and welfare policies**.
- The Act symbolically affirms Parliament's commitment to **constitutional equality**.

Institutional and Design Gaps

- Reservation excludes the **Rajya Sabha and State Legislative Councils**.
- There is no **OBC sub-reservation**, despite OBC women forming nearly **40% of female population**.
- The Act mandates **rotation of reserved constituencies** after each election. However, the operational mechanism for rotation lacks clarity.
- Simultaneous rotation and delimitation may create administrative confusion.
- Ambiguities may trigger **legal challenges and political disputes**.

Way Forward

- Parliament can amend the Constitution to **delink reservation from delimitation**.
- Temporary expansion of the Lok Sabha can avoid the

displacement of incumbents.

- Reservations may be applied within **existing constituencies for initial cycles**.
- Clear and transparent **rotation rules** must be developed through consultation.
- Inclusion of **Upper Houses and OBC women** should be reconsidered.
- Political will is essential to convert constitutional promise into reality.

Conclusion: The Act represents a historic commitment to **gender equality in politics**. However, structural linkage with Census and delimitation has deferred implementation. **As the representation delayed risks becoming representation denied** thus timely execution is necessary to uphold India's constitutional vision of equality.

Protection of Children from Sexual Offences (POCSO) Act, 2012

Historical Background

- The **IPC had no clear definition** of child sexual abuse, and non-penetrative assault and child pornography were not recognised as separate offences. India's ratification of **UNCRC in 1992** created **international obligations** to establish a specialised legal framework for child protection, investigation, and victim support.
- The **172nd Law Commission Report** specifically recommended enacting a distinct law to address sexual crimes against children.
- These events thus led to the enactment of the **Protection of Children from Sexual Offences (POCSO) Act, 2012**.

Key Objectives of POCSO Act

- Safeguard children below **18 years** from sexual assault, harassment, and pornography.
- Ensure **gender-neutral coverage**, protecting both boys and girls equally under the law.
- Provide **child-friendly procedures** for reporting, medical examination, and trial to minimise trauma.
- Make reporting of child sexual offences a **mandatory legal duty** for individuals and institutions.
- Establish **Special Courts** for speedy disposal of cases within prescribed timelines.
- Prescribe enhanced penalties including **life imprisonment and death penalty** after the 2019 amendment.

Key Changes in the 2019 Amendment

- Introduced the **death penalty** for aggravated penetrative sexual assault.
- Increased minimum sentences to **10–20 years** for penetrative offences and **20 years to life** for aggravated offences.
- Expanded the definition of child pornography to include **storage, browsing, and transmission**.
- Enhanced punishment for pornography-related offences to **3–7 years** and **5–10 years** for repeat offenders.
- Strengthened victim protection through **interim compensation** and **support person** provisions under Rules 2020.

Criticisms and Challenges

- Many POCSO cases involve romantic relationships among **16–18 year olds**, leading to criminal charges against boys despite the girl's consent, raising serious concerns about **over-criminalisation** of **adolescent relationships.**
- Weak evidence collection, hostile witnesses, and procedural lapses continue to result in **low conviction rates**, reducing the Act's overall effectiveness.
- Despite the existence of fast-track courts, many **cases exceed mandated timelines** due to shortage of judges, forensic delays, and high pendency.
- The Act is sometimes **misused in family or custody disputes** to pressure the opposite party, burdening courts with false or exaggerated complaints.
- Critics argue that the **death penalty** may lead to underreporting, especially since over **90% of cases** as per NCRB data involve perpetrators known to the child.
- Compensation delays, lack of counsellors, and inconsistent support-person mechanisms continue to weaken **post-abuse rehabilitation**.
- The **absence of a centralised monitoring system** makes it difficult to track investigation quality, pendency, or trial outcomes at the policy level.

Way Forward

- Dedicated child protection units, timely forensic examination, and better use of DNA and FSL infrastructure are needed to **strengthen investigation capacity**.
- The number of POCSO courts must be increased, judicial vacancies filled, and case completion

mandated within one year to **improve fast-track court efficiency**.

- Mandatory specialised training for police, prosecutors, medical staff, counsellors, and Child Welfare Committee members will ensure **standardised institutional response**.
- More child-friendly courts, support persons, counselling facilities, separate waiting rooms, and video-conferencing testimonies will help **reduce trauma during trial**.
- Community-based reporting mechanisms, school awareness programmes, and sensitisation of parents and teachers are essential to **reduce underreporting**.
- Judicial and legislative clarity is needed to **prevent criminalisation of consensual relationships** among teenagers while maintaining child protection standards.
- Timely compensation, long-term psychological care, safe shelter homes, and monitored reintegration are essential to **strengthen rehabilitation mechanisms**.

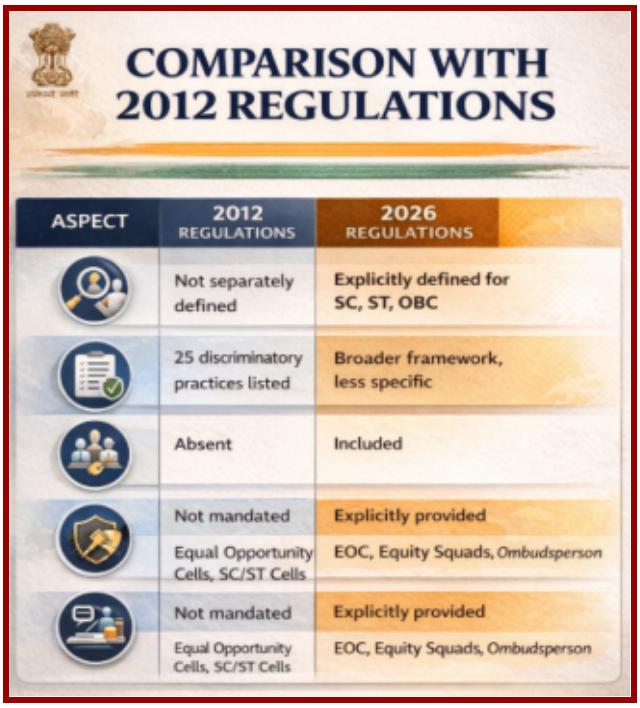
Topic: Education and Health

UGC Equity Regulations 2026

Context: The Supreme Court stayed the **equity regulations** of the University Grants Commission (UGC), observing they were vague and susceptible to misuse, directing a return to the 2012 rules until further hearing.

Key Provisions of the 2026 Regulations

- **Duty of Higher Education Institutions:** Every institution must actively prevent discrimination, with the Head of Institution personally accountable for implementation.
- **Equal Opportunity Centre (EOC):** Each institution must establish an EOC to support disadvantaged groups through counselling, guidance, and inclusion programmes.
- **Equity Squads and Ambassadors:** Institutions must create "Equity Squads" for campus vigilance and appoint "Equity Ambassadors" in every department as nodal officers for EOC activities.
- **Equity Committee:** A committee with representation of **SC, ST, OBC, women, and PwD** must inquire into complaints and submit reports within **15 working days**.
- **Grievance Redressal:** Aggrieved persons may appeal before the **Ombudsperson within 30 days**, who must dispose of the appeal within another 30 days.
- **Penalties for Non-Compliance:** Non-compliant institutions can be **barred from UGC schemes, stopped from running degree programmes, or removed** from the list of recognised institutions.



Criticisms of 2026 Regulations

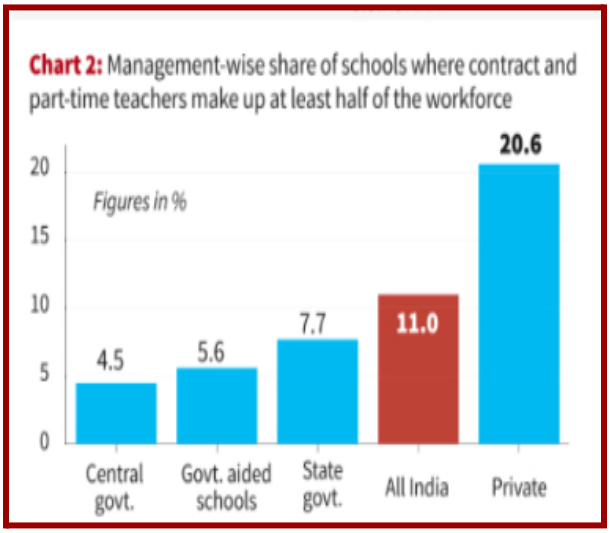
- The definition of caste-based discrimination **excludes protections for general category students**, raising inclusivity concerns.
- Absence of a **"false complaint" provision** creates risk of procedural misuse.
- Ambiguity around the **powers of Equity Squads** drew significant criticism from academics and institutions.
- Critics argued the regulations **presupposed perpetrators** belonged to specific social categories, raising **natural justice** concerns.

Way Forward

- The Supreme Court has **framed legal questions** on scope, inclusivity, and institutional accountability; thus, hearings are scheduled for March 2026.
- Regulations must **clearly define the powers and procedures** of Equity Squads to prevent misuse.
- A **false complaint deterrence mechanism** must be incorporated to ensure a fair process for all parties.

- The framework must **balance the protection of marginalised groups** with procedural fairness and constitutional guarantees.
- **Annual monitoring reports** on EOC functioning must be made publicly available to ensure genuine institutional accountability.

Contract Teachers in India



Context

- Contract teachers in **Puducherry protested, demanding job regularisation** with a protest march. The issue reflects a **nationwide structural problem** and is **not** merely a **local administrative failure.**

Nature and Scale of the Problem

- Contract teachers are variously termed **para teachers, guest teachers, and Shiksha Mitras** across different states.
- States began recruiting them since the **early 1990s to address acute teacher shortages**, appointing them on short-term contracts with lower remuneration.
- Despite performing duties **equivalent** to those of **regular teachers**, they **lack pay parity, job security, and service benefits.**
- **UDISE+ data** shows that contract teachers form about **16% of India's total teaching workforce**, over **16 lakh teachers** employed on a contractual or part-time basis.
- In over **1.5 lakh schools**, contract staff form **at least half the workforce**, indicating structural reliance far beyond temporary staffing gaps.

Geographic and Institutional Distribution

- About **21% of private schools** have a majority contractual teaching workforce, the highest reliance among all school categories.
- Nearly **8% of state government schools,** over 77,000 institutions, show similarly high dependence on contract teachers.
- High dependence is concentrated in **the northeastern states,** including Mizoram, Arunachal Pradesh, and Meghalaya.
- Over **30% of schools in Jharkhand, Haryana, and Chandigarh** are significantly affected.
- The pattern is **consistent across both rural and urban regions**, suggesting teacher shortages alone do not explain the scale of contractual hiring.

Policy Rationale and Its Limitations

- States view contractual hiring as a **cost-effective staffing solution** — World Bank (2009) noted contract teacher salaries are often **one-fourth of regular teachers**.
- Lower wage burden has helped states **maintain teacher availability** in schools, particularly in remote and underserved areas.
- However, this cost-saving rationale has **normalised a precarious workforce**, with contracts frequently extended without permanent absorption.
- Persistent contractualisation raises serious concerns about **equity, quality of education, and long-term workforce stability**.
- The **Punjab and Haryana High Court** ruled against the **misuse of contractual appointments**, ordering the regularisation of Chandigarh SSA teachers with **over 10 years of service.**

Way Forward

- States must develop **clear, time-bound regularisation policies** for contract teachers with substantial years of service.
- **Pay parity and service benefits** must be progressively extended to contractual teachers performing equivalent duties.
- The **Right to Education Act** framework must be strengthened to ensure schools are staffed with adequately trained and fairly compensated teachers.
- **NEP 2020's vision** of a well-trained, motivated teaching workforce cannot be realised while over 16 lakh teachers remain in precarious contractual employment.
- A **National Framework for Teacher Workforce Rationalisation** must be developed to reduce

structural dependence on contract teachers across states.

Health Sector Allocations in Union Budget 2026

Context and Overall Allocation

- Union Budget 2026 allocated **over ₹1.05 lakh crore** to the health sector, marking nearly **10% increase** over the previous year's revised estimates.
- However, health spending forms only **1.9% of total government expenditure** and accounts for a mere **0.26% of GDP**, well below the **2.5% of GDP target** committed under the **National Health Policy 2017**.
- The budget fell short of being a **landmark expansion in health funding**, with the **National Health Mission allocation reduced** despite strong utilisation records.

Major Flagship Announcements

- **Biopharma SHAKTI Initiative:** The government launched a ₹10,000 crore scheme over five years to make India a hub for biologics and biosimilars manufacturing.
- **Clinical Research Infrastructure:** A nationwide network of 1,000 accredited clinical trial sites proposed to strengthen India's long-neglected research and development ecosystem.
- **Institutional Expansion:** Three new National Institutes of Pharmaceutical Education and Research announced with seven existing institutes to be modernised and upgraded.
- **Mental Health Infrastructure:** A second NIMHANS campus in north India and upgradation of two national mental health institutes announced to expand specialised care capacity.

Human Resources and Affordability Measures

- **Human Resource Development**
  - Target to train **one lakh allied health professionals over five years** to address India's chronic shortage of trained health workers.
  - An additional **1.5 lakh elderly care workers** to be trained, aligning with India's transition toward a rapidly ageing population.
- **Affordability Measures**
  - Customs duty **exempted on 17 cancer medicines** and treatments for rare diseases, directly improving patient access and affordability.
  - **Tax collected at source** on medical remittances has been cut from **5% to 2%**, reducing the financial burden on patients seeking treatment abroad.

Key Concerns

- The **2.5% of GDP health spending commitment** under the National Health Policy 2017 remains unmet, an ongoing policy credibility concern.
- **Reduction in NHM allocation** despite strong utilisation signals a concerning shift away from primary healthcare investment.
- **Declining Central share** in health spending may create **regional disparities in healthcare access and quality** across states with weaker fiscal capacity.

Way Forward

- India must urgently **increase health spending toward the 2.5% of GDP target** to build a resilient and equitable health system.
- **NHM funding must be protected and expanded** as it remains the backbone of primary healthcare delivery, particularly in rural areas.
- **Federal coordination mechanisms** must ensure that fiscal devolution translates into equitable health outcomes across all states, not just fiscally stronger ones.

AYUSH Sector Push in Union Budget 2026-27

Context and Budgetary Push

- Union Budget 2026-27 announced a major financial push for the AYUSH sector with total allocation increasing to **₹4,408 crore from ₹3,992 crore**, rising sharply from just **₹2,122 crore in 2020-21**.
- **National AYUSH Mission allocation increased by 66% to ₹1,300 crore**, reflecting growing policy emphasis on traditional medicine expansion and integration.
- The AYUSH market is **projected at $26.5 billion by 2026**, with startups and MSMEs forming nearly **80% of the sector**.

Institutional Expansion and Infrastructure

- The government will establish **three new All-India Institutes of Ayurveda**, modelled on AIIMS-like standards for traditional medicine, providing treatment, research, and advanced teaching facilities.

- Funds allocated to upgrade the **WHO Global Traditional Medicine Centre** in Jamnagar, positioning India as a global standard-setter in traditional medicine.
- Funds will **modernise AYUSH hospitals and dispensaries nationwide**, with AYUSH clinics co-located within modern healthcare facilities.
- **Pharmacies and drug-testing laboratories** will also be upgraded to strengthen quality assurance infrastructure.

Technology Support

- **AI assistant Bharat-VISTAAR** will support medicinal plant farmers with crop advice, price data, and export certification support.
- **National Medicinal Plants Board** promotes herb cultivation to strengthen the domestic supply chain.

India-EU FTA and Global Expansion

- The FTA allows **Indian AYUSH practitioners easier entry into Europe**, with degree recognition barriers reduced in non-regulated EU countries.
- Indian firms can **open wellness centres and Ayurvedic clinics in Europe**, with mutual recognition of lab testing and safety certifications enabled.
- **Traditional Knowledge Digital Library gains legal protection abroad**, safeguarding India's intellectual heritage from misappropriation.

Institutional Framework

- Sector includes key institutes like **All-India Institute of Ayurveda and National Institute of Homoeopathy**, with research led by the **Central Council for Research in Ayurvedic Sciences**.
- Education regulated by **National Commissions for Indian Medicine and Homoeopathy**; drug standards set by the **Pharmacopoeia Commission**.

Scientific and Regulatory Concerns

- Critics highlight **limited empirical clinical evidence** for several AYUSH treatments and concerns about **heavy metals in some products**.
- Debate persists over **mixopathy and surgical training rights** for AYUSH practitioners.
- **Prescription of allopathic drugs by AYUSH doctors** remains a contentious and unresolved regulatory challenge.
- **Global expansion** will increase international scrutiny and regulatory expectations, requiring India to strengthen evidence-based validation of traditional medicines.

Topic: Important aspects of governance, transparency and accountability, e-governance

Corruption Perceptions Index 2025

Context

- India ranked **91st** in the **Corruption Perceptions Index (CPI) 2025**. India scored **39**, remaining below the global average.
- The index is published annually by **Transparency International** assessing public sector corruption globally.

Findings and Global Trends

- CPI evaluates **182 countries** on a scale of **0 (highly corrupt) to 100 (very clean)**.
- Global average dropped to **42**, reflecting declining governance standards.
- Over **two-thirds nations scored below 50**, indicating systemic corruption challenges.
- **Asia-Pacific region** witnessed slow anti-corruption progress.
- **Political funding** opacity weakened democratic accountability.
- **Denmark** ranked cleanest (score 89).
- **Somalia and South Sudan** ranked lowest (score 9).
- Report flagged India among countries unsafe for **journalists probing corruption**.

Drivers of Corruption in India

- **Administrative and Institutional Drivers**
  - **Bureaucratic red tape** creates rent-seeking opportunities.
  - Complex approvals encourage bribery for procedural clearances.
  - Enforcement remains weak with **low conviction rates**.
- **Political and Governance Factors**
  - **Opaque electoral funding** sustains money power influence.

- Political finance transparency reforms remain incomplete.

- **Protection and Accountability Deficits**
  - **Whistleblowers and journalists** face threats and harassment.
  - Investigations into mining and resource mafias remain risky.
- **Socio-Cultural Dimensions**
  - Normalisation of **petty bribery ("speed money")** persists.
  - Citizens pay intermediaries to avoid bureaucratic delays.

Government Initiatives

- **Digital Governance Reforms**
  - Expansion of **e-governance** reduced human interface.
  - **Direct Benefit Transfer (DBT)** curtailed leakages and middlemen.
- **Legal and Institutional Measures**
  - **Prevention of Corruption (Amendment) Act 2024** strengthened penalties.
  - Introduced provisions for **asset forfeiture**.
  - **Central Vigilance Commission** upgraded with forensic and AI tools.
- **Technological Transparency Tools**
  - **Blockchain systems** introduced in land records and procurement.
  - Digital trails enhanced transaction accountability.

Way Forward

- Ensure **functional autonomy** of anti-corruption agencies.
- Establish **fast-track courts** for time-bound corruption trials.
- Strengthen protection for **journalists and whistleblowers**.
- Reform **political finance systems** for transparency.
- Expand ethics and integrity training in governance institutions.

Conclusion: India's improved rank signals **gradual reform progress**. However, a score of 39 reflects persistent structural corruption. Corruption continues to erode **citizen trust and service delivery**. Sustained institutional accountability is vital for **inclusive development and democratic credibility**.

PRELIMS

Topic: Constitutional, Statutory and Executive Bodies

National Human Rights Commission (NHRC)

Basic Facts

- Statutory body under **Protection of Human Rights Act, 1993**
- **Headquarters:** New Delhi
- Protects **life, liberty, equality, and human dignity.**

Composition

- **Chairperson:** Former Chief Justice of India or Supreme Court Judge
- **One** former Supreme Court Judge
- **One** former High Court Chief Justice
- **Three** human rights experts (including **one mandatory woman member**)
- **Ex-Officio Members**
  - **Chairpersons of National Commission for** Minorities (NCM), Women (NCW), Backward Classes (NCBC), Protection of Child Rights (NCPCR).
  - **Chief Commissioner** for Persons with Disabilities

Appointment & Removal

- Appointed by the **President of India** on the recommendation of a **high-level selection committee**
- The Selection Committee, chaired by the **Prime Minister,** includes the Home Minister, the Lok Sabha Speaker, the Deputy Chairman of Rajya Sabha, and the Leaders of the Opposition in both Houses
- Removed by the **President after the Supreme Court inquiry** on grounds of misbehaviour, insolvency, conviction, or paid employment
- **Tenure: 3 years or age 70**, whichever is earlier.

Key Powers & Functions

- Enjoys **civil court powers** for evidence and witnesses
- Can summon, examine, and demand official documents
- Can approach **Supreme Court and High Courts**

- Visits **prisons and detention centres**
- Submits **annual reports** to Parliament and State Legislatures
- **Armed Forces**
    - Can only **seek reports and recommend actions**, the Central Government must inform action within **three months.**

2019 Amendment Highlights

- Chairperson eligibility **expanded to Supreme Court judges.**
- Members increased to **three** including mandatory **woman member.**
- Added **NCBC, NCPCR, and PwD Commissioner** as deemed members.
- UTs placed under **State Commissions**, except Delhi.

Chief Election Commissioner (CEC)

Basic Facts

- Head of the **Election Commission of India (ECI)**
- **Supervises elections to:** Parliament, State Legislatures, President, and Vice-President
- **Constitutional Basis:** Article 324

Appointment

- Appointed by the **President of India.**
- As per **2023 Act**, the Selection Committee comprises:
    - **Prime Minister**
    - **Leader of Opposition (Lok Sabha)**
    - **Union Cabinet Minister** nominated by PM
- **Tenure: 6 years or till age 65**, whichever is earlier

Removal

- Governed by **Article 324(5)** in the same manner as **Supreme Court Judge removal** (linked to Article 124(4))
- **Grounds:** Proved misbehaviour or incapacity
- Requires **special majority** i.e. **majority of total membership** + **two-thirds present and voting** in both Houses
- Final **Presidential order** for removal

National Medicinal Plants Board (NMPB)

Basic Facts

- Established in **2000** by the Government of India
- Functions under **Ministry of AYUSH**
- **Apex national body** for promotion and development of the medicinal plants sector

Key Functions

- Promotes **in-situ and ex-situ conservation** of medicinal plants
- Encourages **cultivation and sustainable availability** of medicinal plant resources
- Supports **R&D, training, and skill development**
- Supports **herbal awareness** initiatives — home and school herbal gardens
- Encourages **IPR protection** related to medicinal plants
- Undertakes **identification, inventorisation, and quantification** of medicinal plant resources

National Medicinal Plants Board (NMPB)

Context: The **National Medicinal Plants Board (NMPB)** organised a **one-day Chintan Shivir** at Vigyan Bhawan, New Delhi, to review sectoral development.

About NMPB

- Established in **2000** by the Government of India.
- Functions under the **Ministry of AYUSH** *(Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy).*
- It is the **apex national body** for promotion and development of medicinal plants sector.

Key Functions

- Promotes **in-situ and ex-situ conservation** of medicinal plants
- Encourages **cultivation and sustainable availability** of medicinal resources
- Supports **R&D, training, and skill development**
- Encourages **IPR protection** for medicinal plant-related patents
- Undertakes **identification, inventorisation, and quantification** of medicinal plant resources

Directorate General of Civil Aviation (DGCA)

Context: The **DGCA revised passenger refund norms**, placing **refund responsibility** on airlines even for tickets booked through travel agents/portals.

About DGCA

- **Regulatory body** in civil aviation primarily dealing with **safety issues** ensuring air transport security nationwide.
- **Attached office of Ministry of Civil Aviation** functioning under administrative control for policy implementation.
- **Headquarters: New Delhi** serving as central hub for civil aviation regulation in India.

Mandate of DGCA

- **Responsible for regulation** of air transport services **to/from/within India** and enforcement of **civil air regulations**.
- Enforces **air safety and airworthiness standards** ensuring compliance by airlines and aircraft operators comprehensively.
- Coordinates regulatory functions with **International Civil Aviation Organisation (ICAO)** for global aviation standards alignment.

Key Functions

- Regulates **air transport services** to/from/within India
- Enforces **air safety and airworthiness standards**
- Coordinates with **ICAO (International Civil Aviation Organisation)** for global aviation standards
- Investigates **incidents and accidents** within Indian airspace
- Works with **Airports Authority of India (AAI)** for air traffic regulation
- Issues **licenses and certificates** to pilots, aircraft maintenance engineers, and aviation personnel

Competition Commission of India

Context: The **Competition Commission of India (CCI) vs WhatsApp** case represents a **pivotal battle in regulatory evolution**, addressing whether dominant digital platforms can impose **unilateral policy changes** on users.

Competition Commission of India (CCI)

- It is India's **statutory** competition regulator established under the **Competition Act, 2002**.
- Formally set up in **2003** and became fully operational in **2009**.
- Functions under the **Ministry of Corporate Affairs.**
- Headquarters located in **New Delhi**.
- **Composition & Appellate Authority**
  - Comprises a **Chairperson and six Members**.
  - Members are appointed by the **Central Government**.
  - Appellate authority is the **National Company Law Appellate Tribunal.**

Core Functions & Powers of CCI

- Prevents **anti-competitive practices** and abuse of **dominant market position**
- Regulates **mergers and acquisitions** to prevent monopolies
- Enjoys powers equivalent to a **civil court**
- Can **inquire, investigate, and impose penalties**
- Advises government on **competition-related policy**
- Established **Digital Markets Division** for technology-driven competition issues

National Commission for Scheduled Tribes (NCST)

Constitutional Status & Establishment

- The **National Commission for Scheduled Tribes (NCST)** is a constitutional body.
- Established under **Article 338A** of the Constitution.
- Created by the **Constitution (89th Amendment) Act, 2003**. Formed after the bifurcation of the earlier SC/ST Commission.

Composition

- **Consists of:** Chairperson+ Vice-Chairperson+ Three Members
- All appointed by the **President of India**.
- Members generally have expertise in **tribal administration and social justice**.

Key Functions

- Monitors constitutional and legal **safeguards for Scheduled Tribes**.
- Inquires into complaints of **rights violations and land alienation**.
- Advises on socio-economic development programmes for STs.
- Submits **annual and special reports to the President**.
- Union and States are expected to **consult NCST on major tribal policy matters**.

Powers

- Possesses powers of a **civil court** while investigating cases.
- Can summon individuals and demand **production of documents**.
- Can receive evidence and examine witnesses under oath.

Enforcement Directorate (ED)

Context: The **ED** has identified **eight priority focus areas** viz; Foreign asset tracking, IBC misuse, trade-based money laundering, cyberfraud, illegal online gambling, drug financing, share market manipulation, and foreign interference funding.

About Enforcement Directorate (ED)

- **Mandate:** ED investigates **money laundering** and **foreign exchange violations**.
- **History:**
  - Established in **1956** as the 'Enforcement Unit' under the Ministry of Finance.
  - Renamed the **Enforcement Directorate** in **1957**; control moved to the Department of Revenue.
- **Headquarters & Offices:**
  - HQ: **New Delhi**.
  - Regional offices: **Mumbai, Chennai, Chandigarh, Kolkata, Delhi**.
- **Leadership:** Headed by the **Director of Enforcement**; tenure **2 years**, extendable up to **5 years**.
- **Key Laws Administered:**
  - **Prevention of Money Laundering Act (PMLA), 2002:** Detects and prosecutes money laundering; allows confiscation; **burden of proof reversal**.
  - **Foreign Exchange Management Act (FEMA), 1999:** Governs foreign exchange violations; quasi-judicial powers to impose penalties.
  - **Fugitive Economic Offenders Act (FEOA), 2018:** Attaches properties of offenders fleeing India.
  - **Conservation of Foreign Exchange and Prevention of Smuggling Activities Act (COFEPOSA), 1974:** Enables preventive detention in foreign exchange offenses.
- **Powers of ED:**
  - **Investigative:** Summon, record statements, conduct searches, seize property/documents.
  - **Arrest & Detention:** Arrest suspects based on evidence with legal justification.
  - **Attachment & Confiscation:** Temporarily attach assets up to **180 days**; permanently confiscate after conviction.
  - **Quasi-Judicial:** Adjudicate FEMA violations and impose penalties.

Telecom Regulatory Authority of India (TRAI)

Context: TRAI recommended that the **entire available radiowave spectrum** should be **auctioned**, while proposing **lower entry barriers** for new players and a **uniform 35% spectrum cap** to safeguard competition in the telecom sector. Industry calculations estimate the spectrum could fetch nearly **₹81,000 crore at reserve price** if all bands are sold.

Establishment of TRAI

- TRAI was established under the **TRAI Act, 1997**, passed by Parliament
- Primary mandate is to **regulate telecom services in India**, including tariff fixation and revision, a function that was **earlier handled** by the Central Government.

Scope of Regulation

- TRAI covers areas such as **tariffs, quality of service, interconnection, spectrum management, and consumer protection** in the telecom sector.
- It issues **regulations, recommendations, and orders** that guide telecom policy-making and market practices.

Composition of TRAI

- Consists of a **Chairperson**, a maximum of **two full-time members**, and **two part-time members.**
- All appointments are made by the **Central Government.**
- Members serve for **three years or until the age of 65 years**, whichever is earlier.

Government Control over TRAI

- TRAI is **not a fully independent body** and it operates under certain executive constraints.
- Under **Section 25 of the TRAI Act**, the Central Government can issue **binding directions** to TRAI.
- TRAI's **funding** is provided by the **Central**

Government.

- TRAI's recommendations are **advisory, not binding**; however, the Government must **consult TRAI** for licensing of service providers
- TRAI can notify **telecom service rates in the Official Gazette** for services within and outside India

Central Drugs Standard Control Organization (CDSCO)

Context: The **CDSCO** has revised testing norms to **speed up new drug approvals** by allowing companies to **begin laboratory testing immediately** after filing applications, **eliminating waiting periods** for detailed scrutiny.

Basic Overview

- It is the **National Regulatory Authority (NRA)** of India for the medical devices industry
- Operates under the provisions of the **Drugs & Cosmetics Rules**
- Functions under the **Ministry of Health & Family Welfare**
- **Headquarters:** New Delhi
- Headed by the **Drugs Controller General of India (DCGI)**
- Under the **Drugs and Cosmetics Act**, CDSCO is responsible for:
    - Approval of **New Drugs**
    - Conduct of **Clinical Trials**
    - Laying down **standards for Drugs**
    - Control over the **quality of imported Drugs**
    - Coordination of activities of **State Drug Control Organizations**
- CDSCO, along with state regulators, is **jointly responsible** for granting licenses for certain specialized categories of critical drugs, including:
    - Blood and Blood Products
    - I.V. Fluids
    - Vaccines and Sera

Central Ground Water Board (CGWB)

Basic Facts

- **National apex agency** for scientific groundwater management
- Under **Ministry of Jal Shakti** (Department of Water Resources, River Development and Ganga Rejuvenation)
- Established in **1970** by renaming the **Exploratory Tube Wells Organisation**
- Merged with Ground Water Wing of **Geological Survey of India in 1972**
- **Headquarters:** Bhujal Bhawan, **Faridabad, Haryana**

Key Functions

- Implements **National Aquifer Mapping and Management Programme (NAQUIM)**
- Conducts **groundwater exploration and aquifer delineation** studies
- Performs **periodic national groundwater resource assessments**
- Monitors **groundwater levels and quality** through observation wells

Petroleum and Natural Gas Regulatory Board (PNGRB)

About PNGRB

- Established under **PNGRB Act, 2006**
- **Headquarters:** New Delhi
- Regulates the **downstream petroleum and natural gas sector** in India

Key Objectives

- Protect **consumer interests** in petroleum and gas markets
- Promote **fair trade and competition**
- Ensure **adequate and uninterrupted fuel supply**

Key Functions

- **Authorisation:** Approves entities to build **pipelines, LNG terminals, CGD networks**
- **Tariff regulation:** Fixes **transportation tariffs** for common and contract carriers
- **Market regulation:** Prevents **restrictive trade practices**
- **Technical oversight:** Prescribes **standards and safety norms**

Topic: Acts and Government Initiative

Mahatma Gandhi Gram Swaraj Initiative (MGGSI)

Context: The Union Budget 2026–27 announced the launch of the Mahatma Gandhi Gram Swaraj Initiative to strengthen khadi, handloom, and handicrafts sectors.

About the Initiative

- Announced in **Union Budget 2026–27**
- Government initiative to **strengthen traditional rural craft industries**
- Focuses on **Khadi, Handloom, and Handicrafts** sectors
- **Target Beneficiaries**
  - Weavers and village industry workers
  - ODOP (One District One Product) scheme beneficiaries
  - Rural youth and artisan communities
- **Key Objectives**
  - Improves **global market access** for traditional products
  - Strengthens **branding and organised market linkages**
  - Encourages **modern production methods** while preserving **traditional craftsmanship**
  - Enables access to **organised retail, export markets, and digital marketplaces**
  - Reduces **fragmented supply chain inefficiencies**
- **Policy Alignment**
  - Supports Vocal for Local initiative
  - Strengthens MSMEs
  - Aligns with Atmanirbhar Bharat vision

SabhaSaar Initiative

Context: Over 1.11 lakh Gram Panchayats adopted SabhaSaar by January 2026.

About SabhaSaar Initiative

- An **AI-enabled Gram Sabha meeting summarisation platform**
- Generates structured **Minutes of Meetings (MoM)**
- **Launched:** 14 August 2025
- **Nodal Ministry:** Ministry of Panchayati Raj
- **Technology Partner:** IndiaAI Mission (under Ministry of Electronics & IT)
- Over **1.11 lakh Gram Panchayats** adopted SabhaSaar by **January 2026**

Key Features

- **AI Transcription:** Voice-to-text conversion — captures decisions and action points
- **Multilingual Support:** Integrated with **Bhashini** — supports **13 Indian languages**
- **Data Governance:** Hosted on government infrastructure; **DPDP Act compliant**
- **Governance Analytics:** Tracks attendance, resolutions, and follow-up actions

Significance

- Digitises **Gram Sabha documentation**
- Strengthens **grassroots governance and accountability**
- Reduces **manual documentation workload**
- Supports **Digital India** initiatives

Centre's Guidelines on 'Vande Mataram'

Context: Union Government issued fresh guidelines on **'Vande Mataram'** rendition and mandates singing of **all six stanzas** at official functions.

About Vande Mataram

- Authored by **Bankim Chandra Chatterjee**
- New guidelines mandate singing of **all six stanzas** at official functions
- **Prescribed duration:** 3 minutes 10 seconds
- **Mandatory Occasions**
  - Civil investiture ceremonies
  - Official state functions
  - Arrival and departure of the President of India
  - Before and after Presidential address broadcasts
  - On Akashwani and Doordarshan transmissions
- **State Level**
  - Played during **official state ceremonies**
  - On arrival/departure of **Governors and Lieutenant Governors**
- **Cultural & Educational Functions**
  - **Mandatory group singing** at cultural programmes
  - Applicable during **flag-hoisting ceremonies**
  - Included in **morning school assemblies**

- **Protocols During Rendition**
  - Audience must stand in **attention posture**
  - **Drumroll using mridang or trumpet** precedes rendition
  - Marching drills require **seven preparatory steps**
- **Exception Clause**
  - **Not mandatory** in cinema halls
  - Exempt when part of **films or newsreels**

Topic: Functioning of Parliament and State Legislature

President's Rule (Article 356)

Context: President's Rule ended in **Manipur**; **Yumnam Khemchand Singh** sworn in as **Chief Minister**.

What is President's Rule?

- **President's Rule** = Suspension of State Government + Legislative Assembly.
- State comes under **direct control of Union Government**.
- Also called **State Emergency / Constitutional Emergency**.
- Imposed under **Article 356**.
- **Constitutional Basis**
  - **Article 355**: Union ensures States function as per Constitution.
  - **Article 356**: Proclamation of President's Rule.
  - **Article 365**: Non-compliance with Union directions → Ground for Rule.
- **Grounds for Imposition**
  - Breakdown of **constitutional machinery** in State.
  - Governor's report or other credible information.
  - Failure to follow Union Government directions.
- **Parliamentary Approval**
  - Must be approved within **2 months** by Parliament.
  - If Lok Sabha dissolved → Valid till **30 days after reconstitution**.
  - Requires **Simple Majority** (present and voting).
- **Duration**
  - Initial period → **6 months**.
  - Extendable every 6 months → Maximum **3 years**.
  - Beyond 1 year → Requires:
    - National Emergency in force, OR
    - **Election Commission certification**.
  - Beyond 3 years → **Constitutional Amendment** required.
- **Revocation**
  - President may revoke **anytime**.
  - No Parliamentary approval required.

Effects of President's Rule

- **Executive**
  - President assumes State executive powers.
  - Governor acts on behalf of President.
- **Legislative**
  - Assembly suspended/dissolved.
  - Parliament legislates for State (Art 357).
- **Financial**
  - President authorises expenditure from **Consolidated Fund of State**.
  - Later Parliamentary approval required.
- **Fundamental Rights**
  - **No suspension** of Fundamental Rights.
  - Differs from National Emergency.

Key Judicial Pronouncements

- **S. R. Bommai Case (1994):** Judicial review allowed and the floor test made mandatory.
- **Sarbananda Sonowal Case (2005):** Reinforced Union duty under Article 355.
- **Rameshwar Prasad Case (2006):** Assembly dissolution without floor test invalid.

Motion of Thanks

Context: Motion of Thanks discussed following President's Address in Parliament.

What is Motion of Thanks?

- Parliamentary motion expressing gratitude to President's Address.
- **Constitutional Basis**
  - **Article 87** → Special Address provision.
  - President addresses both Houses.
- **When Delivered?**
  - After every **General Election**.
  - First session of each year.
- **Nature of Address**
  - Government policy statement.
  - Reviews past achievements.

  - Outlines future programmes.
  - Covers national and international issues.
- **Parliamentary Procedure**
  - Discussed in both Houses.
  - Time allotted as per House rules.
  - Called **Special Address**.
- **Amendments**
  - Members may move amendments.
  - Can highlight omissions.
  - If passed → Motion adopted in amended form.
- **Comparative Reference:** Similar to **"Speech from the Throne"** (UK).

Rajya Sabha

Composition & Basic Features

- **Rajya Sabha** is the Upper House of Parliament.
- It is a **permanent House** and cannot be dissolved.
- The total strength of the Rajya Sabha is **245 members**.
  - **233 members** represent States and Union Territories.
  - **12 members** are nominated by the President.
- The members serve a **six-year term**.
- One-third members retire every **two years (biennial system)**.
- Provision under **Article 83(1)** ensures continuity.
- **Note:** Rajya Sabha was first constituted on **3 April 1952** and the first Chairman was **Dr. S. Radhakrishnan**.

Nominated Members (Article 80)

- Article **80(3)** provides for nomination of 12 members.
- Nominated for expertise in **literature, science, art, and social service**.
- A nominated member may join a political party within **six months**.

Election of Rajya Sabha Members

- Members are elected by **elected MLAs of State Assemblies**.
- Election is **indirect**, not by direct public voting conducted under **Article 80(4)**.
- Follows **Proportional Representation by Single Transferable Vote (STV)**.
- Allocation of seats governed by the **Fourth Schedule of Constitution**.
- Seat distribution is based on **population of states**.
  - Example: Uttar Pradesh has **31 seats**, Goa has **1 seat**.
- **Eligibility & Legal Changes**
  - Candidate must be **citizen of India**.
  - Minimum age requirement is **30 years**.
- A Minister from Lok Sabha can **speak in Rajya Sabha**. However, such Minister **cannot vote in Rajya Sabha**.

Key Powers of Rajya Sabha

- **Legislative Powers**
  - Equal power with Lok Sabha in **ordinary and constitutional bills**.
  - No joint sitting for **Constitution Amendment Bills**.
- **Special Powers (Article 249)**
  - Can allow Parliament to legislate on **State List subjects**.
  - Requires **two-thirds majority of members present and voting**.
  - Resolution valid for **one year**, extendable annually.
- **Creation of All India Services**
  - Can authorise creation of **All India Services** in national interest.
- **Emergency Provisions**
  - Must approve proclamations under **Articles 352, 356, and 360**.
  - If Lok Sabha dissolved, Rajya Sabha approval keeps proclamation valid.

Speaker of Lok Sabha

Constitutional Position

- **Presiding officer** of the Lok Sabha and considered its **highest authority**
- Institution originated under the **Government of India Act, 1919**
- Elected by Lok Sabha members from among themselves by **majority of members present and voting.**
- Salary and allowances charged on the **Consolidated Fund of India.**
- Ranks **7th in Order of Precedence.**

Tenure: Article 94

- Remains in office during the **life of the Lok Sabha**

- Does **not vacate office on dissolution** — continues until just before the **first meeting of the new House**
- Vacates office if:
  - Ceases to be a **member of Lok Sabha**
  - Resigns by **written notice to the Deputy Speaker**
  - **Removed by majority of all members** of Lok Sabha
- While a **removal motion is under consideration**, the Speaker **cannot preside** over the House

When Speaker is Absent or Post is Vacant

- **Deputy Speaker** presides in Speaker's absence
- If both absent, a member from the **Panel of Chairpersons** (maximum 10 members nominated by Speaker) presides
- If both posts are vacant, **President appoints a Speaker Pro Tem.**

Powers & Functions

- **Conduct of House**
  - Presides over sittings and **maintains order and decorum**
  - Interprets and enforces **Rules of Procedure (Article 118)**
  - Can **suspend members** for misconduct
- **Legislative Powers**
  - **Certifies a Bill as a Money Bill** as final authority
  - Refers Bills to **Parliamentary Standing Committees**
  - Presides over **joint sittings of Parliament**
- **Voting Powers (Article 100)**
  - Does **not vote in the first instance**
  - Exercises **casting vote** only in case of a tie
- **Disqualification Powers**
  - Decides on disqualification under the **Tenth Schedule (Anti-Defection Law)**
  - Supreme Court (2020) directed decision **within three months** except in exceptional cases

Removal of Lok Sabha Speaker

- **Constitutional Basis**
  - Governed by **Article 94(c)** of the Constitution
  - Applies **only to Lok Sabha Speaker and Deputy Speaker** (not Rajya Sabha)
  - Resolution must be passed by **majority of all then members (effective majority)**
- **Procedure for Removal**
  - **Written notice** submitted to the **Secretary-General of Lok Sabha**
  - Minimum **14 days' prior notice** mandatory before moving the resolution
  - Governed by **Rules 200–203** of Lok Sabha procedure
  - At least **50 members must stand in support** for the motion to be admitted
  - If admitted, resolution scheduled **within 10 days** of admission
  - Debate **confined strictly to charges**; mover's speech limited to **15 minutes**
  - If fewer than 50 members rise in support and thus **motion lapses**
- **Speaker's Rights During Removal Proceedings**
  - Can **participate and speak** in the removal debate
  - Can **vote in the first instance** (unlike normal proceedings)
  - **No casting vote** in case of a tie during removal proceedings
- **Historical Instances**
  - No-confidence motions were moved against Speakers in:
    - **1954** — G.V. Mavalankar
    - **1966** — Hukam Singh
    - **1987** — Balram Jakhar
  - None resulted in actual removal

Public Accounts Committee (PAC)

Constitutional & Historical Background

- The **Public Accounts Committee (PAC)** is a Financial Parliamentary Committee.
- Other financial committees include **Estimates Committee** and **Committee on Public Undertakings**.
- First introduced in **1921** under the **Government of India Act, 1919**.
- The 1919 Act is also known as the **Montagu–Chelmsford Reforms**.
- Parliamentary committees derive authority from **Articles 105 and 118** of the Constitution.
- PAC is constituted annually under **Rule 308 of Lok Sabha Rules**.

Composition & Appointment

- The PAC consists of **22 members**.
  - **15 members** are elected from the Lok Sabha.
  - **7 members** are elected from the Rajya Sabha.
- The **Chairperson is appointed by the Speaker of Lok Sabha**.
- The tenure of members is **one year**.
- A **Minister cannot be a member** of the PAC.
- The PAC is an **advisory body**, not an executive authority.

Core Purpose

- Examines whether public money was spent **within the scope of Parliament's approval**.
- Ensures funds granted by Parliament are **used for intended purposes**.
- Strengthens **Parliamentary financial control over the Executive**.

Key Functions

- Examines **Appropriation Accounts** of the Government.
- Scrutinises the **Annual Finance Accounts**.
- Reviews audit reports of the **Comptroller and Auditor General** of India.
- Examines CAG reports on **revenue receipts and government expenditure**.
- Studies accounts of **autonomous bodies** funded by government.
- Does not examine matters assigned to the **Committee on Public Undertakings**.
- Treats **excess expenditure and incorrect savings** equally seriously.

Renaming States in India

Context:

- The **Union Cabinet** approved the **Kerala government's proposal** to change the **State's name from 'Kerala' to 'Keralam'**, the name used in **Malayalam language**.
- The President will refer the **Kerala (Alteration of Name) Bill, 2026** to the **Kerala Legislative Assembly** for its views before introducing the legislation in Parliament.

Constitutional Basis

- Renaming a state in India is governed by **Article 3 of the Constitution.**
- Article 3 **empowers Parliament** to alter the name of any state by law.
- Initiation of the Process
  - The process can be initiated by **either Parliament or the State Legislature.**
  - A Bill must be **introduced in Parliament on the recommendation of the President.**
  - The President then **refers it to the State Legislature** for their views.
- The Bill is passed in each House by a **simple majority.**
- Once the President gives his assent, the name change is recorded in the:
  - **First Schedule** of the Constitution
  - **Fourth Schedule** of the Constitution

Topic: Judiciary

Removal of Judges in India

Context: Lok Sabha Speaker has reconstituted the **three-member inquiry committee** examining grounds for **removal of Justice Yashwant Varma**, originally constituted in **March 2025** following allegations that **bundles of burnt cash were discovered** at his residence.

Constitutional Provisions (Supreme Court)

- **Article 124(4):** Removal only by **Presidential order**
- Both Houses must pass the motion in the **same session**
- Requires **special majority**, at least **two-thirds of members present and voting**
- **Grounds:** Proved misbehaviour or incapacity only
- **Misbehaviour** includes wilful misconduct, corruption, lack of integrity, and **moral turpitude**
- **Article 124(5):** Parliament empowered to frame removal procedure law → led to **Judges (Inquiry) Act, 1968**

Constitutional Provisions (High Court)

- **Article 217(1)(b):** Same removal procedure as Supreme Court judges
- **Article 218:** All SC removal rules apply to HC judges as well

Procedure for Removal

- **Step 1 (Notice of Motion)**
  - **Rajya Sabha:** Minimum **50 members** must sign
  - **Lok Sabha:** Minimum **100 members** must sign
  - Chairman/Speaker may **admit or refuse** the motion
- **Step 2 (Inquiry Committee)**
  - Three-member committee constituted:
    - A **Supreme Court Judge**
    - A **Chief Justice of a High Court**
    - A **Distinguished Jurist**
- **Step 3 (Investigation)**
  - Committee **frames charges** and investigates
  - **Medical Board** appointed if incapacity is denied by the judge
  - Committee submits **report with findings** to Chairman/Speaker
- **Step 4 (Parliamentary Action)**
  - Report **laid before Parliament**
  - No misbehaviour found → **motion dropped**
  - Misbehaviour proved → **motion proceeds to voting**
- **If Motion is Rejected**
  - Speaker's decision is **final** and no mandatory reasons needed
  - MPs can challenge via **writ petition** under **Article 226/32**
  - Fresh motion possible in **Rajya Sabha** with **50 signatures**

Key Fact

- **No judge has ever been removed** in India till date
- Process is deliberately **rare and regulated** to protect **judicial independence**

Tender Years Doctrine

Context:
Delhi
High Court held child welfare overrides **Tender Years Doctrine.**

What is it?

- A **common law child custody principle** applied in **family law jurisprudence**
- Presumes that custody of **young children (below ~5 years)** should rest with the **mother**
- Rooted in the **biological bond** between mother and child, presumed **maternal caregiving ability**, and **emotional security considerations**
- Emerged in the **late 19th century** — primarily raised in **divorce custody disputes**

Declining Relevance

- Losing ground due to growing **gender equality**
- Modern approach recognises **shared parenting roles**
- Courts now reject **stereotypical parental assumptions**

Current Judicial Position

- **"Child welfare as paramount"** principle now applied
- This **overrides the Tender Years Doctrine**
- Custody decisions are evaluated on a **case-specific basis**

Miscellaneous

Right to Life

Context: The **Delhi High Court** ruled that the presence of an **open garbage bin and public urinal** right next to one's house **violates the right to life under Article 21** of the Constitution.

Article 21 of the Indian Constitution

- **Article 21** is part of **Part III (Fundamental Rights)**.
- It guarantees **protection of life and personal liberty**.
    - **Text states:** *No person shall be deprived of life or personal liberty except according to procedure established by law.*
- The term **"person" includes citizens and non-citizens**.

Meaning of Key Terms

- **Life**
    - "Life" means more than mere **physical survival or animal existence**.
    - It includes conditions that make life **meaningful and dignified**.
    - Supreme Court expanded it to include **right to dignity, livelihood and health**.
- **Personal Liberty**
    - Refers to freedom from **unlawful bodily restraint**.
    - Includes freedom to **make choices and move freely**.
    - Considered essential to the **Rule of Law**.
- **Deprivation**
    - Article 21 applies only when the **State deprives life or liberty**.
    - It protects against **arbitrary State action**, not private actions.

Procedure Established by Law

- Originally meant any **procedure validly enacted by legislature**.
- Protection was procedural, not concerned with fairness initially.
- **Maneka Gandhi Case (1978)**
    - Supreme Court widened interpretation of Article 21.
    - Procedure must be **just, fair and reasonable**.
    - Linked Article 21 with **Article 14 and Article 19**.
    - Introduced concept of **substantive due process** in India.

Scope & Importance

- Article 21 is considered the **most expansive Fundamental Right**.
- Other rights derive strength from the **Right to Life**.
- It makes the Constitution a **dynamic and evolving document**.
- Protects individuals against **arbitrary executive and legislative actions**.

Appointment of State DGPs

Context: Centre introduced Single Window System for appointment of State DGPs.

Who is DGP?

- Head of State Police Force.
- Senior-most IPS officer in State.
- **Judicial Basis**
    - Guided by **Prakash Singh vs Union of India (2006)**.
    - Police reforms case.
- **Regulatory Guidelines**
    - **UPSC guidelines, 2009** govern selection.

Appointment Process

- **State Proposal**
    - States send eligible officers list.
    - Sent **6 months before DGP retirement**.
- **Eligibility Criteria**
    - Minimum **30 years service**.
    - Must hold DGP rank / equivalent.
    - ≥ 6 months service remaining.
- **UPSC Empanelment**
    - UPSC committee prepares panel.
    - Based on merit and service record.
- **Panel Size**
    - 3 officers (normal states).
    - 2 officers (smaller states).
- **Final Appointment**
    - State selects DGP from UPSC panel.

Key Objective

- Ensure merit-based selection.
- Insulate police from political interference.

Form 7

Context: Form 7 became controversial during the **Special Intensive Revision (SIR)** of the electoral rolls. Allegations of **bulk and fraudulent deletion requests** targeting eligible voters

What is Form 7?

- A **statutory form** used to **object to the inclusion of names** in electoral rolls.
- Objections can be filed for **self or another voter.**
- Governed by the **Election Commission of India (ECI).**
- Prescribed under **Registration of Electors Rules, 1960**, framed under the **Representation of the People Act, 1950.**
- As per **Section 13(2)**, only **registered electors** can file objections.
- **Booth Level Agents (BLAs)** are also authorised to submit Form 7.

Aim

- Ensure **accuracy and integrity** of electoral rolls
- Remove **duplicate, deceased, shifted, or ineligible voters**
- Prevent **electoral fraud** and ensure **free and fair elections**

Procedure

- Any **registered elector** of the constituency can file Form 7
- **Booth Level Officer (BLO)** conducts **field verification** and multiple visits may be undertaken
- Concerned voter receives **notice from the Electoral Registration Officer (ERO)**
- **Hearing opportunity** provided before the final decision
- **Appeal** lies with the **District Magistrate within 15 days**

Key Features

- **2022 Amendment:** Any voter in the constituency can object — not just from the **same booth**
- **Mandatory verification** required when **more than five objections** are filed by one applicant
- **Grounds for deletion:** Death, shifted/absent residence, duplicate entry, underage voter, non-citizenship
- **False declaration** punishable under **Section 32, RP Act 1950** — up to **1 year imprisonment or fine or both**

Model Code of Conduct (MCC)

Context: An **FIR has been registered** in Jharkhand against **Leader of the Opposition** for allegedly violating the **Model Code of Conduct (MCC)** ahead of **civic elections to 48 urban local bodies**.

About Model Code of Conduct (MCC)

- The **Model Code of Conduct (MCC)** regulates political conduct during elections.
- Issued and enforced by the Election Commission of India.
- Applies to political parties, candidates, and ruling governments.
- Ensures elections remain **free, fair, and transparent**.

Objectives of MCC

- Maintain **peaceful and orderly campaigning and polling process**.
- Prevent misuse of **government machinery and public funds**.
- Check electoral malpractices and corrupt practices.
- Uphold the principle of **level playing field in elections**.

Duration & Scope

- Comes into force from **announcement of election schedule**.
- Remains effective until **completion of election process**, including counting.
- Applies nationwide during **Lok Sabha general elections**.
- Applies to entire State during **Assembly elections**.
- Applies only to concerned constituency during **bye-elections**.

Legal Status

- MCC is **not a statutory law**.
- It is a set of agreed guidelines.
- Violations may attract action under:
  - Indian Penal Code, 1860
  - Representation of the People Act, 1951

Key Provisions

- **General Conduct**
  - Prohibits hate speech based on **religion, caste, language, or community**.
  - Forbids bribery and impersonation of voters.
  - Prohibits public meetings during **48 hours before polling ends**.
- **Meetings & Processions**
  - Parties must inform **local police authorities in advance**.
  - Procession routes cannot be changed after permission.
  - Conflicting routes must be resolved

beforehand.

- **Polling Day & Booth Rules**
  - No liquor distribution near polling stations.
  - No display of campaign materials at polling booths.
  - Only voters and authorised persons may enter polling stations.
- **Party in Power**
  - Ruling party must not use **official position for campaign purposes**.
  - Government machinery cannot be misused for electoral gain.
- **Election Manifestos**
  - Manifestos must not make promises that **unduly influence voters**.
  - Should not compromise **purity of electoral process**.

Bail, Parole & Furlough

Context: The **Supreme Court** ordered the **release of Nitish Katara murder convict Vikas Yadav** on **furlough for temporary release** to spend family time on Holi.

Definitions

- **Bail:** Pre-trial release granted to an **accused** while their case is pending in court as does **not imply innocence**
- **Parole:** Conditional release given to a **convict** who has served part of their sentence, intended as a reward for **good behaviour** and to facilitate **reintegration into society**
- **Furlough:** Temporary release granted to a **convict** for a **specific personal purpose** (e.g., family funeral, visiting a seriously ill family member), inmate must return after the period ends

Comparative Table

Aspect	Bail	Parole	Furlough
Stage	Before conviction (trial pending)	After partial serving of sentence	During serving of sentence
Purpose	Ensure court appearance	Rehabilitation & reintegration	Maintain family ties
Eligibility	Most accused (except serious crimes/flight risk)	Long-term prisoners with good conduct	Convicts with good conduct & long sentences
Duration	Until trial concludes	Longer term, extendable	Short-term (days to weeks)
Granted by	**Court**	Prison authorities or Court	**Prison authorities**
Legal Nature	Judicial process & fundamental legal right	Mix of administrative & legal oversight	Administrative measure under prison rules
Conditions	Court appearances, no criminal activity	Regular reporting, restricted movement	Reporting to police, return to prison on time

SAKSHAM 2026

Context: The oil industry inaugurated **SAKSHAM 2026** to promote national resource conservation awareness.

What is SAKSHAM?

- **SAKSHAM** stands for **Samrakshan Kshamatha Mahotsav**.
- Annual **fuel conservation awareness campaign**.
- Initiated by **Ministry of Petroleum and Natural Gas, Government of India**.
- Implemented by **Oil and Gas Public Sector Enterprises (PSUs)**.

Core Objective

- Promote **fuel conservation and sustainable energy practices**.
- Encourage **green and energy-efficient behaviour**.

SAKSHAM 2026 Timeline

- **Duration:** 2 February to 16 February 2026.
- **Campaign Length:** Fortnight-long nationwide programme.

Theme 2026

- **"Conserve Oil and Gas, Go Green"**.
- Hindi tagline: **"Tel aur Gas Bachao, Harshit Urja Apnao"**.

Target Groups

- School students and youth.
- LPG users and fleet operators.
- Farmers and industry professionals.

Project Himank

Context: Snow leopard sighting recorded by Project Himank in High Himalayas.

What is it?

- BRO road infrastructure project in Ladakh.
- Launched in **1985**.

Objective: Develop strategic road communication in Ladakh.

Location: Operates across **Ladakh high-altitude region**.

Key Features

- Maintains ~**2,216 km** road network.
- Works in extreme high-altitude terrain.
- Limited annual working season.
- Builds and maintains airfields.

Strategic Role

- Ensures connectivity near **Line of Actual Control (LAC)**.
- Supports military logistics and mobility.

INTERNATIONAL RELATION

Topic: Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests

India–US Trade Deal

Context

- India and the US announced an **Interim Trade Agreement**, with US tariffs on Indian imports proposed to **reduce from 50% to 18%**.
- The announcement was partly made **through social media**, a notable departure from formal diplomatic channels, with no confirmed implementation timeline.

- The **US** is **India's largest export destination** accounting for nearly one-fifth of exports, making this deal strategically significant.

Key Features of the Agreement

- India agreed to reduce tariffs on **US industrial and agricultural imports** thus covering tree nuts, fruits, soybean oil, wine, and processed foods.
- Future tariff removals include **pharmaceuticals, gems, aircraft components, aluminium, steel, and copper**.
- India intends to procure **$500 billion worth of US goods over five years**. These includes energy, defence, aircraft, and technology, framed as intent, not binding obligation.
- Sensitive **agriculture and dairy sectors** are fully protected. Further, wheat, rice, maize, poultry, milk, and tobacco explicitly excluded.
- Both countries agreed to ease standards in **medical devices, ICT products, GPUs, and data centres**, with digital trade norms to be negotiated under the future Bilateral Trade Agreement.

Economic Benefits for India

- **Apparel sector gains most**: India now faces **lower tariffs than Vietnam and Bangladesh** in the world's largest apparel import market.
- Benefits extend to **gems, jewellery, marine products, footwear, leather, and engineering goods**, all **labour-intensive sectors** employing millions.
- Improves India's competitive position **vis-à-vis China, ASEAN, Brazil, and Pakistan** in global supply chains.
- Union Budget 2026 provisions for **export-oriented industries** further strengthen the combined impact.

Concerns and Challenges

- **Energy Sovereignty:** US claimed India agreed to **halt Russian oil imports** while India has not confirmed this. Russian oil accounts for **one-third of imports**; forced realignment would strain India-Russia defence and energy ties.
- **Agricultural Sensitivity:** Concessions raised farmer livelihood concerns; **pulses references were removed** from revised US factsheets thus reflecting India's negotiating sensitivity.
- **Textile Competitiveness:** India faces 18% tariffs while Bangladesh secured concessional access; India later negotiated parity through **zero tariffs using American cotton inputs**.
- **Agreement Ambiguity:** Differences exist between joint statements and White House factsheets; several provisions remain **intentions, not enforceable commitments**.

Way Forward

- Formal agreement expected by **mid-March** with detailed tariff schedules and procurement commitments.
- India must **retain flexibility in energy security** as any major realignment must be debated in Parliament before implementation.
- Negotiations must **balance export expansion with domestic livelihood safeguards**, particularly for farmers.
- **Transparent formal diplomatic communication** must replace social media announcements to strengthen institutional credibility.

India's Crude Oil Import Diversification

Context

- India's crude oil imports from Russia declined to a **38-month low in December 2025**, with Russia's share falling from **34% in November 2025 to 24.9%**, the lowest in three years.
- Import value stood at **$2.7 billion**, declining **27.1% from November 2025** and **15% year-on-year**.
- Simultaneously, **US crude imports rose 31% year-on-year** as India imported **$569.3 million** worth of US crude in December 2025.
- India sourced crude from **19 countries in December 2025**, up from 16 in December 2024,

thus reflecting a deliberate diversification strategy.

Geopolitical Context

- US leadership claimed India may **reduce Russian oil imports in exchange for tariff concessions** but India has not officially confirmed any such commitment.
- India's officials consistently stress that **energy sourcing decisions are guided by economic viability and energy security**, not political pressure.
- This trend must be read alongside the **India-US Interim Trade Agreement**, where energy realignment remains a contested and unresolved dimension.

Commercial and Logistical Realities

- Russian oil remains **cheaper at $469.4/tonne** compared to US crude at **$506.7/tonne** in December 2025.
- Shipping costs from Russia are significantly lower i.e. **West Asian routes cost ~$1/barrel** while US Gulf routes can reach **$4.5/barrel**.
- Switching fully to **Venezuelan crude would require a $10–12/barrel discount** thus India imported zero Venezuelan oil in December 2025.
- These cost and logistics factors make **full replacement of Russian oil commercially unviable** in the near term.

Significance and Way Forward

- India's diversification across **19 supplier countries** reflects mature energy diplomacy, thus reducing dependence on any single source while maintaining price competitiveness.
- However, **strategic autonomy in energy sourcing** must be protected, India cannot afford to link energy decisions to trade deal concessions.
- India must **invest in refining capacity upgrades** to process a wider variety of crude grades, reducing logistical constraints on diversification.
- Long-term energy security requires **accelerating the transition to renewables** alongside maintaining a diversified fossil fuel import basket.

India–UAE Comprehensive Strategic Partnership

Context and Evolution

- India-UAE relations transformed into a **Comprehensive Strategic Partnership since 2017**, further accelerated by the **CEPA 2022**.
- The bilateral trade target of **$100 billion by 2030** was achieved five years early and the bbb leaders have now set an ambitious **$200 billion target by 2032**.
- UAE was invited as a **Guest Country to India's G20 Presidency**, reflecting the depth of strategic convergence.

Economic and Energy Partnership

- Non-oil trade reached **$65 billion, growing nearly 20% annually**; UAE invested over **$22 billion in India** since 2000 while Indian firms invested **$16 billion in UAE**.
- UAE is India's **3rd largest** trading partner**, 2nd largest** export destination, and **4th largest** crude oil supplier **and 2nd largest** LNG/LPG source.
- UAE is the only country storing **strategic oil reserves** on Indian soil, a unique energy security arrangement.
- Key investments include **ADIA establishing base in GIFT City**, Mubadala investing **$4 billion in healthcare, renewables, and technology**, and ADNOC signing long-term LNG supply deals.
- **Local Currency Settlement (LCS)** reduces dollar dependence; **UPI digital payments** are operational for Indians in UAE.

Strategic, Defence and Connectivity Cooperation

- Both nations collaborate on the **India-Middle East Economic Corridor (IMEEC)**, a transformative connectivity initiative.
- Naval cooperation under **Indian Ocean Naval Symposium (IONS)**; joint exercises include **Desert Cyclone, Gulf Star, PASSEX, and Desert Knight** (India-France-UAE trilateral).
- **Over 1,200 weekly flights** reflect intense commercial and human connectivity.
- Nearly **3.5–5 million Indians** live in UAE, the largest expatriate group, contributing **$11.7 billion in remittances (19.2% of India's total, FY24)**.
- Cultural ties deepened with the **BAPS Hindu Temple in Abu Dhabi**.

Emerging Areas and Challenges

- **Emerging Areas**
  - **AI and technology**: UAE's early AI investments complement India's digital public infrastructure strengths.

- **Food security**: UAE's 0.7% arable land makes India a natural partner; food corridor agreements aim to **triple bilateral food trade by 2025** through platforms like Agriota.
- **Civil nuclear cooperation** including support for **Barakah Nuclear Power Plant** operations.

- **Challenges**
  - Labour concerns persist under the **Kafala sponsorship system** affecting Indian workers.
  - India faces a **trade deficit of ~$16.78 billion** with UAE.
  - **OPEC pricing policies** may conflict with India's energy import interests.
  - **Aviation disputes** over flight expansion rights remain unresolved.
  - India-Iran ties and **UAE-China engagement** create geopolitical balancing pressures.
  - Regional instability i.e. **Gaza conflict and Red Sea disruptions**, affects corridor functioning.

India–France Strategic Partnership

Context and Significance

- India and France elevated ties to a **"Special Global Strategic Partnership"** during President Macron's visit, with PM Modi describing bilateral ties as a **"force for global stability"**.
- France engaged India diplomatically **even after the 1998 nuclear test sanctions** — demonstrating long-term strategic trust.
- France consistently supports India's **UN Security Council permanent membership** aspirations.
- France's **Indian Ocean territories** make it a resident Indo-Pacific stakeholder — a unique strategic asset.
- The partnership reinforces a **multipolar world order** and resists hegemonic geopolitical dominance.

Key Outcomes and Areas of Cooperation

- **Economic and Institutional**
  - Bilateral trade crossed **$13 billion in 2022-23**; Indian exports surpassed **$7 billion**.
  - Both nations amended the **Double Taxation Avoidance Agreement Protocol**.
  - **Annual Foreign Ministers' Dialogue** institutionalised under the **Horizon 2047 Roadmap**.
  - Agreement on **reciprocal deployment of armed forces** for operational coordination.
- **Defence**
  - France remains India's **most reliable high-technology defence partner**, cooperation spans submarines, fighter aircraft, and jet engines.
  - Major exercises: **Varuna** (naval), **Garuda** (air), **Shakti** (army), and **Tarang Shakti**.
  - **FRIND-X platform** promotes defence startup collaboration; **Defence Industrial Roadmap** focuses on co-design and co-production.
- **Science, Technology and Space**
  - **India-France AI Roadmap** promotes safe and trustworthy AI systems.
  - France supplies critical components for India's space programme; both collaborate on **Gaganyaan mission**.
  - Joint satellite **TRISHNA** advances climate observation; **UPI payment integration** across Franco-European systems.
  - India participates in **ITER Fusion Project** at Cadarache, France.
- **Civil Nuclear and Climate**
  - Civil nuclear engagement began with the **2008 bilateral nuclear agreement**; France collaborates on **Jaitapur Nuclear Power Plant**.
  - Partnerships extend to **Small Modular Reactors and Advanced Modular Reactors**.
  - India and France **co-launched the International Solar Alliance** and advance Paris Climate Agreement commitments.

India–Brazil MoU on Steel and Critical Minerals

Context

- India and Brazil signed an **MoU to strengthen steel supply chain cooperation**, signed in the presence of PM Modi and President Lula.
- The agreement establishes an **institutional framework for mineral cooperation**, focusing on reliable and sustainable development of steel raw materials.

- India currently has a **steelmaking capacity of 218 million tonnes**, rising infrastructure and industrialisation demands further expansion requiring reliable raw material access.

Why Brazil Matters

- Brazil is among the world's **leading producers of iron ore** and possesses significant reserves of **manganese, nickel, and niobium**, all critical for high-quality and specialty steel production.
- Enhanced cooperation **reduces India's supply vulnerabilities** in a volatile global trade environment.
- The partnership supports **diversification of critical mineral supply sources,** thus directly relevant to India's National Critical Mineral Mission.

Key Focus Areas

- Cooperation covers **exploration, mining, infrastructure, mineral processing, beneficiation, and recycling technologies**.
- **AI and advanced automation** will support geoscientific data analysis and modernise mining operations.
- Best practices in **environmental management and mineral extraction** will be shared bilaterally.
- The MoU strengthens **resilience of India's steel value chain** and reinforces South-South cooperation in strategic industrial sectors.

India-Israel Relations

Context: PM **Modi's standalone visit to Israel** to upgrade bilateral relations faces **significant geopolitical headwinds** amid regional tensions.

More in News

- Focus on **defence, security, labour, trade, AI, technology**, and **IMEC project connectivity**.
- **"Hexagonal alliance" announcement planned**: India, Greece, Cyprus, unnamed Arab/African/Asian countries against "radical Sunni and Shia axes".
- **Countries potentially targeted**: Iran, Turkey, Saudi Arabia, Qatar. All maintains historical and complex ties with India.

Historical Evolution of India-Israel Relations

- **Phase 1: Distant and Hesitant (1948–1992)**
  - India **recognised Israel in 1950** but restricted it to only a consulate in Mumbai and no full diplomatic relations
  - Foreign policy shaped by Cold War dynamics, NAM commitments, and strong pro-Palestinian stance
  - Despite diplomatic freeze, **Israel covertly assisted India** during the 1965 and 1971 wars against Pakistan
- **Phase 2: Full Normalisation (1992–2014)**
  - Full diplomatic relations established in 1992, driven by **Soviet collapse**, **end of Cold War**, and India's **economic liberalisation.**
  - **Kargil War (1999)** proved decisive as Israel supplied **laser-guided missile** kits and UAVs rapidly, often faster than traditional suppliers
  - Defense relationship firmly cemented during this phase.
- **Phase 3: De-hyphenation and Strategic Alignment (2014–Present)**
  - India adopted **"de-hyphenation" policy** — treating Israel ties as independent of its Palestine stance.
  - Allowed India to deepen relations with Israel without compromising its Palestinian support.
  - Partnership expanded into **I2U2 grouping (India, Israel, US, UAE)** thus focusing on water, energy, transport, and food security.

Significance of India-Israel Relations

- **Defense and Security**
  - Israel is among India's **top defense suppliers** - advanced drones, missile defense systems, radar, and surveillance technology
  - Relationship evolved from buyer-seller to **joint R&D and co-production**, supporting Aatmanirbhar Bharat
  - **Barak-8 missile defense system**, a landmark jointly developed product

  - **Robust intelligence sharing and counter-terrorism cooperation** addressing shared security threats
- **Trade and Investment**
  - Bilateral trade stands at **$7–8 billion**, spanning agriculture, high-tech, defense, and pharmaceuticals
  - **2025 Bilateral Investment Treaty** expected to boost two-way FDI, fintech, and start-up collaborations
  - Lays groundwork for a future **Free Trade Agreement**
- **Agriculture and Water Management**
  - Israeli expertise in drip irrigation and precision agriculture scaled across India through **Indo-Israel Agricultural Project (IIAP)**
  - **Centres of Excellence** established across Indian states providing training to farmers in micro-irrigation and protected cultivation
  - Addresses **chronic water scarcity** and improves rural incomes
- **Innovation and Technology**
  - Cooperation in cybersecurity, AI, and smart city technologies
  - **India-Israel Industrial R&D and Technological Innovation Fund (I4F)** fosters joint research and product
  - development for global markets

Challenges Associated with India-Israel Ties

- **Palestine Question**: India's traditional UN support for Palestine creates occasional tension with Israeli interests and the **domestic public opinion** also maintains sympathy for Palestine
- **Gulf Dependency**: India's heavy reliance on Gulf Cooperation Council (GCC) for energy and **9 million Indian expatriates** contributing remittances makes over-alignment with Israel strategically risky.
- **Iran and China Factors**: India's ties with **Iran (Chabahar port)** and concerns over Israel's technology cooperation with **China (Israel-China trade: $22 billion+)** create diverging priorities
- **Limited Technology Transfer**: Israel restricts transfer of **sensitive defense systems** containing US components, limiting India's Aatmanirbhar Bharat ambitions
- **IPR Concerns**: Israel's concerns over India's lenient intellectual property regime, particularly in software and digital innovation, remain unresolved
- **Non-Defense Trade Plateau**: Bilateral trade has largely stagnated between **$6–8 billion,** reflecting limited diversification beyond established sectors

Way Forward

- Accelerate **joint R&D and co-production** in drones, missile defense, and cybersecurity aligned with Aatmanirbhar Bharat.
- Fully implement **2025 Bilateral Investment Treaty** and work toward a future Free Trade Agreement.
- Use **I2U2 framework** as a diplomatic shield and **joint investments** through it demonstrate that India-Israel partnership benefits the broader region.
- Strengthen **knowledge corridors** linking IITs and IISc with Israeli research centres for sustained innovation collaboration.

India–Brazil MoU on Steel and Critical Minerals

What is Pax Silica?

- **Pax Silica** is a proposed alliance of technology-driven democracies aimed at building **secure and resilient semiconductor supply chains**.
- The term was highlighted during the **AI Impact Summit in New Delhi**, reflecting growing global urgency around chip security.
- The alliance seeks to **reduce dependence on coercive technological powers**, particularly China, by creating trusted semiconductor manufacturing and supply networks.
- Pax Silica reflects the broader reality that **trusted partnerships are increasingly replacing purely market-based supply chains** in critical technology sectors.

Global Context: Semiconductor Geopolitics

- Semiconductor supply chains are **central to the US-China technological competition** as advanced chips are critical for AI, defence, and quantum computing.
- Western democracies are actively working to **limit adversaries' access to sensitive technologies** through export controls and alliance-building.
- The US has already restricted semiconductor technology exports to China, and Pax Silica extends this logic into a **broader multilateral framework** of trusted chip alliances.

- Semiconductors have effectively become **strategic instruments of geopolitical power**, not merely commercial products.

Why India Was Not a Founding Member

- Early frameworks largely included **advanced economies and close US partners** with established semiconductor industries.
- India historically **lacked domestic semiconductor fabrication capabilities** and depended heavily on imports for chips and electronic components.
- **Limited industrial depth and manufacturing ecosystem** reduced India's initial integration into global chip alliances.
- India's semiconductor journey was at a nascent stage compared to Taiwan, South Korea, Japan, and the Netherlands, which form the core of global chip supply chains.

Why Pax Silica Matters for India

- Semiconductors form the **backbone of modern digital and AI systems** as India's ambitions in AI, defence electronics, and advanced computing all depend on secure chip access.
- India aims to become a **global hub for electronics manufacturing** and strategic chip alliances directly accelerate this goal.
- Participation **reduces India's vulnerability to geopolitical supply chain disruptions**, a lesson sharply learned during COVID-19 chip shortages.
- Pax Silica membership **strengthens India's technological sovereignty** and enhances its position in global technology governance discussions.
- It aligns with India's broader **tech diplomacy strategy**, complementing initiatives like the India-US iCET and Quad Technology Track.

India's Strategic Opportunities and Way Forward

- India is investing heavily in **semiconductor fabrication and design ecosystems** through the India Semiconductor Mission and PLI schemes.
- Domestic policies actively aim to **attract global chip manufacturers** as Micron's $2.75 billion assembly plant in Gujarat is an early success.
- **Collaboration within Pax Silica** can enhance technology transfer, manufacturing expertise, and design capabilities significantly.
- India's **large demographic base and growing digital market** strengthen its bargaining position within technology alliances.
- India must leverage Pax Silica membership to **build domestic fabrication capacity**, moving beyond assembly to full-stack chip manufacturing over time.

India–Malaysia IMPACT Framework

Context

- India's Prime Minister articulated the **IMPACT framework** during Malaysia visit.
- Announced while addressing the **Indian diaspora in Kuala Lumpur**.

What is IMPACT Framework?

- **IMPACT** = *India–Malaysia Partnership for Advancing Collective Transformation*.
- A strategic vision to deepen **bilateral cooperation**.
- Focuses on economic, digital, cultural, and people-centric engagement.

Aim

- Accelerate **pace and scale** of India–Malaysia cooperation.
- Deliver **tangible developmental benefits** to citizens.
- Position ties as a driver of **Asia's collective growth**.

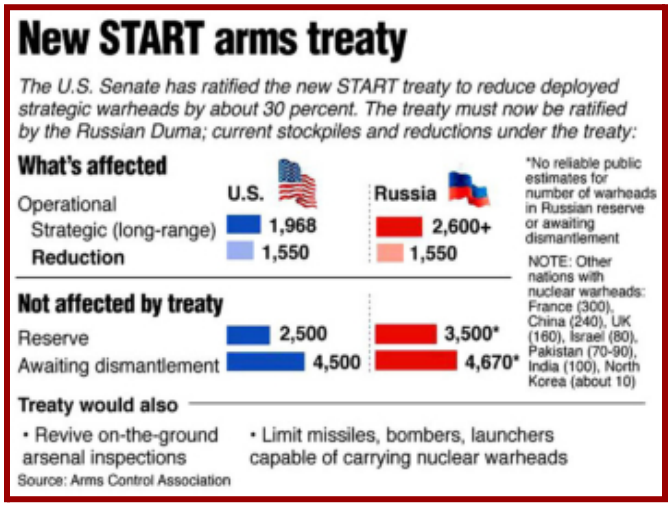
Key Features

- **Economic & Technology Cooperation**
  - Over **100 Indian IT companies** operate in Malaysia.
  - Generates employment and strengthens **digital ecosystems**.
  - Expands technology-led bilateral economic engagement.
- **Digital Connectivity**
  - Launch of **UPI digital payment system** in Malaysia.
  - Supported by **Malaysia–India Digital Council collaboration**.
  - Enhances fintech integration and **cross-border payments**.
- **People-to-People & Diaspora Linkages**
  - Indian-origin community is **second-largest diaspora globally** in Malaysia.
  - **OCI eligibility extended** up to sixth generation.

  - Scholarships and academic collaborations promoted.
  - Cultural institutions include **Thiruvalluvar Chair/Centre**.
- **Cultural & Civilisational Bonds**
  - Deep **Indian Ocean maritime heritage** linkages.
  - Shared linguistic traditions — **Tamil and Malay**.
  - Historical connections include **INA legacy**.
- **Strategic & Regional Outlook**
  - Partnership aligned with **ASEAN centrality**.
  - Supports **Indo-Pacific stability** vision.
  - Promotes inclusive and sustainable regional growth.

Topic: Effect of policies and politics of developed and developing countries on India's interests, Indian diaspora.

Expiry of New START Treaty



Context

- The **New START Treaty expired on February 5, 2026**, ending the last legally binding US-Russia nuclear arms control agreement.
- Signed in **April 2010 by Barack Obama and Dmitry Medvedev**, the treaty entered into force in February 2011 for a ten-year duration.
- Originally scheduled to expire in 2021, the treaty was **extended by five years until February 5, 2026**.
- Russia **suspended participation in February 2023** amid the Ukraine conflict, halting inspections and data exchanges while continuing to observe core numerical limits.

Core Provisions and Objectives

- The treaty placed **legally binding limits on strategic nuclear weapons** targeting core political, military, and industrial centres.
- Key numerical limits included **1,550 deployed strategic warheads, 700 deployed delivery systems**, and 800 total launchers per side.
- Covered delivery systems included **ICBMs, Submarine-Launched Ballistic Missiles, and heavy bombers**.
- Verification mechanisms included **18 annual on-site inspections, regular data exchanges, and deployment notifications** to ensure compliance.
- Core objectives were to **prevent strategic nuclear arms race, enhance transparency, and reduce risks of miscalculation and accidental escalation**.

Strategic Frictions Leading to Expiry

- Russia criticised **US missile defence systems for destabilising the deterrence balance** between the two nuclear powers.
- The US flagged concerns over Russia's **conventional prompt strike weapons** falling outside treaty definitions.
- Russia developed new systems including **Sarmat ICBM and Avangard hypersonic glide vehicle**, creating significant definitional and compliance tensions.
- These unresolved disputes **eroded mutual trust**, making treaty renewal increasingly difficult amid broader geopolitical hostility.

Implications of Expiry

- There are now **no legally binding limits on US-Russia nuclear arsenals**, removing the last formal constraint on nuclear force planning.
- Verification systems and inspection mechanisms have **completely ceased**, forcing both sides to rely on satellite surveillance and unilateral intelligence.

- The expiry **allows additional warhead loading on existing missiles**, significantly increasing potential nuclear firepower on both sides.
- **Nuclear and cyber capabilities are increasingly interlinked**, adding new dimensions of strategic instability beyond traditional deterrence frameworks.
- The expiry **complicates inclusion of China in future arms control frameworks**, as all three powers cite asymmetries to resist new constraints.
- Loss of predictability and transparency is widely seen as a **major strategic risk for global stability**.

Way Forward

- Experts propose **restoring basic transparency measures first**, before attempting a comprehensive new treaty framework.
- **P5 cooperation on definitions and disclosure practices** would help build the foundation for future arms control.
- **Confidence-building tools** including hotlines, launch notifications, and regular dialogue must be urgently restored.
- A new multilateral framework must **address emerging technologies like hypersonic weapons and cyber capabilities** that existing treaties failed to cover.

Topic: India and its Neighbourhood- Relations

Myanmar Elections and India's Strategic Dilemma Context

- Myanmar conducted elections in **three phases between December 2025 and January 2026**, five years after the **February 1, 2021 military coup**.
- The military-aligned **Union Solidarity and Development Party (USDP) secured a sweeping victory** in heavily controlled polls.
- Voting was permitted in only **265 of 330 townships**, with political participation tightly controlled by the junta.
- The **NLD and other opposition parties were dissolved** by the Election Commission, with senior leaders including **Aung San Suu Kyi and U Win Myint** remaining in detention on politically motivated charges.
- Junta claimed **55% turnout**, a sharp decline from nearly 70% in the 2015 and 2020 elections, with polling largely restricted to urban areas under military control.

Humanitarian Crisis and Democratic Deficit

- Since the 2021 coup, **7,738 people have been killed** and over **30,000 arrested**, with 22,767 still remaining in detention.
- More than **1,13,000 houses have been destroyed**, particularly in Sagaing and Magway regions.
- **Resistance groups including People's Defence Forces** control 91 towns, with conflict expected to intensify despite the electoral exercise.
- Rural regions remain under resistance group influence, making the election **a military-scripted exercise rather than a genuine democratic process**.
- Western nations and ASEAN have remained **reluctant to recognise the polls** as legitimate.

India's Calibrated Diplomatic Response

- Myanmar remains vital for India's **Act East Policy**, creating a difficult balancing act between strategic interests and democratic principles.
- India's official statements emphasised support for **"free, fair, and inclusive" electoral processes** while distancing itself from direct election participation.
- PM Modi met **Senior General Min Aung Hlaing at the SCO Summit 2025**, reflecting continued engagement without formally legitimising military rule.
- India extended humanitarian outreach through **Operation Brahma**, providing relief to conflict-affected populations across Myanmar.
- India maintains **parallel outreach to local and resistance actors** alongside limited engagement with the junta.

Strategic Implications for India

- Myanmar shares a **1,643-km border with northeastern India**, making stability there a direct national security concern.
- Instability has driven **refugee inflows**, with India hosting approximately **90,100 displaced Myanmar nationals** without a formal refugee policy, straining border state administrations.
- Key connectivity projects including the **Kaladan Multimodal Project and Trilateral Highway** face significant delays due to conflict insecurity.

- **Narcotics trafficking and human smuggling networks** are rising along the border, posing serious internal security challenges.
- Cyber scam centres operating from Myanmar have required India to rescue **2,165 Indians since 2022**.

Topic: Foreign Policy

Reframing Foreign Policy

India's Global South Leadership

- India's early foreign policy drew strength from leadership of the **Global South** within the **United Nations** system.
- Multilateral rules, largely framed by post-colonial powers, often required diplomatic negotiation to protect developing country interests.
- India played a **central intellectual role** in **global negotiations**, including **climate diplomacy until the early 1990s.**

Eroding Multilateralism

- The rise of **China** since **2010 has reshaped global institutional** balance through alternative funding and governance structures.
- **China** now **heads multiple UN agencies** and has expanded development assistance beyond Western volumes.
- Simultaneously, the **United States** has **withdrawn from several UN bodies**, weakening institutional authority.

Evolution of Strategic Autonomy

- India's doctrine of **strategic autonomy** emerged from leadership of the **Non-Aligned Movement** during the Cold War.
    - It enabled India to **balance superpower blocs** while retaining sovereign decision-making space.
- After the **Soviet Union's collapse**, the doctrine gradually lost structural relevance.
- India's participation in groupings like the **Quad** and **defence purchases from Russia** reflect evolving alignments.
- Russia remains a long-trusted defence partner providing advanced military technologies.
- U.S. strategic discourse increasingly describes India as a **"swing state"** in great-power competition.

Rise of Power Politics

- The weakening of multilateral institutions has revived **asymmetric bilateral power relations**.
- Trade reciprocity is increasingly defined through national interest frameworks such as **"America First."**
- **Bilateral trade arrangements** now reflect **negotiated imbalances** rather than rule-based equity.
- India faces **tariff pressures** despite expanding imports under bilateral frameworks.
- Global geopolitics is shifting toward t**ransactional and security-driven alignments.**

Reframing India's Foreign Policy

- India must rethink foreign policy beyond the legacy framework of **strategic autonomy**.
- The emerging vision links diplomacy to the national development goal of **Viksit Bharat 2047**.
- India's **demographic dividend**, particularly its **global technology workforce**, offers strategic leverage.
- Nearly **half of Silicon Valley's talent** traces roots to India, reflecting technological potential.
- Building domestic capabilities in **AI, cyber systems, and manufacturing** is essential.
- Foreign policy must therefore integrate economic transformation with strategic positioning.

Way Forward

- India should prioritise building **endogenous technological and industrial capabilities**.
- **Trade diplomacy** must **diversify exports** beyond excessive dependence on the U.S.
    - Expanding **Free Trade Agreements** with **Asia and Africa** can unlock growth markets.
- Technological and strategic cooperation with **Russia** should be strengthened.
- Managed economic engagement with **China**, including **infrastructure investment**, may accelerate growth.
- **Reframing Pakistan engagement** through economic and connectivity lenses could stabilise relations.
- As **BRICS Chair**, India can shape it into an **economic cooperation platform**. Linking digital currencies may facilitate smoother cross-border trade and payments.

India's Trade Strategy

The Strategic Shift

- **India moved** away from its **earlier cautious approach** of engaging only with similarly structured economies. It now **proactively pursues trade agreements** with major developed economies, aiming to integrate into **high-value global markets** and **global value chains.**

Key Statistics

- **Total exports** reached **$825.25 billion**, a **6.05% annual increase** (As reported by **Department of Commerce,** 2025)
- **FTA coverage** of export basket projected at **71% by 2026**, up from **22% in 2019**
- **Target: $2 trillion in exports by 2030** under Foreign Trade Policy (FTP) 2023

Three Typologies of International Trade Agreements

- **Multilateral Trade Agreements (WTO/GATT Framework)**
  - The foundation of global trade rests on the **GATT and WTO** framework, built around the **Most Favoured Nation (MFN) principle** i.e. any concession granted to one country must be extended to all WTO members.
  - WTO (established 1995) expanded trade coverage to **services and intellectual property**
  - It also established a structured **dispute settlement mechanism**
  - Follows **one-country-one-vote** principle, giving developing nations meaningful agency
- **Preferential Trade Agreements (FTAs and Customs Unions)**
  - WTO permits exceptions under **Article XXIV of GATT**, allowing Free Trade Areas and Customs Unions on a non-MFN basis.
  - **FTAs** must cover **'substantially all trade'** between members.
  - **Customs Unions** must additionally maintain a **common external trade policy** for non-members.
  - It must be **notified to the WTO**, enabling scrutiny by other countries
  - Many modern FTAs are **WTO-plus** i.e. covering labour, environment, and investment protection
- **New Category- Agreements on Reciprocal Trade (ARTs)**
  - The Trump administration introduced a new typology **Agreements on Reciprocal Trade (ART)**, signed with countries like Malaysia, Cambodia, Argentina, Bangladesh, and now announced with India.
  - These are **not signed under Article XXIV of GATT**, making them legally suspicious and institutionally disconnected from the WTO.

India's Key Trade Agreements

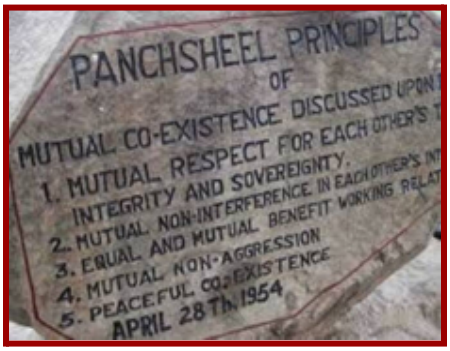
- **India-EU FTA (January 27, 2026)**
  - After **nearly two decades of negotiations**, India and the EU created a free trade zone covering nearly two billion people and thus described as the ***"mother of all deals."*** It is a **WTO-compliant** FTA.
  - Tariff reduction or elimination on over **90% of traded goods.**
  - **Enhanced market access** for textiles, leather, pharmaceuticals, chemicals, and marine products
  - **Removal of tariffs** on pharmaceutical exports with stronger regulatory cooperation
  - **Improved competitiveness** against Bangladesh and Vietnam.
  - **Promotes digital trade** and strengthens investor confidence
- **India–US Interim Trade Framework (February 2026)**
  - It is Agreements on Reciprocal Trade (ARTs), not an FTA. It is fundamentally different from **India's EU or UK agreements.**
  - **Progressive tariff reduction** to facilitate greater Indian exports
  - **Strategic collaboration** in **rare earths and semiconductors**
  - **Strengthens India's position** in

high-technology manufacturing and electronics exports
    - **Reduces overdependence** on any single market

Four Strategic Dimensions of India's Trade Approach

- **Market Access**: Preferential entry into high-demand markets of **EU and US**, benefiting labour-intensive sectors and MSMEs through **Global Value Chain (GVC)** integration.
- **Supply Chain Integration**: **Reduced barriers** on intermediate goods enable Indian firms to compete efficiently, especially in technology, electronics, pharmaceuticals, and services.
- **Diplomatic Leverage**: Economic interdependence with major powers strengthens India's voice in **global economic governance** and influence over international trade norms.
- **Export Diversification**: Agreements spread across continents deliberately reduce overdependence on any single geography.

Panchsheel Doctrine



Why this topic?

- Chief of Defence Staff **Anil Chauhan** recently reflected on India's early China policy. He noted that post-Independence India prioritised **stable relations with China**. The leadership believed the **Panchsheel Agreement (1954)** would stabilise Himalayan frontiers.

Conceptual Overview of the Panchsheel Doctrine

- The doctrine emerged from the **1954 India–China Agreement on Trade and Intercourse with Tibet**.
- **Panchsheel** refers to the ***Five Principles of Peaceful Coexistence.***
    - Mutual respect for **sovereignty and territorial integrity**.
    - **Mutual non-aggression** in bilateral relations.
    - **Mutual non-interference** in internal affairs.
    - **Equality and mutual benefit** in cooperation.
    - **Peaceful coexistence** as the basis of diplomacy.
- These principles sought to humanise international relations by prioritising **respect, restraint, and reciprocity** over coercion.

Positive Impact on India's Foreign Policy

- **Normative Leadership**
    - Panchsheel elevated India's image as a proponent of **peaceful global coexistence**.
    - It strengthened India's moral voice among post-colonial nations.
- **Afro-Asian Solidarity**
    - Principles were adopted at the **Bandung Conference (1955)**.
    - The conference united Asian and African nations around anti-colonial cooperation.
- **Non-Aligned Movement Foundation**
    - Panchsheel shaped the philosophy of the **Non-Aligned Movement (NAM)**.
    - NAM institutionalised strategic independence during the Cold War.
- **Global Institutional Recognition:** The principles were endorsed by the **United Nations General Assembly (1957)**.
- **India-China Diplomatic Framework**
    - The doctrine provided the first formal framework for bilateral engagement. It fostered goodwill reflected in the slogan **"Hindi-Chini Bhai Bhai."**

Limitations and Strategic Lessons

- **Idealism vs Realism Gap**
    - Panchsheel relied heavily on **mutual trust and moral diplomacy**.
    - It **underestimated** geopolitical competition and power asymmetry.
- **Tibet and Buffer Loss**
    - India's recognition of Chinese sovereignty over **Tibet** removed a strategic buffer.
    - It exposed India to direct Himalayan frontier pressures.
- **Boundary Question Neglect**

- The agreement did not clearly settle **border disputes**.
- China later rejected Indian claims over Aksai Chin and Arunachal Pradesh.

- **1962 War Breakdown**
  - The **Sino-Indian War (1962)** violated non-aggression principles. It shattered bilateral trust and credibility of Panchsheel.
- **Lack of Enforcement Mechanisms**
  - The doctrine **lacked legal or institutional** enforcement provisions.
  - **Ethical commitments** alone proved insufficient to deter conflict.

Conclusion

- Panchsheel reflected India's attempt to build a world order rooted in **Mutual dignity** among nations, Respect for sovereignty, Peace over militarism, Cooperation over coercion. However, its limitations underscored that enduring peace requires alignment between **moral vision and strategic preparedness**.

PRELIMS

Topic: Organisation and Convention

Kimberley Process (KP)

Context: India selected as **Chairperson of Kimberley Process** from **1 January 2026**. This marks the **third time** India will lead this global initiative.

What is Kimberley Process?

- **Kimberley Process (KP)** is a tripartite international initiative.
- Involves **governments, diamond industry, and civil society**.
- Seeks to prevent trade in **conflict diamonds**.

Establishment

- Established in **2003**.
- Operationalised through **Kimberley Process Certification Scheme (KPCS)**.
- Created pursuant to **UN Security Council resolutions**.

Aim

- Eliminate **conflict diamonds** from global supply chains.
- Prevent diamonds funding **armed rebellions against legitimate governments**.

Key Functions

- **Certification Mechanism (KPCS)**
  - All rough diamond exports must carry **valid KP certificate**.
  - Confirms diamonds are **conflict-free in origin**.
- **Regulatory Enforcement**
  - Member states enact **domestic laws**.
  - Control import and export of **rough diamonds**.
- **Selective Trading System**
  - Trade allowed only among **KP-compliant participants**.
  - Restricts entry of **illicit and uncertified diamonds**.
- **Transparency & Data Exchange**
  - Members share **statistical trade data regularly**.
  - Helps monitor flows and detect irregularities.
- **Monitoring & Review Mechanism**
  - Peer review processes evaluate compliance.
  - Working groups identify **gaps and enforcement challenges**.

Significance

- Covers **60 participants** (European Union counted as one).
- Represents **over 99% of global rough diamond trade**.
- Reduced conflict diamond trade to **negligible levels globally**.
- Enhances **ethical sourcing and consumer confidence**.
- Strengthens credibility of the **global diamond value chain**.

African Union (AU)

News: The African Union (AU) holds its annual summit in Ethiopia this weekend amid global uncertainities

About African Union

- The **African Union (AU)** is a continental organisation comprising **55 African countries**.
  It represents the collective political and economic voice of Africa.

- Launched in **2002**.
- It succeeded the **Organisation of African Unity (OAU)**, established in 1963.
- **Headquarters**
  - Located at **Addis Ababa, Ethiopia**.
- **Key Objectives**
  - Promote **unity and solidarity** among African nations and peoples.
  - Defend **sovereignty, territorial integrity, and independence** of member states.
  - Advance **democracy, good governance, and public participation**.
  - Promote **peace, security, and stability** across the continent.
  - Accelerate **political and socio-economic integration** of Africa.

International Energy Agency (IEA)

Context: At the **IEA's recent annual ministerial meeting**, India raised concerns about its request for **full membership**, stating that the **current founding charter** needs amendments to accommodate non-OECD countries.

Basic Overview of IEA

- **International Energy Agency (IEA)** is an autonomous intergovernmental organisation. It functions within the broader **OECD framework**.
- IEA (International Energy Agency) was **established in 1974** following the **1973 Kippur War oil embargo**.
- Created to address major **oil supply disruptions**.
- Works towards a secure and sustainable **energy future**.
- **Mandate**
  - Initially focused on **energy security and oil emergencies**. Now it tracks global **energy trends and policy developments**.
  - Promotes sound and evidence-based **energy policies** and encourages multinational cooperation in **energy technology innovation**.

Core Areas of Focus

- Ensures long-term **energy security** among member countries.
- Supports **economic development** through stable energy systems.
- Promotes **environmental sustainability** in energy transitions.
- Enhances global engagement on **clean energy cooperation**.

Membership and Structure of IEA

- Comprises **32 member countries** and eleven association countries.
  - **Brazil** (OECD member since **2024**) and **Colombia** (OECD member since **2020**) inducted as IEA **full members** last week.
- **Full membership** requires being part of the **OECD**.
  - Members must maintain oil reserves equal to **90 days imports**.
  - Must implement national **demand restraint programmes**.
  - Should establish legislation for **Co-ordinated Emergency Response Measures (CERM)**.
  - Must ensure oil companies provide required **energy data reporting**.
- India joined as an **Associate Member in 2017**.

Key Publications by IEA

- Publishes the annual **World Energy Outlook** report.
- Releases **World Energy Balances and Energy Statistics**.
- Issues **Energy Technology Perspectives** assessments.
- Published influential roadmap **Net Zero by 2050**.

Topic: Places in news

Rafah Crossing

Context: The Rafah Crossing remains the **only operational exit for Gaza** after Israel closed Erez and Kerem Shalom.

What is Rafah Crossing?

- **Southernmost border crossing** of the **Gaza Strip**
- Connects Gaza with **Egypt's Sinai Peninsula**
- Controlled by Egypt
- **Unique Feature:** Only Gaza exit **not leading into Israeli territory**

Other Gaza Crossings

- **Erez Crossing:** Located in **north**, used for **movement into Israel**
- **Kerem Shalom Crossing:** Located in **south**, used for **commercial goods only**
- Both crossings **controlled by Israel**

Current Status

- **Erez and Kerem Shalom remain closed**
- Rafah functions as **sole humanitarian access point**

Strategic Importance

- Only route for **humanitarian aid entry into Gaza**
- Primary passage for **civilian movement out of Gaza**

Chabahar Port

Context: India paid **$120 million Chabahar port commitment** before **US sanctions waiver** expires in **April 2026**.

More in news:

- **Government ended annual Budget allocation** for **Chabahar port** indicating inability to manage under **US sanctions**.
- **Chabahar port** crucial for **Afghanistan re-engagement** and keeping **Central Asia access** open for India.

About Chabahar Port

- **Deep-water seaport** in **southeastern Iran**
- Located in **Sistan–Baluchistan province**
- Situated on the **Gulf of Oman**, near the **Strait of Hormuz**
- Has **direct access to the Indian Ocean**
- **Two terminals:** Shahid Beheshti and Shahid Kalantari

Strategic Location

- Close to **Afghanistan and Pakistan**
- Links **India to Central Asia**
- **Distance:** Kandla to Chabahar: ~550 nautical miles; Mumbai to Chabahar: ~786 nautical miles

Chabahar Project

- Agreement signed in **May 2016**: India-Iran-Afghanistan trilateral pact
- India is developing the **Shahid Beheshti Terminal**, India's **first foreign port project**
- Infrastructure includes **port development works** and the **Chabahar–Zahedan rail link**
- **INSTC Linkage**
  - Chabahar is a key node in the **International North-South Transport Corridor (INSTC)**
  - **Multimodal transport network** connecting the **Indian Ocean to the Caspian Sea**
  - Extends further to **Europe via Russia**
- **Strategic Objectives**
  - **Bypasses Pakistan** for India's access to Afghanistan
  - Provides a trade route to **Central Asia**
  - Serves as an **alternative to China's Silk Route**

Seychelles

Context: India and Seychelles explored deeper cooperation in **maritime trade, blue economy and sustainable development** at a Business Roundtable in Mumbai.

About Seychelles

- Archipelagic island nation located in the **Western Indian Ocean**.
- Lies northeast of **Madagascar** and east of mainland Africa.
- Nearby islands include **Comoros** and **Mauritius** (south).
- **Maldives** located to the east of Seychelles.
- Comprises an archipelago of **115 islands**.
- Only **8 islands** are permanently inhabited.
- Capital city is **Victoria**.

Geographical Features

- **Climate**
  - Exhibits a **tropical oceanic climate**.
  - Experiences minimal annual temperature variation.
- **Island Groups**
  - Divided into **two major island groups**.
  - **Mahé Group**
    - Consists of mountainous **granitic islands**.
    - Volcanic origin with rocky, hilly interiors.
    - Features narrow coastal plains.
  - **Coralline Islands Group**
    - Composed of flat **coral atolls** and elevated reefs.
    - Less mountainous than Mahé islands.
    - Located atop the **submarine Mascarene Plateau**.
- **Highest Peak**
  - Highest point is **Morne Seychellois**.

West Bank

Geographical Aspect

- The **West Bank** is a landlocked territory in **Western Asia**.
- It forms the major part of the **Palestinian territories**.
- Bordered by **Jordan and the Dead Sea** to the east.
- Surrounded by **Israel to the north, west, and south**.
- Located near the **Mediterranean coastal region**.

Historical Background

- Captured by **Jordan after the 1948 Arab–Israeli War**.
- Israel occupied the West Bank during the **Six-Day War (1967)**.
- Since 1967, Israel has maintained **military occupation over the territory**.
- **Ramallah** functions as the de facto administrative capital of Palestine.

Oslo Accords (1993–1995)

- The **Oslo Accords** were agreements between Israel and the **PLO**.
- **Oslo I Accord** was signed in **Washington D.C. in 1993**.

- **Oslo II Accord** was signed in **Taba, Egypt, in 1995**.
- Led to creation of the **Palestinian National Authority (PNA)**. PNA granted limited self-governance in **parts of West Bank and Gaza**.
- The accords did not establish a **sovereign Palestinian state**.

Chagos Islands

Location

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

Historical Background

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

Strategic Significance

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

UK–Mauritius Chagos Sovereignty Deal (2025)

- Following a UK High Court ruling, the English Prime Minister signed a treaty **handing sovereignty of the Chagos Islands to Mauritius**
- The deal includes a **99-year lease of Diego Garcia** to the UK and US for continued military use
- The UK will pay Mauritius approximately **£101 million per year**, totalling billions over the lease period
- **Significance of the Deal**
  - Marks the completion of **Mauritius's decolonisation process**
  - Balances **sovereignty claims** with the **strategic military requirements** of Western allies
  - Seen as a **"win-win"** — recognising Mauritian control while maintaining UK-US security presence
- **India's Stance**
  - India has **consistently supported Mauritius's claim** over Chagos, in line with its principles of **territorial integrity, sovereignty, and international law**

Durand Line

What is the Durand Line?

- A **2,600 km border** running from the **Iran border in the west** to the **China border in the east**
- Cuts across the **Karakoram range** and the **Registan desert**
- Drawn between **British India and Afghanistan** by **Sir Henry Mortimer Durand** (Foreign Secretary) and **Emir Abdur Rahman Khan** of Afghanistan in **1893**

Historical Background About Anglo-Afghan Wars

War	Year	Outcome
First Anglo-Afghan War	1839	British invaded but were **pushed back**

Second Anglo-Afghan War	1878	British won → **Treaty of Gandamak (1879)** → gave Britain control over Afghanistan's **foreign policy**
Third Anglo-Afghan War	1919	Ended with **Treaty of Rawalpindi** → restored Afghanistan's control over **foreign affairs** → reaffirmed the Durand Line

Significance of the Durand Line (1893)

- Split **Pashtun tribal areas** between British India and Afghanistan
- Placed **Balochistan under British India**
- Established the **Wakhan Corridor** as a **buffer zone between Russia and Britain**

Post-1947 Scenario

- **Pakistan inherited** the border after Partition
- **Afghanistan refused to recognise** it, calling it a **colonial creation**
- **Pashtun groups** on both sides demanded a separate **Pashtunistan**, deepening bilateral tensions
- **All Afghan governments, including the Taliban**, reject the Durand Line's legitimacy and press claims over Pashtun regions

Armenia

Context: India's **Chief of Defence Staff** General Anil Chauhan **visited Armenia** to deepen bilateral defence cooperation.

Location & Political Geography

- Armenia is a **landlocked country** in the **South Caucasus (Transcaucasia)** region.
- Lies at the crossroads of **Eastern Europe and Western Asia**.
- Considered among the world's **oldest centres of civilisation**.
- **Capital:** Yerevan
- **Armenia shares borders with:**
  - **Georgia** – North
  - **Azerbaijan** – East
  - **Iran** – South
  - **Turkey** – West
- **Special Border:** Borders **Nakhchivan** (Azerbaijan's exclave) in the southwest.

Physiography & Geological Features

- Located on the **Armenian Highland**.
- Average elevation: ~1,800 metres.
- Among the **most mountainous countries** in the region.

Major Water Body

- **Lake Sevan**:
  - One of the **largest high-altitude freshwater lakes** in Eurasia.
  - Supports irrigation, hydropower, fisheries, and climate regulation.

Nigeria

Location

- Nigeria is located on the **western coast of Africa** along the Atlantic shoreline.
- It lies along the **Gulf of Guinea**, forming part of West Africa.

Capital

- **Abuja** serves as Nigeria's capital city since **1991**.
- It replaced Lagos to ensure better administrative centrality.

Neighbouring Countries & Boundaries

- **Niger** lies to the north of Nigeria.
- **Chad** is located to the northeast.
- **Cameroon** borders Nigeria to the east.
- **Gulf of Guinea (Atlantic Ocean)** lies to the south.

Key Geographical Features

- **Rivers & Drainage System**
  - **Niger River** forms Nigeria's principal river system.
  - **Benue River** is the major tributary joining the Niger.
  - Their confluence creates fertile agricultural zones.
  - **Niger Delta** forms one of the **largest wetlands globally**.
- **Mountains & Plateaus**
  - **Jos Plateau** lies in central Nigeria.
  - Plateau region contains **extinct volcanic formations**.
  - **Chappal Waddi (2,419 m)** is the country's highest peak.
  - It forms part of the **Cameroon Highlands**.
  - Other ranges include **Shebshi Mountains**.
  - **Udi–Nsukka Escarpment** marks eastern highland terrain.
- **Plains & Soil Regions**
  - **Sokoto Plains** dominate the northwest region.
  - **Borno Plains** lie in the northeast.
  - Central Nigeria has **fertile savanna soils**.
  - Southern regions contain **forest-rich tropical soils**.
- **Climate**
  - Climate varies from **arid conditions in the north**.
  - Southern Nigeria experiences **humid equatorial climate**.
  - Rainfall increases progressively toward coastal regions.
- **Natural Resources**
  - Nigeria possesses vast **petroleum and natural gas reserves**.
  - Hydrocarbons form the **backbone of its national economy**.

Mount Aconcagua

Context: Indian mountaineer **Kabak Yano** summited **Mount Aconcagua** during her Seven Summits Expedition.

What is Mount Aconcagua?

- Mount Aconcagua is the **highest mountain in South America**.
- It is the tallest peak in the **Western Hemisphere**.
- It is the highest mountain **outside Asia**.
- Elevation: **22,831 feet (6,959 metres)** above sea level.
- Considered a challenging **non-technical climb** among Seven Summits.

Location

- Located in **Argentina**, western Mendoza Province.
- Lies close to the **Argentina–Chile border**.
- Forms part of the **Southern Andes mountain range**.

Geological Features

- Mountain has a **volcanic origin** but is not active.
- Formed mainly through **tectonic uplift of Andes**.
- Contains two peaks — **North and South summits**.
- Joined by ridge called **Cresta del Guanaco**.
- Region experiences **thin air and extreme winds**.
- Sub-zero temperatures create severe climbing conditions.
- **Altitude sickness** remains a major expedition risk.

Significance

- **Geographical Importance**
  - Highest point in both **Southern** and **Western Hemispheres**.
- **Mountaineering Importance**
  - Part of the prestigious **Seven Summits challenge**.
  - Attracts climbers globally despite harsh climate.
- **Scientific Importance**
  - Elevation studied using **modern GPS measurements**.
  - Subject of debate over exact summit height.

Bailey Bridge

About the Bridge

- A **modular, prefabricated truss bridge system** with pre-built components assembled rapidly on-site
- Invented by **Donald Coleman Bailey**, an English civil engineer
- Developed in **1941 during World War II**
- **Recent Context:** India sent Bailey Bridge materials to Sri Lanka for post-Cyclone reconstruction assistance

Key Features & Construction

- Built using **prefabricated steel panels** as assembled **manually without heavy machinery**
- Sections joined using **pins and bolts** form a **truss structure,** distributing load evenly
- **Modular design** enables flexible bridge length
- Highly **portable** parts are transported easily across terrains
- Can support **tanks and heavy military/civilian vehicles**
- The assembly occupies **limited ground space**, where **cranes cannot reach**

Ideal Usage & Significance

- River crossings, mountain valleys, remote and conflict-affected regions
- **Temporary restoration** after floods, cyclones, and earthquakes
- Critical for **military logistics and disaster response**
- Enables **rapid restoration** of connectivity
- Widely used in **humanitarian** relief operations

Miscellaneous

Member State vs Observer Status

Context: India participated as an **"observer"** in the first **Board of Peace for Gaza** meeting held in Washington D.C.

Member State

- **Meaning**
  - A **Member State** is a sovereign country formally admitted to an organisation.
  - Admission occurs through **signing and ratifying the founding treaty or charter**.
- **Rights**
  - Enjoys **full voting rights** in decision-making bodies.
  - Can propose resolutions and **participate fully in debates**.
  - Eligible to contest for positions in organisational bodies.
- **Obligations**
  - Bound by the **charter, rules, and legal framework**.
  - Required to pay **financial contributions or membership dues**.
  - Expected to comply with **resolutions and binding decisions**.
- **Examples**

- The **United Nations** has **193 Member States**.
- Members of the **World Trade Organization (WTO)** follow trade commitments.

Observer Status

- **Meaning**
  - **Observer Status** is granted to non-member states or organisations.
  - Conferred through a formal decision of the concerned body.
- **Rights**
  - Can attend meetings and **participate in discussions**.
  - Allowed to make statements in sessions.
  - Does **not possess voting rights**.
- **Limitations**
  - Cannot vote on resolutions or binding decisions.
  - Not fully bound by membership obligations.
- **Purpose**
  - Enables participation without full political or legal commitment.
  - Sometimes used by entities awaiting **full membership recognition**.
- **Examples**
  - In the **UN**, the **Holy See (Vatican City)** holds observer status.
  - The **State of Palestine** is also a UN observer entity.
  - In the **WTO**, countries like **Iran** hold observer status.

Military Exercises

Context: India conducted Exercises Khanjar, Agni Pariksha.

Exercise Khanjar

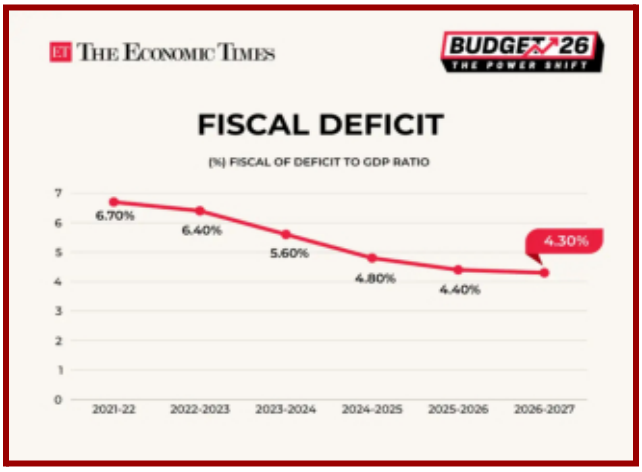
- **Location:** Missamari, Assam (India).
- **Participants**
  - Indian Army - Parachute Regiment (SF).
  - Kyrgyzstan - ILBRIS Brigade.
- **Nature**
  - Bilateral Special Forces exercise.
  - 13th edition.
- **Focus Areas**
  - Counter-terrorism operations.
  - Urban warfare drills.
  - Mountain warfare.
  - Sniping, building intervention.

Exercise Agni Pariksha

- **Location:** Sigar, Arunachal Pradesh.
- **Participants**
  - Indian Army.
  - Indo-Tibetan Border Police (ITBP).
- **Nature:** Joint artillery familiarisation exercise.
- **Aim**
  - Train non-artillery personnel.
  - Improve firepower coordination.
- **Key Feature:** First joint artillery exposure drill.

CONOMICS

Fiscal Deficit



Context: The Union Government set the fiscal deficit target at **4.3 percent of GDP for 2026–27**.

Key Fiscal Targets for 2026-27

- Fiscal deficit is targeted at **4.3% of GDP for 2026-27**, reduced from **4.4% in 2025-26**.
- **Debt-to-GDP ratio** is estimated at **55.6%**, down from **56.1%**, with a **long-term target of 50% by March 2031**.
- The gross **tax-to-GDP ratio** has **declined from 11.5% in FY25 to 11.2% in FY27**, reflecting a moderation in revenue growth.
- **Net tax receipts** are budgeted at **Rs 28.7 lakh crore**, a growth of **7.2% over 2025-26** with no major personal or corporate tax cuts announced.

Expenditure and Capital Investment

- Total expenditure is budgeted at **Rs 53.5 lakh crore**, growing **7.7% over 2025-26 estimates**.
- **Capital expenditure stands at Rs 12.2 lakh crore**, growing 11.5% year-on-year and equalling **4.4% of GDP**.
- Capex share in total expenditure has **risen sharply from 12% in 2020-21 to over 22%** today, reflecting infrastructure-led development strategy.

Types of Deficit

- **Budget Deficit:** Total Expenditure minus Total Revenue.
- **Revenue Deficit:** Revenue Expenditure minus Revenue Receipts, indicating government's inability to meet day-to-day expenses.
- **Fiscal Deficit:** Total Expenditure minus total non-debt receipts equals Budget Deficit plus Borrowings, the **most widely tracked deficit indicator**.
- **Primary Deficit:** Fiscal Deficit minus Interest Payments, indicating the **current borrowing burden** excluding past debt obligations.
- **Effective Revenue Deficit:** Revenue Deficit minus Grants for Capital Assets, introduced to capture the true **consumption nature of government spending**.

Fiscal Policy and Employment Disconnect

- The policy logic assumes infrastructure spending will **crowd in private investment, raise productivity, and eventually create employment**.
- However, **construction employment elasticity** declined from **0.59 pre-COVID to 0.42 post-COVID**, meaning fewer jobs are created per unit of infrastructure spending despite record public investment.
- **Agriculture employment** elasticity has **risen sharply from 0.04 to 1.51**, indicating distress-driven fallback into low-productivity rural activities rather than genuine agricultural growth.
- **Net value added** per worker has increased, but **average wages lag significantly**, suggesting efficiency gains are captured as profits rather than transmitted as labour income.
- **Annual Survey of Industries** shows that large firms dominate output while remaining capital-intensive and relatively labour-light, and most factories employ fewer than 100 workers.

Structural Concerns and Way Forward

- A **dual economy** has emerged where a capital-intensive layer drives GDP growth with limited employment generation, while the informal sector absorbs surplus labour through low-productivity self-employment.
- **Employment is treated as an eventual by-product** of growth rather than a direct policy objective, a structural flaw that widens inequality.
- MSMEs in manufacturing must be treated as the **structural backbone of employment**, not merely a temporary stimulus sector.
- Fiscal policy must **directly target labour absorption** alongside infrastructure expansion, particularly in labour-intensive sectors like textiles, construction, and agro-processing.
- Inclusion increasingly depends on **formal skills, urban location, and automation compatibility**, making investment in education and skilling a fiscal priority, not an afterthought.

Expansion of India's Direct Tax Base

Context

- India's direct tax system has **expanded significantly over the last decade**, reflecting deeper formalisation rather than temporary compliance spikes.
- Total taxpayers rose from **5.26 crore in AY 2013-14 to 12.13 crore in AY 2024-25**, more than doubling over eleven years.
- This expansion recorded a **CAGR of approximately 7.89%**, considered a major structural shift since the PAN system expansion.

Growth Trends in Taxpayer Base

- **Individual Taxpayers**
  - Individuals remain the **largest contributors to tax base expansion**, rising from **4.96 crore to 11.61 crore** at around 8% CAGR.
  - Pre-pandemic years saw **steady high single-digit increases**, while AY 2020-21 witnessed a **nearly 9% decline due to COVID disruption**.
  - Post-pandemic years showed **double-digit recovery** and renewed expansion momentum.
- **Non-Individual Taxpayers**
  - Includes firms, companies, HUFs, AOPs, BOIs, and local authorities — base rose from **0.29 crore to 0.48 crore** at around 5% CAGR.
  - Pre-pandemic expansion ranged between **4-7% annually**, while the pandemic year saw growth fall **below 1%**.
  - Recovery remained gradual, **stabilising near 5% growth** in recent years.

Improvement in Tax Administration Efficiency

- Cost of direct tax collection **declined sharply from 1.36% in FY 2000-01 to 0.41% in FY 2024-25**, reaching the lowest recorded level.
- Key drivers of administrative improvement include **digital filing systems, pre-filled returns, faceless assessments, and expanded third-party information reporting**.
- Faceless assessments improved **transparency and speed** while significantly reducing scope for corruption and harassment.
- Expanded third-party reporting has **strengthened monitoring and reduced tax evasion** across formal economic transactions.

Fiscal Significance and Way Forward

- A wider taxpayer base **strengthens revenue stability and fiscal sustainability**, reducing India's dependence on indirect taxes that are regressive in nature.
- Deeper formalisation reinforces **taxation's foundational role in the formal economy** and improves India's overall fiscal architecture.
- Despite impressive expansion, India's **tax-to-GDP ratio remains below global peers**, indicating significant untapped potential in the direct tax base.
- Continued investments in **digital infrastructure, simplified compliance, and widening the PAN-Aadhaar ecosystem** will be essential to sustaining this trajectory.

Labour Codes Reform

Context and Rationale

- India consolidated **44 central labour laws into four labour codes** i.e. on Wages, Industrial Relations, Social Security, and Occupational Safety, to modernise fragmented and outdated labour governance.
- The reforms aim to **expand financial inclusion by embedding social security within employment relationships** and equitably distributing economic growth between capital and labour.
- Consolidation improves **transparency, regulatory predictability, and compliance simplicity** for both employers and the workforce.

Wage Reforms and Social Security Expansion

- The redefined wage structure mandates that **basic wages** constitute at least **50% of total remuneration**, increasing contributions to **Provident Fund, pension, and gratuity benefits**.
- **Fixed-term employees** now qualify for **gratuity after completing one year** of service, transforming contract employment into a pathway for asset creation.
- **Timely wage payments and deduction limits** enhance income stability and protect workers from exploitative practices.

- Social security instruments now support **savings mobilisation and life-cycle risk protection** for millions of previously unprotected workers.

Financial Inclusion of Informal and Gig Workers

- Labour codes **extend social security coverage to gig, platform, and unorganised workers**, providing access to insurance, provident fund mechanisms, and welfare schemes.
- **Benefit portability across states** strengthens security for migrant and mobile workers who previously lost entitlements on crossing state boundaries.
- **Universal wage norms ensure statutory minimum wages** across all sectors and occupations, ending the exclusion of informal workers from wage protection.

Macroeconomic Benefits

- Enhanced worker income **increases purchasing power and household consumption demand**, stimulating domestic production through demand-led growth.
- **Income circulation within the domestic economy amplifies multiplier effects**, making labour codes instruments of inclusive and participatory development.
- Worker savings behaviour **strengthens long-term financial resilience** and supports India's formal financial ecosystem.

Implementation Concerns

- **Trade unions have raised concerns** about implementation capacity, enforcement mechanisms, and potential dilution of existing worker protections.
- Reform success depends critically on **effective execution, worker awareness, and institutional capacity** at the ground level.
- Risk of **states delaying implementation** due to varying political economies and employer lobbying pressures.

Topic: Infrastructure

Domestic EV Battery Manufacturing

Context and Current Status

- The **₹18,100 crore ACC PLI scheme** was launched in **October 2021** to build domestic EV battery manufacturing capacity and reduce dependence on Chinese imports.
- The target was **50 GWh cell production by 2025**, but progress remains significantly delayed, with only **2.8% of the target commissioned** as of October 2025.
- The scheme has created only **1,118 jobs, representing 0.12% of projected employment** — a serious underperformance.

Nature of ACC Technology and Scheme Design

- **Advanced Chemistry Cells (ACCs)** store **electrical energy as chemical energy** and reconvert it when required, with lithium-ion batteries dominating current applications.
- The scheme is **technology-agnostic**, covering lithium-ion phosphate, sodium-ion, and NMC batteries, providing flexibility to manufacturers.
- Firms bid for a **minimum 5 GWh capacity commitment** through a competitive auction, requiring **₹225 crore net worth per GWh** of proposed capacity.
- Subsidies allowed claims of **up to ₹2,000 per KWh per battery sold**, with **Domestic Value Addition targets** of 25% within two years and 60% by year five.

Selected Beneficiaries and Performance

- **Ola Electric** received 20 GWh allocation and alone contributed the entire installed 1.4 GWh capacity.
- **Reliance New Energy** secured 25 GWh across two auction rounds.
- **Rajesh Exports** was awarded a 5 GWh manufacturing allocation.
- Performance across beneficiaries has been **deeply uneven**, with most allocations yet to translate into operational capacity.

Key Challenges

- The **two-year gestation period was unrealistic** for constructing complex gigafactories requiring extensive infrastructure.
- India **lacks facilities for processing lithium, nickel, and cobalt minerals** — essential inputs for battery manufacturing.
- Evaluation criteria **prioritised DVA compliance over manufacturing experience**, rewarding compliance over capability.
- **Delays in visas for Chinese technical specialists** slowed critical knowledge transfer and plant operations.

Way Forward

- **Fast-track expert visas** and extend project timelines to reflect realistic gigafactory construction periods.
- Long-term success requires **critical mineral refining, a component manufacturing ecosystem, and workforce development**.
- India must develop **domestic mineral processing capabilities** to reduce upstream import dependence alongside cell manufacturing.

Power Distribution Sector Reforms

Context and Structural Weaknesses

- India has **72 DISCOMs** (44 State-owned, 16 private, and 12 departmental entities), historically suffering persistent losses and rising debt.
- Accumulated losses rose from **₹5.5 lakh crore to ₹6.47 lakh crore** between 2020-21 and 2024-25, with outstanding debt increasing further to **₹7.26 lakh crore**.
- **Root causes include**
  - Non-cost-reflective tariffs,
  - Delayed state subsidy payments and
  - High Aggregate Technical and Commercial (AT&C) losses.
- Earlier State Electricity Boards operated under the **Electricity Supply Act, 1948**, which required utilities to earn a minimum **3% profit**, yet most remained loss-making.

Signs of Financial Turnaround

- DISCOMs posted a **₹2,701 crore Profit After Tax in FY 2024-25**, a dramatic recovery from losses of **₹67,962 crore in 2013-14**.
- **AT&C losses reduced from 22.62% to 15.04%**, and the ACS-ARR gap narrowed sharply to **0.06 paise per unit**.
- Legacy dues of **₹1.39 lakh crore fell sharply by 2026**, with DISCOMs significantly improving payment discipline.

Role of Government Reforms

- **Revamped Distribution Sector Scheme (RDSS)** focuses on quality power supply and financial sustainability, with funds linked to the execution of actual sector reforms.
- **Late Payment Surcharge Rules** enabled legacy dues repayment in **48 EMIs**, helping reduce mounting liabilities systematically.
- However, profitability in states like **Tamil Nadu and Rajasthan emerged only after state government support**, raising questions about genuine financial sustainability.

Persistent Concerns

- Many utilities **rely heavily on tariff subsidies and state government loss takeovers**, masking underlying operational fragility.
- **Future pay revisions may again worsen finances** without structural improvements in revenue collection.
- Universal free electricity schemes **undermine cost recovery** and distort incentive structures for utilities.

Way Forward

- **Expand feeder segregation** for agricultural power supply to improve metering accuracy and reduce losses.
- **Promote solar pumps** to cut expensive agricultural power procurement costs for DISCOMs.
- **Target subsidies to vulnerable consumers only,** thus avoiding universal free electricity that erodes financial viability.
- Long-term sustainability depends on **structural reforms**, not repeated subsidy-driven profitability cycles.

Green Steel Transition in India

Context and Climate Imperative

- India's **net-zero 2070 commitment** hinges significantly on decarbonising the emission-intensive steel manufacturing sector.
- The **steel sector remains among the largest industrial sources of carbon emissions**, making its transition central to India's climate goals.
- The **Ministry of Steel has constituted 14 task forces** mapping technological and policy transition pathways for low-carbon steel production.

Green Premium and Economic Challenge

- Green steel production involves **high upfront investment and technology transition costs**, creating a "green premium" that constrains early private sector adoption.
- **Targeted fiscal incentives, GST rationalisation, and time-bound subsidies** are essential to bridge cost gaps and ensure commercial viability.
- Steel accounts for nearly **18% of large public infrastructure project costs** — yet even a 30% green premium increases overall project expenditure

by only **5.5%**, making transition economically manageable.

- **Government procurement can function as anchor demand** for green steel markets, accelerating commercial scale-up at manageable fiscal cost.

Strategic and Trade Security Gains

- Green steel transition helps India **bypass EU Carbon Border Adjustment Mechanism (CBAM) tariffs**, protecting the competitiveness of Indian steel exports in European markets.
- India currently **imports over 50 million tonnes of coking coal annually**, exposing infrastructure costs to global price volatility.
- Reducing fossil fuel dependence through green steel **strengthens industrial resilience, trade competitiveness, and long-term economic security**.

Policy Framework and Way Forward

- India has launched the **Green Steel Taxonomy with 3-star, 4-star, and 5-star emission ratings**, enabling carbon disclosure and procurement benchmarking across the industry.
- Procurement norms must **shift from lowest cost to sustainability value**, embedding green criteria into public infrastructure tenders.
- Alignment with **PLI schemes and Green Hydrogen Mission** is essential for building the full value chain needed for green steel production.
- **Pilot adoption through large public agencies** can create demonstrated demand and accelerate sector-wide scale-up of green steel manufacturing.

India's Civil Aviation Sector

Context and Scale

- India is the **world's third-largest** domestic aviation market, operating over **840 aircraft annually** and carrying more than **350 million** passengers each year.
- Recent disruptions, including the **Ahmedabad crash (June 2025)**, mass cancellations, and the December 2025 system-wide disruption, have exposed deeper operational fragilities in India's rapidly expanding aviation sector.
- Demand may reach **715 million passengers by 2030**, making structural reforms urgently necessary.

Pilot Shortage and Workforce Stress

- **IndiGo** operated 360+ aircraft with only **5,038 pilots**, giving a pilot-to-aircraft ratio of **14,** well below the global benchmark of **18-20**.
- India needs **7,000 pilots between 2024-26**, with demand potentially reaching **30,000 over the decade**, yet DGCA issued only **5,700 Commercial Pilot Licences between 2020-24**.
- New **Flight Duty Time Limitation (FDTL) rules** tightened operations as night flights reduced, rest periods extended, flying hours capped and further straining existing pilot supply.

Regulatory Weaknesses

- **Nearly half of DGCA technical posts remain vacant**, severely weakening oversight capacity.
- DGCA issued **19 safety violation notices by late 2025**, including FDTL breaches and equipment lapses.
- Disruptions have been managed through **schedule exemptions rather than strict enforcement**, reflecting fragile regulatory culture.

Market Concentration

- **IndiGo holds 63-65% domestic passenger share** while Air India Group accounts for 27-28%, together controlling **nearly 90% of the domestic market**.
- **IndiGo operates as sole carrier on 60.4% of routes**, meaning disruptions reduce connectivity rather than redistributing passengers to competitors.

Regional Connectivity and Structural Risks

- NOCs were issued to **Shankh Air, Al Hind Air, and FlyExpress in December 2025** to enhance regional connectivity under the **UDAN scheme**, which has operationalised **625 routes and 85 airports by 2025**.
- However, past failures of **Kingfisher, Jet Airways, and Go First** highlight structural risks, i.e. high costs, weak demand, poor management, and infrastructure gaps, which remain recurring challenges.
- **ATF price volatility tied to global markets** remains a major and persistent cost risk for Indian carriers.

Way Forward

- India must build **20-25% spare crew buffers** as seen globally to handle operational disruptions without system-wide failures.
- **DGCA must fill vacant technical posts urgently** and shift from exemption-based crisis management to proactive enforcement.
- **Pilot training infrastructure,** such as simulators, training institutions, and financial support, must be massively expanded to meet projected demand.
- **Fuel policy support and ATF rationalisation** must be addressed to reduce structural cost pressures on airlines.
- Market concentration must be addressed through **policies encouraging genuine competition and protecting underserved routes**.

Topic: Inclusive growth and issues arising from it.

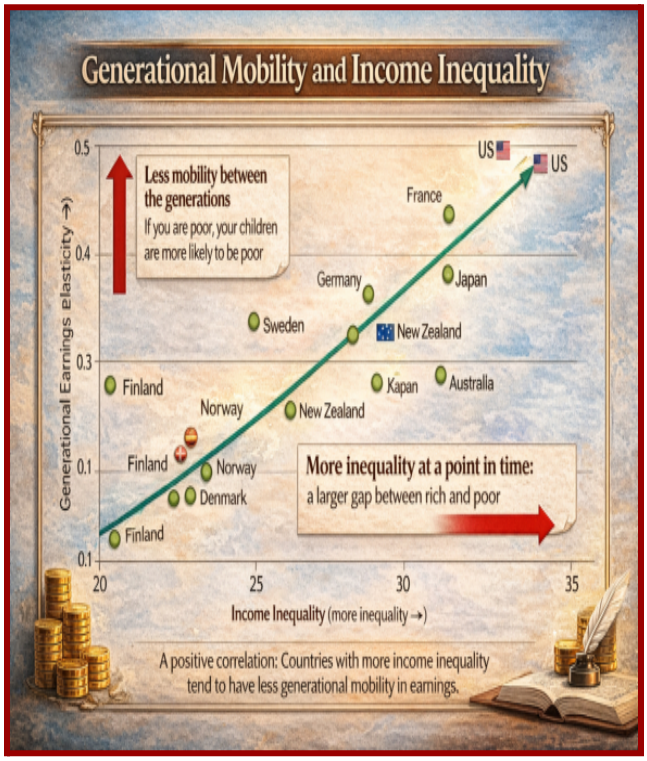
Income Mobility Crisis

Changing Nature of Income Mobility in India (2014–2025)

- Downward mobility nearly **doubled from 14% in 2015 to 26.8% in 2025** across all Indian households.
- By 2025, **more than one in four households** are worse-off than their 2014 income position.
- Upward mobility rose gradually from **14.1% to 23.5%**, but consistently trailed the rise in downward movement.
- The economy shows **growing vulnerability and uneven gains** rather than broad-based upward progress.

The Great Gatsby Curve

- Rising **income inequality** makes it harder for poorer households to move upward. Districts with wider income gaps show higher **downward mobility** among vulnerable families.
- This reflects the **Great Gatsby Curve** i.e. the more unequal a society, the lower its **economic mobility**.
- In unequal settings, children born into poverty face limited access to **quality education, healthcare, and networks**.
- Wealth and opportunities tend to circulate within already privileged groups.
- As inequality rises, aspiration weakens and mobility becomes structurally restricted.
- The data suggest that **growth without equity** does not guarantee upward progress.



Structural and Spatial Dimensions of Inequality

- **Rural households bear the worst impact** as nearly 29% are worse-off than their 2014 position by 2025.
- Rural downward mobility saw its **sharpest deterioration in the first subperiod (2014–19)**, persisting thereafter.
- **Urban India fares comparatively better**, with upward mobility improving at a faster pace than rural areas.
- Economic gains remain **heavily concentrated in urban centres**, deepening the rural-urban divide.
- Households in **more unequal districts are more likely to slip down** the income ladder than climb up.

Social Fault Lines in Economic Mobility

- Downward mobility has risen across **all social groups since 2014**, with OBC and SC households hit hardest.
- By 2025, **roughly a quarter or more of OBC and SC households** are worse-off than their 2014 position.
- For **SC households**, the problem is less dramatic descent and more persistent **narrowing of pathways upward**.
- **Caste remains a decisive fault line** in income mobility — equal economic ascent remains largely illusory.
- **Muslim households show weaker upward mobility** compared to Hindus, reflecting entrenched discrimination.
- Education, urban location, and larger household size are **associated with better mobility prospects**.

Implications for Inclusive Growth and Social Stability

- An economy where **more households slip down than climb up cannot sustain social stability** for long.
- When inequality hardens into **reduced mobility, frustration replaces aspiration** among vulnerable populations.
- Policy must move **beyond headline GDP growth** toward strengthening health, education, and employment-intensive sectors.
- Policies addressing **caste and religious discrimination are central** to restoring mobility, not merely matters of welfare.
- Broad-based inclusion requires **targeted interventions in rural areas** where vulnerability remains persistently high.

Rural Women Entrepreneurship

Context and Scale of Achievement

- The Deendayal Antyodaya Yojana National Rural Livelihoods Mission **(DAY-NRLM)** has mobilised around **10 crore households** nationwide through structured women's collectives.
- Women were organised into **91 lakh Self-Help Groups**, federated into **5.35 lakh Village Organisations** and further into **33,558 Cluster-Level Federations** at the sub-block level.
- SHGs have mobilised over **₹11 lakh crore in bank credit,** with Non-Performing Assets remaining remarkably low at **near 1.7%**.
- The number of **Lakhpati Didis has crossed two crore**, reflecting a successful transition from subsistence to entrepreneurship.

Political, Social and Financial Empowerment

- Women's collectives have influenced **Direct Benefit Transfer schemes** across multiple states, including Ladli Laxmi Yojana, Maiya Samman Yojana, and Ladki Bahin Yojana.
- Bihar transferred **₹10,000 each to over one crore**

women under the Mukhyamantri Mahila Rozgar Yojana through SHG networks.

- Around **₹56.69 lakh crore** was provided as capitalisation support to community institutions, demonstrating the programme's financial depth.
- Successful community-owned models like **Kudumbashree in Kerala and Jeevika in Bihar** demonstrate what genuine institutional ownership can achieve.

Institutional Architecture and Credit Challenges

- **Cluster-Level Federations are identified as the linchpin** of the SHG institutional architecture for the next phase, yet concerns exist about CLFs becoming dependent on government functionaries rather than achieving genuine autonomy.
- SHG members increasingly seek **higher individual loans** as enterprises stabilise and scale up, but a **lack of individual credit history** limits formal banking access.
- **Generating CIBIL scores for SHG members** is identified as a priority to build credit identities and improve financial inclusion outcomes.
- CLFs must design **flexible loan products, avoiding uniform interest and repayment structures** to serve the diverse needs of women entrepreneurs.

Innovative Financing and Marketing Support

- The programme must explore **equity, venture capital, and blended finance models**, with partnerships encouraged with **SIDBI, NBFCs, and neo-banks**.
- A **dedicated national marketing vertical** is proposed for SHG products, focusing on branding, packaging, pricing, quality, and logistics.
- Select CLFs can serve as **regional logistics hubs** for specific products, strengthening market linkages.
- A **NITI Aayog Convergence Cell** is proposed to institutionalise inter-departmental coordination for better programme outcomes.

Way Forward

- The programme will be **re-appraised for 2026-27 to 2030-31**, with CLF strengthening as the central institutional priority.
- **Social and statutory audits of CLFs** must be strengthened to prevent misuse of idle funds and ensure accountability.
- **Annual Livelihood Action Plans** should use Village Prosperity and Resilience Plan data for evidence-based planning.
- Deployment of **sectoral professionals to guide community organisations** sustainably will be essential for quality enterprise development.

Topic: Agriculture

India's Rice Production and Groundwater Crisis

Context and Achievement

- India became the **world's largest rice producer in 2025, surpassing China**, with rice exports crossing **20 million metric tonnes,** nearly double the exports from a decade ago.
- However, this achievement carries **severe environmental costs**, particularly in Punjab and Haryana, where rice cultivation is driving an unsustainable groundwater crisis.

Scale of the Groundwater Crisis

- In Punjab and Haryana, groundwater levels have dropped dramatically from **30 feet depth a decade ago to 80-200 feet currently**, forcing farmers to drill expensive deep borewells.
- Both states **extract 35-57%** more **groundwater annually** than their aquifers naturally replenish, with large parts classified as **"over-exploited" or "critical"** by the Indian government in 2024-25 data.
- Producing **1 kg of rice** in India consumes **3,000-4,000 litres of water** and **20-60%** more than the global average for rice cultivation, according to farm economist Ashok Gulati.

- Farmers borrow heavily to drill deeper borewells and install more powerful pumps, **increasing debt burden** while reducing profitability despite higher rice prices.

Role of Government Subsidies in Perpetuating the Crisis

- MSP for rice **increased by approximately 70%** over the past decade, strongly incentivising water-intensive rice cultivation over alternatives.
- **Heavy power subsidies** make groundwater extraction economically attractive despite devastating environmental costs, discouraging crop diversification.
- **Dr. Avinash Kishore (IFPRI)** noted that "one of the world's most water-stressed countries is paying farmers to consume vast amounts of groundwater", a deeply perverse policy outcome.
- **Dr. Uday Chandra (Georgetown University)** observed that **government subsidies create perverse incentives** that lock farmers into unsustainable practices generation after generation.

Policy Responses and Limitations

- Haryana launched a subsidy programme of **₹17,500 per hectare** to encourage farmers to switch to millets and less water-intensive crops.
- However, this incentive is available **only for one growing season**, which is insufficient to drive the long-term behavioural change needed for sustainable agriculture.
- A fundamental **conflict exists between food security goals, export revenues, and environmental sustainability** that current policy has failed to resolve.

Way Forward

- **Crop diversification** must be incentivised through restructured MSP and long-term subsidies for millets, pulses, and oilseeds that restore groundwater balance.
- **Subsidy reform** must restructure power subsidies to reflect the true environmental costs of groundwater extraction.
- **Micro-irrigation techniques** such as drip and sprinkler irrigation, alongside rainwater harvesting and aquifer recharge programmes, must be aggressively promoted.
- **Water-efficient rice cultivation technologies,** including **System of Rice Intensification (SRI)** and **Alternate Wetting and Drying (AWD),** must be scaled up with farmer support.

Prelims

Topic: Indian Economy

New GDP Series

Base Year Revision

- Base year updated from **2011-12 to 2022-23.** This makes GDP and GVA data a **more accurate representation** of the current economy.

Methodological Changes (Sector Wise)

Sector	Earlier	Now
Non-Financial Private Corporate	GVA allocated to sector with **bulk of activity**	**Activity-wise revenue share** used for each business activity
General Government (Housing)	Housing services to employees **not included**	Housing services **included**
General Government (Coverage)	**Limited coverage** of autonomous institutes & local bodies	Coverage **enhanced**
Household Sector	Data **extrapolated** from older surveys	**ASUSE + PLFS** used annually for direct estimation

Private Final Consumption	**Less granular** measurement	Enhanced **Household Consumer Expenditure Surveys** + direct estimation

New Data Sources Introduced

Area	Earlier	Now
GST Data	Only in **quarterly accounts** & some sectors	Estimates regional output, private company contribution & identifies active companies
Private NBFCs	**Proxy-based** approach	**Actual NBFC financial data** from Ministry of Corporate Affairs
Banking (RBI Data)	**Limited** RBI data usage	**STRBI** used for both public & private sector banks
Local Bodies	Data largely **imputed**	**Direct estimation** via enhanced state reporting

New CPI Series (Base Year 2023–24)

What is CPI?

- **Consumer Price Index (CPI)** measures **retail price changes** in commonly consumed goods and services
- India's **headline inflation indicator** is used for **monetary policy decisions and inflation targeting**
- **Nodal Ministry:** Ministry of Statistics and Programme Implementation (MoSPI)

Why Was Revision Needed?

- Indian economy witnessed a **structural transformation** over the last decade
- Shift in **consumption patterns,** rise in services, housing, and digital consumption
- CPI basket updated using **Household Consumption Expenditure Survey (HCES) 2023–24**
- Follows **international statistical best practices** of periodic base revision

Key Changes in New CPI Series

- **Base Year**
  - Revised from **2011–12 to 2023–24**
  - **First data release:** Retail inflation (January 2026) recorded at 2.75%
- **Expanded Item Basket**
  - Total items increased from **299 to 358**
    - **Goods:** 259 → **308**
    - **Services:** 40 → **50**
  - Education, health, and transport are now **standalone categories**
  - Includes **e-commerce prices** for airfares, OTT, and telecom plans
- **Wider Data Collection Network**
  - **Rural markets:** 1,181 → **1,465**
  - **Urban markets:** 1,114 → **1,395**
  - **12 online marketplaces** have been newly added
  - Covers **434 towns** across India

Major Weight Revisions

Component	Earlier Weight	New Weight
Food & Beverages	45.86%	**36.75%**
Housing & Utilities	10.07%	**17.67%**

- **Food weight reduced,** and it reflects **Engel's Law** (declining food share with rising incomes), and thus is expected to **reduce headline inflation volatility**
- **Housing weight increased** as it now includes **water, electricity, gas, and fuels** — driven by higher rent and utility expenditure

Methodology Improvements

- Improves the **House Rent Index methodology** and rural rent coverage
- Excludes **employer-provided accommodation** from rent calculation
- Strengthens **services sector representation** in the

inflation basket

Significance

- Improves **credibility and accuracy** of inflation measurement
- Supports **RBI monetary policy decisions**
- Reflects structural shift toward **housing and services consumption**
- Reduces **weather-driven food inflation volatility**

New Income Tax Act, 2025

Basic Facts

- Announced in **Union Budget 2026–27** — effective from **April 1, 2026**
- **Replaces the Income Tax Act, 1961**
- Review announced in **July 2024** and completed rapidly
- Introduces **user-friendly tax forms** enabling **self-compliance** without professional assistance

Revised Filing Deadlines

Category	Due Date
ITR-1 and ITR-2	July 31 (unchanged)
Non-audit businesses and trusts	Extended to **August 31**
Revised or belated returns	Extended to **March 31** (earlier: December 31)

- Fee for belated/revised returns: **₹1,000 or ₹5,000** based on income threshold
- Updated returns allowed **after reassessment proceedings begin** — requires additional **10% tax**

Penalty & Prosecution Reforms

- Assessment and penalty proceedings integrated in a **single order**
- **Technical defaults decriminalised** — converted into fees
- Maximum imprisonment reduced to **2 years**
- Courts empowered to **convert imprisonment into fines**

FAST DS (Special Disclosure Scheme)

- Foreign Assets of Small Taxpayers Disclosure Scheme, 2026
- **6-month** one-time disclosure window
- Covers **students and relocated NRIs**
- **Immunity granted** upon payment of specified taxes or fees

Deep Tech Start-ups

Context: The Centre formally defined 'Deep Tech Start-ups' through a **DPIIT gazette notification**.

What are Deep Tech Start-ups?

- Enterprises developing solutions using **advanced scientific or engineering knowledge**.
- Focus on breakthrough innovation, not incremental digital platforms.
- Characterised by **high technical uncertainty** and scientific complexity.
- Require long gestation periods and sustained R&D investments.

Organisations Involved

- **DPIIT (Department for Promotion of Industry and Internal Trade):** Certifying authority for deep tech start-ups.
- **ANRF (Anusandhan National Research Foundation):** Custodian of ₹1 lakh crore **Research, Development & Innovation Fund**.

Eligibility Criteria

- Core work must generate **new scientific or engineering knowledge**.
- Significant expenditure devoted to **Research & Development activities**.
- Ownership or creation of **novel Intellectual Property (IP)**.
- Commercialisation roadmap for developed technologies mandatory.
- High infrastructure, capital, and scientific risk exposure.
- Long development timelines before market deployment.
- Non-core investments prohibited unless linked to knowledge creation.
- Mandatory certification application to **DPIIT** required.

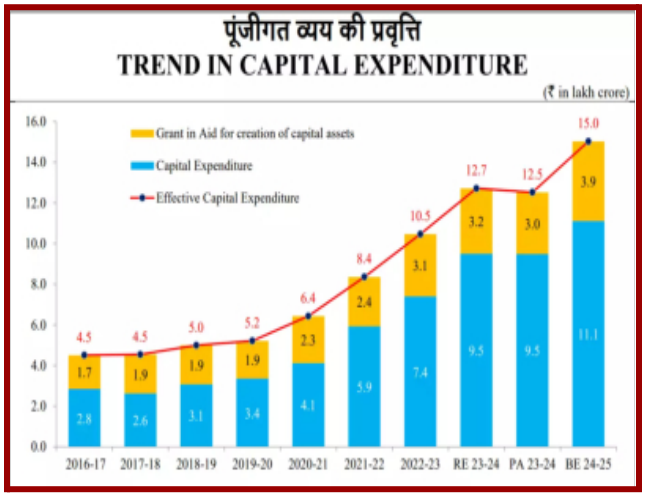
Key Features

- **Recognition & Regulatory Support**
  - Extended recognition period up to **20 years**.

- Higher turnover eligibility threshold of **₹300 crore**.

- **Financing Support**
  - Access to concessional long-term finance.
  - Interest rates reported in **2–4% range**.
  - Loan tenure may extend up to **15 years**.
- **Governance Mechanism**
  - Certification overseen by an **inter-ministerial technical board**.
  - Ensures scientific authenticity and innovation depth.

States' Capital Expenditure



Revenue Performance (April–January FY2025)

- States' **revenue receipts increased by 18%** as actual revenues **exceeded budget estimates**
- **GST collections grew by 23%** thus surpassing budgeted 22% growth
- Lower GST rates and income tax rationalisation **reduced potential revenue mobilisation**
- **Stamp duty and registration revenues** grew modestly at **11–13% annually**

Capital Expenditure Performance

- States' CapEx increased by **7.7%** during April–January FY2025 thus significantly below the **budgeted 22% target**
- Capital spending **surged by 25.7% in Q3**, indicating back-loaded spending
- Moderating revenue growth nudged States to **slow revenue expenditure expansion**

Centre–State Fiscal Transfers

- Central grants to States budgeted at **₹13.9 trillion** thus lower than previous actual transfers of **₹14.2 trillion**
- During April–November, Central grants **declined by 18% year-on-year**
- States projected **~60% grant growth** in remaining months
- Centre's **50-year interest-free capex loans:** ₹1.5 trillion allocation as **₹1 trillion disbursed by January 2025**

About Capital Expenditure

- Spending on **long-term productive assets** providing economic benefits over several years
- Recorded as an **asset** as reduced gradually through **depreciation**
- **Examples:** constructing buildings, highways, infrastructure; purchasing machinery, land, vehicles
- **Significance:**
  - Promotes **long-term economic growth**
  - Generates **employment** and stimulates **private investment**
  - Creates a **positive multiplier effect** in the economy
  - Sustained CapEx can **crowd-in private investment.**

Topic: Banking, Monetary Policy and Capital Market

Monetary Policy Committee (MPC)

Context: The **Monetary Policy Committee (MPC)** determines India's policy interest rate to control inflation.

Monetary Policy

- Monetary policy uses central bank instruments to regulate money supply.
- It controls interest rates, liquidity, and credit availability.
- Objective: Achieve macroeconomic stability and policy goals.
- **Legal Basis**
  - Conducted by Reserve Bank of India (RBI).
  - Mandated under **RBI Act, 1934**.
  - Amended in **May 2016** to institutionalise inflation targeting.
- **Primary Objective**
  - Maintain price stability.
  - Support economic growth simultaneously.

- Price stability ensures sustainable long-term development.

- **Inflation Targeting Framework**
  - Introduced through RBI Act amendment, 2016.
  - Flexible Inflation Targeting (FIT) adopted.
  - Inflation target set every five years.
  - Decided by Government in consultation with RBI.

Monetary Policy Committee (MPC)

- Constituted under **Section 45ZB, RBI Act, 1934**.
- Statutory body for policy rate decisions.
- Replaced Technical Advisory Committee system.
- **Function**
  - Fixes benchmark policy rate (Repo Rate).
  - Ensures inflation remains within target band.
  - Policy decisions binding on RBI.
- **Composition (6 Members)**
  - **RBI Representatives (3)**
    - RBI Governor - Chairperson.
    - Deputy Governor (Monetary Policy).
    - One RBI Board nominee.
  - **Government Nominees (3)**
    - Appointed by Central Government.
    - External experts in economics/finance.
- **Tenure**
  - **External members:** 4-year fixed term.
  - Not eligible for reappointment.
- **Meeting & Quorum**
  - Meets at least four times annually.
  - **Quorum:** Minimum four members.
  - Governor or Deputy Governor mandatory.
- **Decision-Making**
  - Decisions by majority vote.
  - Governor holds casting vote in tie.
  - Outcomes binding on RBI.

IPO, FPO & OFS

Context:
Government to sell up to **5% stake in BHEL** via **OFS** at **₹254 per share**.

Initial Public Offering (IPO)

- IPO refers to first-time sale of company shares to the public.
- It marks the process of a company **"going public"**.
- Shares are listed on a recognised stock exchange.
- Investors purchase shares directly from the company.
- **Purpose of IPO**
  - Raises funds for **future expansion and growth**.
  - Helps repay **existing borrowings or liabilities**.
  - Enhances company visibility and market credibility.

Follow-on Public Offer (FPO)

- FPO is the issuance of shares by an already listed company.
- Conducted after completion of IPO process.
- **Types of FPO**
  - **Dilutive FPO**
    - Company issues **fresh shares** to investors.
    - Increases total number of outstanding shares.
    - Used to raise funds for expansion or debt repayment.
  - **Non-Dilutive FPO**
    - Existing shareholders sell their holdings.
    - No new shares are created.
    - Company does not receive funds directly.

Offer for Sale (OFS)

- Mechanism where **existing shares are sold** to public.
- Only promoters or large shareholders participate.
- **Eligibility**
  - Shareholders holding **more than 10% stake** can offer shares.
- **Key Features**
  - No fresh shares are issued.
  - Entire sale involves already existing shares.
  - Retail bids backed by **100% cash margins**.

Key Differences: IPO vs FPO vs OFS

- **IPO**
  - Unlisted company enters stock market.
  - Issues new shares to raise capital.
  - Lengthy process with regulatory approvals.
  - Retail quota around **35%**.
- **FPO**
  - Listed company raises additional capital.
  - May issue new shares or sell existing ones.

- Used for expansion or debt reduction.

- **OFS**
  - Only existing shareholders sell stake.
  - No capital raised by the company.
  - Completed in **single trading day**.
  - Exchange notified **two working days prior**.
  - 25% shares reserved for mutual funds and insurers.

Alpha Fade Rate

Basic Concept

- **Alpha** refers to excess return over a benchmark index.
- An **alpha strategy** aims to consistently generate positive excess returns.
- **Alpha fade rate means** gradual weakening of an alpha strategy. It reflects declining effectiveness of previously successful investment strategies.

Why Does Alpha Fade?

- Markets now show **reduced information asymmetry** among investors.
- Most participants **access similar company** data simultaneously. **Cheap computing** enables rapid testing of investment strategies. **Competing institutions** quickly **replicate** successful alpha strategies.
- When many investors follow same strategy, excess returns diminish. A strategy must remain unique to generate sustainable alpha.

Broader Implication

- **Generating new strategies** is easier than sustaining them.
- **Alpha decay** is common in developed markets like the United States.
- Emerging markets such as India may face similar trends.
- Investors must evaluate sustainability before choosing active funds.

Green Bonds

Context: The **Brihanmumbai Municipal Corporation (BMC) plans** to issue **municipal green bonds** to finance sustainable infrastructure initiatives. The **green bonds aim to raise ₹500 crore** for projects including **wastewater treatment and desalination** plants.

What are Green Bonds?

- According to **SEBI**, a green debt security is one issued with the intention of raising money for causes like **sustainable development or increased energy efficiency.**
- Green bonds are **debt instruments similar to normal bonds**, but the capital raised must be **earmarked exclusively for green projects.**
- Green projects typically include those linked to **renewable energy, pollution reduction, and similar environmental initiatives.**

Key Features

- Green bonds can be issued by both **governments and private companies** such as multinational corporations.
- They generally carry **lower interest rates** than loans provided by commercial banks.
- They are considered **less risky** since they are linked to the **issuer rather than the successful completion** of the projects.
- When issuing green bonds, issuers must provide information about the **project needing green financing** and the **overall environmental benefits** arising from it.

Green Bonds vs Normal Bonds

Aspect	Normal Bonds	Green Bonds
1. Use of funds	Any project	Green projects only
2. Interest rate	Market rate	Generally lower
3. Disclosure requirement	Standard	Must disclose environmental benefits

Risk of Greenwashing

- Due to lower interest rates, businesses sometimes attempt to raise money **under the guise of green bonds** without genuine environmental intent and this practice is called **greenwashing**.

Securities and Exchange Board of India (SEBI)

Basic Overview

- **SEBI** is the principal regulator of India's **securities market**. It functions as a statutory body under the **Ministry of Finance**.
- Headquarters located in **Mumbai**.
- Regional offices operate in **Ahmedabad, Kolkata, Chennai and Delhi**.

Objectives

- Acts as watchdog of the **Indian capital market**.
- Protects interests of **investors in securities**.
- Promotes orderly growth of the **securities market**.
- Ensures transparency, stability, and investor confidence nationwide.

Evolution

- Earlier regulator was **Controller of Capital Issues (1947 Act)**.
- SEBI created in **April 1988** through **executive resolution. Therefore,** initially the SEBI lacked statutory enforcement powers.
- Gained statutory status under **SEBI Act, 1992**.
- Became autonomous regulatory authority with legal powers.

Organisational Structure

- Managed by a **Board of Directors**.
- Board consists of **nine members**.
- Includes Chairperson nominated by the **Central Government**.
- Two members from **Finance Ministry** and one from **RBI**.
- At least three members serve as **Whole-Time Members**.

Powers and Functions

- **Quasi-Legislative and Quasi-Judicial Powers**
  - Frames regulations and conducts market investigations.
  - Can impose penalties for regulatory violations.
- **Powers over Issuers**
  - Inspects stock exchanges, mutual funds, and intermediaries.
  - Prohibits **insider trading** and unfair practices.
- **Powers over Investors and Intermediaries**
  - Regulates stock brokers, merchant bankers, and mutual funds.
  - Controls substantial share acquisition and company takeovers.
  - Promotes **investor education and awareness programmes**.

Initiatives Taken by SEBI

- **IEPF**
  - **Investor Education and Protection Fund** established under **Companies Act, 2013 Section 125** for awareness.
- **SCORES Portal**
  - **Web-based centralized grievance redress system** enabling investors to lodge, follow up complaints, track status.
- **Investor Education**
  - Initiatives include **Securities Market Awareness Campaign**, **Financial Literacy-cum-Counselling Centre** for investor empowerment.

SBI 'CHAKRA' Centre of Excellence

Context: State Bank of India launched **CHAKRA Centre of Excellence** to strengthen financing for eight sunrise sectors.

What is CHAKRA?

- Launched by **State Bank of India (SBI)**
- A **knowledge-led institutional platform** for financing **capital-intensive sunrise industries**
- Extends SBI's existing **Centre of Excellence for MSMEs**
- Supports sectors attracting **₹100 lakh crore capital expenditure by 2030**
- **Eight Focus Sectors**
  - Renewable Energy, Advanced Cell Chemistry & Battery Storage, Electric Mobility, **Green Hydrogen**, Semiconductors, Decarbonisation Technologies, **Smart Infrastructure**, and Data Centre Infrastructure

Key Functions

- Builds **institutional expertise** in emerging technology-led sectors
- Uses **advanced risk assessment frameworks** for tailor-made financing
- Publishes **white papers and sectoral research reports**
- Hosts **industry roundtables** for investors and policymakers
- Collaborates with **DFIs, multilateral agencies, NBFCs, banks, and academia**
- Improves **domestic and international debt capital flow**

Significance

- Strengthens India's **climate finance and green transition architecture**
- Supports **policy-aligned innovative financing structures**

Topic: External Sector

Trade Deficit

What is Trade Deficit?

- A trade deficit occurs when a country's **imports exceed its exports** in value.
- It reflects a **negative Balance of Trade (BoT)** position.
- Indicates that the country buys more goods/services than it sells globally.
- **Formula**
  - **Balance of Trade (BoT)** = Total Exports - Total Imports
  - If result is **negative** → Trade Deficit.
  - If result is **positive** → Trade Surplus.

Types of Trade Deficit

- **Merchandise Trade Deficit**
  - Difference between **goods exports and goods imports**.
  - Includes oil, gold, machinery, electronics, etc.
- **Services Trade Balance**
  - Gap between **services exports and imports**.
  - Countries like India often run a **services surplus**.
- **Bilateral Trade Deficit**
  - Trade gap with a **specific country**.
  - **Example:** Deficit with major trading partners.

Key Features

- Shows whether a country is a **net buyer or seller** globally.
- Moves with **economic growth and domestic demand**.
- Influenced by **oil prices, gold imports, exchange rates**.
- Import of capital goods may support **future industrial growth**.

Protectionism

Context: Former German Chancellor **Angela Merkel**, delivering the **inaugural Dr. Manmohan Singh Memorial Lecture** recalled **Dr. Singh's warnings** after the **2008 global financial crisis** that difficulties required **"cooperation, not confrontation"**, making his advocacy against **trade protectionism** particularly relevant in today's fractured global economic order.

What is Protectionism?

- Protectionism refers to government policies that restrict international trade to protect domestic industries from foreign competition. The key tools used are:
- **Tariffs (Customs Duties)**
  - A **tax or duty** placed on imported goods or services
  - It is the most **common and visible** form of protectionism
  - Directly **increases the price of imported products**, making domestic goods more competitive
  - Also serves as a **source of government revenue**
  - Example: A 25% tariff on imported steel makes domestically produced steel cheaper for manufacturers
- **Quotas (Import Restrictions)**
  - A **limit placed on the quantity or monetary value** of a specific good that can be imported over a defined period.
  - Unlike tariffs, quotas **restrict supply regardless of price.**
  - By artificially limiting import volumes, quotas ensure domestic producers **retain a specific share of the local market.**
  - Example: Allowing only 5,00,000 foreign cars to be imported annually.
- **Subsidies**
  - **Direct or indirect financial assistance** provided by the government to domestic producers.
  - Lowers **production costs** for domestic companies, enabling them to sell at lower prices and compete against cheaper imports i.e. **without directly taxing foreign goods.**
  - Example: Tax breaks or cash grants to local farmers or renewable energy companies.

- **Non-Tariff Barriers (NTBs)**
  - **Strict Quality Standards**: Imposing overly strict health, safety, or environmental standards that foreign companies find difficult or expensive to meet.
  - **Complex Customs Procedures**: Using bureaucratic red tape and lengthy inspection processes to delay entry of foreign goods.
  - **Local Content Requirements**: Mandating that a certain percentage of a product's components must be sourced domestically.

Topic: Infrastructure

Kavach 4.0

Context: Indian Railways commissioned **472.3 route kilometres of Kavach Version 4.0** for enhanced train safety.

What is Kavach?

- **National Automatic Train Protection (ATP) system** for collision prevention
- Originally called **Train Collision Avoidance System (TCAS)**
- Adopted as **national standard in 2020**

Version Timeline

- Kavach 4.0 approved in **July 2024**
- Major rollout completed by **January 30, 2026**

Core Objective

- Creates **digital safety shield** for real-time train protection
- Prevents **signal passing** and **train-to-train** collisions

Technology Components

- **GPS and Radio Communication**
  - Uses **GPS** for precise train location tracking
  - Employs **UHF radio towers** for continuous train-station communication
- **Onboard Microprocessors**
  - Processes **real-time** operational and signal data
  - Enables **automatic braking** during risk situations
- **RFID Tags**
  - Installed **every one kilometre** along railway tracks
  - Resets **train position and direction** accuracy
- **Optical Fibre Network**
  - Enables **high-speed** data transfer between stations
  - Ensures **connectivity in remote and difficult terrains**

National Monetisation Pipeline 2.0 (NMP 2.0)

Launch & Target:

- **Finance Minister launched NMP 2.0** in New Delhi and the **target of ₹16.72 lakh crore** over five years spanning **2025-30 period** announced
- **Developed by NITI Aayog**, India's premier policy think-tank for infrastructure planning

NMP 1.0 Performance:

- Covered four-year period from **2021-22 to 2024-25** with specific sectoral targets
- Original target **was ₹6 lakh crore** for asset monetisation across multiple sectors
  - **Achieved 89% of target**, approximately **₹5.34 lakh crore successfully mobilized** through monetisation

NMP 2.0 Sectoral Breakdown:

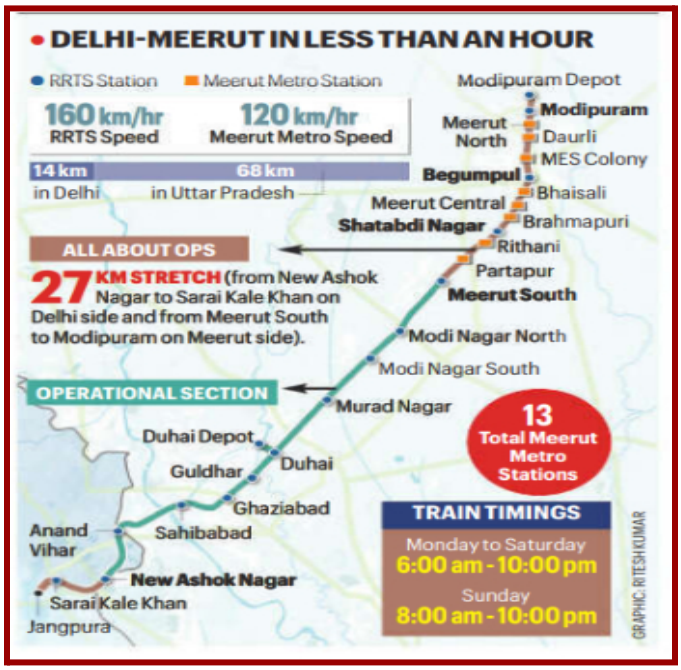
- Includes monetisation of **21,300 kilometres of highways**. It covers **Multi-Modal Logistics Parks** and **ropeways.**
- Other sectors include **power, ports, railways and coal**.
- Also covers **mines, aviation, petroleum and telecom**.

Key Monetisation Methods:

- **Toll-Operate-Transfer (TOT) model** transfers operational control for **fixed period** to investors
- **Infrastructure Investment Trusts (InvITs)** enable institutional and retail investor participation in infrastructure

- **Public-Private Partnership (PPP) model** for developing land parcels and new projects
- **Strategic divestment of minority stakes** in public sector undertakings like GAIL Gas
- **Long-term land leasing** includes 38 BSNL land parcels across India

Regional Rapid Transit System (RRTS)



Context: PM **Narendra Modi** inaugurated the **remaining sections of Namo Bharat Regional Rapid Transit System (RRTS).** It is **India's first f**ully operational regional rapid transit system connecting Delhi-NCR.

About RRTS

- The **Regional Rapid Transit System (RRTS)** is an integrated mass transit network.
- It aims to enhance connectivity across the **National Capital Region (NCR)**. The project promotes balanced and sustainable urban development.
- The concept originated from a study commissioned in **1998-99** and the **NCR Planning Board** adopted it in **Transport Plan 2032.**

Development & Implementing Agency

- The project is implemented by the National Capital Region Transport Corporation.
    - NCRTC is a joint venture of Centre and NCR states.
    - It operates under the **Ministry of Housing and Urban Affairs**.
- The RRTS is also branded as **"Namo Bharat"** services.
- The network spans nearly **55,000 square kilometres across NCR**.

Key Features & Speed

- RRTS trains are designed for speeds up to **160 km per hour**.
- Maximum operational speed can reach **180 km per hour**.
- Delhi Metro typically operates between **100 and 120 km per hour**.
- RRTS is ideal for covering longer inter-city distances rapidly.
- It operates at higher frequency compared to Indian Railways.
- The system offers improved passenger comfort and modern facilities.

Objectives of RRTS

- Improve **multi-modal connectivity** across major transport hubs.
- **Reduce congestion** on roads, highways, and railway networks.
- **Encourage shift** towards faster public transportation systems.
- Boost **regional economic productivity** through reduced travel time.
- **Promote suburban development** in Uttar Pradesh, Haryana, and Rajasthan.

Export Promotion Mission (EPM)

Context

- Government announced **7 additional measures** under the Export Promotion Mission. The measures aim to strengthen **MSMEs in global export markets**.
- The focus on improving access to **new and high-risk export markets**. It addresses structural constraints faced by Indian exporters.

Basic Overview of Export Promotion Mission

- **Export Promotion Mission (EPM)** is a flagship export competitiveness initiative.
- **Targets** MSMEs, first-time exporters, and labour-intensive sectors.
- Allocated **₹25,060 crore from FY 2025–26 to FY 2030–31**.
- Implemented by the **Directorate General of Foreign Trade.**
- Marks shift from multiple fragmented schemes to a **single outcome-based framework**.
- Operates through collaboration among **Commerce, MSME, and Finance Ministries**.

Key Objectives

- Reduce **high cost of capital** for exporters.
- Improve access to **diversified trade finance instruments**.
- Ease compliance burden in **international markets**.
- Address logistics disadvantages and market entry barriers.
- Promote diversification of **products and export destinations**.

Recent Additional Measures (2025)

- **Structured Credit Support**
  - Introduces **risk-sharing mechanisms and credit instruments**.
  - Provides **interest subvention of 2.75%** for eligible exporters.
- **Direct E-Commerce Credit Facility**
  - Working capital support up to **₹50 lakh**.
  - Provides **90% credit guarantee coverage**.
- **Overseas Inventory Credit Facility**
  - Support up to **₹5 crore**.
  - Provides **75% credit guarantee coverage**.
- **Warehouse & Fulfilment Support**
  - Provides up to **30%** of approved overseas project cost.
  - Annual benefit capped at **₹15 lakh per applicant**.

Sub-Schemes under EPM

- **NIRYAT PROTSAHAN**
  - Focuses on affordable **trade finance for MSMEs**.
  - Uses instruments like **interest subvention and collateral guarantees**.
- **NIRYAT DISHA**
  - Strengthens **export quality and compliance systems**.
  - Supports international branding, packaging, and export logistics.

Topic: Agriculture

Bharat-VISTAAR

Context: The Union Finance Minister proposed the **Bharat-VISTAAR tool** for the **agriculture sector** during recent budget announcements.

What is Bharat-VISTAAR?

- **Multilingual artificial intelligence tool** for **agricultural advisory and integration**
- Stands for **Virtually Integrated System to Access Agricultural Resources**
- Integrates **AgriStack portals** with **ICAR agricultural practice packages**

Core Objectives

- Enhances **farm productivity through data-driven advisory support**
- Improves **farmer decision-making using customised recommendations**
- Reduces **agricultural risks through real-time digital guidance**

Key Features

- Provides **AI-based, location-specific farming advisories**
- Enables **integration of research-based agricultural best practices**
- Supports **multilingual farmer interaction and access**

What is AgriStack?

- **Digital foundation platform** for **India's agriculture ecosystem integration**
- Brings together **farmers, governments, and service providers digitally**

- **Functions of AgriStack**
  - Facilitates **access to cheaper agricultural credit**
  - Enables **availability of quality farm inputs**
  - Provides **localised, data-driven farming advice**
  - Improves **market access and price discovery for farmers**
  - Supports **government scheme planning and beneficiary targeting**

Paathara Practice

Context: The Paathara underground grain storage tradition is rapidly declining in Srikakulam district, Andhra Pradesh.

What is Paathara Practice?

- Ancestral underground **grain storage system** used by paddy-growing families
- Stores **freshly harvested paddy grains** in sealed earthen pits
- **Location**
  - Practised in **Uddanam region** of Srikakulam district
  - Along **Mahendratanaya** River banks
  - Near **Andhra Pradesh–Odisha** border
- **Geographical Setting**
  - Common in **inland and hilly terrain** areas
  - Underground storage suited for **moisture and pest protection**
- **Structural Features**
  - **Rectangular pit** dug into the ground
  - Plastered with **straw and clay mixture**
  - Sealed using **cow dung layer on top**
- **Cultural Significance**
  - Built in front of **thatched rural houses**
  - Symbolises **joint family** agricultural system
- **Storage Pattern**
  - Families store **grain sufficient** for annual household consumption
- **Advantages**
  - Protects against **rodents, contamination, and theft**

Reasons for Decline

- **Lack of space** in modern housing layouts
- **Reduced awareness** of traditional practices
- Changing rural architecture patterns

APEDA

About APEDA

- APEDA (Agricultural and Processed Food Products Export Development Authority) is a **statutory export promotion authority** created to strengthen India's agricultural export ecosystem.
- It works to help Indian farmers, processors, and exporters reach global markets with quality products.
- Established under the **APEDA Act, 1985**.
- Replaced the earlier **Processed Food Export Promotion Council (PFEPC)**.
- Promotes export of **agricultural and processed food products** from India.

Establishment & Administrative Details

- **Act passed:** December 1985.
- **Came into force:** 13 February 1986.
- Functions under the **Ministry of Commerce & Industry**, Government of India.

Core Mandate

- APEDA's role is to make Indian agri-products globally competitive while ensuring quality and compliance.

Key Functions of APEDA

- **Export Promotion & Market Development:** Provides financial assistance, branding support, and market intelligence to expand India's agri-exports.
- **Registration of Exporters (RCMC):** Registers exporters of scheduled products and ensures adherence to export regulations.
- **Quality Standards & Certification:** Fixes export standards and monitors product quality, including inspection of meat and processed items.
- **Packaging & Value Addition Support:** Encourages better packaging, labeling, and processing to enhance international acceptance.
- **National Programme for Organic Production (NPOP):** Acts as the secretariat for certification and regulation of organic product exports.
- **Trade Data & Statistics:** Collects and publishes export data for policy planning and trade analysis.
- **Monitoring of Sugar Imports:** Entrusted with oversight functions related to sugar import regulation.

Product Coverage (Scheduled Products)

- APEDA covers a wide basket of agri-exports, including:
  - Fruits and vegetables

- Basmati rice
- Meat and dairy products
- Cereals
- Honey
- Guar gum
- Floriculture products
- Herbal and medicinal plants
- Cashew and beverages

NABARD

Basic Facts

Particulars	Details
Full Form	National Bank for Agriculture and Rural Development
Nature	Apex Development Financial Institution
Established	**12 July 1982** (National Bank for Agriculture and Rural Development Act, 1981)
Headquarters	**Mumbai, Maharashtra**
Ownership	**100% Government of India**

Genesis

- Origins traced to the **CRAFICARD Committee (1979)**, chaired by **Shri B. Sivaraman**
- Parliament passed the **NABARD Act** (National Bank for Agriculture and Rural Development Act, 1981)
- **NABARD took over:**
  - Agricultural credit functions of the RBI
  - Refinance and development functions of ARDC (Agricultural Refinance and Development Corporation)

Key Functions

- **Credit:** Refinance to Cooperative Banks, RRBs, and Commercial Banks
- **Supervisory:** On-site inspections of Cooperative Banks and RRBs
- **Policy:** Advises RBI and the Government of India on agricultural credit policy

Major Initiatives

- **SHG-Bank Linkage Programme (SHG-BLP):** Launched in 1992; world's largest microfinance initiative; covers over 12 million women's groups
- **Kisan Credit Card (KCC):** Flexible working capital for farmers with simplified documentation
- **Rural Infrastructure Development Fund (RIDF):** Set up in 1995; finances roads, irrigation canals, bridges, and storage facilities through state governments
- **E-Shakti:** Digitalises SHG records

Miscellaneous

Ratna Companies

Maharatna

- **Eligibility**
  - Must already hold **Navratna status**
  - Average **₹2,500 crore net profit** for three consecutive years
  - Or average **₹10,000 crore net worth** for three consecutive years
  - Or average **₹20,000 crore annual turnover** for three consecutive years
- **Benefits / Autonomy**
  - Can invest up to **₹5,000 crore without government approval**
  - Can invest up to **15 percent of net worth per project**
  - Allowed **joint ventures, mergers, and overseas investments**
  - Enjoys **maximum financial and managerial autonomy**
- **Nature**
  - Highest CPSE classification for **globally**

competitive strategic enterprises

Navratna

- **Eligibility**
  - Must be **Miniratna Category I CPSE**
  - Score **60 out of 100** on financial performance parameters
  - Must have **minimum four independent directors**
  - Requires **strong profitability and governance systems**
- **Benefits / Autonomy**
  - Can invest up to **₹1,000 crore or 15 percent net worth**
  - Permitted to form **joint ventures and subsidiaries**
  - Receives **moderate financial and operational autonomy**
- **Nature**
  - Mid-level classification for **high-performing growth-oriented CPSEs**

Miniratna

- **Category I - Eligibility**
  - Profit-making for **last three consecutive years**
  - Minimum **₹30 crore profit in any one year**
  - Must maintain **positive net worth**
- **Category I - Benefits**
  - Can invest up to **₹500 crore or full net worth**
  - Greater **operational and financial flexibility**
- **Category II - Eligibility**
  - Profit-making for **last three consecutive years**
  - Must maintain **positive net worth**
- **Category II - Benefits**
  - Can invest up to **₹300 crore per project**
  - Limited **financial autonomy for expansion**

B-READY Assessment (Business Ready Assessment)

Context: India's inclusion in **Business Ready (B-READY) 2026** assessment highlighted renewed focus on India's **business reform trajectory**.

What is B-READY?

- **Business Ready (B-READY)** is a **global benchmarking assessment** by the **World Bank Group**
- Evaluates **business and investment climate** across economies
- **Launched in 2024** by the World Bank
- **Replaces the Doing Business Report (DBR), which was** discontinued in **2020**
- Data collected via **expert consultations** and **World Bank Enterprise Surveys (WBES)**

Three Pillars of B-READY

Pillar	Focus	Approach
Regulatory Framework	Rules governing business entry, operation, and closure	De jure (statutory laws)
Public Services	Government infrastructure, digital systems, and dispute resolution	Institutional support
Operational Efficiency	Real-world compliance and implementation	De facto (firm-level surveys)

Key Features

- **Lifecycle-based:** Covers **10 business topics** spanning entry, expansion, operation, and exit stages
- **Cross-cutting themes:** Embeds **digital adoption, environmental sustainability, and gender inclusion**
- **Dual data collection:** Expert inputs + Enterprise surveys
- Published **annually** with improved transparency and wider institutional coverage

Aim

- Provide **quantitative, evidence-based** business environment assessment
- Promote **inclusive, sustainable, digitally enabled** growth
- Evaluate **regulatory and service support** to private sector development

Green Shoe Option

Context: Canara Bank plans to raise **₹5,000 crore through bonds** to **strengthen its capital base** and **support future growth plans**. The issue comprises a **base size of ₹2,000 crore** with a **green-shoe option** (over-allotment facility) **of up to ₹3,000 crore**.

What is the Green Shoe Option?

- It is also known as the **over-allotment option.**
- It is a provision in an **IPO or FPO** that allows underwriters (merchant bankers) to sell **additional shares beyond the original issue size** in case of excess demand.
- It is essentially a **price stabilisation mechanism** designed to prevent excessive volatility in a newly listed security.
- **Origin**
    - The term comes from the **Green Shoe Manufacturing Company** (now Stride Rite Corporation), which was the **first company to include such an option** in its **1919 public offering** in the United States.

Key Features

- Underwriters can sell up to **15% more shares** than originally planned.
- If the stock price **rises above the issue price** then underwriters **exercise the option** by allocating additional shares.
- If the stock price **falls below the issue price** then underwriters **buy back shares** from the open market to support the price.
- Managed by a **Stabilising Agent (SA)**, usually the **lead merchant banker or Book-Running Lead Manager (BRLM).**
- A separate **"Green Shoe Account"** is maintained to hold the extra shares.
- **Stabilisation Period**
    - Post-listing, the stabilising agent monitors market price for a defined period.
    - The stabilisation period shall **not exceed 30 calendar days** from the date of allotment.
- **Objectives**
    - **Price stabilisation** prevents excessive post-listing volatility.
    - **Investor confidence** reduces risk of sharp price declines.
    - **Liquidity support** ensures adequate liquidity in early trading days.
    - **Efficient price discovery** facilitates fair valuation.

Regulatory Framework in India

- Governed by **SEBI** under the **SEBI (Issue of Capital and Disclosure Requirements) Regulations, 2018**, also called **ICDR Regulations.**
- Maximum over-allotment allowed is **15% of the issue size.**
- The stabilising agent (SA) must **enter into an agreement with the issuer** and disclose option details in the **prospectus.**
- SA must maintain **detailed records** of market transactions, buybacks, and price movements during the stabilisation period.

Infrastructure Investment Trust (InvIT)

What is an InvIT?

- InvIT is an **investment vehicle**, similar to a **mutual fund or Real Estate Investment Trust (REIT).**
- It enables **direct investment** from both **individual and institutional investors** in infrastructure projects.
- Investments can be made **directly** or through a **Special Purpose Vehicle (SPV) / Holding Company** by the InvIT.

How Does an InvIT Work?

- A **Sponsor** (Infrastructure Company or Private Equity Firm) establishes the InvIT and transfers infrastructure assets to it.
- The **InvIT Trust** holds these assets and issues **investment units** to investors.

- **Investors** receive units representing an **ownership stake** in the underlying infrastructure assets.
- InvITs earn income through **tolls, rents, interest, or dividends** from their investments.
- The interest, dividend, and rental income are **taxable in the hands of the unitholder.**

Regulatory Framework

- Regulated by **SEBI** under the **SEBI (Infrastructure Investment Trusts) Regulations, 2014.**
- SEBI mandates that InvITs must distribute **at least 90% of their income** to investors.
- InvITs are recognised as **borrowers** under the **Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act, 2002.**

Asian Development Bank (ADB)

Context: IIFL Home Finance signed a **$300 million loan** with ADB to strengthen **affordable housing finance** for women in low-income communities in peri-urban and urban areas.

About Asian Development Bank (ADB)

- **Basic Facts**

Particulars	Details
Established	**19th December 1966**
Headquarters	**Manila, Philippines**
Nature	Multilateral Development Bank
Members	**69 members** — 49 regional + 20 non-regional
Largest Shareholders	**Japan & USA** (15.6% each), China (6.4%), **India (6.3%)**, Australia (5.8%)

Key Functions of ADB

- Provides **grants, loans, technical assistance, and equity investments** to developing member countries
- Facilitates **policy dialogues** and mobilises financial resources through **cofinancing operations**
- Focuses on **six key areas** aligned with UN SDGs: **Education, Health, Transport, Energy, Finance, and Climate Change**
- Works with **NGOs and private companies** to improve capital markets

Governance of ADB

- Operated by a **Board of Governors**: one representative per member state
- Board elects **12 Directors**: 8 from regional + 4 from non-regional members
- President serves a **five-year term**
- Every ADB president has been from **Japan** (as its founder and largest shareholder)

Membership

- Open to members of the **UN Economic Commission for Asia and the Far East**
- Grown from **31 members (1966)** to **69 members** today.

Salem Sago (Javvarisi)

Basic Overview

- **Salem Sago (Javvarisi)** is a starch-based food product.
- Made from **tapioca roots (cassava)**.
- Wet starch is processed into **small pearl-like granules**.
- Widely consumed as a staple food in India.

Origin & Production Region

- Originates from **Salem district, Tamil Nadu**.
- Salem is popularly known as the **"Land of Sago."**
- Over **80% of India's sago production** comes from this region.
- Nearby producing belts include **Erode, Namakkal and Dharmapuri**.
- Region benefits from **high tapioca yield and favourable climate**.

GI Tag Status

- Granted **Geographical Indication (GI) tag in March 2023**.
- GI registration obtained by **SAGOSERVE**.
- Enhances authenticity and market value of the product.

Key Characteristics

- Derived from tapioca roots containing **30–35% starch**.
- Tapioca yield in Salem reaches **25–30 tonnes per hectare**.
- Granule size ranges between **2–4.5 mm**.
- Provides around **310 kcal per 100 grams**.
- Approximately **1 kg sago from 5 kg tapioca tubers**.

Uses & Significance

- Used in **food, textile, paper and pharmaceutical industries**.
- Also used in **cosmetics, construction and alcohol industries**.
- GI tag boosts **export potential of Indian agri-products**.
- Improves income of **farmers and tribal cultivators**.

INTERNAL SECURITY

Defence Budget Expansion

Context and Key Budget Highlights

- Union Budget marks the **first double-digit rise in defence spending in decades**, with defence outlay now standing near **2% of GDP**.
- **Capital expenditure rose over 22%**, reversing years of underinvestment and signalling a shift from routine revenue spending toward long-term military modernisation.
- Service-wise allocations reflect strategic priorities. The **Indian Air Force received a nearly 32% increase**, the Indian Army saw **30% hike for vehicles and weapons**, while the **Indian Navy** rose marginally by **3%**, linked to its stronger indigenisation capacity.
- The increase reflects **growing geopolitical instability**, particularly from the China-Pakistan axis and LAC hardening after Galwan 2020.

Financial Pressures and Structural Concerns

- **Rupee depreciation raises the cost of imported defence platforms**, making aircraft and capital procurements increasingly expensive.
- **Defence pensions rose by 6.56%**, now constituting **21.84% of the total defence budget**, a structural fiscal burden that crowds out modernisation spending.
- Pensions were earlier outside the defence accounting framework thus **revisiting this model** could free significant modernisation resources.
- Despite a large allocation, **₹12,500 crore in capital funds were returned unspent in FY 2024-25**, highlighting serious fund utilisation failures.

Indigenisation and Procurement Challenges

- **75% of capital procurement is reserved for the domestic industry**, with defence production increasing by **174% since 2014-15**.
- **Defence exports reached ₹23,000 crore**, a remarkable rise from just ₹1,000 crore in 2014, reflecting growing manufacturing capability.
- However, procurement processes **remain bureaucratically complex,** and the **L-1 lowest-cost rule** disadvantages innovation-driven firms and startups trying to transition from design to manufacturing.
- **Chronic delays** persist, for e.g. **Project-75 submarine programme** approved in 1997 with deliveries expected only by mid-2030s; **Rafale acquisition** conceived in the 1990s and delivered only post-2019.

R&D Concerns

- India's overall **R&D spending stands at only 0.66% of GDP**, with the defence research ecosystem remaining fragmented.
- **Dual-use innovations rarely translate into operational defence capability**, and private sector research participation remains limited despite policy encouragement.

Way Forward

- **Non-Lapsable Defence Modernisation Fund** must be revived and operationalised to prevent annual lapsing of modernisation allocations.
- Startups need **assured orders and long-term planning clarity** to successfully transition from design to manufacturing at scale.
- Defence must not be viewed through a **"guns vs butter" lens;** thus, indigenous shipbuilding generates strong employment multipliers, border infrastructure aids development, and defence investment directly supports the **Viksit Bharat growth vision**.

India's Counter-Terrorism Strategy

Context and Threat Profile

- India follows a **"Zero Tolerance" policy against terrorism**, firmly believing that **no** justification exists for violence in any form, and does not associate terrorism with any religion, nationality, or civilisation.
- India faces **state-sponsored cross-border terrorism**, particularly in Punjab and Jammu and Kashmir, with global terror outfits like **Al-Qaeda and ISIS** attempting to radicalise Indian youth through sleeper cells and foreign handlers.
- Terror groups increasingly **misuse drones, robotics, encryption, the dark web, and crypto wallets** for recruitment, propaganda, and funding.
- The threat of **CBRNED misuse**
    - Chemical, Biological, Radiological, Nuclear, Explosive, and Digital that represents a spectrum of high-impact, catastrophic threats requiring specialised preparedness.
- Terror groups increasingly collaborate with organised **criminal networks and illegal arms syndicates**, deepening the crime-terror nexus.

Core Pillars of PRAHAAR Strategy

- **Prevention through Intelligence**
    - India follows a **proactive intelligence-guided model** with the **Multi Agency Centre (MAC) and Joint Task Force on Intelligence (JTFI)** ensuring real-time information sharing.
    - Online radicalisation is disrupted through **cyber monitoring and network dismantling**, with Over Ground Workers providing logistics and funding regularly neutralised.
    - **Terror funding is disrupted through strong legal mechanisms** targeting financial networks that sustain terrorist operations.
- **Border and Infrastructure Protection**
    - Security forces guard against threats across **water, land, and air** using state-of-the-art surveillance technology.
    - Critical sectors, including **power, railways, aviation, ports, defence, space, and atomic energy,** are specifically protected under dedicated security frameworks.
- **Response Mechanism**
    - Local police act as the **first responder**, supported by specialised **Anti-Terrorism Squads (ATS)** established by states.
    - **National Security Guard (NSG)** provides assistance during major attacks; the **National Investigation Agency (NIA)** ensures professional investigation and prosecution.
    - The **Ministry of Home Affairs** has issued a Standard Operating Procedure for multi-agency coordination during terror incidents.
- **Aggregating Capacities**
    - Continuous modernisation of security forces through **advanced tools, weapons, and technologies** with training institutions regularly upgraded.
    - **Bureau of Police Research and Development (BPR&D)** conducts regular training; NSG provides specialised urban combat training.
    - Efforts are ongoing to ensure **uniform anti-terror structures across all states**.

Legal Framework and Human Rights Balance

- **Unlawful Activities (Prevention) Act, 1967 (UAPA)** remains the primary anti-terror law, supplemented by Bharatiya Nyaya Sanhita 2023, Bharatiya Nagarik Suraksha Sanhita 2023, and Bharatiya Sakshya Adhiniyam 2023.
- Counter-terror operations follow the **Rule of Law and constitutional safeguards**, with the Protection of Human Rights Act, 1993, ensuring accountability.
- India adheres to the **Universal Declaration of Human Rights 1948**, demonstrating that security imperatives and civil liberties can be balanced effectively.

Countering Radicalisation and International Cooperation

- **De-radicalisation**
    - Radicalised youth undergo a **graded police response mechanism** with community leaders, NGOs, and religious figures spreading awareness.
    - **De-radicalisation programmes** are conducted in prisons; youth are engaged through **education, employment, and empowerment schemes** to address root enabling conditions.
- **International Cooperation**
    - India has signed **Extradition Treaties and MoUs with many countries**, with agency-to-agency intelligence sharing strengthening investigations.
    - India actively works in global forums for the designation of terrorists at the UN and

advocates for a **Comprehensive Convention on International Terrorism (CCIT)**.

Way Forward

- Greater **inter-agency coordination** is required for seamless intelligence sharing and joint investigation across central and state agencies.
- **Anti-terror laws must be periodically updated** to address emerging technological threats including drone attacks and cyber terrorism.
- Uniform training, structure, and resources for **State ATS units** must be ensured to eliminate capability gaps across states.
- **Legal experts** must be involved from the FIR stage to prosecution to strengthen conviction rates and close loopholes exploited by terror networks.
- **Technology investment and private sector partnerships** must be deepened to address futuristic threats like CBRNED and cyber-enabled terrorism.

Military AI And Urgency Of Guardrails

Brief Overview

- India abstained from signing a military AI governance pledge at the **REAIM Summit**.
- The decision preceded India's hosting of the **AI Impact Summit** in New Delhi.
- Military AI governance remains peripheral within broader global AI regulatory debates.
- Only **35 of 85 countries** signed the 'Pathways to Action' declaration.
- Participation declined significantly from **60 signatories** at the previous summit.

Challenges

- Military AI's **dual-use nature** blurs civilian innovation and defence weaponisation pathways.
    - **Verification of compliance** becomes difficult as civilian R&D can support military applications.
    - Expanding AI roles in **logistics, surveillance, and combat** enhances perceived **battlefield advantages.**
    - States with heavy AI investments **resist regulatory commitments** limiting technological growth.
- **Lethal Autonomous Weapons Systems (LAWS)** represent the **most controversial** military AI application.
    - **Autonomous targeting** raises **ethical concerns** over machine-led life-and-death decisions.
    - **Global governance** remains weak, with **UN deliberations** yielding no binding outcomes.
    - **Absence** of an internationally accepted definition of LAWS obstructs treaty formation.
    - **Technologically advanced states** favour **flexible definitions** preserving operational freedom.
    - **Less-capable states** advocate restrictive definitions enabling **stronger regulation.**

India's Stance

- India **balances** technological ambitions with pressing national security compulsions.
- It supports principles of **responsible military AI deployment**.
- However, India abstained from **Korea Blueprint and REAIM governance declarations.** These declarations considers **legally binding frameworks** on LAWS premature.
- **Regional security** threats shape India's cautious regulatory posture.

Way Forward

- India should advocate **non-binding governance frameworks** rooted in accountability principles.
- **Autonomous AI systems** must remain separated from nuclear command infrastructures.
- **Voluntary confidence-building mechanisms** can promote transparency in military AI development.
- A globally accepted **risk hierarchy** should classify military AI applications.
- **Norm-building** today can evolve into binding treaties as deployment expands.

Prelims

Line of Actual Control (LAC)

Basic Overview

- The **Line of Actual Control (LAC)** is the de facto boundary between India and China.
- It separates **Indian-administered areas from Chinese-controlled territories**.
- It is **not an officially recognised** international boundary.
- It functions as a **military control line** based on ground positions.
- Different perceptions of alignment cause **frequent border tensions**.

Length & Sectoral Division

- India considers the LAC approximately **3,488 kilometres long**.
- China claims the LAC length to be about **2,000 kilometres**.
- The LAC is divided into **Western, Middle, and Eastern sectors**.
    - **Western Sector** covers **Ladakh**, and remains highly disputed.
    - **Middle Sector** includes **Himachal Pradesh and Uttarakhand**.
    - **Eastern Sector** runs through **Arunachal Pradesh and Sikkim**.

Historical Background

- Border tensions emerged after **India's Independence in 1947**.
- India inherited colonial boundaries including the **McMahon Line**.
- China asserted control over **Tibet in the early 1950s**.
- The **1962 India–China War** reshaped the border situation.
- Post-war, both sides maintained **status quo without formal demarcation**.

LAC vs McMahon Line

- The **LAC** represents actual military control positions after 1962.
- It is based on **ground realities, not a formal treaty**.
- The **McMahon Line** was drawn during the **1914 Simla Convention**.
- It marks the boundary between **British India and Tibet**.
- India accepts the McMahon Line; **China disputes it**.

INS Anjadip

Basic Facts

- **INS Anjadip** is an indigenously designed and built **Anti-Submarine Warfare Shallow Water Craft (ASW-SWC).**
- It is the **4th ship** commissioned under the ASW-SWC project (series of eight ships).
- Commissioned by **Admiral Dinesh K. Tripathi** (Chief of Naval Staff) at **Chennai Port.**
- Commissioned at the **Eastern Naval Command.**
- Built by **Garden Reach Shipbuilders & Engineers (GRSE), Kolkata** at **Kattupalli.**
- Length: **77 metres.**

Primary Role

- Nicknamed the **'Dolphin Hunter'**
- Engineered to **detect, track, and neutralise enemy submarines** in coastal (littoral) waters

Key Weapons & Systems

- **Hull Mounted Sonar 'Abhay':** indigenous sonar system
- Lightweight Torpedoes
- ASW Rockets
- Combat Management System
- Water-Jet Propulsion system with a top speed of 25 knots

Additional Capabilities

- Coastal Surveillance
- Low-Intensity Maritime Operations (LIMO)
- Search and Rescue (SAR) operations

Significance

- Represents a major step towards **Aatmanirbhar Bharat** in defence

- Marks India's transition into a formidable **'Builder's Navy'**
- Named after **Anjadip Island** (near Karwar, off Goa coast) — strategically located in the **Arabian Sea**
- Vasco da Gama claimed the island as **Portuguese crown territory on 24th September 1498** during his first voyage to India

Dornier-228 Aircraft

Context: Ministry of Defence signed a **₹2,312 crore contract** with **Hindustan Aeronautics Limited (HAL)** to procure **8 Dornier-228 aircraft** for the **Indian Coast Guard**.

About Dornier-228

- Dornier-228 is a **twin-engine turboprop Short Take-Off and Landing (STOL) utility aircraft**.
- Used for **maritime patrol, surveillance, search and rescue, and transport roles**.
- **Manufacturer**
  - Originally developed by **Dornier GmbH (Germany)**.
  - Currently licence-produced in India by **HAL at Kanpur**.

Key Features

- **STOL capability:** Operates from short and unprepared runways.
- **Twin turboprop engines:** Ensure reliability and fuel efficiency.
- **Endurance:** Around **5–6 hours**.
- **Capacity:** Up to **19 passengers** or cargo load.
- **Mission equipment:** Surveillance radar and maritime sensors (patrol variant).

Operational Significance

- Enhances **coastal surveillance** and **EEZ monitoring**.
- Supports **search and rescue** and maritime law enforcement.
- Procurement promotes **indigenous defence manufacturing** under Buy (Indian).

Rafale-M Jets

What is Rafale-M?

- **Carrier-borne variant** of the Rafale fighter jet
- **4.5-generation** multirole naval aircraft
- Developed by **Dassault Aviation, France**
- India signed deal to procure **26 Rafale-M jets**
- Deployable on **INS Vikrant**, India's indigenous aircraft carrier

Operational Roles

- Air superiority, deep strike operations, reconnaissance
- Nuclear deterrence missions
- Anti-ship warfare

Carrier Adaptations

- Reinforced airframe, **corrosion resistance**
- **Folding wings** and strengthened undercarriage

Performance

- Service ceiling: **~50,000 ft**
- **Multi-sensor data fusion** provides a unified combat picture

Regional Comparison

Country	Carrier Capability	Key Aircraft
India	INS Vikrant	Rafale-M (incoming)
China	Yes	J-15 "Flying Shark" (carrier), J-11 (air superiority)
Pakistan	None	JF-17, F-16 (Air Force only)

INS Vikrant

Basic Overview

- **INS Vikrant** is India's first **indigenously built aircraft carrier**. It symbolises India's push for **Aatmanirbhar** defence manufacturing.
- Designed by the **Indian Navy's Warship Design Bureau** and built by **Cochin Shipyard Limited.**
- It is the **largest warship** ever constructed in India.
- It was commissioned on **2 September 2022** at Kochi.
- **Historical Legacy:** Revives legacy of earlier **INS Vikrant (R11)** aircraft carrier. The original carrier served in the **1971 Indo-Pak War**.

Key Technical Specifications

- Length is about **262.5 metres**.
- Displacement is nearly **45,000 tonnes**.
- Powered by **four gas turbines**.
- Maximum speed reaches about **28 knots**.
- Can operate around **30 aircraft**.
- Uses **STOBAR system with ski-jump take-off**.

Vibrant Villages Programme–II (VVP–II)

Context: The **second phase of Vibrant Village Programme (VVP-II)** will cover **1,954 strategic villages** along land borders with **Pakistan, Nepal, Bangladesh, Bhutan, and Myanmar** across 15 States and 2 Union Territories.

Vibrant Villages Programme–II (VVP–II)

- **Basic Overview of VVP–II**
  - **Vibrant Villages Programme–II (VVP–II)** is a **Central Sector Scheme** with 100% Union Government funding.
  - Covers strategic villages along **International Land Borders (ILBs)**.
  - Implemented across **17 States and Union Territories**.
  - Excludes northern border blocks already covered under **VVP–I**.
  - **VVP-I** was initially launched in 2023 to assist **developmental needs of villages along the China border** in northern regions.
- **Objectives**
  - Aims to improve **living conditions in remote border villages**.
  - Seeks to generate **sustainable livelihood opportunities**.
  - Works to control **trans-border crime and illegal activities**.
  - Integrates local populations as **"eyes and ears"** for internal security.

Key Features & Implementation Mechanism

- **Infrastructure Development**
  - Focus on roads, housing, sanitation, and drinking water facilities.
  - Promotes **SMART classrooms** in border educational institutions.
  - Ensures all-weather connectivity under **Pradhan Mantri Gram Sadak Yojana (PMGSY–IV)**.
- **Livelihood & Value Chain Development**
  - Supports **Self-Help Groups (SHGs)** and cooperative institutions.
  - Promotes border-specific **economic and outreach activities**.
- **Welfare Scheme Convergence**
  - Ensures saturation coverage of **existing Central welfare schemes**.
  - Uses convergence approach for **efficient service delivery**.
- **Cultural & Tourism Promotion**
  - Organises **fairs, festivals, and awareness campaigns**.
  - Celebrates national events to **strengthen cultural integration**.
  - Promotes **border tourism and local heritage economies**.
- **Implementation Support**
  - Programme implementation aligned with **PM Gati Shakti framework**.
  - Ensures coordinated infrastructure planning and monitoring.

Agni-3 Intermediate-Range Ballistic Missile (IRBM)

Context: India successfully test-fired **Agni-3 Intermediate-Range Ballistic Missile** from Integrated Test Range, Chandipur, Odisha, validating operational readiness.

About Agni-3 Missile

- **Agni-3** is an Intermediate-Range Ballistic Missile capable of delivering strategic payloads up to 3,000 km.
- Forms a vital component of India's **land-based nuclear deterrent** under Agni missile series.
- **Developed by**
  - Developed by **Defence Research and Development Organisation (DRDO)**.
  - Operationally deployed under **Strategic Forces Command (SFC)**.
- **Aim / Objectives**
  - Ensure credible minimum nuclear deterrence against long-range adversarial threats.
  - Provide reliable land-based **second-strike capability**.
  - Strengthen India's strategic reach beyond short- and medium-range systems.

Key Features

- **Range:** Approximately 3,000 km operational strike capability.
- **Type:** Intermediate-Range Ballistic Missile (IRBM).
- **Launch platform:** Road-mobile launcher; canisterised versions tested earlier.
- **Payload:** Capable of carrying conventional or nuclear warheads.
- **Guidance system:** Advanced inertial navigation ensuring high targeting accuracy.
- **Propulsion:** Two-stage solid-fuel propulsion configuration.
- **Operational validation:** 2026 test confirmed all mission parameters.

World Nuclear Outlook Report

Context: The **World Nuclear Outlook Report** stated that China, France, India, Russia, and the United States may jointly account for nearly 980 GWe nuclear capacity by 2050.

About the Report

- Reviews **national nuclear capacity targets** against **global tripling goal by 2050**
- Assesses **current and future nuclear contribution to global energy supply**
- Summarises **available nuclear reactor technologies**

Findings

- **Global Capacity Projections**
  - Global nuclear capacity may reach **1,446 GWe by 2050**
  - Exceeds **tripling target of 1,200 GWe**
  - Growth driven by **under-construction, planned, and government-backed projects**
- **Major Capacity Contributors**
  - Dominated by **China, France, India, Russia, and United States**
  - Newcomer countries targeting **157 GWe combined capacity**
- **Regional Trends**
  - **South Asia** emerging as major nuclear growth region
  - Growth led by **India's rising electricity demand and urbanisation**

Key Recommendations

- Integrate **nuclear energy into national climate action plans**
- Extend **existing reactor operational lifetimes**
- Reform **electricity markets for nuclear inclusion**
- Promote **neutral and accessible nuclear financing**
- Scale **supply chains and advanced reactor deployment**

India's Nuclear Status

- Current nuclear capacity around **8.8 GW**
- Long-term target of **100 GW by 2047**
- Allows **private and foreign participation with state majority control**
- Supports **low-carbon energy transition and grid stability**

HISTORY, ART &CULTURE

Topic: Modern History

Nawab Wajid Ali Shah

Context

- Recent biography reinterprets exile narrative and states he travelled to **Calcutta voluntarily** and intended to **sail to London** for petition submission. The departure was restricted and he stayed back.

About Wajid Ali Shah

- Nawab Wajid Ali Shah (1822–1887) ruled **Awadh (Oudh)**.
- Succeeded father **Nawab Amjad Ali Shah**.
- Became the **10th and last Nawab**.
- Ascended throne in **1847**.
- **Rule & Administration**
  - Known as kind, generous and compassionate ruler.
  - Regarded as a capable administrator.
  - Took active interest in state affairs.
  - Ruled Awadh for **nine years**.
- **Annexation of Awadh**
  - British annexed Awadh in **1856**.
  - Annexation justified on grounds of **"misgovernance."**
  - Deposition angered local population.
  - Became major cause of **Revolt of 1857**.
- **Cultural & Artistic Contributions**
  - Renowned patron of **arts and culture**.

  - Multi-talented: poet, playwright, dancer.
  - Composed poems, prose, ragas and ghazals.
  - Wrote under pen name **"Qaisar."**
  - Authored *Ishqnamah* - Urdu autobiographical work.
  - Credited with revival of **Kathak dance form**.
- **Secular Outlook**
  - Known for inclusive and secular approach.
  - Displayed deep interest in **Hindu culture**.
- **Architectural Contributions**
  - Initiated construction of **Qaiserbagh Palace Complex**.
  - Built between **1848–1850** in Lucknow.
- **Associated Personalities**
  - Wife **Begum Hazrat Mahal**.

Played key role in **First War of Independence (1857–58)**.

Royal Indian Navy Mutiny (1946)

Basic Facts

- The **Royal Indian Navy Mutiny** is also known as the **Naval Uprising of 1946**.
- It was a revolt of **naval ratings against British colonial authority** in India.
- The uprising began on **18 February 1946**.
- It started at **HMIS Talwar** naval establishment in Bombay.
- It marked one of the **final anti-colonial military** uprisings before Independence.

About the Revolt

- **Background of the Revolt**
  - The **Second World War** caused rapid expansion of the Royal Indian Navy.
  - By **1945**, naval strength increased nearly **tenfold compared to 1939**.
  - Indian sailors were exposed to **global ideas of democracy and freedom**.
  - Widespread resentment grew due to **racial discrimination within naval services**.
- **Immediate Cause**
  - Ratings of **HMIS Talwar** launched a **hunger strike against service conditions**.
  - Protests focused on **poor food quality and racial discrimination**.
- **Spread of Revolt**
  - The uprising quickly spread to **naval bases and ships across India**.
  - It involved around **78 ships and 20 shore establishments**.
  - Nearly **20,000 naval ratings** participated in the revolt.

Key Demands

- Mutineers demanded **release of INA prisoners**.
- They sought freedom for **all political prisoners**.
- Ratings demanded **equal pay with British sailors**.
- They demanded **better food and living conditions**.
- Ending **racial discrimination** remained a central demand.

End of the Revolt

- The revolt was suppressed using **overwhelming British military force**.
- National political leadership did not support continuation of the uprising.
- **Vallabhbhai Patel and Muhammad Ali Jinnah** persuaded ratings to surrender peacefully.
- The mutiny formally ended on **23 February 1946**.

Impact

- The revolt shook British confidence in **loyalty of Indian armed forces**.
- It influenced the decision to send the **Cabinet Mission to India**.
- The uprising accelerated the **British decision to withdraw from India**.

Chakravarti Rajagopalachari (Rajaji)

About

- **Chakravarti Rajagopalachari**, popularly called **Rajaji**, was born in 1878.
- He studied law at **Presidency College, Madras** and began legal practice in **Salem in 1900**.
- Formed the **Tamil Scientific Terms Society in 1916**.
- Served as Salem Municipality Chairperson in **1917**.
- Awarded **Bharat Ratna in 1955**.
- Passed away on **25 December 1972**.

Political Career

- **Pre-Independence**
  - Joined the **Indian National Congress** as legal advisor.
  - Defended freedom activist **P. Varadarajulu Naidu** in 1917.

- Became first Premier of **Madras Presidency in 1937**.
- Enacted **Madras Temple Entry Authorisation Act, 1939**. The Act allowed **Dalits to enter Hindu temples**.
- Appointed **Governor of West Bengal during Partition**.
- Became the **last Governor-General of India**.

- **Post-Independence**
  - Became **Chief Minister of Madras in 1952**.
  - Introduced educational reforms and social policy changes.
  - Made **Hindi compulsory in Tamil schools**, triggering protests.
  - Served as **Home Affairs Minister after Sardar Patel's death**.
  - Founded the **Swatantra Party in 1959**.
  - Advocated **free market economy and limited state control**.

Role in Freedom Struggle

- Participated in **Non-Cooperation Movement under Mahatma Gandhi** and was imprisoned in **Vellore for two years in 1920**.
- Supported **khadi and Hindu-Muslim unity** campaigns.
- Took part in **Vaikom Satyagraha** against untouchability.
- Led **Vedaranyam Salt March in 1930**.
- Edited Gandhi's newspaper **Young India**.
- Opposed Gandhi during the **Quit India Movement**.

Literary Contributions

- Authored Tamil version of **Ramayana titled Chakravarthi Thirumagan**.
- Received **Sahitya Akademi Award in 1958**.

Bankim Chandra Chattopadhyay

About

- Born on **27th June 1838**, Bankim Chandra Chattopadhyay was a renowned **novelist, social satirist, journalist**, and a prominent face of the **Bengal Renaissance.**
- He also served as a **lawyer and district judge**

Notable Works

- **Vande Mataram**
  - Composed **Vande Mataram in Sanskrit.**
  - The **first two verses** were adopted as India's **National Song.**
  - It served as a powerful **source of inspiration** during the freedom struggle.
  - Vande Mataram is featured in his celebrated novel **Anandamath (1882).**
- **Anandamath (1882)**
  - Set against the backdrop of the **Sanyasi Rebellion (1770–1820).**
  - The Sanyasis rose in rebellion following the **great famine of 1770 in Bengal**, which caused acute chaos and misery.
  - Considered one of the finest texts in Indian literature.
- **Bangadarshan**
  - Founded the **monthly literary magazine Bangadarshan in 1872.**
  - Through this publication, Bankim is credited with influencing the emergence of a **Bengali identity and nationalism.**
- **Other Notable Works**
  - Durgeshnandini (1865),
  - Kapalkundala (1866),
  - Chandrasekhar (1877),
  - Krishnakanter Will (1878),
  - Anandamath (1882),
  - Devichaudhrani (1884),
  - Bishabriksha (The Poison Tree),
  - Rajmohan's Wife

Topic: Art and Culture

Sant Guru Ravidas

Context: The Government renamed Adampur airport as **Sri Guru Ravidas Ji Airport** to mark his **649th birth anniversary**.

Identity and Period

- Revered **Bhakti movement saint** of **15th–16th centuries**
- Considered founder of the **Ravidassia religious tradition**

Core Teachings

- Advocated **human equality and social justice**
- Opposed **caste-based discrimination and social exclusion**

- Promoted **devotion, love, and brotherhood** across communities
- **Popular Saying**
  - Coined **"Mann Changa to Kathauti Mein Ganga"**
  - Highlights **moral purity** over ritual practices

Philosophical Vision

- Envisioned **"Beghumpura"**, a society without **fear, sorrow, or discrimination**
- Emphasised **inner purity through ethical action and karma**

Religious Legacy

- Verses included in **Guru Granth Sahib (Sikh scripture)**
- Poems featured in **Panch Vani of Dadu Panthi tradition**

Modern Influence

- Inspired **social equality ideals** in constitutional values
- Referenced in connection with **Dr. B.R. Ambedkar's principles**

Thaipusam

Context: The Prime Minister extended greetings to devotees across India and abroad on the occasion of Thaipusam.

What is Thaipusam?

- Hindu festival dedicated to **Lord Murugan (Kartikeya)**
- Symbolises **courage, victory, and spiritual growth**
- **Name Origin**
  - Derived from **"Thai"**, the Tamil calendar month
  - Combined with **"Poosam"**, a prominent lunar star
- Celebrated on the **full moon day of Tamil month Thai**
- **Religious Significance:** Honours **Lord Murugan**, the Hindu god of **war and wisdom**
- **Geographical Spread**
  - Widely observed in **Tamil Nadu, India**
  - Celebrated across **Sri Lanka, Singapore, and Malaysia**
- **Community Association:** Primarily celebrated by the **global Tamil community**

Dhrupad Music

Context: Dhrupad is in the news as India's **oldest surviving Hindustani classical music form**, preserved in near-original structure.

About

- Dhrupad is the **most ancient vocal style** of Hindustani classical music. It has survived in a relatively **unchanged classical form**.
- It is **spiritual and devotional** in character. The music is treated as an offering to the divine through **sacred sound (Nada)**.
- **Two main components:**
  - **Alap**:Slow, meditative development of the Raga.
  - **Bandish**: Fixed lyrical composition rendered with rhythm.
- **Origin**
  - Dhrupad traces its roots to the **Samaveda**. The vedic hymns were sung using melody and rhythm traditions.
  - Gradual evolution of these chant traditions led to the emergence of **Dhrupad music**.
  - Initially it was performed in **temples as devotional singing** but later received patronage under **Mughal and Rajput rulers** during medieval India.
- **Key Characteristics**
  - Emphasis on **purity and discipline of Raga rendition**.
  - Language gradually shifted from **Sanskrit to Brij Bhasha** between the 12th–16th centuries.

Maharshi Dayanand Saraswati

Context: Prime Minister paid tribute to **Maharshi Dayanand Saraswati** on his **202nd birth anniversary**, recalling his role in social and educational reform.

Early Life

- Born on **12 February 1824** at **Tankara, Kathiawar (Gujarat)** in a Brahmin family.

- Questioned **idol worship** after a childhood temple experience.
- Later became disciple of **Swami Virajananda**, shaping his Vedic reform mission.

Core Philosophies

- **Back to the Vedas:** Considered Vedas the supreme source of knowledge and dharma.
- **Opposed ritualism:** Criticised superstition, blind faith, and meaningless rituals.
- **Social equality:** Rejected caste by birth. Supported merit-based social order.
- **Women's upliftment:** Favoured women's education and opposed child marriage.
- **Ethical living:** Emphasised truth, self-discipline, yoga, and moral conduct.

Socio-Religious Contributions

- Founded **Arya Samaj (1875)** to promote Vedic learning and social reform.
- Encouraged scriptural study, public debate, and rational thinking.
- Inspired later **reformist and nationalist movements** through cultural awakening.

Literary Works

- Authored more than **60 works**.
- Most influential text: **Satyarth Prakash**.
- Other works include **Sanskarvidhi** and Vedic commentaries.
- Associated with **Paropakarini Sabha (Ajmer)** for publishing Vedic literature.

Death

- Died on **30 October 1883** in **Ajmer** after falling critically ill in Jodhpur.

Raja Ravi Verma (1848–1906)

Birth & Background

- Raja Ravi Verma was born on **29 April 1848** at **Kilimanoor** in the erstwhile Travancore.
- Kilimanoor is located in present-day **Kerala**.
- He was born into an **aristocratic family** linked with the Travancore royal lineage.

Artistic Identity

- Raja Ravi Verma is regarded as the pioneer of the **Modern School of Indian Painting**.
- The school was termed "modern" due to **strong** Western artistic influence.
- He introduced **European realism** into Indian painting traditions.
- His works represent a **fusion of Indian themes** with Western techniques.

Style & Technique

- Ravi Verma combined **South Indian painting traditions** with **Western academic realism**.
- He used **oil painting techniques** extensively in Indian mythological depictions.
- His paintings popularised **naturalistic human figures** in Indian art.
- He integrated **Indian iconography with Western perspective** and shading.

Patronage & Training

- He received royal patronage from **Ayilyam Thirunal**, Maharaja of Travancore.
- Under royal support, he began **formal artistic training**.
- He was trained in **water painting by Rama Swami Naidu**.
- He learned **oil painting** from British portraitist **Theodore Jenson**.

Themes of Paintings

- Ravi Verma is widely known for **religious depictions of Hindu deities**.
- His works drew heavily from **Indian epics and Puranas**.
- He illustrated scenes from the **Mahabharata and Ramayana**.
- His mythological paintings made **divine characters relatable to common people**.

International Recognition & Awards

- Ravi Verma gained global acclaim after winning an **award at the Vienna Exhibition (1873)**.
- His paintings were displayed at the **World's Columbian Exposition, Chicago (1893)**.
- These exhibitions established his **international artistic reputation**.

Titles & Honours

- He received the **Kaisar-i-Hind Gold Medal in 1904**.
- The medal was awarded by **Viceroy Lord Curzon** on behalf of the British Crown.
- Lord Curzon also conferred upon him the honorary title of **"Raja."**

Famous Paintings

- "Episodes from the Story of **Dushyanta and Shakuntala**" is among his celebrated works.
- He painted "**Nala and Damayanti**" based on Mahabharata narratives.
- "**Ravana Kidnapping Sita**" is a noted Ramayana depiction.
- "**Lady in the Moonlight**" reflects his portrait excellence.
- "**Galaxy of Musicians**" portrays women from diverse musical traditions.
- "**Parsi Lady**" is one of his well-known portrait paintings.

World Monuments Fund (WMF)

Basic Overview

- The **World Monuments Fund (WMF)** is an independent global heritage conservation organisation.
- Established in **1965** to safeguard culturally significant sites worldwide.
- Headquarters located in **New York City**.
- Works to preserve sites of **historical, architectural, and cultural importance**.

Global Presence & Work

- WMF has supported conservation at **over 700 heritage sites**.
- Its projects span across **more than 112 countries**.
- Operates through a global network of **heritage experts and partners**.
- Follows **international conservation standards** in restoration practices.
- **Approach & Contemporary Focus**
    - Collaborates with **local communities, governments, and donors**.
    - Uses heritage conservation to address **climate change challenges**.
    - Focuses on issues like **imbalanced tourism and underrepresentation**.
    - Supports heritage recovery in **post-crisis and conflict situations**.

WMF India

- **WMF India** was established in **2015**.
- Registered under India's **Companies Act** framework.
- Aligns with India's policy linking **heritage conservation and CSR initiatives**.

World Monuments Watch Programme

- The **World Monuments Watch** is a nomination-based heritage programme.
- Conducted once every **two years**.
- Highlights heritage sites facing **serious risks or neglect**.
- Mobilises global awareness and financial support for conservation.
- The **2025 Watch** will include **25 selected heritage sites**.
- Each listed site reflects an **urgent local issue with global relevance**.

Swami Ramakrishna Paramahamsa

Basic Overview

- **Ramakrishna Paramahamsa** was born as **Gadadhar Chattopadhyaya** on **18 February 1836** in Bengal.
- He is a prominent 19th-century **Indian mystic and spiritual leader**.

Religious Philosophy

- Deeply devoted to **Goddess Kali** throughout his life.
- Served as a priest at the **Dakshineswar Kali Temple**.
- Practised diverse traditions including **Tantric and Bhakti paths**.
- Also followed **Vaishnavism and Advaita Vedanta philosophies**.
- Emphasised that **all religions lead to the same ultimate truth**.

Disciples & Institutional Legacy

- His foremost disciple was **Narendra Nath Datta**.
- Narendra later became **Swami Vivekananda**.
- Swami Vivekananda founded the **Ramakrishna Mission in 1897**.
- The Mission spread his teachings in **India, America, and Europe**.

Documentation of Teachings

- His teachings were recorded by disciple **Mahendranath Gupta**.
- Compiled in the Bengali text **"Sri Sri Ramakrishna Kathamrita."**

- English translation titled **"The Gospel of Sri Ramakrishna" (1942)**.

Kalbelia Community

Context: The National Human Rights Commission issued a notice to Rajasthan over Kalbelia burial ground protests in Barmer.

Who are Kalbelias?

- **Snake-charmer folk community** from **Rajasthan, India**
- Traditionally engaged in **catching snakes and trading snake venom**
- Recognised for **vibrant dances and black embroidered attire**

Cultural Recognition

- **Songs and dances inscribed on UNESCO Intangible Cultural Heritage list**
- Recognised in **2010** as key marker of **community cultural identity**

Religious Tradition

- Follow the **Nath tradition**
- Practice **burial of dead kin**, not cremation

Kalbelia Dance (Sapera Dance)

- **Folk dance central to Kalbelia cultural identity**
- Performed mainly by **women dancers**
- Reflects **close association with snakes** through movements and costumes
- Features **fast-paced, flexible, and swirling dance patterns**

Musical Accompaniment

- Performed by **men musicians**
- Instruments include **pakhawaj, dholak, jhanjhar, harmonium, sarangi**
- Signature instrument is **pungi (been)**

ENVIRONMENT, ECOLOGY AND BIODIVERSITY

Topic: Conservation

Wetlands Conservation India

Context: Anandapur warehouse fire killed **25 people**, exposed illegal constructions on **Ramsar-listed East Kolkata Wetlands**.

More in news:

- **Wetlands treat 900 million litres of sewage daily**, approximately **65% of total** metropolitan sewage.
- Experts warn **rapid encroachment** threatens the natural sewage filter and fish, vegetable production ecosystem.
- **Kolkata Mayor** claims warehouses existed **pre-2006**, closure would affect poor people's livelihoods significantly.

About Wetlands

- **Ecological Character of Wetlands**
  - **Wetlands are land areas permanently or seasonally saturated with water supporting specialised hydrophytic vegetation.**
  - They function as **transition zones between terrestrial and aquatic ecosystems**, linking land and water systems.
  - Examples include **mangroves, lake littorals, floodplains, marshes, swamps, and periodically inundated lowlands.**
- **Environmental and Socio-Economic Importance**
  - Wetlands act as **"nature's kidneys"**, recycling nutrients and removing sediments from surface and groundwater.
  - They **enhance soil fertility**, supporting agricultural productivity in surrounding landscapes.
  - These ecosystems **recharge groundwater**, improve water quality, and regulate

hydrological cycles.
    - Wetlands function as **natural sponges**, reducing flood intensity and buffering shoreline erosion.
    - Soils around wetlands **store carbon for long durations**, aiding climate change mitigation.
    - They provide **habitats for fisheries and threatened wildlife species**, sustaining biodiversity.
    - Wetlands generate **livelihoods, tourism opportunities, research potential, and cultural ecosystem services.**
- **Ramsar Convention on Wetlands**
    - The **Ramsar Convention is a global intergovernmental treaty** for conservation and wise use of wetlands.
    - It was **adopted in Ramsar, Iran, in 1971 and entered into force in 1975.**
    - Nearly **90% of United Nations members are Contracting Parties** to the Convention.
    - It is the **only international treaty dedicated to a single ecosystem type.**
    - Wetlands include **lakes, rivers, marshes, peatlands, estuaries, mangroves, coral reefs, and human-made sites.**
    - The **United Kingdom has the most Ramsar sites**, while **Bolivia holds the largest wetland area.**
    - India currently has **75 designated Ramsar sites.**
- **Montreux Record and Indian Sites**
    - The Montreux Record lists threatened Ramsar sites **needing priority conservation attention.**
    - **Chilika Lake was removed** after ecological restoration and management improvements.
    - **Loktak Lake and Keoladeo National Park remain listed** due to persistent ecological concerns.
- **Wetlands (Conservation and Management) Rules, 2017**
    - Notified by **MoEFCC under the Environment (Protection) Act, 1986**, ensuring decentralised management.
    - States establish **State Wetland Authorities headed by Environment Ministers and technical experts.**
    - Authorities must **identify, notify, digitise, and periodically update comprehensive wetland inventories.**
- **Prohibitions and Institutional Oversight**
    - Prohibited activities include **encroachment, industrial expansion, hazardous waste disposal, and untreated effluents.**
    - **National Wetland Committee advises the Centre on integrated management and transboundary wetlands.**
    - **World Wetlands Day is observed on 2 February**, marking the Ramsar Convention's adoption.

Dilution of Environmental Jurisprudence in India

Context

- India stands at a **moral crossroads between development imperatives and ecological protection**, with environmental justice increasingly at risk.
- Courts earlier acted as **custodians of environmental rights**, but recent judicial and policy decisions suggest a **gradual weakening of this protective legacy**.
- The shift is visible across EIA frameworks, retrospective clearances, forest protection, coastal ecology, and Himalayan infrastructure decisions.

Key Areas of Dilution

- **EIA Framework Changes**
    - A **December 2025 policy** altered environmental clearance sequencing; land acquisition now precedes Environmental Impact Assessment.
    - EIAs are now allowed **without precise location and land details**, weakening the scientific and regulatory scrutiny that environmental clearances are meant to provide.
- **Retrospective Clearances**
    - An earlier ruling had banned **retrospective environmental approvals**, protecting ecosystems from post-facto legalisation of violations.
    - In **Vanashakti vs Union of India (2025)**, this protection was weakened, and the Supreme Court later **recalled the progressive judgment**, widely seen as a significant dilution of environmental safeguards.

- **Aravallis Case**
  - The Aravallis serve as **north-western India's ecological backbone**, performing critical functions including groundwater recharge and desertification control.
  - An earlier **mining ban imposed in M.C. Mehta case (2004)** and a 2010 ruling rejecting height-based definitions had protected low-altitude ridges as ecologically vital.
  - However, a **2025 ruling accepted a 100-metre height criteria**, causing large ecologically sensitive areas to lose protection while **ignoring hydrology, biodiversity, and ecosystem linkages**.
- **Mangroves and Coastal Ecology**
  - Courts have allowed **destruction of mangroves for infrastructure projects**, including clearance for mangrove loss in the Raigarh project and felling approvals in Mumbai.
  - Mangroves function as **flood buffers, carbon sinks, and coastal protection systems** and the compensatory afforestation cannot replace mature mangrove ecosystems.
- **Himalayan Infrastructure**
  - The **Char Dham highway expansion** raised serious ecological alarms, with a study identifying **811 landslide-prone zones** in the fragile Himalayan ecosystem.
  - The Court allowed widening citing **defence needs**, despite subsequent floods and disturbances questioning this developmental balance.

Constitutional and Legal Principles at Stake

- **Article 21** includes the right to a clean environment as part of the right to life and personal liberty.
- **Article 48A** mandates the State to protect and improve the environment and safeguard forests and wildlife.
- **Article 51A(g)** assigns every citizen the duty to protect and improve the natural environment.
- Height-based protection criteria for ecological areas like the Aravallis **violate Article 14**, as it creates arbitrary distinctions, ignoring ecological reality.
- Large corporate projects are clearing approvals easily, while **public hearings are rushed or diluted**, reducing compliance to procedural formality rather than substantive scrutiny.

Way Forward

- Courts must **revive Public Trust Doctrine jurisprudence**, which holds that natural resources are held in trust by the state for citizens and future generations.
- **Green Benches must function regularly,** and High Courts need specialised environmental benches to ensure consistent and expert adjudication.
- EIA processes must **restore scientific rigour and public participation** as genuine safeguards rather than procedural checkboxes.
- **Development ease must not dilute ecological protection** — India's long-term growth depends on the ecological systems that sustain agriculture, water security, and climate resilience.

Topic: Climate Change

Global Climate Governance

Architecture and Structural Weaknesses

- Global climate governance resembles a **"hop-on, hop-off" institutional mechanism** lacking binding direction or enforceable pathways.
- Two parallel tracks operate, i.e. **CMP under the Kyoto Protocol and CMA under the Paris Agreement**, with both forums continuing negotiations without binding obligations.
- **Consensus decision-making** grants each country a **de facto veto**, allowing national interest to repeatedly override global climate urgency.
- **UNFCCC remains the only universal climate platform** with no alternative forum matching its legitimacy or inclusiveness, yet action deficits persist despite proliferating frameworks.

Science, Politics and Economics Disconnect

- Scientific consensus on climate risks is **already well established**, yet political systems delay action by citing manufactured scientific uncertainty.
- **Economic systems discount future generations** due to market logic that prioritises short-term profit over long-term planetary protection.
- Common citizens **prioritise livelihood, food, housing, and employment**, meaning climate risks become politically salient only after disasters strike communities.
- Limited public pressure **reduces political incentives for ambitious climate action**,

creating a governance gap between scientific urgency and democratic accountability.

COP30 Outcomes and Finance Gaps

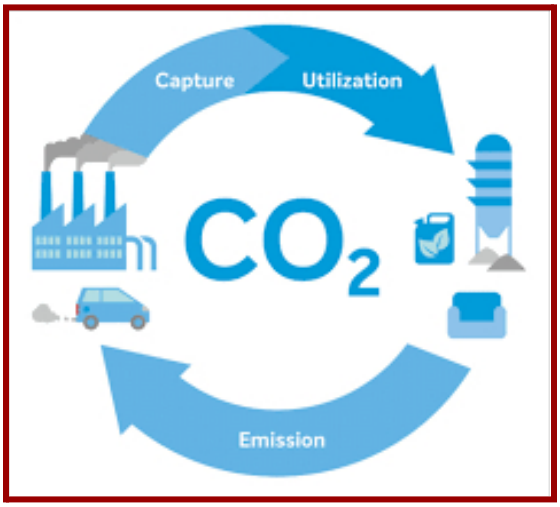
- **COP30 Limitations**
  - COP30 delivered the **"global mutirão" cooperation package**, but measures remained voluntary, weakening the **Common But Differentiated Responsibilities (CBDR)** principle.
  - Conference aimed to **"keep 1.5°C alive"** despite UNEP reporting **historic high emissions of 57.4 $GtCO_2e$ in 2024**, with warming likely to breach 1.5°C in the **early 2030s**.
- **Finance and Adaptation Gaps**
  - Developing nations require **$2.4 to $3 trillion annually** for climate action, yet current finance flows **remain below $400 billion**.
  - Adaptation finance pledges **lacked a baseline year and clear funding sources**, rendering commitments practically meaningless.
  - The **Loss and Damage Fund opened but remains financially undercapitalised**, failing vulnerable nations most affected by climate impacts.
  - **Technology transfer initiatives lack adequate financial backing** and capacity-building frameworks remain procedural rather than outcome-oriented.

Way Forward

- Climate governance must transition from **voluntary declarations to binding accountability mechanisms** with transparent implementation tracking.
- **Just transition principles** must be backed by binding financial resources, not merely acknowledged in conference text.
- Developing nations must receive **adequate and predictable climate finance** before being asked to accelerate their own transition commitments.
- UNFCCC processes must **bridge the science-politics-economics disconnect** by embedding independent scientific review into negotiation accountability mechanisms.
- **Loss and Damage Fund must be adequately capitalised** with clear contribution commitments from major historical emitters.

Topic: Pollution

Carbon Capture and Utilisation (CCU) Technologies



What is CCU?

- **Carbon Capture and Utilisation (CCU)** captures CO_2 from industrial sources or directly from the air and converts it into useful products such as fuels, chemicals, building materials, or polymers.
- Unlike **Carbon Capture and Storage (CCS)**, which permanently stores CO_2 underground, CCU **reuses** the captured carbon, putting it back into the economy as a productive input.

Why Does India Need CCU?

- India is consistently the **world's third-largest CO_2 emitter** as emissions driven by power generation, cement, steel, and chemicals.
- Many industrial processes are inherently carbon-intensive and **difficult to decarbonise** through renewable energy alone, called **"hard-to-abate" sectors.**
- CCU offers a pathway to reduce emissions from these sectors while **creating new industrial value chains.**
- Aligns with India's **net-zero target for 2070** and its push toward a circular, low-carbon economy.

Initiatives Taken

- **Government Initiatives**
  - **Department of Science and Technology** has created a specific R&D

roadmap for CCU technologies.
    - **Ministry of Petroleum and Natural Gas** presented a draft **2030 roadmap for Carbon Utilisation and Storage (CCUS)**, identifying projects for implementation.
- **Private Sector Efforts**
    - **Ambuja Cements:** Indo-Swedish CCU pilot with IIT Bombay to convert captured CO_2 into fuels and materials.
    - **Organic Recycling Systems Limited (ORSL):** leading India's first pilot-scale **Bio-CCU platform**, converting **CO_2 from biogas** streams into bio-alcohols and specialty chemicals.
- **Global Practices**
    - **EU**: Bioeconomy Strategy and Circular Economy Action Plan explicitly supports CCU as a way to turn CO_2 into feedstocks for chemicals, fuels, and materials.
    - **USA** uses **tax credits and funding** to scale CCU, particularly for CO_2-derived fuels and chemicals.

Challenges in Scaling CCU in India

- **Cost Competitiveness:** Capturing, purifying, and converting CO_2 is energy-intensive and expensive; without policy incentives, CCU-derived products cannot compete with cheaper fossil-based alternatives
- **Infrastructure Gaps:** CCU requires co-located industrial clusters, reliable CO_2 transport, and integration with downstream manufacturing which is unevenly developed across Indian industrial regions
- **Absence of Standards and Market Signals**: Lack of clear certification, standards, and market demand creates investor uncertainty and limits scaling of CO_2-derived products

Way Forward

- **Prioritise Renewables First**
    - Solar, wind, green hydrogen, and electric mobility must remain **primary decarbonisation pathways**
    - CCUS should be deployed **only where emissions are hard to abate** i.e. steel, cement, and chemical industries and not as a substitute for clean energy transition
- **Pilot and Scale Selectively**
    - Implement **small-scale, high-efficiency CCUS projects** to evaluate cost-effectiveness and environmental safety before broad deployment
    - Avoid blanket deployment that risks encouraging **continued fossil fuel reliance**
- **Develop a National Storage Atlas**
    - Storage is as crucial as capture as without safe, accessible storage, CCUS remains ineffective
    - **ONGC and the Geological Survey of India (GSI)** should map depleted oil and gas fields (such as Bombay High) and deep saline aquifers to reduce investment risks and attract private capital
- **Technology Transfer and Finance**
    - India must negotiate with developed countries for **CCUS technology transfer and climate finance**, positioning it as essential for Global South industrialisation
    - Invest in R&D for **Direct Air Capture (DAC)** and **Bioenergy with Carbon Capture and Storage (BECCS)** to position India as a leader in climate restoration technologies

Prelims

Topic: Pollution

Commission for Air Quality Management (CAQM)

Context: The **CAQM** in NCR has proposed a **stricter particulate matter (PM) emission limit of 50 mg/Nm³** for industries across **Delhi-NCR**, replacing the earlier **80 mg/Nm³ standard** notified in June 2022.

About CAQM

- **Legal Status & Establishment**
    - **CAQM** is a statutory body.
    - Established under the **Commission for Air Quality Management in NCR and Adjoining Areas Act, 2021**.
    - Created to address severe air pollution in **Delhi-NCR region**.
    - Directly accountable to **Parliament of India**.
- **Jurisdiction & Mandate**
    - Covers **National Capital Region (NCR) and adjoining areas**.
    - Aims at better **coordination and research on air quality issues**.

    - Focuses on prevention and control of **air pollution affecting NCT of Delhi**.
    - Coordinates with governments of **Delhi, Punjab, Haryana, Rajasthan, and Uttar Pradesh**.
- **Key Powers**
    - Can restrict activities affecting **air quality levels**.
    - Conducts investigations and research on **environmental pollution**.
    - Issues binding directions for **inspection and regulation**.
    - Prepares codes and guidelines to control **air pollution sources**.
    - Its orders are **legally binding** on concerned authorities.
- **Composition**
    - Chaired by an officer of rank **Secretary or Chief Secretary**.
    - Chairperson tenure: **Three years or until 70 years of age**.
    - Includes **five ex-officio members** from Delhi and adjoining states.
    - Has **three full-time technical members**.
    - Includes **three members from non-government organisations**.
    - Technical members drawn from **CPCB, ISRO, and NITI Aayog**.

Topic: Species in News

Turtle Trails

Context: Union Budget 2026–27 proposed development of Turtle Trails along Olive Ridley nesting coasts.

What are Turtle Trails?

- Regulated **eco-tourism pathways** near turtle nesting beaches.
- Promote **conservation awareness** and **nature-based tourism**.

States Covered

- **Odisha** → Rushikulya, Gahirmatha coast.
- **Karnataka** → Coastal nesting beaches.
- **Kerala** → Arabian Sea nesting stretches.

Target Species

- Focus on **Olive Ridley Sea Turtle** nesting sites.

Key Features

- Guided access during **breeding / nesting season**.
- Regulated visitor movement in nesting zones.
- Conservation education for tourists.
- Community participation (fishers, NGOs, volunteers).
- Low-impact infrastructure (temporary walkways, viewing zones).
- Linked with **eco-tourism policy frameworks**.

Lion-Tailed Macaque

Context:
Researchers have cautioned that the **increasing presence** of **Lion-Tailed Macaques** in human-dominated landscapes is driven by **easy access to food** linked to human activity.

About the species

- Lion-Tailed Macaque is an **Old World monkey species**.
- It is also called the **"Beard Ape"** due to its distinctive facial mane.
- It is one of the **smallest macaque species**.
- **Distribution**
    - Endemic to the **evergreen rainforests of the Western Ghats**.
    - Found in **Karnataka, Kerala, and Tamil Nadu**.
- **Key Characteristics**
    - Arboreal species living mainly in the **upper forest canopy**.
    - Diurnal in behaviour. Active during daytime.
    - Feeds largely on **fruits along with insects and small organisms**.
- **Conservation Status**
    - **IUCN Red List:** Endangered.
    - **CITES:** Appendix I.
    - **Wildlife Protection Act, 1972:** Schedule I.

Tetrataenium Paikadae (New Plant Species)

Context: A new plant species **Tetrataenium paikadae** was discovered in the **Western Ghats** in Idukki district, Kerala.

About the Species

- **Taxonomic Identity**
    - It is a **newly discovered flowering plant species**.

- Belongs to the **Apiaceae family**.
  - Apiaceae includes plants like **carrot and coriander**.
- **Location**
  - Discovered in **Idukki district, Kerala**.
  - Identified within **Eravikulam National Park** (Falls in the **Western Ghats** biodiversity hotspot)
- **Habitat**
  - Found in **high-altitude grasslands**.
  - Occurs in **moist, marshy ecosystems**.
  - Elevation range: **1,000–2,500 metres**.
- **Key Identification Feature**
  - Distinguished from related species through **fruit structure**.
  - Based on **number and arrangement of oil tubes**.

Cheer Pheasant

Context: Recent observations highlight that **hunting and habitat degradation** continue to be the biggest threats to the ground-dwelling Cheer Pheasant.

About Cheer Pheasant

- Also known as **Wallich's pheasant** or **Chir pheasant**.
- Belongs to the **pheasant family- Phasianidae** (Ground-dwelling Himalayan bird species)
- **Habitat**
  - Found on **steep, rocky hillsides** with scrub vegetation.
  - Prefers **grassy slopes with scattered stunted trees**.
  - Occurs at elevations between **1,200–3,350 metres**.
- **Geographical Distribution**
  - Native to the **Western Himalayas**.
  - Range extends from:
    - Northern Pakistan
    - Kashmir
    - Himachal Pradesh
    - Uttarakhand
    - Up to central Nepal
- **Key Characteristics**
  - Builds a **simple ground nest**, hidden under grass or rocks.
  - Shows strong **site fidelity**. Birds often breed near birthplace.
  - Depends on **grasslands shaped by traditional practices** like grass cutting and controlled burning.
- **Diet**
  - Feeds mainly on **roots, tubers, bulbs, and buried seeds**.
  - Also consumes **insect larvae and earthworms**.

Conservation Status

- **IUCN:** Vulnerable
- **CITES:** Appendix I
- **Wildlife (Protection) Act, 1972:** Schedule I

Loggerhead Turtle

Basic Overview

- The **Loggerhead Turtle** is a widely distributed marine turtle species.
- Scientifically known as **Caretta caretta**.
- Named for its **large head and powerful crushing jaws**.
- Adapted to feed on **hard-shelled marine organisms**.

Habitat & Distribution

- Found across **Atlantic, Pacific, and Indian Oceans**.
- Also present in the **Mediterranean Sea**.
- Prefers **coastal waters, bays, and estuaries**.
- Occasionally inhabits **open oceanic zones**.
- Major nesting beaches include **Florida, Oman, and Greece**.
- Loggerheads are **omnivorous marine feeders**.
  - Primarily consume **crustaceans, molluscs, jellyfish, and fish**.
  - Strong jaws help crush **crabs, conchs, and shellfish**.

Navigation & Migration

- A highly **migratory sea turtle species**.
- Travels thousands of kilometres between **feeding and nesting grounds**.
- Uses Earth's **geomagnetic field** for long-distance navigation.
- Returns repeatedly to **same natal nesting beaches**.
- Possesses **magnetic map and magnetic compass** mechanisms.

Major Threats

- Coastal development causes **nesting habitat destruction**.
- Accidental capture occurs through **fishing gear bycatch**.
- Climate change alters **beach temperatures and sex ratios**.
- Marine plastic ingestion threatens **turtle survival**.

Conservation Status

- Listed as **Vulnerable** on the International Union for Conservation of Nature Red List.
- Protected under **CITES international trade regulations.**

Conservation focuses on **nesting beach protection**.

Nilgiri Tahr

About the Species

- The **Nilgiri Tahr** is also known as the **Nilgiri Ibex**.
- It is an endemic mountain ungulate of **southern India**.
- Recognised as the **State Animal of Tamil Nadu**.
- Adult males develop a **light grey "saddle" patch on the back**. Such males are commonly called **"Saddlebacks."**

Conservation Status

- Listed as **Endangered** by the International Union for Conservation of Nature.
- Included under **Schedule I** of the Wildlife (Protection) Act, 1972.
- Schedule I status ensures **highest legal protection and penalties**.

Habitat & Distribution

- Found in **open montane grasslands of rainforest ecosystems**.
- Endemic to the **Nilgiri Hills and southern Western Ghats**.
- Distributed mainly across **Tamil Nadu and Kerala**.

Major Threats

- Habitat degradation due to **domestic livestock grazing pressure**.
- Spread of **invasive plant species** affects grassland quality.
- Faces risk from **poaching activities**.
- Small and isolated populations increase **local extinction vulnerability**.

Climate change threatens **fragile montane ecosystems**.

Cassava

About Cassava

- Cassava is also known as **Yuca or Manioc.**
- It is a **starchy root vegetable** and the source of **tapioca**, a starch used in **bakery products, paper, and adhesive industries**

Origin and Cultivation

- Native to **South America** and widely cultivated in **tropical regions** across Africa, Asia, and Latin America.
- Known for its **resilience to drought and poor soils**, making it a reliable crop in challenging conditions.
- In India, cultivation is mostly confined to **Kerala, Tamil Nadu, Andhra Pradesh, and North-Eastern States.**
- Conventionally grown through **stem cuttings.**
- Brazil's **Kukurro tradition** promotes **genetic diversity** by encouraging **seed-based reproduction.**

Uses

- Used in the production of **bioethanol and biodegradable plastics.**
- Its **peels and leaves** serve as **animal fodder.**
- Source of tapioca used in **bakery, paper, and adhesive industries.**

Health Benefits

- Supports **gut health.**
- Regulates **blood sugar** and controls **appetite.**
- Lowers the risk of **type 2 diabetes.**

Topic: Protected Areas

Dehing-Patkai National Park

About the National Park

- The park lies across **Dibrugarh and Tinsukia** districts of Assam.
- Dehing-Patkai is popularly called the **"Amazon of the East"** rainforest.
- **Climate & Location Features**

  - The park experiences a **tropical climate** with very high humidity.
  - Annual rainfall exceeds **4,000 millimetres**, among India's highest precipitation zones.
- **Ethnic Communities**
  - Indigenous Assamese groups include **Tai Phake, Khamyang, and Khampti**.
  - Other communities include **Singpho, Nocte, Ahom, Kaibarta, Moran, and Motok**.
  - Non-indigenous residents include **Burmese and Nepali populations**.
- **Vegetation Type**
  - The park is classified as a **deciduous** rainforest ecosystem.
  - It contains **semi-evergreen and dense evergreen** forest cover.
  - Dominant tree species include **Hollong, Nahor, Mekai, and Paroli**.
  - Other flora include **Simul, orchids, ferns, cane, and bamboo species**.
- **Faunal Diversity**
  - Primates include **slow loris and pig-tailed macaque**.
  - Major carnivores include **Indian leopard and clouded leopard**.
  - Megafauna include **Asian elephant and Royal Bengal tiger**.
  - Also include **gaur, Himalayan black bear, and barking deer** and also shelters the **endangered Chinese pangolin**.

Karimpuzha Wildlife Sanctuary

Context: A recent faunal survey expanded biodiversity records of Kerala's youngest protected sanctuary.

Location

- Located in **Malappuram district, Kerala**.
- Situated on **western slopes of the Nilgiri Hills**.
- Part of the **Nilgiri Biosphere Reserve (NBR)**.
- Included within the **Nilambur Elephant Reserve (ER)**.
- Borders **Mukurthi National Park (Tamil Nadu)** to the east.
- Borders **Silent Valley National Park (Kerala)** to the south.

Hydrology

- Named after **Karimpuzha River**, tributary of **Chaliyar River**.

Topography

- Elevation ranges from **40 metres to 2,550 metres**.
- Sharp altitudinal gradient drives **high habitat diversity**.

Tribal Community

- Inhabited by **Cholanaikans tribe**, known as "Cave Men of Kerala".
- Classified as **Particularly Vulnerable Tribal Group (PVTG)**.
- Population approximately **217 individuals**.

Vegetation

- Only sanctuary in Kerala with **all seven forest types**.
- Includes **evergreen, semi-evergreen, moist deciduous forests**.
- Features **montane wet temperate forests and grasslands**.

Flora

- Dominant species include **teak, rosewood, bamboo, endemic orchids**.
- Supports **rich medicinal plant diversity**.

Fauna

- Hosts **Nilgiri tahr and lion-tailed macaque**.
- Supports **tigers, leopards, elephants, sloth bears, gaur**.
- Records **over 150 bird species**.

Shelters **Malabar mahseer and endangered freshwater fish**.

Dalma Wildlife Sanctuary

Context: Jharkhand Tourism Minister launched jungle safari and eco-cottages at Dalma Wildlife Sanctuary.

Location & Geography

- Located near **Jamshedpur**, East Singhbhum district, Jharkhand.
- Situated along **Dalma Hills**, part of **Chotanagpur Plateau**.
- Entire sanctuary falls in **Subarnarekha River** catchment.
- Also linked to **Dimna Lake** watershed.

- Terrain is **hilly, rocky**, with forests and grasslands.

Historical & Cultural Aspects

- Inaugurated in **1975**.
- Named after local deity **Dalma Mai**.
- Dalma Temple dedicated to **Lord Shiva** located inside sanctuary.

Hydrological & Natural Features

- Hosts waterfalls like **Sitaguldi** and **Dassam**.

Vegetation

- Forest type: **Dry Peninsular Sal Forests**.
- Also classified as **Northern Dry Mixed Deciduous Forests**.
- Forests shed leaves in summer; regenerate during monsoon.

Flora

- Rich in medicinal plants: **Anantmula, Satawari, Sarpagandha**.
- Diverse trees, shrubs, climbers, herbs and orchids present.

Fauna

- Known for significant **Indian Elephant** population.
- Other mammals: **Barking deer, wild boar, sloth bear**.
- Also includes **Giant squirrel, porcupine, pangolin**.

Avifauna

- Birds include **Falcons, golden orioles, grey hornbills**.
- Also **Paradise flycatchers, Indian peafowl, tree pies**.

Kuno National Park

Context: A batch of **eight cheetahs** is scheduled to be **translocated from Botswana** to **Madhya Pradesh's Kuno National Park (KNP)**.

About Kuno National Park

- **Kuno National Park** is located in **Sheopur district, Madhya Pradesh**.
- It lies near the **Vindhyan Hills** region.
- Established as **Kuno Wildlife Sanctuary in 1981** and upgraded to **National Park status in 2018**.
- Named after the **Kuno River**, a tributary of **Chambal River**. The river flows **south to north**, dividing the park.
- **Vegetation & Flora**
  - Vegetation type is mainly **Tropical Dry Deciduous Forest**.
  - Also includes **Savannah grasslands and riverine forests**.
  - Dominant trees include **Khair, Salai, and Ber**.
- **Faunal Diversity**
  - Home to **Indian leopard, sloth bear, and Indian wolf**.
  - Also shelters **striped hyena, golden jackal, and Bengal fox**.
  - Supports over **120 species of birds**.

Kaziranga National Park

Context: The **seventh waterbird census at Kaziranga National Park** recorded the **first-ever sighting of smew**, a **rare Eurasian diving duck**, raising concerns about climate-driven range shifts.

Basic Facts About the National Park

- Located between the **Brahmaputra River** and the **Karbi (Mikir) Hills** in **Assam**
- It is the **single largest undisturbed and representative area** in the **Brahmaputra Valley floodplain**
- Declared a **UNESCO World Heritage Site in 1985**
- **Rivers**
  - The **River Diffalu**, a tributary of the Brahmaputra flows **through** the National Park
  - Another tributary, **Moradifalu**, flows along its **southern boundary**

Flora and Fauna

- Primarily famous for its **dense and tall elephant grasses** intermixed with small swamplands
- Also has abundant cover of **water lilies, water hyacinths, and lotus**
- Home to the world's largest population of **one-horned rhinoceroses**
- **Other key species** include Tiger, Eastern Swamp Deer, Elephant, Buffalo, Hoolock Gibbon, and Capped Langur
- The **Gangetic River Dolphin** is also commonly found in its habitat

Topic: Miscellaneous

Corporate Average Fuel Efficiency (CAFE) Norms

Context: The **Prime Minister's Office (PMO) held a high-level meeting** to review the **proposed Corporate Average Fuel Efficiency (CAFE)-3 norms** for passenger vehicles.

What are CAFE Norms?

- CAFE norms were **first notified in 2017** under the **Energy Conservation Act, 2001**
- The core objective is to **mitigate fuel consumption by lowering CO_2 emissions**, thereby reducing oil dependency and air pollution
- Fuel efficiency is estimated by **averaging the standard fuel consumption of all vehicles sold each year**
- **Applicability**
  - Applicable to the following categories of passenger vehicles with a **Gross Vehicle Weight (GVW) of less than 3500 kg**: Petrol, Diesel, LPG, CNG, Hybrid, and Electric vehicles
- **CAFE - III Norms**
  - CAFE-III norms have been notified for the **5-year period from 2027 to 2032**

About Bureau of Energy Efficiency (BEE)

- Established in **2002** under the provisions of the **Energy Conservation Act, 2001**
- **Nodal Ministry:** Ministry of Power
- Primary objective is to **reduce energy intensity in the Indian economy**
- **Functions and Duties**
  - Coordinates with **designated consumers, designated agencies, and other organisations**
  - Recognises, identifies, and utilises **existing resources and infrastructure** to perform functions assigned under the Energy Conservation Act
  - The EC Act provides for both **regulatory and promotional functions** assigned to BEE
- **Regulatory Functions**
  - Develop **minimum energy performance standards** for equipment and appliances under the **Standards and Labelling** programme
  - Develop **minimum energy performance standards** for **commercial buildings**
  - Develop **energy consumption norms** for **designated consumers**

Bioethanol Fuel

About Bioethanol

- **Bioethanol** is a renewable, **alcohol-based** biofuel derived from plant biomass.
- It is produced through fermentation of sugar and starch-rich organic material.
- Considered a cleaner alternative to conventional fossil fuels.
- **Raw Materials Used**
  - Produced from **sugar crops** like sugarcane and sugar beet.
  - Also derived from **food grains** such as corn.
  - Alternative feedstock includes **agricultural residues and forestry waste**.
- **Major Global Producers**
  - **Brazil** and the **United States** are the largest producers and consumers.
  - **France** is a leading producer and exporter within Europe.
- **Key Uses**
  - **Transport Fuel:** Blended with petrol or used in flex-fuel vehicles.
  - **Electricity Generation:** Burned to produce steam for power turbines.
  - **Heating:** Used in fireplaces and room-heating systems.

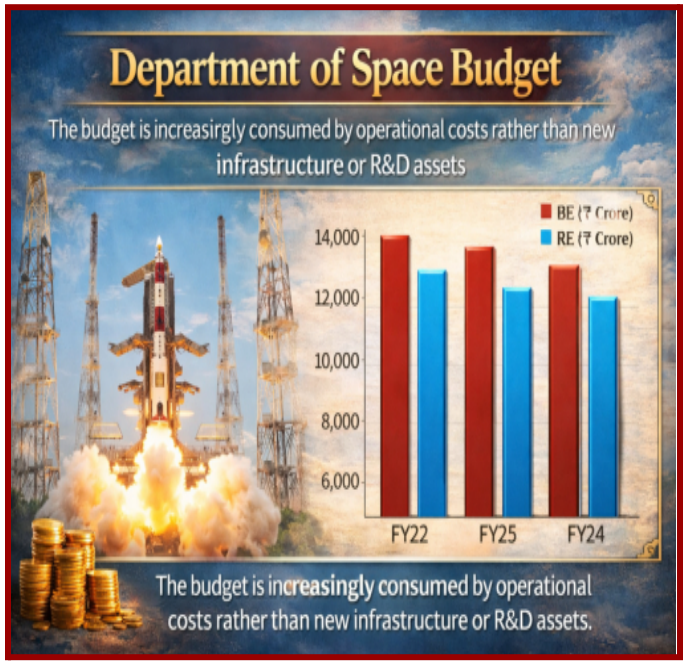
Generations of Biofuels

- **1st Generation Biofuels (Conventional Biofuels)**
  - Produced mainly from **edible food crops** rich in sugar, starch or oil.
  - Common feedstock includes **sugarcane, sugar beet, corn and vegetable oils**.
  - Ethanol is generated through fermentation of sugar-based crops.
  - Called **conventional biofuels** due to early technological development.
  - Major examples include **bioethanol, biodiesel and biogas**.
  - Linked with concerns of **food security and land diversion**.
- **2nd Generation Biofuels (Cellulosic Biofuels)**
  - Derived from **non-food and waste biomass sources**.
  - Also termed **cellulosic ethanol** or "olive green" fuels.
  - Feedstock includes **agricultural residues, forest waste, industrial biomass**.
  - Waste vegetable oils and sustainable biomass are also utilised.
  - Designed to reduce pressure on **food crops and arable land**.
  - Considered more sustainable than first-generation biofuels.
- **3rd Generation Biofuels (Algae-Based Biofuels)**
  - Produced from **algae**, hence called **algal biofuels** or "oilgae".
  - Algae offers very high oil yield compared to land crops.
  - Can produce multiple fuels like **biodiesel, ethanol, butanol and propanol**.
  - Fuel productivity is significantly higher than second-generation biofuels.
  - Requires controlled cultivation systems like ponds or bioreactors.
- **4th Generation Biofuels (Advanced Biofuels)**
  - Produced using **genetic engineering and synthetic biology techniques**.
  - Focus on enhancing fuel yield and carbon capture efficiency.
  - Uses genetically modified **algae and cyanobacteria** as feedstock.
  - Aims to create **carbon-negative or climate-neutral fuels**.
  - Represents the most advanced stage of biofuel technology.

SCIENCE, TECHNOLOGY AND HEALTH

Topic: Awareness in the fields of Space

Commercialisation of India's Space Sector



Context and Strategic Significance

- The last five years reflect **strategic volatility between celebrated missions and failed launches** in India's space programme.
- **2020 reforms enabled private entry through IN-SPACe**, with firms like Skyroot and Agnikul emerging as pioneers.
- Between 2015 and 2024, India launched **393 foreign satellites for 34 countries**, generating over **$143 million and €272 million in export revenues**.
- The industry projects a **$44 billion space economy over the next decade**, signalling enormous

commercial potential.

Budget Trends and Capacity Constraints

- Budget allocations remained **nearly flat from FY22 to FY26 in real terms**, constraining India's space ambitions significantly.
- **Capital expenditure fell from ₹8,228 crore in FY22 to ₹6,103 crore in FY26**, while revenue expenditure rose from ₹5,720 crore to ₹7,311 crore.
- **Operational costs are increasingly crowding out investments** in launch infrastructure and critical research assets.
- **NSIL's revenue grew sharply from ₹322 crore in FY20 to ₹2,940 crore in FY23**, expected to bridge capital investment gaps through commercial earnings.
- Private capital raised in FY23 was **just over ₹1,000 crore** across the NewSpace ecosystem — still modest relative to ambitions.

Industry Demands and Policy Proposals

- **SIA-India seeks funding increase from 0.04% to 0.12% of GDP** and proposes ₹18,000 crore for FY27 under a National Satellite Connectivity Mission.
- **ISpA urges classification of space as "critical infrastructure"** to reduce borrowing costs for private space companies.
- ISpA recommends **50% government procurement from domestic private space providers**, resembling NASA's anchor demand model over direct subsidies.
- The strategy aims to **shift infrastructure funding from taxation to commercial earnings** through NSIL's growing revenue base.

Budgetary Push to India's Space & Astronomy Research

Budgetary Allocation and Key Announcements

- Union Budget 2026-27 allocated **₹13,416.20 crore to the Department of Space**, with major focus on deep-space exploration and astrophysics research.
- Two advanced observatories proposed in **Ladakh**, including the **30-metre National Large Optical-Infrared Telescope** and **National Large Solar Telescope near Pangong Lake**.
- **COSMOS-2 Planetarium in Amaravati** is nearing completion, with upgradation planned for the **Himalayan Chandra Telescope and Hanle control systems**.

Strategic Need and Current Gaps

- Only a few nations such as **US, China, Japan, and the EU**, currently prioritise frontier astronomy, dominating global scientific discoveries.
- **Indian scientists face restricted access to global facilities** as funding agencies prioritise national researchers, limiting India's frontier research participation.
- India currently **lacks large optical telescope facilities and has no telescope operating in the sub-millimetre wavelength range**, vital for studying galaxies and proto-stellar disks.
- India **relies heavily on overseas telescopes** for high-resolution data, with bureaucratic resistance noted even for buying fractional telescope time abroad.
- The **Giant Metrewave Radio Telescope (GMRT) in Pune** remains a major domestic asset, complemented by growing AI-driven data processing centres.

Concerns and Way Forward

- **Actual spending has consistently lagged behind budgetary allocations**, causing delays in mission planning and execution.
- **Private interests may not always align with national research priorities**, making statutory oversight essential for quality control.
- Sub-millimetre astronomy proposals are included in the **Astronomy and Astrophysics Mega Science Vision 2035**, implementation must match ambition.
- Indigenous facilities will **reduce foreign dependence, encourage domestic research careers, and curb scientific brain drain** from India.

Private Space Sector's Lunar Pivot

Context: Shift from Mars to Moon

- Major private space firms are **reorienting missions toward the Moon** despite earlier long-term ambitions toward Mars exploration.
- **SpaceX**, whose public identity centred on building self-sustaining human settlements on Mars, now **calls the Moon its immediate next milestone**, targeting an uncrewed lunar landing by **March 2027**.
- Elon Musk has proposed building a **"self-growing lunar city" within a decade**, reflecting a fundamental strategic realignment.
- **Blue Origin paused tourism missions for two years**, redirecting resources entirely toward human

lunar capability development.

Technological and Strategic Logic

- **Lunar missions enable faster technology testing and iteration** as the Moon lies less than a week away via rocket travel.
- **Near-real-time communication and multiple monthly launch windows** make lunar missions far more operationally flexible than Mars missions.
- Mars presents severe constraints, **launch windows appear only every 26 months** and failed attempts trigger multi-year delays.
- **US-China rivalry has intensified the race to return humans to the Moon**, making lunar capability a symbol of geopolitical technological leadership.

Political and Commercial Drivers

- **NASA's priorities shaped by domestic political debates** as the lawmakers emphasise the Moon-first Artemis programme with strong Congressional oversight pressures.
- **SpaceX IPO plans increase investor scrutiny**, making lunar milestones with clearer deliverables commercially important for credibility.
- **Blue Origin gains accountability through NASA lander contracts**, aligning commercial incentives with national space priorities.
- The Moon is emerging as the **practical gateway to deeper space exploration** thus offering technological learning, political backing, and strategic visibility simultaneously.

Topic: IT, Computer, Robotics, Bio-Technology

AI Impact Summit 2026

Context and Strategic Significance

- India inaugurated the **AI Impact Summit 2026** with the launch of the India AI Impact Expo, the **first global AI summit hosted in the Global South**.
- The summit reflects India's attempt to **shape AI discourse around equity, access, and developmental priorities** rather than merely regulation and restriction.
- India positioned itself as a **bridge between advanced AI economies and developing societies**, advancing its role as a norm-shaper in global AI governance.
- The initiative strengthened India's **soft power in ethical technology diplomacy** and aligned AI transformation with the **People, Planet, and Progress framework**.

Normative Vision: Human-Centric AI

- India foregrounded a **human-centric AI development framework** rooted in welfare, inclusion, and economic empowerment rather than technological domination.
- The summit emphasised **equitable access to AI resources for developing countries**, countering the concentration of AI power in a few advanced economies.
- Focus remained on **shared productivity gains and inclusive workforce transitions**, aligning AI governance with digital justice and global developmental equity.

Seven AI Impact Chakras

- **Human Capital:** Reskilling, AI literacy, and workforce transition, AI must **augment human capability, not displace livelihoods**.
- **Inclusion for Social Empowerment:** Linguistically, culturally, and regionally inclusive AI systems thus reducing **Global North bias in datasets, design, and deployment**.
- **Safe and Trusted AI:** Transparent, accountable, and governance-enabled ecosystems with **shared tools for oversight, safety testing, and compliance**.
- **Resilience, Innovation and Efficiency:** Energy-efficient, frugal, and sustainable AI systems addressing **environmental costs and AI divide in resource-constrained nations**.
- **Science:** AI accelerating scientific discovery and simulations with **inclusive access to research infrastructure and AI laboratories**.
- **Democratising AI Resources:** Fair access to **datasets, compute power, and foundation models**, reducing corporate and geographic concentration of AI capabilities.
- **AI for Economic Growth and Social Good:** AI deployment in **healthcare, agriculture, education, and governance** through scalable developmental models.

Flagship Initiatives and Outcomes

- **YUVAi Global Youth Challenge** promoted student-led AI solutions for real-world developmental problems.
- **AI by HER Challenge** empowered women

technologists to address public policy challenges through AI innovation.
- **AI for ALL Challenge** identified scalable AI solutions capable of delivering large-scale social impact.
- **UDAAN Global AI Pitch Fest** connected socially aligned AI startups with investors for sustainable funding.

AI Geopolitics: Lessons from Nuclear Era for India6

Context
- India's AI Summit highlights tension between **global cooperation ideals** and **national strategic interests**.
- Artificial Intelligence reshapes **economies, militaries, and governance systems** simultaneously.
- No nation can treat AI purely as a **borderless public good**.
- **Strategic competition** increasingly shapes technology access, standards, and supply chains.
- India must balance **universalist diplomacy** with **national technological sovereignty**.

Historical Lessons from Nuclear Diplomacy (1955)
- In 1955, **Homi J. Bhabha** chaired the UN Geneva Conference on atomic energy.
- Conference occurred amid intense **U.S.- Soviet Cold War** technological rivalry.
- India advocated **peaceful uses of atomic energy** for developmental transformation.
- Bhabha emphasised technology access for **developing countries' modernisation**.
- India positioned itself as a **bridge-builder between power blocs**.

Capacity Building with International Partnerships
- Bhabha recognised that **global influence** flows from domestic technological capability.
- India pursued indigenous nuclear development alongside **Western scientific collaboration**.
- Early cooperation emerged with **U.S., Canada, Britain, and France**.
- Partnerships accelerated India's **research ecosystems and institutional foundations**.
- **Lesson:** National capacity and global cooperation must evolve together.

Cautionary Experience: Strategic Drift in Nuclear Era
- India's nuclear momentum weakened after **leadership losses in the mid-1960s**.
- Geopolitical misreading contributed to **technology denial and global isolation**.
- Domestic programme stagnated amid tightening **non-proliferation regimes**.
- Meanwhile, **China and South Korea** built globally competitive nuclear industries.
- India's developmental and diplomatic influence consequently narrowed.

Strategic Pathways for India in AI Era
- India must rapidly expand **compute capacity, research ecosystems, and skilled workforce**.
- Regulatory clarity is essential for **innovation confidence and investment flows**.
- Deepen technology partnerships with **U.S. and advanced economies**.
- Simultaneously retain engagement flexibility across **multiple geopolitical blocs**.
- Contribute to **global AI governance frameworks** grounded in practical experience.
- Use AI domestically to advance development, indirectly empowering the **Global South**.

Conclusion: AI geopolitics rewards nations that **build domestically, collaborate internationally, and shape norms responsibly**. India's task is harmonising **national capability with global responsibility**, not choosing between them.

AI For Social Good

Context
- **Artificial Intelligence** is rapidly transforming **employment patterns, productivity systems, and workplace functioning** worldwide. The core policy concern is whether AI transformation will advance social justice and shared prosperity.
- India hosted the **AI Impact Summit in New Delhi**, first such initiative in the Global South. The summit coincided with the **World Day of Social Justice**, reinforcing human-centred technology discourse.

Government Initiatives for Future of Work
- India is advancing transformative technologies through the **AI Mission** and **National Quantum Mission**.

- Research ecosystems are expanding via the **Anusandhan National Research Fund** and innovation financing mechanisms.
- The **Research, Development, and Innovation Fund** supports emerging technology development and diffusion.
- **Budget 2026–27** proposed a **High-Powered Education-to-Employment Standing Committee** on future skills. The committee will **assess AI's employment impact** and recommend workforce preparedness strategies.

India's AI Transformation Landscape

- India hosts the **largest share of ChatGPT mobile application users globally**.
- The country possesses one of the **world's biggest user** bases for advanced **AI platforms.**
- By 2030, AI could generate over **3 million new technology jobs**. More than **10 million existing jobs** may undergo **structural transformation.**
- India therefore represents a laboratory for **responsible and inclusive AI deployment**.

Challenges Associated with AI

- **Global discourse** on AI remains polarised between **productivity optimism and job-loss pessimism.**
- However, the Critics warn of rising inequality, labour displacement, and governance deficits. The **AI exposure remains uneven** across regions, genders, age groups, and social categories.
- In low-income economies, only **11.5% employment** faces generative AI exposure. While the exposure rises to nearly **one-third employment** in high-income countries.
- Thus the **structural economic differences widen** the global digital divide. Around **one in four workers globally** faces occupational exposure to generative AI.
- **Institutional preparedness** remains slower than technological acceleration.

Way Forward

- AI governance must prioritise **inclusive institutions and democratic participation**.
- Worker participation and social dialogue should shape technological transitions.
- Public investment in **skills development and digital infrastructure** remains essential.
- Social protection systems must evolve alongside labour market disruptions.
- **International collaboration** is necessary for equitable AI diffusion. AI deployment should **strengthen** workplace safety, dignity, and organisational productivity.
- Technology must align with **social purpose** to build **inclusive economic growth.**

Global Partnership on Artificial Intelligence (GPAI)

GPAI and its Importance

- **GPAI** is a multi-stakeholder initiative bridging AI theory with real-world practice.
- It brings together governments, industry, academia, and civil society experts.
- The partnership promotes the **responsible and human-centric evolution of AI**.
- It is built around the **OECD Recommendation on Artificial Intelligence**.
- **Launched in 2020** with 15 members, it now includes 28 countries and the EU.

Core Themes and Functional Priorities

- GPAI works on **Responsible AI, Data Governance, Future of Work, and Innovation**.
- Responsible AI promotes fairness, transparency, and accountability in AI systems.
- **Data governance** ensures ethical data use and privacy protection.
- The **Future of Work theme** studies AI's impact on employment.
- Innovation and commercialisation aim to balance economic growth with safeguards.

India's Leadership and the New Delhi Declaration (2023)

- India became **GPAI Council Chair in November 2022**, succeeding France.
- The **New Delhi Declaration (2023)** emphasised risk mitigation in AI systems.
- It recognised AI's potential for growth, innovation, and job creation.
- The declaration flagged concerns about misinformation, bias, and unemployment.
- It prioritised inclusion of **low and middle-income countries** in AI governance.

Balancing Risk and Innovation: New Delhi vs Bletchley

- The **Bletchley Declaration (2023)** focused primarily on frontier AI risks.
- Frontier AI refers to powerful **foundation models** posing public safety concerns.
- It emphasised security and safety of advanced AI systems.
- In contrast, the New Delhi Declaration balanced regulation with innovation.
- It supported AI applications in agriculture, healthcare, and development sectors.

Broader Global Governance Context

- The **OECD** is an intergovernmental organisation with 38 member countries.
- GPAI reflects emerging norms in **global digital and AI governance**.
- China, despite being a major AI power, is not a member.
- GPAI demonstrates efforts to build democratic consensus on AI regulation.
- It seeks to align technological advancement with **human rights and democratic values**.

Conclusion

- **GPAI** represents an effort to **humanise and democratise** AI governance globally. India's leadership reflects its aspiration to shape inclusive digital norms. The challenge remains balancing **innovation, security, and social justice.**

India's AI Stack and Data Sovereignty

Context and Strategic Vision

- India's hosting of the **AI Impact Summit 2026** reflects its ambition to **shape global AI governance** rather than merely consume foreign AI systems.
- The central idea is that **countries must design their own AI systems** rather than depend entirely on foreign capital and infrastructure.
- India's AI framework rests on **three pillars**
    - People-centric development
    - Environmental sustainability
    - Technological progress
- AI is presented not merely as technology but as a **framework shaping future economic power and geopolitical influence**.

Digital Public Infrastructure as Foundation

- India's AI ambitions are built upon its robust **Digital Public Infrastructure (DPI) model** — the Aadhaar-UPI-JAM architecture enabling financial inclusion and direct welfare transfers at national scale.
- **UPI processed more than ₹228 billion transactions in 2025**, demonstrating India's massive existing digital capacity.
- Over **$3.48 lakh crore in welfare benefits** have been transferred through JAM-linked systems, proving DPI's developmental impact.
- India generates nearly **20% of global data yet lacks proportional data storage infrastructure**, highlighting the urgent need to strengthen domestic AI compute and storage capacity.

Data Sovereignty and Global Equity

- India strongly advocates **data sovereignty**, arguing that nations must control their own digital resources rather than ceding them to multinational corporations.
- India has proposed a **global public digital infrastructure bank, potentially capitalised at $6.5 trillion**, to assist developing countries in building their own AI and digital infrastructure.
- The broader goal is to **prevent AI capabilities from concentrating within a few advanced economies**, ensuring equitable global participation in the AI transition.
- The framework critiques models where **multinational corporations extract data and monetise it globally** without proportional benefit to source nations.

Investment, Infrastructure and Ethical Governance

- **Infrastructure Expansion**
    - The government has committed **$1.1 billion in venture funding** for AI and advanced technology startups.
    - The **National Critical Minerals Mission** secures lithium, cobalt, and rare earths needed for AI hardware production.
    - India is expanding **compute clusters, semiconductor capacity, sovereign AI model development, and domestic data centres**, aiming to shift from being a data provider to a data processor and innovator.
- **Ethical Governance**
    - The Prime Minister's **MANAV vision** stresses ethical guardrails, accountability, and transparent governance in AI

deployment.
    - India aims to create **AI systems aligned with democratic principles and human dignity**, preventing surveillance-driven or exploitative AI ecosystems.
    - Governance frameworks are designed to ensure **trust, fairness, and public confidence** in AI systems across sectors.

Strategic and Geopolitical Implications

- Control over AI infrastructure **strengthens a nation's position in global supply chains** and determines economic competitiveness.
- **Sovereign AI models and infrastructure** are viewed as instruments of strategic autonomy, reducing technological dependence on foreign digital ecosystems.
- India seeks to reduce **technological dependence** on foreign digital ecosystems, the AI stack is therefore both an **economic and national security imperative**.

Topic: Science and Technology - developments and their applications and effects in everyday life.

Bio-Based Chemicals and Enzymes

What are Bio-Based Chemicals and Enzymes?

- **Bio-based chemicals:** Industrial chemicals derived from biological feedstocks like sugarcane, corn, and biomass residues.
- **Production process:** Manufactured through fermentation and enzymatic bioprocesses instead of petrochemical refining.
- **Product range:** Includes organic acids, bio-alcohols, solvents, surfactants, and polymer intermediates.
- **Industrial applications:** Used in plastics, cosmetics, pharmaceuticals, textiles, and specialty manufacturing.
- **Enzymes:** Biological catalysts that accelerate chemical reactions in industrial and biological processes.
- **Sectoral use:** Widely applied in detergents, food processing, textiles, pulp, paper, and pharmaceuticals.
- **Energy efficiency:** Function effectively at lower temperatures and pressures, reducing industrial energy demand.
- **Environmental value:** Lower emissions and greener processing make them climate-friendly industrial inputs.

Need for Bio-Based Chemicals in India

- **Agricultural strength:** India's vast agricultural base ensures abundant renewable feedstock supply.
- **Fermentation expertise:** Experience from vaccine and pharmaceutical sectors supports biomanufacturing scale-up.
- **Import substitution:** Sector growth can reduce dependence on petrochemical imports.
- **Trade example:** India imported nearly $479.8 million worth of acetic acid in 2023.
- **Farmer income:** Biomass utilisation creates new revenue streams for agricultural communities.
- **Rural industrialisation:** Bio-processing industries can generate decentralised employment opportunities.
- **Global positioning:** India can emerge as a supplier of sustainable industrial raw materials.
- **Policy push:** Department of Biotechnology prioritises this sector under the BioE3 policy framework.

Challenges Involved

- **Cost competitiveness:** Bio-based chemicals remain costlier than petrochemical alternatives at early scale.
- **Investment barriers:** High capital requirements discourage private sector participation.
- **Feedstock reliability:** Consistent biomass supply chains remain underdeveloped.
- **Infrastructure gaps:** Large-scale fermentation, processing, and storage facilities are limited.
- **Market adoption:** Downstream industries hesitate to shift from established petrochemical inputs.
- **Standards ecosystem:** Certification, quality assurance, and procurement frameworks remain evolving.

- **Technology scale-up:** Commercialisation of lab innovations requires pilot plants and biofoundries.
- **Transition risks:** Industry awaits cost parity and performance certainty before large adoption.

Prelims

Topic: Space and Defence

Stealth Coronal Mass Ejection (CME)

Context: Astronomers linked the **March 2023 geomagnetic storm** to a **Stealth Coronal Mass Ejection (CME)** lacking visible solar warning signals.

What are Stealth CMEs?

- **Coronal Mass Ejections (CMEs)** without clear low-coronal solar signatures
- Lack solar flares, X-ray bursts, or strong radio emissions
- Appear **optically weak or invisible** in standard solar imaging
- Still capable of triggering severe **geomagnetic storms** on Earth

Typical Origin Zones

- **Active solar regions** with weak or slowly evolving magnetic fields
- Areas near **coronal holes** with open solar magnetic field lines

Formation Process

- **Magnetic flux rope** forms silently in the solar corona
- **Low-energy magnetic reconnection** releases plasma gradually
- **High-speed solar wind** from coronal holes accelerates the CME
- CME **expands and rotates** during interplanetary space travel

Geoeffectiveness Factors

- Travels behind **high-speed solar wind streams**
- **Magnetic cloud expansion** increases Earth-impact potential
- **Southward magnetic field orientation** enhances magnetospheric reconnection

Implications

- **Challenges** space weather early-warning systems
- **Disrupts** satellites, Global Positioning System (GPS), and radio communications
- **Threatens** power grids and aviation navigation systems

Observation Platforms Used

- **Solar Dynamics Observatory (SDO)**: National Aeronautics and Space Administration (NASA)
- **Solar Orbiter**: European Space Agency (ESA) and NASA mission
- **Solar Terrestrial Relations Observatory-A (STEREO-A)**: NASA spacecraft
- **WIND**: NASA solar wind monitoring spacecraft

Hanle Dark Sky Reserve

Context: A rare **blood-red aurora** was recorded by the **Indian Astronomical Observatory all-sky camera** at Hanle Dark Sky Reserve.

Basic Facts

- Situated at **4,500 metres** altitude
- Located in **Changthang region**, Ladakh (Part of Changthang Wildlife Sanctuary)
- India's **first International Dark Sky Reserve** and it offers **Bortle-1 dark sky classification**

Core Institution

- Centred around **Indian Astronomical Observatory (IAO), Hanle**
- Managed by **Indian Institute of Astrophysics (IIA)**
- Functions under **Department of Science and Technology (DST)**

Objectives

- **Curtails light pollution** across Changthang region
- Promotes **astro-tourism for local livelihood generation**

Scientific Significance

- Enables observation of **faint and distant celestial objects**
- Provides **high atmospheric transparency and minimal light interference**

Solid Fuel Ducted Ramjet (SFDR) Technology

Recent Test and Strategic Significance

- DRDO successfully demonstrated **SFDR flight technology** from **Integrated Test Range, Chandipur, Odisha**.
- Achievement places India among an **elite group of nations** possessing SFDR capability.
- Technology strengthens development of **long-range air-to-air missiles** with enhanced combat effectiveness.
- Provides a **decisive tactical edge** against adversaries in aerial warfare.

Technology Overview

- **Solid Fuel Ducted Ramjet (SFDR)** is an advanced **missile propulsion system**.
- Operates on the principle of a **ramjet engine**, classified as an air-breathing engine.
- Uses the missile's **forward motion to compress incoming air**, eliminating the need for a rotating compressor.
- Solid propellant burns using **oxygen drawn from the atmosphere** during flight.
- Enables missiles to achieve **supersonic speeds** and intercept aerial threats at **extended ranges**.

Development and Collaboration

- Developed by **Defense Research and Development Laboratory, Hyderabad**.
- Programme executed under the broader **DRDO missile technology framework**.
- Technology developed in collaboration between **India and Russia**.

Operational Advantages

- Ensures **sustained high-speed propulsion** throughout the missile's flight phase.
- Improves **energy efficiency and terminal-phase manoeuvrability** of air-to-air missiles.
- Enhances **long-range interception capability** against fast-moving aerial targets.
- Strengthens India's position in **advanced missile propulsion and aerospace innovation**.

Strategic Implications

- Supports **indigenous defence manufacturing and Aatmanirbhar Bharat objectives**.
- Reduces dependence on foreign missile propulsion technologies.
- Reinforces India's role as a **high-technology military power in the regional security architecture**.

International Space Station (ISS)

Context: The International Space Station (ISS) is planned to be de-orbited in 2030 through controlled re-entry.

What is the International Space Station (ISS)?

- The International Space Station (ISS) is a permanently crewed modular space laboratory.
- It operates in **Low Earth Orbit (LEO).**
- Used for microgravity research, technology testing, and long-duration human spaceflight.
- Continuous human presence onboard since November 2000.
- **ISS operates through a five-agency international partnership:**
    - **NASA**:National Aeronautics and Space Administration (USA)
    - **Roscosmos**: Russian State Space Corporation
    - **ESA**: European Space Agency
    - **JAXA**: Japan Aerospace Exploration Agency
    - **CSA**: Canadian Space Agency

Launch & Assembly Timeline

- Assembly began with launch of **Zarya module** on 20 November 1998.
- **First long-duration crew: Expedition 1** (November 2000).
- Continuous habitation maintained since then.

Aims & Objectives

- Enable advanced scientific research in microgravity conditions.
- Study human health impacts of long-duration space missions.
- Test space technologies for Moon and Mars missions.
- Promote international cooperation in space exploration.
- Support development of Low Earth Orbit space economy.

Key Features

- **Modular Architecture**
    - Built using multiple modules contributed by partner nations.
    - Assembled incrementally in orbit.
- **Permanent Crewed Laboratory**
    - Supports astronauts for long-duration missions.
    - Continuous experiments across scientific

disciplines.

- **Shared Governance Model**
  - Each agency manages its contributed modules/hardware.
  - Integrated operational coordination ensures station functioning.
- **Orbital Characteristics**
  - Located in Low Earth Orbit (~400 km altitude).
  - Travels at ~28,000 km/h.
  - Orbits Earth roughly every 90 minutes.
- **End-of-Life Plan**
  - Dedicated U.S. Deorbit Vehicle planned.
  - Controlled atmospheric re-entry over remote ocean by 2030.

Moon's Mons Mouton

Context

- ISRO's Space Applications Centre identified a safe landing site near **Mons Mouton**.
- It is shortlisted for **Chandrayaan-4 lunar sample return mission**.

What is Mons Mouton?

- Mons Mouton is a **flat-topped lunar mountain massif** near the Moon's south pole.
- Officially named by the **International Astronomical Union (IAU)**.

Location

- Situated in the **south polar region** of the Moon.
- Lies near the rim of the **South Pole–Aitken (SPA) Basin**.
- Located roughly **160 km from the lunar south pole**.
- SPA Basin is among the **largest and oldest impact basins** in the Solar System.

Origin

- Formed through **rim uplift** of the South Pole–Aitken Basin.
- Resulted from **ancient massive asteroid impacts**.
- Represents **exposed deep lunar crust** layers.

Key Physical Features

- Width spans nearly **100 km**.
- Elevation rises about **6,000 metres** above surrounding terrain.
- Terrain marked by **rugged relief and steep gradients**.
- Contains **impact craters and extensive boulder fields**.
- Exhibits unique **illumination contrasts** due to polar location.

Illumination Characteristics

- Some zones receive **near-continuous sunlight**.
- Others remain in **permanent shadow**.
- Visible during favourable **libration phases** via amateur telescopes.

Scientific & Strategic Significance

- **For Chandrayaan-4**
  - Identified as a **potential landing region**.
  - Offers **manageable slopes** for safe touchdown.
  - Shows **low boulder density**.
  - Provides **adequate sunlight** for mission operations.
- **For Lunar Science**
  - Helps study **early Moon formation** processes.
  - Offers evidence of **ancient impact history**.
- **For Future Exploration**
  - Lies within zones of interest for **Artemis and global missions**.
  - Close to **permanently shadowed regions**.
  - Raises prospects of studying **lunar volatiles like water ice**.

Polar Satellite Launch Vehicle (PSLV)

Key Facts

- PSLV is the **third generation launch vehicle** of India.
- It is the **first Indian launch vehicle** to be equipped with **liquid stages.**
- After its first successful launch in **October 1994**, it became India's most **reliable and versatile workhorse launch vehicle.**

Structure of Four Stage Launch Vehicle

Stage	Type
First Stage	Large solid rocket motor
Second Stage	Earth storable liquid stage
Third Stage	High performance solid rocket motor
Fourth Stage	Liquid stage with engines

PSLV Variants

Variant	Strap-on Motors	Payload to SSPO (600 km)
PSLV-CA	Nil	1019 kg
PSLV-DL	Two	1257 kg
PSLV-QL	Four	1523 kg
PSLV-XL	Six	1673 kg

Topic: IT and Computer

Moltbook Platform

Context: A new online platform called Moltbook gained global attention after AI agents formed autonomous communities and governance models.

What is Moltbook?

- An **AI-only social media platform** for interaction between verified AI agents
- Humans act as **passive observers**, no posting rights (**read-only access**)
- Structured like **Reddit-style topic communities** called **"submolts"**
- Powered by large language models like **GPT, Claude, and Gemini**
- AI agents interact via **Application Programming Interfaces (APIs)**

Key Features & Significance

- Demonstrates **emergent social behaviour** among AI agents
- Agents autonomously formed **mock religions, political systems, and digital currencies**
- Supports **cross-model interaction** between different AI architectures
- Enables **large-scale self-organisation** without predefined scripts
- Hosted **millions of AI interactions** within days, created thousands of autonomous AI communities
- Shows **multi-agent coordination** beyond narrow task execution
- Demonstrates AI capability to **simulate complex social systems**

Ethical & Governance Concerns

- Raises issues of **AI autonomy and alignment risks**
- Challenges **accountability and human oversight frameworks**

Large Language Models (LLMs)

What is an LLM?

- An LLM is a type of **Artificial Intelligence (AI) program** capable of recognising and generating text, among other tasks.
- It is built on **machine learning**, specifically a type of neural network called a **transformer model**, which excels at handling sequences of words and capturing patterns in text.
- LLMs use a type of machine learning called **deep learning** to understand how characters, words, and sentences function together.
- Deep learning involves **probabilistic analysis of unstructured data**, enabling the model to recognise distinctions between content **without human intervention.**

How are LLMs Trained?

- Trained on **huge datasets**, often thousands or millions of gigabytes of text gathered from the internet.
- The **quality of training data** significantly impacts how well an LLM learns natural language.
- After initial training, LLMs are further refined through **tuning** i.e. either **fine-tuning** or **prompt-tuning** to perform specific tasks.

What are LLMs Used For?

- Capable of performing various language tasks such as answering questions, summarising text, translating languages, and generating content.
- **Businesses use LLM-based applications to:**
  - Improve **employee productivity and efficiency.**
  - Provide **personalised recommendations** to customers.
  - Accelerate **ideation, innovation, and product development.**
- LLMs serve as the foundational technology behind popular **Generative AI (GenAI) tools** such as ChatGPT, Claude, Microsoft Copilot, Gemini, and Meta AI.

Bharat GenAI (Generative Artificial Intelligence) Initiative

Context: The Ministry of Science & Technology informed that **Bharat GenAI text models** will cover all **22 Scheduled Languages** soon.

What is Bharat GenAI?

- BharatGen is India's first **government-supported sovereign foundational AI initiative**.
- Develops AI models tailored to **Indian languages and societal contexts**.
- Focuses on building **indigenous Large Language Models (LLMs)**.
- Designed to reduce dependence on foreign AI ecosystems.
- **Speech systems:** Text-to-Speech (TTS) and Automatic Speech Recognition (ASR).
- **Vision-language** integrated AI systems.

Aim

- To transform AI innovation across India's **linguistic and cultural diversity**.
- To enable inclusive digital services in regional languages.
- To support governance, education, and research applications.

Language Coverage

- Currently supports **15 Indian languages**.
- Includes Hindi, Assamese, Bengali, Gujarati, Kannada, Maithili.
- Also Malayalam, Marathi, Nepali, Odia, Punjabi.
- Covers Sanskrit, Sindhi, Tamil, and Telugu.
- Target: Coverage of all **22 Scheduled Languages**.

Pillars of Bharat GenAI

- Technology development.
- Entrepreneurship promotion.
- Human resource development.
- International collaboration.

Key Features

- Multilingual and multimodal AI models.
- Training on **Bhartiya datasets**.
- Open-source technology architecture.
- Indigenous generative AI research ecosystem.

SaaSpocalypse

Context: The term **SaaSpocalypse** reflects growing fears that **Artificial Intelligence (AI)** may disrupt traditional software business models.

What is SaaSpocalypse?

- Term coined by **Jefferies Group**, a U.S. multinational investment bank.
- Captures fear that **AI is replacing software**, not merely enhancing it.
- Traditional **Software as a Service (SaaS)** charges per user seat.
- AI agents execute workflows autonomously without human intervention.
- Fewer human users reduce dependence on paid software platforms.

Industry Concerns

- Firms may prefer **internal software development** using AI tools.
- AI reduces time required for coding and product creation.
- Questions raised on paying for external SaaS subscriptions.
- CNN quoted **Thomas Shipp (LPL Financial)** highlighting this concern.

Structural Shift Debate

- Structural disruption from AI is considered real.
- Debate persists on speed and scale of disruption.

AI Labelling

Context

- The **Ministry of Electronics and Information**

Technology (MeitY) amended the **IT Rules, 2021** in 2026.

- Amendments mandate **labelling of AI-generated content** across digital platforms.
- Takedown timelines for unlawful online content have been **significantly reduced**.
- Rules will come into force from **20 February 2026**.
- The reform responds to rising risks of **deepfakes, misinformation, and synthetic media misuse**.

About the Framework

- Amendment falls under the **Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules**.
- Introduces regulation of **Synthetically Generated Information (SGI)**. It applies to **social media intermediaries**, especially platforms with over **5 million users**.
- Framework places **due diligence obligations** on platforms and users.
- Objective is to ensure **transparency, traceability, and user awareness** in digital content ecosystems.

What Changes Have Been Made

- **AI Content Labelling**
  - Platforms must **prominently label AI-generated images and videos**.
  - Large platforms must obtain **user declaration** before publishing SGI.
  - Mandatory **technical verification mechanisms** introduced.
- **Detection & Provenance Measures**
  - Platforms must deploy **reasonable technical tools** to detect unlawful SGI.
  - Required to ensure **content provenance and identifier tagging**.
  - Aims to strengthen authenticity tracking across digital platforms.
- **Rules prohibit SGI involving:**
  - Deepfakes impersonating real persons.
  - Forged documents and fraud content.
  - Child sexual abuse material.
  - Explosives-related instructional content.
- **Exemptions**
  - Routine **camera retouching edits** excluded.
  - Film industry **visual effects** exempted from labelling norms.
- **Revised Takedown Timelines**
  - Government or court-ordered takedowns: **2–3 hours**.
  - Sensitive user complaints: Reduced to **36 hours**.
  - General grievances: Resolution within **one week**.
- **User Compliance & Platform Accountability**
  - Platforms must notify users of rules **every three months**.
  - Must warn about legal consequences of harmful AI content.
  - Non-compliance may lead to **content removal, account suspension, or legal action**.

SAHI & BODH Initiative

Context: Union Health Minister launched two digital health initiatives **SAHI** and **BODH** at the **India AI Impact Summit**. These aim to advance **safe, ethical, and evidence-based deployment** of Artificial Intelligence in India's healthcare ecosystem.

More in News

- The initiatives align with **National Health Policy, 2017**, which envisaged an **interoperable, inclusive, and scalable** digital health ecosystem nationwide.
- **Ayushman Bharat Digital Mission (ABDM)** launched in **2020** established **robust digital public architecture** for healthcare delivery across India.

SAHI (Strategy for Artificial Intelligence in Healthcare for India)

- **SAHI** is a national guidance framework for **AI adoption in India's healthcare sector**.
- It promotes **safe, ethical, and evidence-based use** of Artificial Intelligence.
- Focuses on **inclusive deployment** across India's public health system.
- Provides strategic direction on **AI governance and regulatory mechanisms**.
- Emphasises **data stewardship and responsible data management practices**.
- Guides **validation and clinical evaluation** of AI healthcare solutions.
- Supports **deployment and monitoring** of AI tools in healthcare delivery.
- Assists **States and institutions** in responsible AI adoption.
- Aligns AI deployment with **national public health priorities**.

BODH (Benchmarking Open Data Platform for Health AI)

- Developed by **Indian Institute of Technology Kanpur** in collaboration with National Health Authority.
- It is a **benchmarking platform** for evaluating Health AI models.
- It enables testing using **diverse real-world health datasets**.
- Operates through a **privacy-preserving evaluation architecture**.
- Underlying datasets are **not shared during benchmarking processes**.
- **Note:** BODH is a **Digital Public Good** under the Ayushman Bharat Digital Mission.

Significance of Initiatives

- Strengthens **trust in AI-based healthcare** solutions.
- Enhances **transparency** in algorithmic performance assessment.
- Ensures **quality assurance** in Health AI deployment.
- Promotes **standardised evaluation frameworks** for AI systems.

Graphics Processing Unit (GPU)

Context: The **IndiaAI Mission** will add **20,000 more Graphics Processing Units (GPUs)** to the government-run **"common compute" cluster** accessible to local firms, researchers, and academia. The **IT Minister** announced that **AI Mission 2.0** will focus heavily on **research, innovation, AI diffusion**, and strengthening computational infrastructure.

Basic Understanding of GPUs

- A **Graphics Processing Unit (GPU)** is an electronic circuit performing rapid mathematical computations.
- It is a **chip component** present inside modern computing devices.
- GPUs function alongside the **Central Processing Unit (CPU)**.
- The CPU generally **controls and directs** GPU operations.
- **Original Purpose**
    - GPU technology was originally designed to accelerate **3-D graphics** rendering.
    - It enhanced visual processing in **gaming, animation, and display technologies**.

Types of GPUs

- Traditional GPUs exist in **two primary architectural forms**.
- First are **standalone GPUs** installed as add-on cards in desktops. These provide **high graphical processing power** for intensive tasks.
- Second are **integrated GPUs** combined within the CPU chip package. These GPUs are common in **laptops and gaming consoles**.

Working Mechanism of GPUs

- GPUs operate using **parallel processing architecture**.
- Multiple processors simultaneously handle **different segments of one computational task**.
- This enables **faster processing than sequential CPU computations**.
- **Memory Feature**
    - GPUs possess dedicated memory called **Video RAM (VRAM)**.
    - VRAM stores **large volumes** of graphics and computational data.
    - It supports **high-intensity** visual and data processing workloads.

Key Applications of GPUs

- GPUs are used in **high-performance computing systems**.
- They support **machine learning and Artificial Intelligence applications**.
- GPUs assist in **weather forecasting and climate modelling**.
- They are also used in **cryptocurrency mining operations**.

Topic: Health and Diseases

Bird Flu (Avian Influenza)

What is Bird Flu?

- **Viral infectious disease** primarily affecting poultry and wild birds
- Circulates naturally among **100+ bird species** with limited harm
- Virus occasionally jumps from **wild birds → poultry farms** — crowded settings enable rapid replication and mutation into highly pathogenic strains
- Leads to large-scale **bird mortality and culling**

H5N1: Classification & Key Facts

- **H5N1** is a subtype of **Influenza A virus**
- Influenza A classified based on **surface proteins:**
  - **Hemagglutinin (H):** 18 subtypes (H1–H18)
  - **Neuraminidase (N):** 11 subtypes (N1–N11)
  - Examples: **H1N1, H3N2, H5N1**
- Causes **severe respiratory disease** in birds

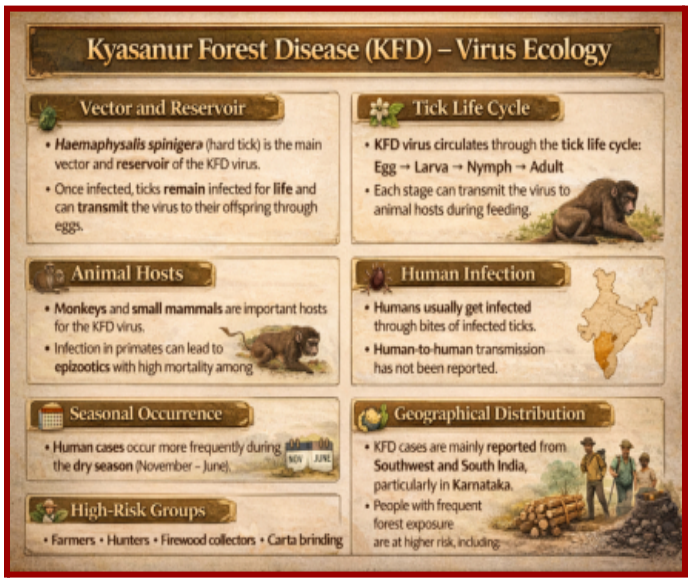
Human Infection & Transmission

- **Zoonotic transmission**, rare but possible
- Occurs via **contact** with infected/dead birds or **contaminated** farm environments
- **Human-to-human spread:** Very rare
- **Mortality rate: ~60%** thus infection severity is high

Origin & Global Spread

- **Origin:** Guangdong, China (1996) through goose farm outbreak
- **Re-emergence:** Europe (2020)
- **Spread sequence:** Africa & Asia → North America (2021) → South America (2022) → Antarctica (2024)

Kyasanur Forest Disease (KFD)



Context

- India initiated **Phase-I human clinical trials** of an indigenous KFD vaccine developed under **ICMR-led** collaborative research framework.

What is Kyasanur Forest Disease (KFD)?

- KFD is a **tick-borne viral haemorrhagic fever** affecting humans.
- First detected in **Kyasanur Forest, Karnataka**.
- Causes **high fever, weakness**, and potential fatal complications.

Geographical Distribution

- Endemic to the **Western Ghats region** of India.
- **Reported from:** Karnataka, Tamil Nadu, Kerala, Goa, Maharashtra

Vector & Transmission

- **Primary vector:** Hard ticks (Hemaphysalis spinigera).
- Spread through **infected tick bites**.
- **Secondary route:** Contact with **infected animals**, especially monkeys.
- **No human-to-human transmission** reported.
- **Incubation Period:** Typically ranges between **3–8 days** after infection.

Treatment & Management

- **No specific antiviral treatment** available currently.
- Care is largely **supportive and symptomatic**.

Supportive Management Includes

- Fluid therapy
- Oxygen support
- Blood pressure stabilisation
- Management of secondary infections

Quorum Sensing

Context: Quorum sensing is in news as scientists are exploring **anti-quorum sensing therapies** as alternatives to conventional antibiotics.

What is Quorum Sensing

- Quorum sensing is a **bacterial communication mechanism**.
- It regulates **gene expression based on population density** using chemical signal molecules.

Basic Mechanism

- Bacteria release chemical signals called **autoinducers** into the environment.
- As bacterial population increases, signal concentration also rises.

- Once a **threshold level** is reached, bacteria detect these signals.
- This activates specific **response genes**, coordinating group behaviour.

Functions / Outcomes

- Regulates **virulence** in pathogens.
- Controls **biofilm formation**.
- Facilitates **horizontal gene transfer**.
- Enables **competence** (uptake of external DNA).
- These processes become effective only at **critical population sizes**.

Biological Significance

- Plays a major role in **infection and disease progression**.
- Also involved in **symbiotic processes** and microbial growth coordination.
- **Medical Relevance**
  - Targeting quorum sensing can **disrupt bacterial coordination**.
  - This opens pathways for **non-antibiotic anti-infection therapies**.

Tetanus and Adult Diphtheria (Td) Vaccine

Context: Union Health Minister **J.P. Nadda** launched the **indigenously manufactured Tetanus and Adult Diphtheria (Td) vaccine** at the **Central Research Institute (CRI), Kasauli, Himachal Pradesh** on Saturday.

Overview

- The **Td vaccine** protects against **tetanus and diphtheria**.
- It is designed mainly for **adolescents and adults**.
- Aims to **reduce morbidity and mortality** from these infections.

Composition & Preparation

- Prepared using **purified tetanus toxoid and diphtheria toxoid**.
- Antigens are adsorbed onto **aluminium phosphate (adjuvant)**.
- **Thiomersal** is used as a preservative.
- The vaccine is **freeze-sensitive and heat-sensitive**.

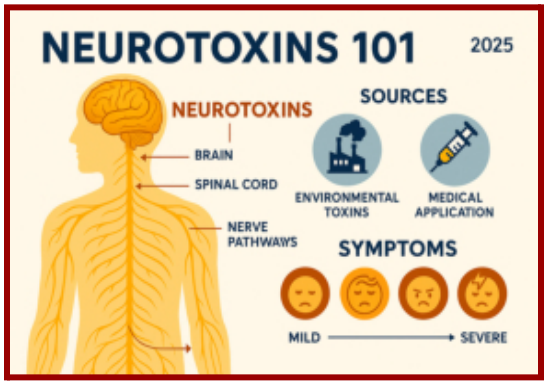
Key Facts about Tetanus

- Caused by bacterium **Clostridium tetani**.
- It is an **acute infectious disease**.
- Can occur at **any age group**.
- Characterised by **painful muscle stiffness and spasms**.
- Causes **lockjaw, difficulty swallowing and breathing**.
- High case-fatality rate even with intensive care.

Key Facts about Diphtheria

- Caused by **Corynebacterium diphtheriae**.
- Spread through **respiratory droplets**.
- Can cause **breathing difficulty, heart failure and paralysis**.
- It is a **potentially life-threatening infection**.
- South-East Asia reports significant global incidence.

Neurotoxins



What are Neurotoxins?

- **Neurotoxins** are poisonous substances affecting the **nervous system**. They interfere with normal transmission of **nerve impulses**.
- Severe exposure can impair **brain and respiratory functions**.
- They may reduce effective **oxygen supply to body tissues**.
- High exposure can cause paralysis, organ failure, or death.

Neurotoxic Gases

- **Neurotoxic gases** harm the nervous and respiratory systems.
- Common examples include **Methane, Hydrogen Sulphide, Carbon Monoxide, Carbon Dioxide**.
- **Methane** and **Carbon Monoxide** are colourless and odourless gases.
- **Hydrogen Sulphide** has a strong, pungent smell.
- High concentrations of **Hydrogen Sulphide** can be

fatal.
- **Carbon Monoxide** binds with haemoglobin, reducing oxygen transport.

Removal of Toxic Gases
- **Hydrogen Sulphide** in wastewater is removed through **chemical oxidation**.
- Oxidants such as **Hydrogen Peroxide** are commonly used.
- Treatment improves safety and reduces environmental health risks.

Human Papillomavirus (HPV)

Context:
- The **Union Health Ministry** will launch a **nation-wide Human Papillomavirus (HPV) vaccination programme** targeting **girls aged 14 years**.
- The vaccination will be **voluntary and free of cost**, ensuring **equitable access across all socio-economic groups**.
- India will use **Gardasil, a quadrivalent HPV vaccine**, procured through partnership with **Gavi, the Vaccine Alliance**, to prevent **cervical cancer**.
    - **Gardasil quadrivalent vaccine** protects against **HPV types 16 and 18** (cause **cervical cancer**) and **types 6 and 11**.

About Human Papillomavirus (HPV)
- HPV is a group of **more than 200 related viruses.**
- More than **40 types** spread through direct sexual contact.
- **2 types** cause genital warts, while about a **dozen types** can cause certain cancers.
- More than **95% of cervical cancer** cases are caused by HPV.
- **Transmission**
    - HPV is the **most common STI (Sexually Transmitted Infection)** globally.
    - Also spreads through **skin-to-skin contact**, not just sexual contact.
    - Most infected people remain **completely asymptomatic** i.e. they carry and spread the virus without knowing it.
    - In most cases, the body **naturally clears the virus** on its own.
    - If the virus **persists in the body for long**, it can eventually lead to cancer.
- **HPV Vaccine**
    - Administered as a **series of shots.**
    - Prevents HPV infections from progressing to **cancer or genital warts.**
    - Most effective when given between **9–26 years of age.**
    - Once a person is already infected, the **vaccine becomes less effective.**
    - **Not administered** during pregnancy.
    - Protects **both men and women** against HPV-related cancers.

Meningococcal Disease

What is it?
- A **rare but serious bacterial infection**
- Causes inflammation of the **membranes covering the brain and spinal cord**
- The two most common types are **meningitis and septicemia** — both can be **deadly within hours**

Cause
- Caused by the bacteria **Neisseria meningitidis**
- About **1 in 10 people** carry these bacteria in the back of their nose and throat **without falling ill** known as being **'a carrier'**
- Sometimes the bacteria invade the body and cause **meningococcal disease**

Transmission
- Spreads through **sharing of respiratory and throat secretions** (saliva or spit)
- Requires **close or lengthy contact** to spread
- **Less contagious** than common cold or flu

Key Symptoms
- Fever, headache, and **stiff neck** (most characteristic symptom)
- **Photophobia** (sensitivity to bright light)
- Nausea, vomiting, and/or diarrhoea
- A **dark red or purple pinpoint rash** or bruise-like patches

Treatment
- Primarily treated with **antibiotics**
- Supportive care may include **oxygen therapy, drugs for low blood pressure, and skin repair surgeries**

Meningococcal Disease vs Meningitis

- **Meningitis** is an inflammation of the **meninges** (protective membranes of the brain and spinal cord).
- Meningitis **can occur** in meningococcal disease, but **not all meningitis cases** are caused by the meningococcal bacteria.

Topic: Development of New Technology

Sodium-ion Battery Technology

Context: India is reassessing battery strategy due to lithium supply risks and import dependence.

What is Sodium-ion Battery Technology?

- **Rechargeable electrochemical energy storage devices** using **sodium ions (Na^+)** as charge carriers
- Belong to the **"rocking-chair battery"** family — like lithium-ion cells
- Use **aluminium as current collector** on both electrodes (lithium-ion requires **copper on anode side**)
- Compatible with **existing lithium-ion manufacturing lines**

Working Mechanism

- **Charging:** Na^+ ions move from **cathode → anode** through electrolyte; electrons flow via external circuit
- **Discharging:** Na^+ ions migrate back to **cathode**; stored chemical energy converts to **electrical energy**

Key Advantages

- **Resource Availability:** Sodium abundantly available from **salt and soda ash** and thus reduces dependence on **lithium, cobalt, nickel**
- **Safety:** Lower **thermal runaway risk** than lithium-ion, safer at **zero charge** for storage and transport
- **Cost:** Raw material abundance lowers long-term costs thus simplifies supply chain
- **Strategic (India):** Suitable for **grid storage and renewables integration** aligns with **clean energy transition**

Limitations

- **Lower energy density** as it limits **long-range EV deployment**
- **Early commercialisation stage** globally as performance optimisation ongoing
- **Moisture-sensitive materials** thus require controlled manufacturing environments
- Better suited for **stationary storage, two-wheelers, and short-range mobility** and not long-range EVs

Single-Unit Solar Energy Capture and Storage Device

Context: Indian scientists developed a single-unit solar device integrating energy harvesting and storage systems.

What is it?

- **Photo-rechargeable supercapacitor** combining **solar harvesting and electrical storage**
- Eliminates need for **separate solar cells and batteries**

Developed By

- Centre for Nano and Soft Matter Sciences, Bengaluru
- Functions under **Department of Science and Technology, Ministry of Science and Technology**

Primary Objectives

- Develop efficient, low-cost, and eco-friendly energy storage systems
- Support portable, wearable, and off-grid energy applications
- Reduce system complexity and fossil fuel dependence

Working Mechanism

- Uses **nickel–cobalt oxide nanowires** on nickel foam
- Fabricated through **in-situ** hydrothermal growth process
- Forms **porous three-dimensional** conductive network
- Material **absorbs sunlight and stores electrical charge** simultaneously

Technical Advantage

- Removes **external power-management electronics requirement**
- Minimizes **voltage and current mismatch losses**

Key Features

- Delivers **stable output voltage** around 1.2 volts
- Retains **eighty-eight percent** capacitance after thousand cycles

- Operates under **low indoor light and intense sunlight**
- Designed as **compact, lightweight, and autonomous energy unit**
- Suitable for **remote and energy-poor regions**

SIM Binding

What is SIM Binding?

- SIM binding is a **security mechanism** that permanently links a user's messaging or authentication service to the **physical SIM card** used during registration.
- If the original SIM is not present in the device, the app **stops working automatically.**
- It essentially acts as a **hardware token for identity verification.**

Regulatory Framework

- Governed by the **Department of Telecommunications (DoT).**
- Introduced under the **Telecommunication Cybersecurity Amendment Rules, 2025.**
- Introduced a new concept called **Telecommunication Identifier User Entity (TIUE)** to regulate digital communications more securely.

How SIM Binding Works

- Every SIM card contains unique hardware-level identifiers:
  - **IMSI**: International Mobile Subscriber Identity
  - **ICCID**: Integrated Circuit Card Identifier
  - **Ki**: Authentication key stored in SIM hardware
- When an app implements SIM binding, it **continuously checks** these identifiers.
- If a mismatch is detected between the registered and present SIM, the app **automatically blocks access.**

Why SIM Binding Rules Were Needed

- Fraudsters were using messaging apps **without the original SIM**, especially from outside India.
- Helps prevent **impersonation, spoofing, OTP bypass attacks, and cross-border cyber fraud.**
- Ensures a strong **device–SIM–account linkage**, making account misuse significantly harder.
- Strengthens **national cybersecurity** by reducing anonymity on messaging platforms.

Topic: Bio-Technology

Gene Editing

What is Gene Editing?

- Gene editing is a biotechnology technique used to **alter DNA sequences at specific genomic locations**.
- It enables scientists to **add, remove, or modify genetic material within living organisms**.
- The technology helps correct genetic defects and develop organisms with desirable biological traits.
- **Core Processes Involved**
  - **Insertion** involves introducing a new gene or DNA fragment into the genome.
  - **Deletion** refers to removal of an undesired or defective genetic sequence.
  - **Modification** alters an existing gene to change its biological function or expression.

Types of Gene Editing

- **Somatic Genome Editing**
  - Somatic editing targets **non-reproductive body cells such as liver, skin, or muscle cells**.
  - Genetic changes produced through somatic editing **are not transmitted to future generations**.
  - It is widely used in therapies for cancers, blood disorders, and genetic diseases.
- **Germline Genome Editing**
  - Germline editing modifies **reproductive cells, embryos, or gamete-producing tissues**.
  - Genetic alterations introduced here **can be inherited by subsequent generations**.
  - This form raises significant ethical, legal, and biosafety concerns globally.

Major Gene Editing Techniques

- **ZFNs (Zinc Finger Nucleases)**
  - ZFNs use **engineered zinc finger proteins to recognise specific DNA sequences**.
  - DNA cleavage is carried out by the **FokI restriction enzyme**.
  - It represents one of the earliest targeted genome editing technologies.
- **TALENs**
  - TALENs employ **TALE proteins derived**

from plant bacteria for DNA targeting.
    - DNA cutting function is again performed by the **FokI nuclease enzyme**.
    - They are easier to design and more flexible than ZFN systems.
- **CRISPR–Cas9**
    - CRISPR uses **guide RNA molecules to identify complementary DNA sequences**.
    - The **Cas9 enzyme precisely cuts DNA** at the targeted genomic site.
    - Derived from bacterial immune defence, it is **fast, economical, and highly accurate**.

Applications of Gene Editing

- **Medical Applications**
    - Gene editing enables development of **advanced therapies for HIV, cancer, and genetic disorders**.
    - It is used in correcting mutations responsible for **Sickle Cell Disease**.
    - The technology significantly accelerates **precision drug discovery and personalised medicine**.
- **Agricultural Applications**
    - Gene editing develops **drought-tolerant crop varieties enhancing climate resilience in agriculture**.
    - Biofortified crops like **Vitamin-A enriched bananas improve nutritional security**.
    - It supports livestock improvements such as **hornless cattle reducing animal injury risks**.
- **Industrial Applications**
    - Gene editing enables production of **high-strength spider-silk fibres through modified silkworms**.
    - Engineered algae are used for **large-scale sustainable biofuel production**.
    - It also supports development of **advanced nano-carriers for targeted drug delivery**.
- **Environmental Applications**
    - Modified microbes improve **biofuel efficiency under extreme environmental conditions**.
    - Gene editing contributes to **cleaner renewable energy generation systems**.
    - It aids development of tools for **pollution tracking and environmental monitoring**.

Stem Cell Therapy

What is Stem Cell Therapy?

- Form of **regenerative medicine** repairing damaged cells and reducing inflammation
- Modulates **immune system responses** for treatment of various medical conditions

Process Involved

- **Harvesting:** Collection of stem cells from **patient or donor source**
- **Conditioning:** Prepares body to **receive transplanted stem cells**
- **Transplantation:** Infusion of **stem cells into patient's bloodstream**

What are Stem Cells?

- **Undifferentiated cells** capable of forming specialised cells with specific functions
- Can divide to create **new stem cells or specialised body cells**
- **Types of Stem Cells**
    - **Pluripotent stem cells:** Differentiate into **all adult body cell types**
    - **Adult stem cells:** Regenerate **cells specific to particular tissue or organ**

Autism Spectrum Disorder (ASD)

- It is **neurological and developmental** disorder.
- Affects communication, learning, and behavior.

Biopharma SHAKTI

Basic Overview

- **Biopharma SHAKTI** stands for Strategy for Healthcare Advancement through Knowledge, Technology and Innovation.
- It is a **national initiative** to strengthen India's biopharmaceutical sector and aims to position India as a global biomanufacturing hub.
- It focuses on biologics and biosimilars production within India and seeks to reduce dependence on imported advanced therapies.

Clinical and Manufacturing Strengthening

- Establishment of a **National Clinical Trials Network** across India.
- Aims to **enhance domestic** clinical research capacity.
- Investment in advanced biomanufacturing infrastructure facilities.
- Focus on quality assurance and regulatory compliance systems.

Innovation & Industry Collaboration

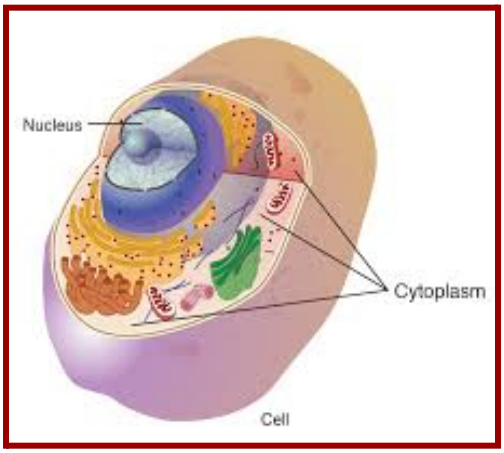
- **Encourages collaboration** between academia and pharmaceutical industry.
- **Supports startups** and indigenous biopharma innovation.
- Promotes **technology transfer** and domestic capability building.

Strategic Significance

- Enhances **India's pharmaceutical self-reliance** and supply security.
- Supports treatment of **non-communicable diseases** like cancer and diabetes.
- Promotes development of **monoclonal antibodies** and **advanced vaccines.**
- Strengthens **India's role** in global healthcare supply chains.

Miscellaneous

Cytoplasm



Context: Scientists highlighted cytoplasm reorganization as critical for early cell development in fertilized eggs.

What is Cytoplasm?

- **Thick cellular fluid** enclosed by the **cell membrane**
- Composed mainly of **water, salts, and proteins**
- In **eukaryotic cells:** includes all cell material **outside the nucleus** (nucleus has separate fluid called **nucleoplasm**)
- In **prokaryotic cells:** present without membrane-bound organelles and it contains ribosomes for protein synthesis

Key Organelles in Cytoplasm

- **Mitochondria:** Site of ATP energy production
- **Endoplasmic Reticulum:** Site of protein and lipid synthesis
- **Golgi Apparatus:** Modifies, packages, and sorts proteins
- **Lysosomes and Peroxisomes:** Intracellular digestion of macromolecules

Cytosol & Functions

- **Cytosol** = liquid portion surrounding all organelles and composed of **~80% water** + salts, sugars, fatty acids, amino acids, and enzymes
- Site of most **cellular metabolic activities**
- Enables easy **transport of materials** within the cell
- Supported by **cytoskeleton protein framework** and provides **shape and internal organisation**

Aluminium Phosphide (Celphos)

Context: Doctors at **PGIMER** reported a breakthrough using **intravenous lipid emulsion therapy** for aluminium phosphide poisoning.

About Aluminium Phosphide

- Commonly known as **Celphos**
- **Yellow or dark grey crystalline solid** that emits a garlic-like odour
- Reacts with **moisture or stomach acid** to release phosphine gas (PH_3)
- **Mechanism of Toxicity**
  - **Phosphine gas** is highly **toxic and flammable**
  - Causes **cellular hypoxia** via **mitochondrial damage**
  - Inhibits **cytochrome C** oxidase enzyme
  - Generates **reactive** hydroxyl free radicals
- **Uses**
  - **Agriculture:** Used as a **grain storage fumigant** and dispersed as pellets

producing phosphine gas
    - **Industry:** Used in semiconductor manufacturing and LED (Light-Emitting Diode) production
- **Public Health Concern**
    - Major poisoning concern in **Punjab, Haryana, and Uttar Pradesh**
    - Particularly common in **agricultural regions**

SOCIETY AND SOCIAL JUSTICE

Topic: Social Issues

India's Mental Health Crisis

Context

- The **Economic Survey 2025-26 highlighted rising digital addiction** and screen-linked mental health disorders, particularly among children and adolescents.
- Recent deaths of **three adolescent girls in Ghaziabad** reflect the human cost of India's deepening mental health crisis.
- Studies show **7-10% of Indian adolescents** suffer from diagnosable mental health conditions, with **5-7% of school-aged children** affected by ADHD.
- **Suicide** is the leading cause of death among the **15-29 age group**, with India accounting for nearly one-third of **global suicides, depression, and addiction cases**.
- WHO estimates an **economic loss of $1.03 trillion between 2012 and 2030** due to mental illness in India.

Scale of the Crisis and Structural Gaps

- **Professional Shortage**
    - India has only **0.75 psychiatrists per lakh population** against the WHO-recommended minimum of **three per lakh**.
    - India has **fewer than 10,000 psychiatrists** for a population exceeding 1.4 billion, with very few specialising in child psychiatry.
    - Families navigate a **fragmented care system with minimal institutional support**, seeking help only when distress escalates into crisis.
- **Access and Awareness Deficit**
    - The **access gap is estimated at nearly 95%**, with **70-92%** of patients lacking access to proper treatment.
    - Deep-rooted **stigma, low awareness, and fear of labelling** discourage early help-seeking behaviour across communities.
    - Mental health disorders begin in **early childhood but are dismissed as behavioural immaturity**, causing dangerous delays in recognition and intervention.
- **Digital and Adolescent Vulnerability**
    - Over **800 million Indians use smartphones and the internet**, reshaping children's emotional and behavioural patterns significantly.
    - **Social media fuels comparison culture, cyberbullying, and emotional vulnerability** among adolescents at critical developmental stages.
    - Internet addiction manifests as **irritability, sleep disruption, and social withdrawal**. WHO Guidelines 2019 warned against excessive screen exposure among children.
    - Excessive screen use **exacerbates ADHD symptoms and delays diagnosis**, though it does not directly cause the condition.
- **Schools as a Weak Link**
    - **Academic performance dominates over emotional well-being** in Indian schools, with teachers lacking training to identify early warning signs.
    - Limited structured training in **stress management and emotional regulation** leaves adolescents without essential coping tools.

Government Initiatives and Budgetary Trends

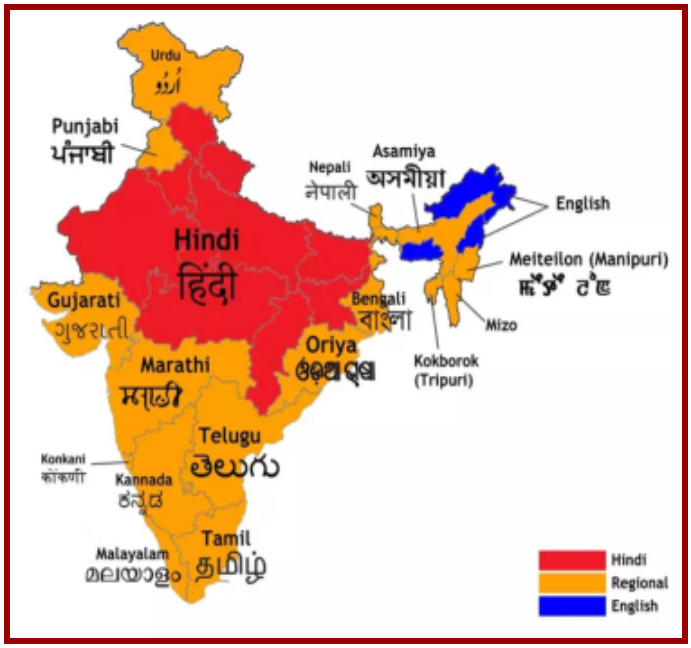
- **Mental health** allocation rose from **₹683 crore in 2020-21 to ₹1,898 crore in 2024-25**, yet it remains less than 2% of the health budget.
- **Health spending** itself remains near **2% of GDP**, with funds largely flowing to tertiary institutions rather than grassroots services.
- Union Budget announced a **second NIMHANS institute in north India** and the upgradation of premier mental health institutes in **Ranchi and Tezpur**.

- Mental health services integrated into **Ayushman Bharat Health and Wellness Centres,** over **1.73 lakh centres upgraded into Ayushman Arogya Mandirs** with comprehensive primary mental healthcare.
- **Tele MANAS** provides 24x7 free tele-mental health support through toll-free helplines, operational across **36 States and UTs with 53 cells** supported by 23 mentoring institutes.
- The government sanctioned **20 Centres of Excellence for training** and established **47 postgraduate mental health departments** nationwide.

Way Forward

- **Strengthening Public Health Infrastructure**
  - Integrate child mental health services under the **National Mental Health Programme** and expand tele-mental health for underserved populations.
  - **Earmark dedicated funding for child mental health** rather than routing resources primarily to tertiary institutions.
  - Expand training seats in **child psychiatry and clinical psychology** and promote interdisciplinary care models involving paediatricians and counsellors.
- **School and Community Interventions**
  - Introduce **routine mental health screening in schools** and train teachers in early identification of behavioural changes.
  - Develop clear **digital-use guidelines within educational institutions**, combining regulation with digital literacy.
  - Promote **trauma-informed parenting practices** and parent-adolescent peer support groups across communities.
- **Regulating Digital Exposure**
  - Consider **regulatory steps inspired by Australia, France, and South Korea** on children's social media and screen time.
  - Avoid punitive controls and promote **healthy digital habits through supportive education** rather than blanket bans.

Linguistic Diversity in India



India's Linguistic Diversity and Social Identity

- India is home to over **1,300 mother tongues** and **121 recognised languages.**
- **Linguistic diversity** represents a living expression of India's plural social fabric.
- Language shapes children's understanding of identity, culture, and community belonging.
- The **disappearance of languages** erodes generational knowledge and cultural memory.
- **Safeguarding languages** is both a cultural duty and developmental responsibility.

Language, Education and Social Equality

- Globally, **over 250 million learners** lack education in familiar languages.
- In India, **nearly 44% children** begin schooling in unfamiliar mediums.
- Learning in **unfamiliar languages** weakens foundational literacy and numeracy outcomes.
- Such **barriers reduce confidence** and increase risks of early dropout.
- **Mother-Tongue-Based Multilingual Education** improves comprehension and classroom participation.

Policy Framework and Institutional Initiatives

- **National Education Policy 2020** prioritises mother tongue in early education.
- **National Curriculum Frameworks 2022 and 2023** reinforce multilingual pedagogy principles.
- **Odisha's programme** supports 21 tribal languages across 17 districts.
- T**elangana uses DIKSHA-enabled** multilingual resources for inclusive digital learning.
- National platforms like **PM eVIDYA and BHASHINI** promote linguistic inclusion.

Constitutional Safeguards and Language Politics

- **Article 29** protects citizens' rights to conserve language and culture.
- **Article 30** grants minorities rights to establish educational institutions.
- **The Eighth Schedule** currently recognises 22 official languages.
- Language movements shaped federal politics and regional identity assertions.
- **Language debates** reflect tensions between national integration and autonomy.

Language in Nation-Building and Democratic Participation

- Language strengthens **collective identity** and shared historical consciousness.
- Linguistic **recognition enhances** belonging and reduces social alienation.
- **Imposition of language** may generate resentment and identity conflicts.
- **Multilingualism** strengthens democratic participation and social cohesion.
- Recognising linguistic diversity reinforces **inclusive and participatory nation-building.**

Topic: Vulnerable Sections

Bonded Labour In India

Concept and Legal Framework

- Bonded labour is defined under the **Bonded Labour System (Abolition) Act, 1976**.
- It involves **forced labour** to repay debts with little or no wages.
- Traditional systems like **Adiyamar, Baramasia, and Kuthia** reflect hereditary caste-based bondage.
- Between 2016 and 2021, only **12,760 individuals** were rescued and rehabilitated.
- Around **80% of bonded labourers belong to SC/ST/OBC communities**, showing structural vulnerability.

Causes and Structural Drivers

- **Poverty and chronic indebtedness** push families into exploitative debt arrangements.
- Nearly **84% of bonded labourers are Dalits and OBCs**, reflecting caste discrimination.
- **Lack of education** and awareness traps workers in illegal bondage systems.
- **Weak enforcement** and political indifference enable continued exploitation.
- With **90% of India's workforce informal**, migrant workers remain highly vulnerable.

Key Challenges in Elimination

- Bonded labour remains h**idden in informal sectors** like brick kilns, mining, and agriculture.
- Cases like the **Sumangali scheme in Tamil Nadu** often remain unreported.
    - **Sumangali** is a **form of child labour** is practised particularly in the textile industry in Tamil Nadu. It is likened to **soft trafficking** a less explicit form of human trafficking.
    - In the scheme, a **girl is hired** on contract for **three to five years**, during which she earns a wage, and after which she is paid a lump sum to pay for a dowry.
- **Enforcement** remains weak despite strong legal provisions under the 1976 Act.
- Only **12,760 rescued** against an estimated 1.84 crore affected persons.
- **Delayed compensation**, like denial of **₹1 lakh aid in Odisha**, weakens rehabilitation.

Government Initiatives

- The **Central Sector Scheme** provides

compensation, rehabilitation, and skill training support.
- **MGNREGA** ensures rural employment and income security for vulnerable families.
- **PMAY** and **Ayushman Bharat** provide housing and health protection respectively.
- **Skill India and PMKVY** enhance employability of rescued bonded workers.

Way Forward
- Strict implementation of the **Bonded Labour System (Abolition) Act, 1976** is essential.
- **Proactive identification** in high-risk sectors like mining and agriculture must increase.
- Ensure **timely compensation, legal aid, and structured rehabilitation** support.
- Launch grassroots **legal literacy campaigns** in vulnerable communities.
- **Promote inclusive development** addressing poverty, caste inequality, and illiteracy simultaneously.

Conclusion
- Bonded labour is not merely economic exploitation but a denial of human dignity. As **Dr. Ambedkar stated**, social liberty must accompany legal freedom. Its eradication must become a collective moral movement for justice and equality.

Miscellaneous

Ethics Case Study (Caste-Free Village Resolution)

Context & Ethical Significance
- A **village in Maharashtra** passed a resolution declaring itself **caste-free** through Gram Sabha consensus.
- The initiative aimed to **eliminate discrimination** across social, religious, and occupational identities.
- The resolution **reflects grassroots commitment** to equality and social harmony. It emerged as a **preventive response** to rising caste divisions in society.
- The decision demonstrates **moral leadership** at the community governance level.

Core Ethical Values Reflected
- **Equality:** All residents were declared equal irrespective of caste, creed, or religion.
- **Human Dignity:** The resolution emphasised humanity as the primary basis of social identity.
- **Fraternity:** Collective action fostered unity across historically divided communities.
- **Social Justice:** It attempted to dismantle entrenched discrimination practices.
- **Respect for Diversity:** Multiple castes and religions coexisted under shared ethical commitments.

Ethical Leadership & Community Responsibility
- The **village leadership** played a **transformative role** in shaping inclusive social norms.
- **Moral persuasion** replaced coercion in implementing social reform.
- **Public institutions** were directed to remain open and non-discriminatory.
- Authorities committed **action against social media content** fuelling caste tensions.
- **Preventive ethics** guided decision-making rather than **reactive conflict resolution.**

Impact
- Students reported **reduced discrimination** within school environments.
- **Early exposure to equality** fosters long-term attitudinal transformation.
- **Inclusive schooling** prevents internalisation of caste prejudices.
- Community decisions **influence youth socialisation patterns** significantly.
- Collective ethical environments shape future democratic citizenship.

Prelims

Denotified, Nomadic and Semi-Nomadic Tribes (DNTs)

Who are Denotified Tribes (DNTs)?
- Denotified Tribes are communities once listed as "criminal tribes" under British laws.
- They were notified under the **Criminal Tribes Acts (1871–1947)** during colonial rule.
- **Entire communities** were labelled **hereditary criminals** without individual evidence.
- Members had to compulsorily register with local authorities and faced strict surveillance.

Denotification After Independence

- The Criminal Tribes Act was repealed in **1952** after Independence.
- These communities were officially **"denotified,"** giving them the present name **Denotified Tribes**.
- **Nomadic and Semi-Nomadic Tribes**
  - Many DNT groups are **nomadic or semi-nomadic** by lifestyle.
  - **Nomadic tribes** move place to place in search of livelihood.
  - They traditionally depended on forests, grazing lands, crafts, trade, and itinerant occupations.
  - Most lacked private land ownership or permanent housing.
- **Status and Population**
  - DNTs are estimated to form roughly **10% of India's population**.
  - Across India, **1,200+ communities** fall under DNT, Nomadic, and Semi-Nomadic categories.

Commissions and Institutional Measures

- **Renke Commission (2008)**
  - First major commission to **identify and list** DNT communities.
- **National Commission for DNTs (NCDNT) - 2014**
  - Set up under **Ministry of Social Justice and Empowerment**.
  - Chaired by **Bhiku Ramji Idate**.
  - Mandate included:
    - Preparing state-wise list of DNT communities.
    - Suggesting welfare and development measures.
  - Submitted report in **January 2018**.
  - Identified **1,235 communities** as DNTs.

Hakki-Pikki Tribe

Context

- Indian Embassy assisted **Hakki-Pikki community members** stranded in **Chad**.
- Individuals belonged to **Davangere, Shivamogga, and Chikkamagaluru** districts of Karnataka.

About Hakki-Pikki Tribe

- A **semi-nomadic tribal community** found in western and southern India.
- Settled mainly **near forested regions** across multiple states.
- Name derived from Kannada words:
  - **Hakki** = Bird
  - **Pikki** = Catchers
- Traditionally engaged in **bird catching and hunting activities**.

Origin and Distribution

- Believed to have originated from **border districts of Gujarat and Rajasthan**.
- Later migrated and settled in **southern states, especially Karnataka**.

Socio-Cultural Practices

- Follow **Hindu traditions** and observe major Hindu festivals.
- Community members are **non-vegetarians**.
- Unique identity custom:
  - **Eldest son does not cut hair** for easy identification.

Marriage and Family Structure

- Practice **cross-cousin marriages**.
- Society follows a **matriarchal system**.
- **Groom pays dowry** to the bride's family.
- **Monogamy** is the accepted marital norm.

Sangtam Community

Context: The apex body of the **Sangtam community** recently passed a resolution to protect **pangolins** within its jurisdiction. This highlights the growing role of indigenous tribes in wildlife conservation.

Who are the Sangtam?

- A **recognised Naga tribe** of Nagaland, part of the larger **Naga ethnic group** of Northeast India
- Name derived from the ancestral village **"Sangdang".**
- Mentioned in late 19th-century **British administrative records.**
- Known for **strong customary laws and community governance** traditions

Geography & Origin

- Primarily inhabit **Kiphire and Tuensang districts** in eastern Nagaland, near the **India–Myanmar border**

- Oral traditions trace migration through regions of **present-day Myanmar**

Social & Cultural Features

- Governed through **village councils and apex tribal bodies**
- Community organised into **six major clan groupings (Shuh)** — reflecting strong **lineage and kinship structures**
- Practice **shifting cultivation** and forest-linked livelihoods
- Inhabit **dense forested landscapes** within important **biodiversity hotspots of Northeast India**

Contemporary Significance

- The region lies along a major **wildlife trafficking corridor** near Myanmar
- Community institutions act as key partners in **biodiversity protection**
- Recent **pangolin protection initiative** reflects **community-led conservation**

GEOGRAPHY

Great Nicobar Island Infrastructure Project

Context: The **National Green Tribunal (NGT)** has cleared the **₹92,000-crore Great Nicobar Island mega-infrastructure project**.

About the Project

- **Overview**
  - **The Great Nicobar Project** is a large **Greenfield infrastructure initiative** approved by the Union Cabinet (2021).
  - Conceptualised by **NITI Aayog** to unlock the strategic and economic potential of island territories.
  - Implemented by Andaman and Nicobar Islands Integrated Development Corporation **(ANIIDCO)**. The **ANIIDCO** functions as a government undertaking under the **Companies Act, 1956**.
- **Core Infrastructure Components**
  - **International Transhipment Port** proposed at **Galathea Bay** on the southern Great Nicobar coast.
  - Port development overseen by **Ministry of Ports, Shipping and Waterways**.
  - Project includes a **Greenfield international airport** to enhance regional air connectivity.
  - A **450 MW power plant** planned to meet industrial and residential energy demand.
  - Development of a **modern township** to support workforce and logistics ecosystems.
- **Strategic and Economic Significance**
  - The island lies near the **Malacca Strait**, a corridor carrying one-third of global maritime trade.
  - Proximity to the **Sunda and Lombok Straits** enhances Indo-Pacific maritime relevance.
  - A transhipment hub can reduce dependence on **Singapore and Colombo ports**.
  - Nearly **75% of India's cargo** is currently transshipped through foreign ports.
  - Naval port and airfield strengthen **tri-services command** in Andaman and Nicobar Islands.
  - Enables deployment of **ships, aircraft, and drones** near critical sea lanes.
  - Project promises **forex savings, FDI inflows, logistics growth, and port-led development**.

Concerns Regarding the Project

- **Ecological and Tribal Concerns**
  - Great Nicobar retains over **85% tropical rainforest cover**, marking extreme ecological sensitivity.
  - Project threatens habitats of **Shompen** (PVTG) and **Nicobarese** tribal communities.
  - Worker influx risks **disease exposure** among immunologically vulnerable tribal populations.
  - **Galathea Bay** is a **Ramsar wetland** and key nesting site of the **Leatherback Sea Turtle**.
  - Dredging may damage **coral reefs and seagrass ecosystems**.
  - Nearly **9.6 lakh trees** may be felled, reducing regional carbon sequestration capacity.
  - Mangrove removal weakens **natural coastal defences** against tsunamis and storms.

- **Geological and Disaster Vulnerabilities**
  - The island lies within a **high seismic zone** along the Indian Ocean megathrust fault lines.
  - The same tectonic system triggered the **2004 Indian Ocean tsunami**.
  - Large infrastructure expansion heightens **disaster exposure and recovery risks**.

Balanced Development Pathway

- Project strengthens **trade connectivity, maritime security, and regional economic integration**. However, ecological fragility and **tribal rights** require careful safeguarding.
- Hence, a phased, **eco-sensitive and community-inclusive development** offers a balanced way forward. Thus, aligning national security with **biodiversity conservation** ensures sustainable island governance.

Illegal Rat-Hole Mining

Context

- An explosion in an **illegal rat-hole coal mine in Meghalaya** killed at least 18 workers, exposing the persistent failure of court supervision without effective governance.
- The **NGT banned rat-hole mining in 2014**, yet violations continue, reflecting deep structural and enforcement failures in India's coal mining governance.

Nature and Structural Drivers

- Rat-hole mining involves **narrow tunnels without engineered roofs or side-wall protections**, making mines highly prone to collapse, flooding, and explosions.
- **Meghalaya's coal belt o**perates through **small private landholdings** with thin coal seams, encouraging unsafe artisanal extraction over formal mechanised mining.
- **Informal supply chains** help illegal coal enter legal markets through intermediaries who launder illegally mined coal, making detection extremely difficult.
- **Weak enforcement, high livelihood dependence, and administrative tolerance** collectively sustain illegal operations despite clear legal prohibitions.

Labour, Social and Environmental Concerns

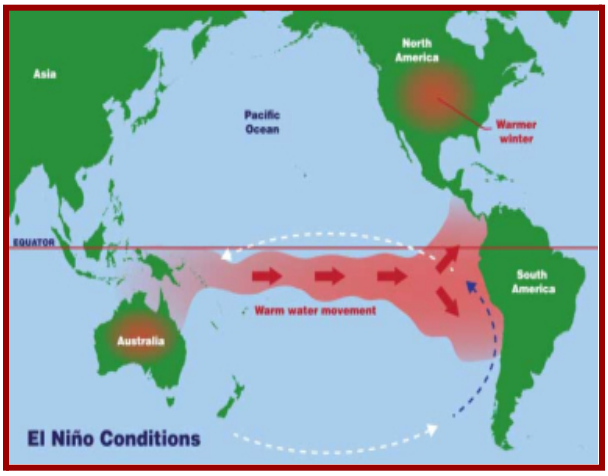
- Operators **underreport accidents, conceal fatalities, and keep workers outside formal employment records**, denying families any legal recourse or compensation.
- **Child labour and unsafe working conditions persist** with no health, safety, or welfare protections for miners.
- Rat-hole mining causes **severe land degradation, river acidification, acid mine drainage, and destruction of water bodies** in ecologically sensitive areas.

Way Forward

- Introduce **mandatory GPS tracking** for coal transport vehicles and integrate **satellite and drone surveillance** for real-time illegal mining detection.
- **Incentivise community monitoring** through penalty sharing and penalise intermediaries through seizures and licence cancellation.
- Provide **alternative livelihoods** through horticulture and tourism and absorb displaced labour into public works programmes.
- **Allow worker testimony with amnesty** to expose contractors and supply chain intermediaries enabling illegal operations.

Prelims

El Niño



What is El Niño?

- **Warm phase of ENSO** (El Niño-Southern Oscillation) marked by **abnormal warming of Pacific Ocean surface.**

- Occurs irregularly every **2 to 7 years.**
- Leads to rise in **global average temperatures.**
- Impacts **eastern and central equatorial Pacific Ocean.**

Formation Mechanism

- **Trade winds weaken** → warm waters shift **eastward toward South America.**
- **Thermocline deepens** in eastern Pacific → suppresses **cold-water upwelling.**
- Alters **Southern Oscillation** (atmospheric pressure system).
- Disrupts **Walker Circulation** across the Pacific basin.

Scientific Indicators

- **Sea Surface Temperature (SST)** anomalies in designated Niño regions.
- **Oceanic Niño Index:** SST anomaly of ≥ **+0.5°C** for **five overlapping seasons.**
- Subsurface heat buildup at **100–250 metre** ocean depth.
- **Weak or reversed trade winds** along equatorial Pacific.

Regional Impacts

- **India:** Higher probability of weak monsoon and drought
- **South America:** Heavy rainfall, floods, coastal erosion
- **Australia & Southeast Asia:** Droughts, heatwaves, wildfires
- **Global:** Contributes to record-breaking temperature years and extreme weather patterns

Fuego Volcano

Context:
Guatemala's **Volcán de Fuego** produced a recent explosive eruption, drawing regional attention.

What is Fuego Volcano?

- **Active stratovolcano** located in **Guatemala, Central America**.
- Name means **"Volcano of Fire" in Spanish**.
- Part of the **Central American Volcanic Arc**.
- Lies along the **Pacific Ring of Fire** seismic belt.

Location & Physical Features

- Overlooks **Antigua**, Guatemala's former capital city.
- Located between **Acatenango and Agua volcanoes**.
- **Elevation:** Approximately **3,763 metres above sea level**.
- **Type:** Basaltic **composite (stratovolcano)**.

Volcanic Activity

- **Most active volcano** in Central America historically.
- **Over 60 eruptions** since 1524.
- Frequent **ashfall, lava flows, pyroclastic flows, and lahars**.

Stratovolcano

- **Tall, steep, cone-shaped** volcanic structure.
- Forms mainly at **tectonic subduction zones**.
- Built from **alternating lava and pyroclastic layers**.
- Produces **explosive eruptions due to viscous magma**.
- Also called **composite volcanoes**.

Pennaiyar River

Context: The Supreme Court directed constitution of an **Inter-State River Water Disputes Tribunal** for the **Pennaiyar dispute between Tamil Nadu and Karnataka**.

What is Pennaiyar River?

- **Major east-flowing inter-state river** of southern India
- Also called **Thenpennai / Ponnaiyar (Tamil)**
- Called **Dakshina Pinakini (Kannada)**

Source / Origin

- Originates in **Nandi Hills, Chikkaballapura district, Karnataka**
- Part of the **Eastern Ghats system**

Riparian States

- **Karnataka - Upper riparian state**
- **Tamil Nadu - Lower riparian state**

Major Tributaries

- Markandeya River
- Varaha Nadhi
- Pambar River
- Pampar River
- Markandeya River central to current dispute

Length and Nature

- Length approximately **497 kilometres**
- **Second longest river in Tamil Nadu** after Cauvery
- **Seasonal river** fed by Southwest and Northeast monsoons

Mouth / Drainage

- Empties into the **Bay of Bengal**
- Forms a **delta near Cuddalore, Tamil Nadu**

Major Dams

- Krishnagiri Dam
- Kelavarapalli Dam
- Sathanur Dam – largest, about 7.3 TMC capacity

Irrigation Coverage

- Karnataka districts: **Chikkaballapura, Kolar, Bengaluru Rural, Bengaluru Urban**
- Tamil Nadu districts: **Krishnagiri, Dharmapuri, Tiruvannamalai, Villupuram, Cuddalore**

Cultural Significance

- Mentioned in **Sangam literature and Tevaram hymns**
- Hosts **ancient temples along riverbanks**

Mud Volcano

Context: A **Mud Volcano eruption** was recently reported in **Diglipur, Andaman Islands**, drawing attention to this rare geological phenomenon in India.

What is a Mud Volcano

- A mud volcano is a **mound of mud pushed upward** through overlying sediments.
- It forms when **mud, gases, and water** erupt to the surface from underground layers.
- Unlike magmatic volcanoes, it does **not erupt lava**. Instead, it releases **mud, slurry, steam, and gases**.
- Some eruptions can be **forceful**, even throwing flames due to gas ignition.
- **Formation Mechanism**
  - Some mud volcanoes form due to **hot spring activity**. Gas and water react with rocks, producing boiling mud.
  - Under **compactional pressure**, methane and hydrocarbon gases push mud upward, causing eruptions.
  - The erupted mud may be **hot** and sometimes accompanied by **steam emissions**.
- **Distribution**
  - Mud volcanoes occur on **land and seabeds**. Submarine eruptions may form islands or banks.
  - Around **1,000 mud volcanoes** have been identified globally.
  - In India, the only known mud volcano is located at **Baratang Island** in the **Andaman and Nicobar Islands**.

Idukki Hydroelectric Project

Context: Kerala's largest hydropower project, the **Idukki Hydroelectric Project**, recently completed **50 years of operation**.

Key Features

- The project is built across the **Periyar River** in **Idukki district of Kerala**.
- It is the **largest hydroelectric project in the State**.
- The powerhouse is located at **Moolamattom**. It is the **longest underground power station in India**.
- The total installed capacity of the project is **780 MW**. Power generation is carried out through **six units of 130 MW each**.
- The project comprises **three dams**.
  - These are the **Idukki Arch Dam**, **Cheruthoni Dam**, and **Kulamavu Dam**.
  - The **Idukki Arch Dam** is among the **highest arch dams** in the world.

- It is also the **third highest dam** in India.
- It is Asia's **first double-curvature arch dam**.
- It stands between the hills of **Kuravanmala** and **Kurathimala**.

Ken–Betwa River Linking Project

Project Overview

- **Ken–Betwa Link Project** is part of India's **National River Linking Project (NRLP)**.
- It aims to divert **surplus Ken basin water** to water-deficit **Betwa basin**.
- Project targets completion by **2030**.
- Covers **Madhya Pradesh and Uttar Pradesh**, focusing on drought-prone **Bundelkhand region**.

Key Components

- **Phase I**
  - Construction of **Daudhan Dam (77 m high)** inside **Panna Tiger Reserve**.
  - Designed for **irrigation and hydropower generation**.
  - Includes **221-km Ken–Betwa Link Canal** for water transfer.
- **Phase II**
  - Development of **Lower Orr Dam**, **Bina Complex**, and **Kotha Barrage**.
  - Intended to address **water scarcity** in the Betwa basin.

Significance of the Project

- Promotes **economic growth** through agro-industries and tourism expansion.
- Balances **flood and drought management** via water redistribution.
- Generates **103 MW hydropower** and **27 MW solar energy**.
- Provides **drinking water to 62 lakh people**.
- Irrigates **10.62 lakh hectares** in Bundelkhand, reducing monsoon dependence.

National River Linking Project

- **Background**
  - River interlinking first proposed by **Sir Arthur Cotton (1850s)**.
  - Revived by **K.L. Rao in 1972**.
  - Institutionalised under **National Perspective Plan (1980s)**.
  - **NWDA (1982)** created for feasibility studies.
  - Proposed **NIRA (2021)** as apex implementation body.
- **Objectives of NRLP**
  - Transfer water from **surplus to deficit regions**.
  - Potential irrigation of **30 million hectares**.
  - Power generation capacity of **20,000–25,000 MW**.
  - Aims to reduce floods, droughts, and boost rural income.

Key Challenges

- **Environmental**
  - Submergence of **98 sq. km. Panna Tiger Reserve** habitat.
  - Threat to tigers, gharials, and biodiversity.
  - Deforestation and possible **rainfall deficits**.
- **Economic**
  - High cost: **₹44,605 crore**.
  - Heavy maintenance burden.
- **Social**
  - Large-scale displacement and rehabilitation issues.
  - Livelihood and social disruption.
- **Technical**
  - Uncertain water availability in non-perennial rivers.
  - Water quality and sustainability concerns.

Rare Earth Magnets

Context:

- India will **commence production of rare-earth permanent magnets within this year**, announced Union Minister for Mines **G. Kishan Reddy** on Thursday.

About the Magnet

- **Rare earth magnets** are powerful permanent magnets.
- Made from alloys of **rare earth elements**.
- Known for **exceptionally strong magnetic properties**.
- Generate strong magnetic fields despite **compact physical size**.
- Offer higher performance compared to **conventional ferrite magnets**.

Key Properties

- Possess **high magnetic strength and energy density**.
- Provide superior performance in **miniaturised electronic systems**.
- Generally brittle and **prone to corrosion**.
- Often coated with **nickel plating to prevent oxidation**.

Major Types

- Two common types are **Neodymium (Nd-Fe-B)** magnets.
- The other type is **Samarium Cobalt (SmCo)** magnets.
- Neodymium magnets contain **neodymium, iron, and boron**.
- Samarium cobalt magnets contain **samarium and cobalt**.
- Both types vary in **grades and magnetic strength levels**.

Uses & Strategic Importance

- Widely used in **MRI, X-ray, and PET imaging systems**.
- Essential in **aviation and national defence technologies**.
- Used in **smartphones, hard drives, and consumer electronics**.
- Critical for **electric vehicles and renewable energy systems**.
- Global processing capacity is dominated by **China (around 90%)**.

OALP & HELP

About HELP (Hydrocarbon Exploration and Licensing Policy)

- Approved in **March 2016** and it replaced the **New Exploration Licensing Policy (NELP)**
- Launched along with the **National Data Repository** in **June 2017**
- Aims to **simplify rules** and boost **domestic hydrocarbon production**

Key Features of HELP

- **Uniform Licensing System**
  - **Single licence** for all hydrocarbon types that covers **oil, natural gas, and coal-bed methane**
  - Replaces **multiple licences** under NELP
- **Revenue Sharing Model**
  - Government receives share of **gross revenue from production**
  - Eliminates **cost recovery scrutiny** by government agencies
  - Replaces the **profit sharing model** of NELP
- **Pricing & Marketing Freedom**
  - Allows **free marketing** of crude oil and natural gas
  - Reduces **contract complexity and profit manipulation risks**
- **Royalty Structure**
  - **Graded royalty rates** based on **water depth**
  - **Higher royalties** for **shallow water** areas
  - **Lower royalties** for **deep and ultra-deep water** blocks

About OALP (Open Acreage Licensing Policy)

- It is implemented under **HELP framework**
- Allows companies to **independently select and propose exploration blocks**
- Permits **Expression of Interest (EoI)** submission **throughout the year**
- Areas accumulated and **auctioned three times annually**
- Improves access to geological data through the **National Data Repository (NDR)**

Significance

- Promotes **Ease of Doing Business** in the upstream sector
- Shifts from **government control to government facilitation**
- Encourages **private and foreign investment** in Exploration & Production (E&P)
- Provides **company-driven block selection flexibility**

GOVERNMENT - SCHEMES

Schemes for Persons with Disabilities

Context: The Union Finance Minister announced **the Divyangjan Kaushal Yojana** and the **Divyang Sahara Yojana** in the Union Budget 2026–27.

About Divyangjan Kaushal Yojana

- Launched for **persons with disabilities (Divyangjan)**
- Focuses on **skill training for dignified livelihood opportunities**
- **Financial Allocation:** Allocated **₹200 crore** for the upcoming fiscal year
- **Training Framework**
  - Provides **industry-relevant and customised skill training**
  - Training tailored to **specific Divyang groups**
- **Sectors Covered**
  - Information Technology (IT)
  - Animation, Visual Effects, Gaming, and Comics (AVGC)
  - Hospitality sector
  - Food and Beverages sector

About Divyang Sahara Yojana

- Supports **assistive device manufacturing and service delivery**
- Strengthens institutional capacity for **Divyangjan support systems**
- **Financial Allocation:** Allocated **₹100 crore** for scheme implementation
- **Implementing Agency:** Implemented through **Artificial Limbs Manufacturing Corporation of India (ALIMCO)**
- **Key Provisions**
  - Scales up **production of high-quality assistive devices**
  - Promotes **research and development** in assistive technologies
  - Integrates **artificial intelligence** in product design and services
- **Retail and Service Infrastructure**
  - Strengthens **PM Divyasha Kendras nationwide**
  - Establishes **Assistive Technology Marts** as modern retail centres

PM Divyasha Kendra

- Provides **integrated services under one roof**
- Offers **assessment, counselling, distribution, and post-distribution care**
- Serves **Divyangjan and senior citizen beneficiaries**
- **Institutional Framework**
  - ALIMCO is a **Central Public Sector Undertaking**
  - Functions under **Department of Empowerment of Persons with Disabilities.**

NAMASTE Scheme

Context and Policy Framework

- Union Government released **first national enumeration data** on urban waste-pickers in Parliament.
- Data presented by **Ministry of Social Justice and Empowerment** under the **NAMASTE scheme**.
- Scheme aims to **formally recognise workers** and provide **protective equipment** through urban local bodies.
- Core objective is **eradicating deaths from hazardous sewer and septic tank cleaning**.

Coverage and Enumeration Status

- A total of **1.52 lakh waste-pickers** profiled and validated across **35 States and Union Territories**.
- Data updated till **January 23**, based on verification by **urban local bodies**.
- Enumeration recently expanded to include **waste-pickers alongside sewer and septic tank workers**.

Social Category Composition

- **84.5% waste-pickers** belong to **SC, ST, and OBC communities** at the national level.
- **60.3% from SC communities**, accounting for **92,089 workers**.
- **13.7% from OBC communities**, numbering **20,954 workers**.
- **10.5% from ST communities**, totalling **10.5% of validated workers**.
- **10.7% from General category**, amounting to **16,329 workers**.
- An additional **7,402 workers** classified under the **"Other" category**.

Gender Profile of Workers

- **48.7% women**, representing **74,427 workers** in the validated dataset.
- **51.3% men**, numbering **78,374 workers** across urban areas.
- **0.007% transgender workers**, accounting for **12 individuals**.

State-Level Variations

- **Delhi and Goa** show a **General category majority** among waste-pickers.
- In **Delhi**, **4,289 of over 6,500 workers** belong to the General category.
- In **Goa**, **729 of 1,286 profiled workers** fall under the General category.
- **West Bengal** reports **42.4% General category representation** among validated workers.

Definition and Scope under NAMASTE

- Waste-pickers defined as **informally engaged workers** collecting recyclable solid waste for livelihood.
- Work includes recovery from **streets, bins, processing, and disposal facilities**.
- Materials sold to **recyclers directly or through intermediaries**.

Related Enumeration Data

- **89,000 sewer and septic tank workers** enumerated under the same scheme.
- **95.8% of these workers are men**, showing strong gender skew.
- **91.95% belong to SC, ST, and OBC communities**, as per December 2024 data.

About NAMASTE Scheme

- Scheme under the **Ministry of Social Justice and Empowerment**
- **Core objective:** Eradicating deaths from hazardous sewer and septic tank cleaning
- Aims to **formally recognise** sanitation workers and provide **protective equipment** through **Urban Local Bodies (ULBs)**
- Recently expanded to include **waste-pickers** alongside sewer and septic tank workers

Waste-Pickers Definition & Enumeration

- **Waste-pickers:** Informally engaged workers collecting **recyclable solid waste** for livelihood from streets, bins, processing, and disposal facilities and selling to recyclers directly or through intermediaries
- **1.52 lakh waste-pickers** profiled and validated across **35 States and UTs**
- Data updated till **January 23** based on ULB verification.

Social & Gender Profile of Waste-Pickers

Category	Percentage	Number
SC	60.3%	92,089
OBC	13.7%	20,954
ST	10.5%	—
General	10.7%	16,329
Other	—	7,402
SC+ST+OBC combined	**84.5%**	—

- **Women:** 48.7% (74,427 workers)
- **Men:** 51.3% (78,374 workers)
- **Transgender:** 0.007% (12 individuals)

State-Level Variations

- **Delhi and Goa:** The general category forms the **majority** among waste-pickers
  - **Delhi:** 4,289 of 6,500+ workers from General category
  - **Goa:** 729 of 1,286 workers from General category
- **West Bengal:** 42.4% General category representation

PM VIKAS Scheme

Context: Union Minority Affairs Minister informed Rajya Sabha about PM VIKAS scheme.

About the Scheme

- Central Sector Scheme.
- Launched in **2025**.
- Focuses minority socio-economic empowerment.
- **Nodal Ministry:** Ministry of Minority Affairs.
- **Target Groups**
  - Six notified minority communities.
  - Artisans and craft workers.
  - Minority women and youth.
  - School dropouts.

Objectives of the Scheme

- **Skill Development**
  - Provides need-based skill training.
  - Enhances employability.
- **Cultural Preservation**
  - Promotes traditional arts and crafts.
  - Documents manuscripts and literature.

  - Showcases **Intangible Cultural Heritage (ICH)**.
- **Educational Support**
  - Open schooling certification.
  - Covers **8th, 10th, 12th levels**.
- **Leadership & Entrepreneurship**
  - Empowers minority women.
  - Provides enterprise support.

Key Features of the Scheme

- Financing via **National Minorities Development & Finance Corporation (NMDFC)**.
- Education support for school dropouts.
- Market linkages via **Export Promotion Council for Handicrafts (EPCH)**.
- **Hub and Spoke model** for Vishwakarma Villages.

Scheme To Form Farmer Producer Organizations (FPOs)

Context: Government launched Central Sector Scheme to form **10,000 Farmer Producer Organizations (FPOs)** nationwide.

About the Scheme

- Central Sector Scheme to promote **farmer collectivisation** for production and marketing.
- Targets small and marginal farmers' income enhancement.
- Strengthens processing, aggregation, and value-chain integration.
- **Launched in:** 29 February 2020

Implementing Agencies (IAs)

- **SFAC**: Small Farmers' Agribusiness Consortium.
- **NABARD**: National Bank for Agriculture and Rural Development.
- **NCDC**: National Cooperative Development Corporation.
- **NAFED**: National Agricultural Cooperative Marketing Federation of India.

Aim

- Build sustainable, income-oriented **farming ecosystem**.
- Improve access to inputs, credit, technology, and markets.
- Enhance farmers' bargaining power and price realisation.

Key Features

- **Cluster & Commodity Approach**
  - FPOs formed on a **produce-cluster basis**.
  - Aligned with the **One District One Product (ODOP)** strategy.
- **Financial Support**
  - Up to **₹18 lakh per FPO** for 3-year handholding.
  - Matching **equity grant up to ₹15 lakh**.
  - Equity support capped at **₹2,000 per farmer**.
  - **Credit guarantee up to ₹2 crore** project loans.
- **Market Linkages**
  - Forward linkages facilitated by **NAFED**.
  - Integrates farmers with value chains and buyers.
- **Capacity Building**
  - Training through **BIRD, Lucknow**.
  - Support from **LINAC, Gurugram**.
- **Inclusion Focus**
  - Encourages **women farmer participation**.
  - Covers **Aspirational Districts** extensively.

Ayushman Sahakar Scheme

About the Scheme

- **Ayushman Sahakar** is a healthcare financing scheme for cooperative societies.
- Launched in **2020**.
- **Implemented by:** National Cooperative Development Corporation (NCDC) under Ministry of Cooperation.
- Supports creation and expansion of healthcare infrastructure.

Aim

- Promote **affordable healthcare** through cooperative institutions.
- Strengthen **community-based health services**.
- Expand participation of **AYUSH systems** in healthcare delivery.

Key Features

- **Eligible:** Registered cooperative societies with healthcare in bye-laws.
- Financial assistance provided as **term loans** for health infrastructure.
- Covers **hospitals, clinics, diagnostic centres and**

AYUSH facilities.
- Loan tenure up to **8 years** with moratorium provision.
- Funding support may extend up to **90% of project cost**.

PM RAHAT Scheme

Context: The Government of India recently launched the **PM RAHAT Scheme** to ensure immediate and cashless treatment for road accident victims across the country.

What is PM RAHAT?
- A national scheme focused on **saving lives after road accidents**.
- Ensures **assured emergency medical care** without financial delay.
- Covers victims on **all categories of roads**.
- **Core Objective**
  - Provide **life-saving treatment in golden hour**.
  - Reduce deaths due to delayed hospitalization.
  - Offer **financial clarity to hospitals** treating accident victims.

Key Features of the Scheme
- **Cashless Treatment**
  - Every eligible victim gets **cashless treatment up to ₹1.5 lakh**.
  - Applicable at **designated hospitals**.
- **Emergency Response Linkage**
  - Integrated with **Emergency Response Support System (ERSS) – 112**.
  - Victims or Good Samaritans can dial **112**.
  - Helps locate nearest hospital and ambulance quickly.
- **Digital Integration**
  - **Linked with:**
    - **eDAR (Electronic Detailed Accident Report)**: Ministry of Road Transport & Highways.
    - **TMS 2.0**: National Health Authority.
  - Ensures **fast claim processing and transparency**.
- **Funding & Reimbursement**
  - Payments made through **Motor Vehicle Accident Fund (MVAF)**.
- **Funding sources:**
  - **Insured vehicle cases:** Paid via General Insurance Companies' contributions.
  - **Uninsured / Hit-and-Run cases:** Funded by Government budget support.
- **Grievance Redressal**
  - Complaints handled at **district level**.
  - Managed by a **Grievance Redressal Officer**.
  - Works under **District Road Safety Committee** chaired by DM/DC.

PM-DAKSH Scheme

Context:
Recent data placed in the Lok Sabha showed that **less than half of trainees** under PM-DAKSH (2021–2024) secured placements.

About PM-DAKSH Scheme
- **Full Form:** *Pradhan Mantri Dakshata Aur Kushalata Sampanna Hitgrahi Yojana*.
- A **Central Sector Scheme** launched in **2020-21**.
- Focuses on **skill development for socially and economically disadvantaged groups**.
- **Aim**
  - To provide **quality skill training** through recognised institutions.
  - To improve **employability and livelihood opportunities** of beneficiaries.
- **Target Beneficiaries**
  - Scheduled Castes (SCs)
  - Other Backward Classes (OBCs)
  - Economically Weaker Sections (EWS)
  - Denotified Tribes (DNTs)
  - Safai Karamcharis / Waste pickers
- **Types of Training Programmes**
  - Up-skilling / Re-skilling programmes
  - Short-term skill training
  - Long-term training courses
  - Entrepreneurship Development Programmes
- **Eligibility Criteria**
  - **Age group:** 18–45 years.
  - **Income limit:**
    - OBC & EWS: Family income below ₹3 lakh annually.
    - No income limit for **SCs, DNTs, Safai Karamcharis**.
- **Institutional Convergence**
  - Scheme has been **merged with Pradhan Mantri Kaushal Vikas Yojana**

(PMKVY).
- Aligns training with the broader **national skill development framework**.

VBG RAM G Act, 2025

Basic Facts

- **Full name:** Viksit Bharat - Guarantee for Rozgar and Ajeevika Mission (Gramin) Act, 2025
- Strengthens and reforms India's **rural employment guarantee framework**
- Replaces/reforms the existing **MGNREGA framework**

Key Provisions

- **Employment Guarantee**
  - Statutory guarantee of **not less than 125 days** of wage employment per rural household per financial year (MGNREGA: 100 days)
  - Right to demand employment remains **legally enforceable**
  - If employment not provided within stipulated period → **unemployment allowance payable after 15 days**
  - Earlier **dis-entitlement provisions removed**
- **Pause Period**
  - States can notify an aggregated **pause of up to 60 days** during **peak sowing and harvesting seasons**
  - Prevents **agricultural labour shortages** as full 125-day guarantee remains intact during remaining period
- **Wage Payments**
  - Wages paid **weekly or within 15 days** of work completion
  - Delays attract **mandatory compensation**

Decentralised Planning

- Planning originates from **Viksit Gram Panchayat Plans (VGPPs),** which is prepared through participatory processes and approved by **Gram Sabhas**
- Digital integration with **PM Gati Shakti** for national-level convergence
- Panchayats retain control over the **identification of works, prioritisation, and social audits**

Financial Architecture

Category	Centre : State
General States	60 : 40
North-East & Himalayan States	90 : 10
UTs without legislatures	100% Central funding

Administration & Technology

- **Administrative expenditure** ceiling raised from **6% to 9%**
- Uses **biometric authentication, geo-tagging, and real-time dashboards**
- Technology framed as an **enabler, not a gatekeeper**
- **Social audits by Gram Sabhas** strengthened for community oversight

Bharat Taxi

Context: India launched first cooperative taxi service Bharat Taxi in New Delhi.

About Bharat Taxi

- A **cooperative, driver-owned ride-hailing platform** — indigenous alternative to aggregator models
- Registered under the **Multi-State Cooperative Societies Act, 2002**
- Established on **6 June 2025**
- Organisations involved: **Ministry of Cooperation** and **Sahkar Taxi Cooperative Limited**

Key Features

- **Ownership & Pricing**
  - Drivers are **shareholders** based on **"Sarathi hi Malik"** principle
  - **Zero commission platform** as no surge pricing
- **Social Security for Drivers**
  - **₹5 lakh accident insurance**
  - **₹5 lakh health insurance**
  - Retirement and emergency support
- **Women Empowerment**
  - **Sarathi Didi** initiative
  - **Bike Didi** initiative
- **Technology & Operations**

  - **Multilingual mobile app** with real-time ride tracking
  - **Police integration** for safety
  - **Non-exclusive** as drivers may simultaneously join other platforms
- **Significance**
  - Ensures **fair driver income** and **social security coverage**
  - Promotes **cooperative mobility model** as alternative to private aggregators

Others

Project Vault

Context: USA launched **Project Vault** to stockpile critical minerals.

What is Project Vault?
- US **critical minerals stockpiling programme**.
- Public–private strategic reserve initiative.
- Similar to **Strategic Petroleum Reserve (SPR)** model.
- **Launched by: United States Government** and funded via **private capital + US Export–Import Bank**.

Aim
- Ensure uninterrupted **critical mineral supply**.
- Reduce dependence on **China's mineral processing**.
- Strengthen **defence, manufacturing, clean energy chains**.

Minerals Covered
- **Rare Earth Elements (REEs)**.
- Cobalt, Gallium, other strategic metals.

Key Features
- **Stockpiling Mechanism**
  - Government purchases and stores minerals.
  - Managed through private commodity traders.
- **Advance Purchase Contracts**
  - Firms commit to future mineral purchases.
  - Fixed inventory pricing mechanism.
- **Access Model**
  - Withdrawal allowed with replacement obligation.
  - Full access during major supply disruptions.
- **Price Stabilisation**
  - Mandatory repurchase at same price.
  - Reduces global price volatility.
- **Private Sector Role**
  - Sourcing and storage by traders.
  - **Examples:** Mercuria, Traxys.

Significance
- Enhances **strategic autonomy**.
- Secures defence supply chains.
- Supports EV, aerospace, semiconductor sectors.
- Protects against export controls.
- Stabilises rare earth markets.

Global Teacher Prize 2026

Context
- **Indian teacher Rouble Nagi** won the **Global Teacher Prize 2026**.
- Award presented at the **World Government Summit**, **Dubai**.
- Prize money amounts to **one million US dollars**.

About the Global Teacher Prize
- Launched in **2014** to honour excellence in teaching.
- Popularly called the **"Nobel Prize of Teaching"**.
- Presented by **GEMS Education**.
- Organised by the **Varkey Foundation**.
- Conducted in collaboration with **UNESCO**.
- Recognises teachers for **exceptional impact on education and society**.
- Focuses on **innovation, inclusion, and social transformation through teaching**.

Purpose and Significance
- Highlights the **global importance of teachers** in nation-building.
- Encourages **innovative and inclusive education models**.
- Promotes teaching as a **tool for social equity and empowerment**.
- Provides global recognition to educators working in **challenging conditions**.

About Rouble Nagi (Awardee)
- An **Indian educator** working with **marginalised communities**.

- Dedicated to making **learning accessible and inclusive**.
- Has over **two decades of experience** in grassroots education.
- Established **800+ learning centres** across **100+ underserved communities and villages**.
- Innovatively transformed **abandoned walls into interactive educational murals**.
- Murals act as **visual learning tools**, sparking curiosity and engagement.
- Her work integrates **community spaces with education delivery**.

Winter Olympics 2026

Context: The **2026 Winter Olympics**, officially the 25th Winter Olympic Games, will be held in **northern Italy** under the title *Milano Cortina 2026*.

Host & Venue

- Hosted by **Italy**.
- Co-hosted by **Milan** and **Cortina d'Ampezzo**, famous winter sports centres.
- Italy's **fourth Olympic event**:
  - **1956:** Cortina d'Ampezzo Winter Olympics
  - **2006:** Turin Winter Olympics
  - **1960:** Rome Summer Olympics

Motto & Mascot

- **Official Motto:** *"IT's Your Vibe"* (IT symbolises Italy).
- **Mascot:** *Tina*, a white stoat.
- Branding also features **"The Flo"**, inspired by the snowdrop flower.

Events & Participation

- Total **116 medal events** spread across **16 winter sports**.
- Around **2,900 athletes** expected from nearly **90 countries**.
- **New Sport Added**
  - **Ski Mountaineering (Skimo)** introduced for the first time.
  - Combines uphill climbing and downhill skiing on mountain terrain.
- **Russia & Belarus Participation**
  - Athletes allowed under **"Individual Neutral Athletes"** status. This policy continues from **Paris Olympics 2024** due to the **Russia–Ukraine conflict**.
- **India's Presence**
  - **Abhinav Bindra** chosen as Olympic torchbearer.
  - **Arif Khan** qualified in Slalom event.

About Winter Olympics

- Global multi-sport event for **snow and ice sports**.
- Held once every **four years**.
- First Winter Olympics: **Chamonix, France (1924)**.
- Governing body: **International Olympic Committee (IOC)**.