INSIGHTSIAS

SIMPLIFYING IAS EXAM PREPARATION

BODH GAYA

BODH GAYA IS WITNESSING WIDESPREAD PROTESTS BY BUDDHIST GROUPS DEMANDING FULL CONTROL OF THE MAHABODHI TEMPLE, OBJECTING TO HINDU PARTICIPATION IN THE TEMPLE'S ADMINISTRATION UNDER THE BODH GAYA TEMPLE ACT, 1949.

INSIGHTS CURRENT AFFAIRS

MARCH 2025

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FACTS FOR PRELIMS (FFP)

MAPPING:

GENERAL STUDIES – 1

Syllabus: Urbanization, their problems and their remedies.

1. URBAN TRAP

Context:
Across India, rural communities are resisting forced urbanization due to fears of **losing economic security, agricultural rights, and local governance autonomy**. Protests, such as those in **Rajasthan's Hanumangarh district**, highlight the negative impact of **village-to-town conversions, including the loss of welfare benefits and increased financial burdens**.

What is the Issue?

- **Forced urbanization without consent** – Rural areas are **converted into towns** without community participation, disrupting traditional economies.
- **Loss of welfare benefits** – Programs like **MGNREGA**, which ensure **100 days of employment**, become inaccessible after urban reclassification.
- **Threat to agricultural livelihoods** – **Land-use policies change**, leading to forced **conversion of farmlands into residential or commercial spaces**.
- **Weakening of local governance** – **Panchayats dissolve**, and decision-making shifts to **municipal councils**, increasing bureaucratic detachment.
- **Higher cost of living** – **Newly urbanized areas face increased taxation**, including **property tax, water fees, and waste management levies**.

Why is Urbanization Considered Necessary?

- **Demographic shifts** – Rising **population density in villages** necessitates urban expansion for better planning.
- **Infrastructure development** – Urban areas **receive better roads, sanitation, and public services** than rural regions.
- **Economic growth & job creation** – Urbanization **attracts investments**, creating **opportunities in industries and services**.
- **Streamlined administration** – **Larger municipal bodies** can standardize governance and **improve service delivery**.
- **Alignment with national urbanization goals** – India's **urban population is projected to reach 38.2% by 2036**, requiring expanded urban governance.

Challenges associated

- **Economic insecurity** – Over **3,100 families in Rajasthan** lost MGNREGA benefits after reclassification, **impacting rural employment stability**.
- **Agricultural decline** – Farmers struggle as **land-use changes** restrict agricultural activities and increase **land acquisition risks**.
- **Bureaucratic alienation** – Rural residents lose access to **hyperlocal governance**, facing **delays and inefficiencies in municipal bodies**.
- **Financial burden** – Residents must pay **higher taxes and urban service fees**, increasing their cost of living.
- **Lack of transparent planning** – Many **urban expansions lack master plans**, leading to **haphazard growth and mismanaged resources**.

What Can Be Done?

- **Mandatory community consultation** – Policy frameworks must **ensure local participation** before changing rural status.
- **Hybrid governance models** – Retain **gram panchayat roles** while integrating essential **urban services**.
- **Legal protections against arbitrary reclassification** – Strengthen **Article 243Q(2)** enforcement to prevent **unregulated urban expansion**.
- **Urban employment alternatives** – Introduce **structured urban employment schemes** with benefits equivalent to **MGNREGA**.
- **Planned & inclusive urban expansion** – Urbanization must be **systematic, transparent, and inclusive of rural economic realities**.

Conclusion:
Forced urbanization, if done without **inclusive planning and local engagement**, disrupts **livelihoods, governance, and economic stability**. While urban expansion is inevitable, it should be **structured, participatory, and sensitive to rural concerns**. A balanced policy approach will **ensure development without marginalizing rural populations**.

PYQ::
Does urbanisation lead to more segregation and/or marginalisation of the poor in Indian metropolises. (15 M) (2023)

2. HMAR AND ZOMI TRIBE

Context:
The Hmar and Zomi tribal leaders in Manipur have agreed to cooperate for restoring peace in Churachandpur after recent clashes.

About Hmar Tribe:
Who they are:
- Hmar tribe belongs to the larger Chin-Kuki-Mizo ethnic group.
- They are one of the Scheduled Tribes under the Sixth Schedule of the Indian Constitution.

Habitat: Found in Manipur, Mizoram, Assam (North Cachar Hills), Tripura, Meghalaya, and parts of the Chittagong Hill Tracts.

Uniqueness:
- **Origin:** Trace ancestry from Sinlung (disputed), migrated from China to Burma and then settled in Northeast India.
- **Physical features:** Mongoloid stock, short stature, straight black hair, dark brown eyes.
- **Language:** Speak Hmar dialect, part of the Kuki-Chin-Mizo language family.
- **Festivals:** *Sikpui Ruoi* – post-harvest festival with dances and music celebrating community bonding.
- **Occupation:** Practice slash-and-burn (jhum) agriculture.
- **Housing:** Build houses on hilltops with wooden planks.
- **Social structure:** Divided into exogamous clans; monogamy is strictly followed.

About Zomi Tribe:
Who they are:
- The Zomi are part of the larger Zo ethnic group, which includes Mizo, Kuki, and Chin communities.
- The term "Zomi" means *Zo people*.

Habitat: Inhabiting Manipur, Mizoram, Nagaland, Assam, and extending into Burma (Chin State, Sagaing division) and Bangladesh (Chittagong Hills).

Uniqueness:
- **Origin:** Centuries-old settlers of mountainous regions between India and Myanmar.
- **Physical features:** Tibeto-Burman traits, short height, straight black hair, brown eyes.
- **Language:** Speak one of the Kukish language dialects within the Kuki-Chin linguistic family.
- **Festivals:**
  - *Chapchar Kut* – celebrated after jhum clearing with traditional dance and feasts.
- **Culture:** Known for vibrant traditions, distinctive customs, rich folklore, and communal harmony.
- **Social identity issue:** The British-imposed name "Chin" is considered derogatory; Zomi prefer self-identification as Zo.

GENERAL STUDIES – 2

Syllabus: Government policies and interventions for development in various sectors and issues arising out of their design and implementation:

1. OVERHAULING THE COMPLIANCE FRAMEWORK

Context:: India's business environment faces challenges from **corruption**, **frequent compliance updates**, and **regulatory**

inefficiencies. Despite reforms like the Jan Vishwas Act (2023) and the proposed **Jan Vishwas 2.0**, businesses continue to struggle with complex compliance systems. Introducing a **unified compliance identity system** and ensuring **predictable regulations** is crucial for improving India's investment climate.

Key challenges in the existing compliance framework

- **Widespread bribery practices:** The India Business Corruption Survey **2024** reveals that **66%** of businesses admitted to paying bribes, with **54%** coerced for permits, licences, or approvals.
- **Excessive compliance updates:** In 2024 alone, India experienced **9,420 compliance updates**, averaging **36 daily changes**, creating confusion and providing officials with opportunities to exploit ambiguity.
- **Regulatory exploitation:** Inspectors misuse subjective powers to threaten **factory shutdowns** or **imprisonment**, even when businesses comply with rules, fostering corruption.
- **Unresolved labour code delays:** Despite consolidating **29 colonial-era labour laws** into **four new Labour Codes**, delays in implementation continue to burden businesses.
- **Fragmented compliance framework:** Businesses are required to manage **23 different identity numbers**, including **PAN**, **GSTIN**, and **CIN**, resulting in excessive paperwork and frequent renewals.

Implications

- **Corruption-Induced Compliance Costs:** Businesses are forced to pay bribes even after meeting regulatory requirements, driving up operational costs.
- **Productivity Losses:** Time spent addressing frequent compliance updates and facing inspections reduces overall business efficiency and hampers growth.
- **Stunted MSME Growth:** Startups and MSMEs struggle to navigate complex regulations, delaying permits and increasing costs, limiting their ability to scale.
- **Trust Deficit in Governance:** The unchecked power of inspectors and frequent compliance changes weaken business trust in regulatory authorities.
- **Operational Delays:** Unpredictable rule changes, such as the **9,420 compliance updates** in 2024, create disruptions in business operations, supply chains, and production cycles.

The Global Context and Strategic Imperatives:

- **Competitive Disadvantage:** The **United States** has launched the Department of Government Efficiency (DOGE) to simplify business operations. If the US improves its efficiency further, India's **$4 trillion economy** risks losing investments to the **US's $27 trillion economy**.
- **Manufacturing Slowdown:** Regulatory complexities and excessive compliance rules hamper India's ambition to become a **global manufacturing hub**, particularly in sectors like **pharmaceuticals** and **textiles**.
- **Investor Perception Damage:** India's reputation as a complex regulatory environment discourages long-term foreign investment, limiting the benefits of initiatives like **Make in India**.
- **Entrepreneurial Exodus:** Burdensome regulations are driving Indian start-ups to relocate to more business-friendly nations, reducing India's potential as a hub for innovation and growth.
- **Digital Gap in Compliance:** While India's Digital Public Infrastructure (DPI) has revolutionized sectors like digital payments, compliance systems remain fragmented, hindering India's ability to fully modernize its business ecosystem.

Key Reforms and Solutions for Compliance Overhaul

- **Jan Vishwas (Amendment of Provisions) Act, 2023:** This act decriminalised **180 provisions**, reducing the risk of imprisonment for minor business violations, marking a positive step toward reducing regulatory harassment.
- **Jan Vishwas 2.0:** The proposed bill seeks to decriminalise **100 additional provisions**, but with **20,000 imprisonment clauses** still in place, a more extensive overhaul is necessary.
- **FSSAI's Annual Update Model:** The **Food Safety and Standards Authority of India (FSSAI)** now restricts food label regulatory changes to **once a year**, ensuring stability in compliance requirements.
- **'One Nation, One Business' Identity System:** Consolidating **23 identifiers** (such as **PAN**, **GSTIN**, and **CIN**) into a unified identity system would reduce paperwork, improve compliance efficiency, and minimize corruption.
- **Digi Locker for Businesses:** Establishing a **tamper-proof document repository** where businesses can upload verified documents would significantly reduce opportunities for corruption in approval processes, mirroring the success of Digi Yatra in streamlining airport security.

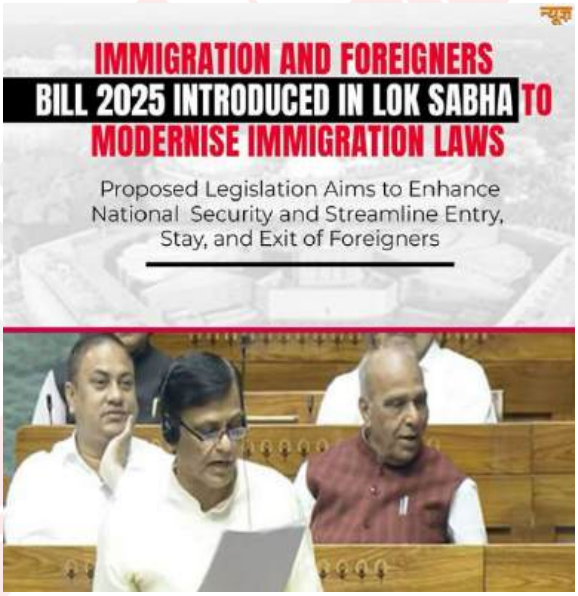
Conclusion::
To sustain growth, India must transition to a **transparent**, **predictable**, and **digital-first** compliance system. Implementing the **Jan Vishwas 2.0**, enforcing the **Labour Codes**, and adopting a **'One Nation, One Business' Identity System** are essential to reducing corruption, attracting investment, and promoting business growth. Delay in reforms risks undermining India's economic potential.

PYQ::
'In the context of neo-liberal paradigm of development planning, multi-level planning is expected to make operations cost effective and remove many implementation blockages.'-Discuss. (15 M) (2019)

2. IMMIGRATION BILL INTRODUCED IN LS

Context:
The Immigration and Foreigners Bill, 2025, was introduced in **Lok Sabha** to **streamline immigration laws** governing the **entry, stay, and exit of foreigners** in India.

The **Opposition raised concerns** over its constitutional validity and sought its **referral to a Joint Parliamentary Committee**.



About Immigration and Foreigners Bill, 2025:
What is the Immigration Bill? The bill aims to **consolidate and modernize existing immigration laws** in India.

It seeks to **replace four existing laws**:

- The Passport (Entry into India) Act, 1920
- The Registration of Foreigners Act, 1939
- The Foreigners Act, 1946
- The Immigration (Carriers' Liability) Act, 2000

Nodal Ministry::
Ministry of Home Affairs (MHA), Government of India

Key Features of the Bill

- **Regulation of Foreign Nationals**: Mandates **passport and visa requirements** for entry and stay in India.
    a. Establishes a **clear legal framework for deportation, detention, and registration**.
- **Centralized Database & Monitoring:** Introduces **digital tracking of foreigners**, ensuring **real-time immigration data**.
    a. Makes **hospitals, universities, and institutions responsible** for reporting foreign nationals.
- **Streamlining Existing Laws**: Eliminates **redundant and outdated provisions** from pre-Constitution laws.
    a. Brings **immigration regulations under a single comprehensive law**.
- **No Appeal Mechanism for Immigration Officers' Decisions**: Grants immigration officers **absolute authority** in deciding entry and stay.
    a. Critics argue this **violates natural justice and constitutional rights**.

Provisions for Immigration in India

- The Citizenship Act, 1955: Governs **acquisition, renunciation, and termination** of Indian citizenship.
- The Foreigners Act, 1946: Regulates the **entry and exit of foreigners** in India.
- **The Visa Regulations**: Issued under the **Passport Act, 1920**, defining entry conditions.
- **Refugee Policies**: Though **India is not a signatory** to the **1951 Refugee Convention**, it provides asylum on a **case-by-case basis** (e.g., Tibetans, Sri Lankan Tamils, Rohingyas).

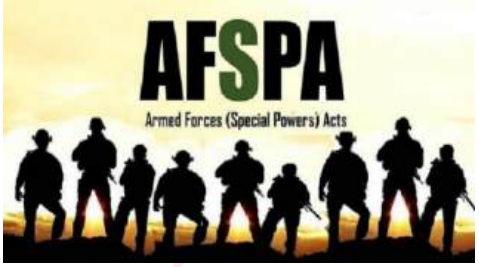
3. ARMED FORCES (SPECIAL POWERS) ACT (AFSPA)

Context:
The Union Home Ministry is reviewing AFSPA coverage in Manipur, Nagaland, Arunachal Pradesh, and Assam after recent ethnic and law-and-order disturbances.

About Armed Forces (Special Powers) Act (AFSPA):

- AFSPA is a law that empowers the armed forces to **maintain public order in "disturbed areas"**.

- Enacted in **1958**, it allows armed forces to act with **special authority** in regions with severe unrest.



Aim of AFSPA:

- To **enable armed forces to assist civil administration** in maintaining law and order.
- To control **insurgency, violence, and external threats** in disturbed areas.

Procedure to Include a District/State under AFSPA:

- The **Governor of a State**, or the **Central Government**, can declare any area as 'disturbed'.
- The declaration is made through a **notification in the Official Gazette**.
- The notification is reviewed **every six months**, with the possibility of extension or withdrawal.

Term of Enforcement:

Declared disturbed areas under AFSPA are notified for **six months** and periodically reviewed.

States Under AFSPA (As of February 2025):

Manipur, Nagaland, Arunachal Pradesh, Assam, and Jammu and Kashmir.

Removal Process: Removal of AFSPA requires:

- **Improved security and law & order situation**.
- Review by the **Union Home Ministry** and **state government**.
- Official **withdrawal notification** in the gazette.

Powers under AFSPA:

- **Use of Force:** Military officers can open fire after due warning to maintain public order.
- **Arrests without Warrant:** Permission to arrest suspected offenders without a warrant.
- **Search without Warrant:** Enter premises to search for arms, explosives, or wanted persons.
- **Protection from Prosecution:** No legal action can be initiated against personnel without the **Centre's sanction**.

Syllabus: Election Commission & Electoral Reforms

4. WHY ARE ELECTORAL REFORMS NECESSARY?

Context:

The Election Commission (EC) has invited political parties to discuss strengthening the electoral process amid allegations of electoral roll manipulation, duplicate EPIC numbers, and concerns over EVM-VVPAT reliability. These issues highlight the urgent need for electoral reforms to ensure free and fair elections.

About Electoral Reforms:

Legal Provisions for Electoral Reforms:

- **Article 324 of the Constitution:** Vests the superintendence, direction, and control of elections in the EC, ensuring its autonomy in conducting elections.
- **Representation of the People Act, 1950:** Governs the preparation of electoral rolls and voter registration.
- **Registration of Electors Rules, 1960:** Provides the framework for voter registration and EPIC issuance.
- **Model Code of Conduct (MCC):** A set of guidelines to ensure ethical campaigning and fair play during elections.
- **Supreme Court Directives:** Include mandatory VVPAT use, disclosure of criminal antecedents by candidates, and verification of EVM microcontrollers in case of disputes.

Issues Calling for Electoral Reforms:

- **EVM and VVPAT Concerns:** Opposition parties demand 100% VVPAT-EVM matching, citing potential tampering. Example: PILs filed in the Supreme Court seeking a return to paper ballots.
- **Electoral Roll Manipulation:** Allegations of fake voters in Maharashtra and Delhi elections. Example: Trinamool Congress accused the EC of adding bogus voters to benefit the ruling party.
- **Duplicate EPIC Numbers:** Voters in states like West Bengal and Gujarat share identical EPIC numbers, raising doubts

about voter list integrity.

- **Criminalization of Politics:** 46% of MPs elected in 2024 have criminal cases, with 31% facing serious charges like murder and rape (ADR report).
- **Unregulated Campaign Expenditure:** Political parties exceed expenditure limits, with the 2024 Lok Sabha elections estimated to cost ₹1,00,000 crore (CMS report).

Key Committees on Electoral Reforms:

- Dinesh Goswami Committee (1990): Recommended state funding of elections and stricter MCC enforcement.
- Vohra Committee (1993): Highlighted the nexus between crime and politics.
- Indrajit Gupta Committee (1998): Advocated partial state funding of elections.
- Second Administrative Reforms Commission (2007): Focused on ethics in governance and electoral transparency.
- Tankha Committee (2010): Proposed reforms in election laws, including EVM and VVPAT improvements.

Reforms Needed:

- **EVM-VVPAT Enhancements:** Increase the sample size for VVPAT-EVM matching scientifically. Example: Use region-wise sampling and count all VVPAT slips in case of discrepancies.
- **Aadhaar-EPIC Linking:** Link Aadhaar with EPIC to eliminate duplicate voters, ensuring privacy safeguards. Example: EC's ERONET platform can be leveraged for centralized data management.
- **Stricter MCC Enforcement:** Empower the EC to revoke 'Star Campaigner' status for MCC violations. Example: Action under Paragraph 16A of the Symbols Order against major parties for unethical campaigning.
- **Expenditure Caps:** Impose limits on political party expenditure and include party funding within candidate expenditure limits. Example: Amend the Representation of the People Act to enforce this.
- **Publicizing Criminal Records:** Enforce Supreme Court directives to publicize criminal antecedents of candidates at least three times before elections. Example: Use local newspapers and electronic media for wider reach.

Conclusion:

Electoral reforms are essential to address issues like EVM reliability, electoral roll manipulation, and criminalization of politics. By implementing scientific VVPAT sampling, linking Aadhaar with EPIC, and enforcing stricter campaign regulations, the EC can restore public trust in the electoral process. A collaborative effort between the EC, political parties, and civil society is crucial to ensure free, fair, and transparent elections.

PYQ:

In the light of recent controversy regarding the use of Electronic Voting Machines (EVM), what are the challenges before the Election Commission of India to ensure the trustworthiness of elections in India? (UPSC-2018)

5. WOMEN'S PARTICIPATION IN THE ELECTORAL PROCESS

Context:

The increasing voter turnout among women in the 2024 Lok Sabha elections has sparked discussions on their political participation, agency, and the factors shaping their electoral choices, as highlighted by study using National Election Studies (NES) data.

Data on Women's Participation in the Electoral Process:

- **Rising Voter Turnout:** In 2024, 65.78% of female electors voted, compared to 65.55% of male electors, marking the second time in history where women outnumbered men in voter turnout.
- **Gender Gap Reduction:** The gender gap in voter turnout has narrowed significantly, with 946 female electors per 1000 male electors in 2024, up from 926 in 2019.
- **State Variations:** States like Kerala (51.56% female electors) and Puducherry (53.03% female electors) recorded the highest percentage of female voters, reflecting regional political dynamics.
- **Welfare-Driven Voting:** Welfare schemes like Ujjwala and Ladli Behna have been pivotal in mobilizing women voters, particularly in BJP-ruled states like Madhya Pradesh.
- **Limited Beyond Voting:** Despite increased voting participation, women's involvement in rallies, campaigns, and policy advocacy remains low, with only 14% seeking voting advice from spouses, compared to higher rates among men.

Factors Hindering Women's Political Participation:

- **Social and Cultural Barriers**: Patriarchal norms and gender roles often restrict women's mobility and decision-making autonomy, limiting their political engagement.
  Example: In rural areas, women face societal pressure to prioritize household duties over political activities.
- **Economic Dependence:** Low workforce participation (below 25%) and financial reliance on male family members reduce women's political agency.
- **Lack of Representation:** Women constitute only 14% of MPs in the Lok Sabha, discouraging active participation due to limited role models.
- **Structural Challenges:** Unequal voter registration rates and limited access to political networks hinder women's involvement.
  Example: Fewer women are registered as voters compared to men, despite efforts by the Election Commission.
- **Intersectional Identities:** Caste, class, and regional disparities further complicate women's political participation, as their priorities often align with community interests rather than gender-based agendas.

Consequences of Limited Women's Participation:

- **Policy Bias**: Limited representation leads to inadequate attention to women-centric issues like healthcare, education, and safety.
  Example: Delayed implementation of the Women's Reservation Bill reflects systemic neglect.
- **Reinforcement of Stereotypes**: Women are often viewed as passive beneficiaries of welfare schemes rather than active political agents.
- **Unequal Development**: Exclusion of women from decision-making processes results in policies that fail to address gender-specific challenges.
- **Weak Political Accountability**: Low female participation reduces pressure on political parties to prioritize gender equality in their agendas.
- **Social Stagnation**: Limited political engagement perpetuates patriarchal norms, hindering societal progress toward gender equality.

Way Ahead:

- **Empowerment Through Education**: Increasing literacy rates and awareness programs can enhance women's political agency and decision-making capabilities.
  Example: Kerala's high female literacy rate correlates with higher political participation.
- **Economic Independence:** Promoting women's employment and entrepreneurship can reduce dependency and foster political engagement.
- **Quotas and Representation:** Implementing the Women's Reservation Bill to ensure 33% representation in legislatures can amplify women's voices.
- **Grassroots Mobilization:** Encouraging women's participation in local governance (e.g., Panchayati Raj institutions) can build confidence and leadership skills.
  Example: States like Bihar have seen success with increased female representation in Panchayats.
- **Inclusive Policies:** Political parties should adopt gender-sensitive policies and actively involve women in campaign planning and decision-making.

Conclusion:

Women's political participation in India has seen progress, but challenges like social barriers, economic dependence, and limited representation persist. Addressing these issues through education, economic empowerment, and policy reforms is crucial for achieving gender equality in politics. A holistic approach is needed to transform women from passive beneficiaries into active political agents.

PYQ:

"The reservation of seats for women in the institution of local self-government has had a limited impact on the patriarchal character of the Indian political process". Comment (UPSC-2019)

6. POLICING DIGITAL GIANTS

Context:

The Competition Commission of India (CCI) imposed a ₹213.14 crore fine on Meta for abusing its dominant position, highlighting the growing global scrutiny of digital giants for anti-competitive practices and data exploitation.

What are Digital Giant Companies?

- **Definition**: Digital giants are large technology companies that dominate global markets through data-driven platforms, such as social media, e-commerce, and search engines.
  Examples: Meta (Facebook, WhatsApp, Instagram), Google, Amazon, Apple, and Microsoft.
- **Market Influence**: They control vast user data, enabling hyper-targeted advertising and personalized services, creating high entry barriers for competitors.
- **Global Reach:** These companies operate across multiple jurisdictions, often leveraging their dominance to influence markets and consumer behavior.
- **Economic Impact:** They contribute significantly to the digital economy but also raise concerns about monopolistic practices and data privacy.

Need for Policing the Digital Giants:

- **Prevent Monopolistic Practices**: To curb anti-competitive behaviors like predatory pricing, exclusive agreements, and data exploitation.
  Example: Google's mandatory pre-installation of apps on Android devices.
- **Protect Consumer Privacy:** Ensure user data is not misused for targeted advertising or shared without explicit consent.
  Example: Meta's WhatsApp privacy policy update in 2021.
- **Promote Fair Competition:** Create a level playing field for smaller competitors and startups.
- **Ensure Market Innovation:** Prevent dominant players from stifling innovation by acquiring or eliminating competitors.
  Example: Meta's acquisitions of Instagram and WhatsApp.
- **Global Regulatory Alignment:** Harmonize laws to address cross-border data exploitation and anti-competitive practices. Example: EU's Digital Markets Act (DMA) and GDPR.

Challenges in Policing Digital Giants

- **Data-Centric Dominance:** Traditional competition laws focus on price-based dominance, not data aggregation.
- **Jurisdictional Complexity:** Digital giants operate globally, making it difficult to enforce local regulations.
  Example: Meta's appeal against CCI's order in NCLAT.
- **Rapid Technological Advancements:** Laws struggle to keep pace with evolving technologies like AI and big data.
  Example: AI-driven algorithms enhancing Meta's advertising dominance.
- **Regulatory Fragmentation:** Lack of coordination between competition and data protection authorities.
  Example: Absence of synergy between CCI and India's Data Protection Board.
- **Resource Constraints:** Limited expertise and resources to investigate complex digital market dynamics.

Government Measures Taken So Far:

- **Competition Commission of India (CCI):** Imposed fines on Meta and Google for anti-competitive practices.
  Example: ₹1,337.76 crore fine on Google in 2022.
- **Digital Personal Data Protection Act, 2023:** Regulates data collection, consent, and usage.
- **Global Collaboration:** Aligning with international frameworks like EU's DMA and GDPR.
- **Judicial Oversight:** NCLAT's intervention in Meta's case to ensure fair proceedings.
  Example: Stay on CCI's five-year ban on Meta's data sharing.
- **Economic Survey 2024-25:** Highlights the need for AI and digital market regulation.

Way Ahead:

- **Amend Competition Act, 2002:** Introduce provisions to address data monopolies and redefine market dominance.
  Example: Include "data monopolization" as a parameter for assessing dominance.
- **Enhance Regulatory Coordination:** Establish mechanisms for collaboration between CCI and Data Protection Board.
  Example: EU's integrated approach with DMA and GDPR.

- **Promote Interoperability:** Mandate data-sharing agreements to level the playing field.
  Example: EU's interoperability requirements for tech giants.
- **Capacity Building:** Invest in expertise and resources to tackle digital market complexities.
- **Global Harmonization:** Align Indian laws with international best practices to address cross-border challenges.
  Example: Adopting principles from the U.S. Subcommittee on Antitrust.

Conclusion:

India must adapt its competition laws to keep pace with rapid technological advancements and ensure fair market practices. A multidisciplinary approach, combining competition law and data protection, is essential to harness the full potential of the digital economy while safeguarding consumer rights and promoting innovation.

PYQ:

Discuss the role of the Competition Commission of India in containing the abuse of dominant position by the Multinational Corporations in India. Refer to the recent decisions. (UPSC-2023)

7. ADR REPORT ON CRIMINALIZATION OF POLITICS

Context:

The Association for Democratic Reforms (ADR) released its 2025 analysis of 4,092 MLAs from 28 states and 3 Union Territories, revealing alarming levels of criminalization in Indian politics.

Data Insights from ADR Report:

Overall, India Data:

- 45% (1,861 MLAs) have declared criminal cases, indicating widespread criminalization in Indian politics.
- 29% (1,205 MLAs) face serious criminal charges, including murder, attempted murder, kidnapping, and crimes against women, reflecting the gravity of the issue.

State-wise Rankings (Highest Criminal MLAs): Andhra Pradesh leads with 79% MLAs having criminal cases, followed by Kerala and Telangana at 69% each.Bihar (66%), Maharashtra (65%), and Tamil Nadu (59%) also show high percentages, highlighting regional disparities.

States with Highest Serious Criminal Charges: Andhra Pradesh (56%), Telangana (50%), and Bihar (49%) top the list, indicating a concentration of serious offenses in these states.

National Party vs Regional Party Comparison: According to the ADR 2025 report, regional parties show a higher percentage of MLAs with criminal cases compared to national parties.

Gender-wise Data:23% of women MLAs (out of 282 analyzed) have declared criminal cases, showing that criminalization is not limited to male politicians.

MLAs Facing Heinous Charges:54 MLAs face murder charges, 226 face attempted murder charges, and 127 face crimes against women, including 13 charged with rape.

Education Ranking of MLAs (State-wise): Delhi (100%), Kerala (99%), and Maharashtra (98%) have the most highly educated MLAs, while Jharkhand (68%), Odisha (71%), and UP (78%) lag behind.

Billionaire MLA Ranking (State-wise): Andhra Pradesh (36%), Telangana (28%), and Karnataka (28%) have the highest percentage of billionaire MLAs, linking wealth to political candidacy.

Causes of Criminalization of Politics in India

- **Electoral Popularity of 'Strongmen':** Criminals are often seen as protectors and problem-solvers, especially in regions with weak governance.
- **Weak Legal System**: Slow judicial processes allow candidates to contest elections despite pending criminal charges.
- The 17th Law Commission's recommendation to expedite trials has not been implemented.
- **Lack of Transparency**: While affidavits are mandatory, voters often lack awareness or access to detailed criminal records of candidates.
- **Party Complicity**: Political parties prioritize electability over integrity, often fielding candidates with criminal backgrounds to ensure victory.
- **Money-Muscle Power Nexus**: Candidates with criminal backgrounds often have significant financial resources and local influence, enabling them to dominate elections.

Consequences of Criminalization of Politics

- **Undermines Democratic Institutions:** The presence of criminals in legislatures erodes public trust in democratic processes and institutions.
  Example: Low voter turnout in areas dominated by criminal MLAs reflects disillusionment.
- **Policy Paralysis:** Legislators with criminal backgrounds often prioritize personal interests over public welfare, leading to stalled reforms.
  Example: Delayed criminal justice reforms due to the influence of such MLAs.
- **Increased Lawlessness:** Criminals in power promote a culture of impunity, leading to higher crime rates and corruption.
  Example: NCRB data shows rising political crime rates in states with high criminal MLAs.
- **Erosion of Ethics in Governance:** The presence of tainted legislators contradicts the constitutional ethos of integrity and public service.
  Example: MLAs charged with rape or murder holding public office undermines ethical governance.
- **Deterrent to Honest Candidates:** Clean individuals are often discouraged from entering politics due to the dominance of money and muscle power.
  Example: Many educated professionals avoid politics, fearing unfair competition from criminal candidates.

Way Forward to Address Criminalization of Politics

- **Election Commission Reforms:** Implement strict disqualification rules for candidates with serious criminal charges, as recommended by the Second Administrative Reforms Commission (ARC).
  Example: Barring candidates charged with heinous crimes like murder or rape from contesting elections.
- **Fast-Track Courts:** Expedite trials of political candidates to ensure timely justice, as endorsed by the Supreme Court in its 2014 judgment.
  Example: Setting up special courts to handle cases against politicians.
- **State Funding of Elections:** Reduce the influence of money power in elections by implementing state funding, as suggested by the Indrajit Gupta Committee.
  Example: Providing public funds to candidates to level the playing field.
- **Voter Awareness Campaigns:** Strengthen awareness about candidates' criminal records through digital and grassroots outreach programs.
  Example: Mobile apps and community workshops to educate voters.
- **Political Party Accountability:** Enforce rules to penalize parties for fielding tainted candidates, as directed by the Supreme Court in 2020.
  Example: Imposing fines or de-registering parties that repeatedly field criminals.

Conclusion:

The criminalization of politics poses a significant threat to India's democratic fabric. Urgent reforms, including stricter disqualification rules, fast-track courts, and voter awareness campaigns, are essential to restore public trust. Political parties must prioritize integrity over electability, and the judiciary and Election Commission must play a proactive role in ensuring clean governance.

PYQ:

Discuss the procedures to decide the disputes arising out of the election of a Member of the Parliament or State Legislature under The Representation of the People Act, 1951. What are the grounds on which the election of any returned candidate may be declared void? What remedy is available to the aggrieved party against the decision? Refer to the case laws. (UPSC-2022)

8. WFI SUSPENSION REVOKED

Context:

The **Union government revoked the suspension of** the Wrestling Federation of India (WFI), restoring its status as a **National Sports Federation (NSF)**. The suspension, imposed in **December 2023**, was lifted after the **WFI shifted its office location and complied with governance norms**.

Why was WFI Suspended? The suspension was imposed in December 2023 due to:

Sexual harassment allegations against former WFI President **Brij Bhushan Sharan Singh**.

Irregularities in governance, including WFI operating from the former president's residence.

Lack of transparency and violation of National Sports Code provisions.

Failure to function independently, with undue influence from previous leadership.

About Wrestling Federation of India (WFI):

What is WFI?

- **The Wrestling Federation of India (WFI)** is the **national governing body for wrestling** in India.
- It is responsible for **organizing national tournaments, selecting teams for international competitions, and promoting the sport**.
- It operates under the **Ministry of Youth Affairs and Sports** and is affiliated with **United World Wrestling (UWW)**.
- **Headquarters**: **Delhi**

Structure and Functions of WFI

- **Administrative Functions**: Regulates and governs **wrestling tournaments and events** in India.
- Implements **rules and regulations set by UWW and the Indian government**.
- **Athlete Development & Selection**: Conducts **national-level selection trials** for international competitions.
- Oversees **training programs and wrestling camps**.
- **International Representation**: Affiliated with **United World Wrestling (UWW)**.
- Ensures **India's participation in Olympics, Asian Games, and World Championships**.
- **Governance and Compliance**: Must adhere to the **National Sports Code**.
- Required to **maintain transparency and accountability in management**.

Syllabus: Schemes

9. FARMER PRODUCER ORGANIZATIONS (FPOS)

Context:

The Government of India has successfully achieved the target of forming 10,000 Farmer Producer Organizations (FPOs) under its Central Sector Scheme for Formation and Promotion of FPOs, launched in 2020 with a ₹6,865 crore budget. The 10,000th FPO was launched in **Khagaria district, Bihar,** focusing on maize, banana, and paddy, marking a milestone in the Atmanirbhar Krishi initiative.

About Farmer Producer Organisation:

What is an FPO? Definition: A **Farmer Producer Organization (FPO)** is a **collective of farmers** registered under the Companies Act or Co-operative Societies Act to enhance bargaining power, market access, and productivity.

Objective: To **reduce input costs, improve productivity**, and enable **better price realization** for small and marginal farmers.

Role: Acts as a bridge between **farmers and markets** by facilitating bulk procurement, value addition, storage, processing, and direct market linkages.

Features of FPOs:

- **Collective Strength:** Empowers **small and marginal farmers** through collective marketing and procurement.
- **Institutional Credit Support:** Access to loans via **₹2 crore credit guarantee cover** and **₹18 lakh management support** per FPO.
- **Market Linkages:** Integration with **e-NAM, ONDC, APEDA**, and other e-commerce platforms.
- **Value Addition & Processing:** Infrastructure for **grading, sorting, storage, and primary processing** of agricultural produce.
- **Gender Inclusion:** **40% of members** in registered FPOs are **women**, promoting gender empowerment.

ABOUT 10,000 FPO SCHEME:

- **Launched In:** February 29, 2020.
- **Ministry:** Ministry of Agriculture & Farmers Welfare (MoA&FW).
- **Budget:** ₹6,865 crore allocated for the scheme.
- **Implementation Period:** 2020-2027 (Seven years).
- **Aim:**
  - Strengthen small and marginal farmers by collectivizing them into Farmer Producer Organizations (FPOs) to enhance market access, financial security, and input procurement.
  - Increase farmers' income through economies of scale, better price realization, and reduced input costs.
- **Implementing Agencies:** Small Farmers' Agribusiness Consortium (SFAC), National Bank for Agriculture and Rural Development (NABARD), and National Cooperative Development Corporation (NCDC).

Need for FPOs in India:

- **Fragmented Land Holdings:** 86% of farmers in India are small and marginal, lacking economies of scale.
- **Market Access Issues:** Farmers struggle with low bargaining power, price fluctuations, and dependence on

middlemen.

- **Limited Credit Availability:** Lack of formal financial support forces farmers to rely on informal lending sources.
- **High Input Costs:** Difficulty in procuring quality seeds, fertilizers, and pesticides at affordable prices.
- **Lack of Storage & Processing Facilities:** Leads to post-harvest losses, reducing farmer income.

Challenges Faced by FPOs:

- **Complex Regulations**: Multiple agencies like FSSAI, BIS, APEDA impose different compliance standards, creating confusion for FPOs.
- **Low Digital Adoption:** Despite ONDC & eNAM, most FPOs lack digital literacy, limiting their ability to leverage e-commerce platforms.
- **Limited Market Linkages:** 80% of FPOs struggle to connect with buyers, processors, and exporters, reducing their revenue potential.
- **Traceability & Export Barriers:** Lack of quality certification and traceability systems restricts access to international markets.
- **Lack of Product Information:** No centralized database on FPO products, leading to poor visibility and reduced market access.

Way Forward

- **Strengthen E-commerce Integration:** Train FPOs on digital marketing, e-NAM, and ONDC platforms to expand their reach.
- **Simplified Compliance Process:** Create a unified regulatory framework to streamline export and domestic trade compliance.
- **Scaling Best Practices:** Replicate successful models like Kandhamal Turmeric FPO (Odisha) and Thailand's One Village, One Product (OVOP) initiative.
- **Database for FPOs:** Develop a centralized, product-specific database for better buyer-seller matchmaking and market integration.
- **Capacity Building & Training:** Implement specialized training programs on global compliance, food safety, and quality certification.

Conclusion:

The achievement of 10,000 FPOs marks a transformative shift in Indian agriculture towards self-reliance and economic sustainability. By enhancing market access, ensuring financial support, and fostering collective strength, FPOs can significantly boost farmer incomes.

PYQ:

"In the villages itself no form of credit organisation will be suitable except the cooperative society." – All Indian rural credit survey. Discuss this statement in the background of agriculture finance in India. What constrain and challenges do financial institutions supplying agricultural finances? How can technology be used to better reach and serve rural clients? (UPSC-2014)

Syllabus: Governance

10. SLIPPING GOOD GOVERNANCE

Context:

The New Delhi railway stampede, which claimed 18 lives, raised concerns over lack of accountability and poor governance mechanisms. The handling of inquiry reports, blame deflection, and lack of preventive measures highlight India's governance challenges.

What is Good Governance?

- Transparent, accountable, and participatory governance that ensures effective decision-making and service delivery.
- **Key Principles**: Rule of law, responsiveness, equity, inclusivity, efficiency, and accountability.
- Essential for democracy, ensuring public trust, institutional efficiency, and socio-economic development.

Challenges to Good Governance in India:

- **Lack of Transparency:** Inquiry reports on public disasters are often suppressed, limiting accountability.
- **Bureaucratic Red Tape:** Slow decision-making and inefficient administrative processes hinder effective governance.
- **Political Interference:** Frequent transfers and political influence affect independent functioning of institutions.
- **Corruption & Nepotism:** Lack of integrity in public offices leads to resource misallocation and trust deficit.
- **Weak Accountability Mechanisms:** No clear liability for administrative failures, leading to repeated governance lapses.

Government Schemes for Good Governance

- Right to Information Act **(RTI), 2005**: Enhances transparency by allowing citizens access to government records.
- **PRAGATI (Pro-Active Governance and Timely Implementation):** Real-time monitoring system for fast-tracking government projects.
- **Digital India Initiative:** Focuses on e-governance, digital services, and transparency in public administration.
- **Mission Karmayogi:** Aims to train civil servants in governance reforms and improve public service delivery.
- **Citizen's Charter & Sevottam Model:** Promotes service accountability and quality in public administration.

Way Ahead:

- **Strengthening Accountability:** Ensure independent inquiry mechanisms and public access to investigative reports.
- **Bureaucratic Reforms:** Implement transparent appointment processes and reduce political interference.
- **Technology-Driven Governance:** Expand AI-based predictive governance, digital monitoring, and e-governance initiatives.
- **Public Participation:** Enhance citizen engagement in policy-making and governance through participatory democracy.
- **Anti-Corruption Measures:** Strengthen whistleblower protection laws and transparent funding mechanisms.

Conclusion:

Good governance is key to democracy and sustainable development. India must strengthen transparency, ensure accountability, and enhance institutional efficiency to build public trust. A responsible, proactive, and participatory governance model is essential to prevent governance failures and foster national progress.

PYQ:

Hunger and Poverty are the biggest challenges for good governance in India still today. Evaluate how far successive governments have progressed in dealing with these humongous problems. Suggest measures for improvement. (UPSC-2017)

11. THE GLOBAL ENVIRONMENTAL DATA STRATEGY (GEDS)

Context:

The Global Environmental Data Strategy (GEDS) is in the spotlight as the United Nations Environment Programme (UNEP) works to finalize it by December 2025.

This strategy aims to address the triple planetary crises of climate change, pollution, and biodiversity loss by leveraging high-quality, accessible environmental data for informed decision-making and innovative solutions.

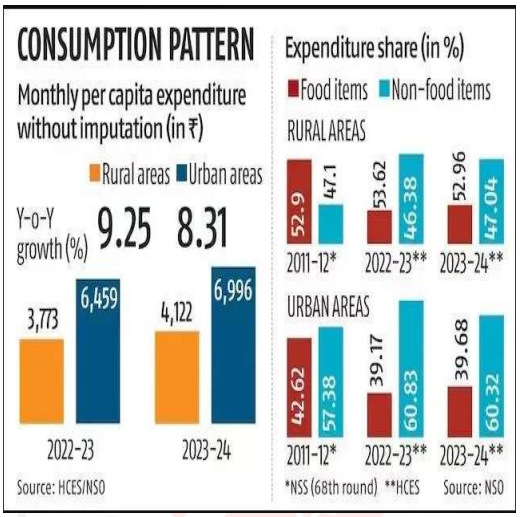
What is GEDS Strategy?

- The Global Environmental Data Strategy (GEDS) is a comprehensive framework developed by UNEP to enhance the use of environmental data.
- It focuses on overcoming barriers like data fragmentation, lack of interoperability, and limited access to support global efforts in tackling environmental crises.
- The strategy is **built on five key pillars:** data quality, governance, interoperability, access, and capacity-building.

Key Pillars of GEDS:

- **Data Quality and Provenance:** Establishes frameworks and standards to ensure accurate classification and quality of environmental data.

- **Data Governance:** Promotes ethical and sustainable methodologies for managing environmental data.
- **Data Interoperability:** Federates global and thematic data standards to enable seamless data sharing and integration.
- **Inclusive Data Access:** Advocates for open, affordable, and machine-readable data to ensure accessibility for all stakeholders.
- **Capacity-Building:** Focuses on enhancing skills and knowledge for effective data collection, governance, and use, particularly in Global South countries.



Advantages of GEDS:

- **Informed Decision-Making:** Provides high-quality data to support evidence-based policies and actions.
- **Global Collaboration:** Encourages international cooperation and data sharing to address environmental challenges.
- **Innovation:** Facilitates the development of AI and data analytics tools for environmental solutions.
- **Equity:** Ensures inclusive access to data, particularly for developing nations.

Limitations and Challenges:

- **Implementation Barriers:** Differences in technological capabilities and resources among countries may hinder uniform adoption.
- **Data Privacy Concerns:** Balancing open access with ethical data governance remains a challenge.
- **Coordination Issues:** Achieving global consensus on data standards and interoperability can be complex.
- **Resource Constraints:** Limited funding and technical expertise, especially in the Global South, may slow progress.

Significance of GEDS:

- **Addressing Triple Planetary Crises:** Provides a data-driven approach to combat climate change, pollution, and biodiversity loss.
- **Sustainable Development:** Aligns with the UN Sustainable Development Goals (SDGs) by promoting responsible data use.
- **Empowering Stakeholders:** Enhances the capacity of governments, organizations, and communities to make informed environmental decisions.

Conclusion:

The Global Environmental Data Strategy (GEDS) is a transformative initiative to harness the power of environmental data for global sustainability. By addressing data quality, governance, and accessibility, GEDS aims to foster innovation and collaboration. Its success will depend on overcoming implementation challenges and ensuring inclusive participation from all stakeholders.

PYQ:

"Access to affordable, reliable, sustainable and modern energy is the sine qua non to achieve Sustainable Development Goals (SDGs)". Comment on the progress made in India in this regard. (UPSC-2018)

Syllabus: Education

12. APAAR ID

Context:

The Centre and several State governments are pushing for large-scale adoption of the APAAR ID, leading to concerns over privacy, data security, and its voluntary status.

About APAAR ID:

- APAAR stands for Automated Permanent Academic Account Registry, a unique 12-digit student identification number.
- It consolidates all academic records, making them accessible via **DigiLocker** under the 'One Nation, One Student ID' initiative.

Ministry and Origin:

- Launched by the Ministry of Education, Government of India.
- Introduced under National Education Policy (NEP) 2020 and the National Credit and Qualifications Framework (NCrF).

Aim:

- To streamline academic record-keeping and facilitate **seamless student transitions** between institutions.
- To promote **multiple entry-exit systems**, track academic and co-curricular achievements, and enable transparent educational data management.

Key Features:

- **Permanent academic record** stored on DigiLocker.
- Covers **school and higher education** students across India.
- Generated through the **UDISE+ portal** with Aadhaar linkage and parental consent for minors.
- Schools play a key role in verifying student data and assisting in the generation of the ID.

Who Are Covered:

- All **school and higher education students** in India, both from government and private institutions.
- Mandatory Aadhaar authentication and parental consent for minors.

Is It Mandatory?

- Officially **voluntary**, but State governments (like Uttar Pradesh) and authorities (CBSE) are pushing for **100% adoption**, causing confusion.
- **Parents can opt out** by submitting written consent.

Advantages of Having APAAR ID:

- **Seamless Transfers:** Helps students move across institutions with verified academic records.
  Example: Karnataka government highlights easier academic transitions across 74,200 schools.
- **Academic Transparency:** Showcases both curricular and co-curricular achievements on a single platform.
- **Career Support:** Facilitates **job applications, skilling, and higher education admissions**.
- **Permanent Storage:** Safeguards records in DigiLocker, reducing dependency on paper certificates.
- **Tracking Progress:** Enables policymakers to assess educational outcomes across regions.

Limitations and Challenges:

- **Privacy Concerns:** Lack of clear safeguards raises concerns about children's data being misused or leaked. Example: Internet Freedom Foundation flagged risks of open APIs exposing children's data.
- **Confusion Over Voluntariness:** Mixed communication from schools and state circulars creates uncertainty.
- **Technical Glitches:** Challenges in linking Aadhaar to SATS and mismatches in student data.
  Example: Bengaluru Urban South recorded only **24% APAAR ID generation** due to data mismatch issues.
- **Legal Uncertainty:** Large-scale collection of minors' data without a robust legal framework is considered unconstitutional.

Way Ahead:

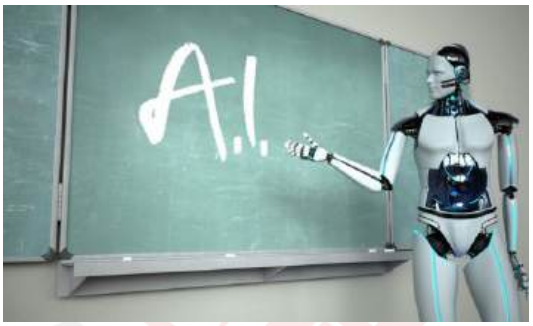
- **Clear Communication:** Government must emphasize the voluntary nature and inform parents transparently.
- **Legal Safeguards:** Strong data privacy and protection mechanisms must be embedded.
- **Capacity Building:** Train school officials and digital outreach teams to handle consent, verification, and data linkage smoothly.
- **Decentralized Monitoring:** States should report regular progress and address public grievances through dedicated helplines.

Conclusion: The APAAR initiative has the potential to transform student record management and ease academic transitions. However, privacy concerns, legal ambiguity, and implementation gaps need urgent attention. Clear policy communication and robust safeguards are essential to build trust among parents and stakeholders.

PYQ: The quality of higher education in India requires major improvements to make it internationally competitive. Do you think that the entry of foreign educational institutions would help improve the quality of higher and technical education in the country? Discuss. (UPSC-2015)

13. AI LITERACY

Context:
India faces a critical choice in the AI revolution—remain a service provider or emerge as a global innovator. AI literacy is now essential to harness this transformative technology equitably.



About AI Literacy:

- Human-AI Collaboration: Understanding how to effectively partner with AI systems rather than just use them passively. This enables professionals across fields to enhance their work through AI assistance.
- Critical AI Awareness: Developing the ability to assess AI outputs for potential biases, errors or ethical concerns. This is crucial in an era of AI-generated content and automated decisions.
- Problem-Solving with AI: Applying AI tools creatively to address real-world challenges, regardless of one's technical background. This makes AI accessible beyond just computer scientists.
- Beyond Just Coding: Focusing on conceptual understanding and application rather than just programming skills. AI literacy is about mindset more than specific technical abilities.
- Universal Competency: Becoming as fundamental as traditional literacy across all professions and demographics. AI understanding should not be limited to tech specialists.

Why Growing Focus on AI Literacy?

- **Economic Imperative:** AI adoption could add nearly $1 trillion to India's economy by 2035, making literacy essential for workforce participation in this growth.
- **Employment Transformation:** With automation changing job requirements, workers across sectors need AI skills to remain relevant in the labor market.
- **Global Leadership Race:** Countries investing in AI education are pulling ahead in innovation and economic competitiveness on the world stage.
- **Democratic Access:** Widespread AI literacy prevents concentration of benefits among tech elites and ensures equitable distribution of opportunities.
- **National Security Needs:** Understanding AI is becoming crucial for cybersecurity, misinformation detection and strategic decision-making.

Challenges to AI Literacy in India:

- **Digital Divide:** Uneven internet access and device availability creates disparities in AI education opportunities across regions.
  Example: Only 38% of rural schools have computer labs versus 72% urban schools.
- **Education System Gaps:** Most Indian schools still focus on rote learning rather than critical thinking skills needed for AI comprehension.
  Example: Less than 5% of schools have AI in their curriculum.
- Skilling Shortages: India faces a severe shortage of qualified instructors who can teach AI concepts effectively.
  Example: Many engineering colleges lack faculty trained in machine learning.
- **Ethical Concerns:** Potential biases in AI systems and lack of transparency raise important questions about responsible use.
  Example: Facial recognition systems showing racial bias in trials.
- **Funding Limitations:** Inadequate investment in AI research and infrastructure hampers widespread literacy efforts.
  Example: Government spending on AI is just 0.1% of the education budget.

India's Current AI Literacy Landscape:

- **Innovation Examples:** Homegrown solutions demonstrate India's potential when combining AI with local needs.
  - Example: Kisan AI providing voice-based agricultural advice in regional languages.
- **Policy Initiatives:** Government programs are beginning to address AI education at various levels.
  - Example: National Education Policy 2020's emphasis on emerging technologies.
- **Private Sector Role:** Tech companies are contributing through training programs and tools development.
  - Example: Google's AI literacy workshops for small businesses.
- **State-Level Experiments:** Some regions are pioneering localized approaches to AI education.
  - Example: Karnataka's AI curriculum pilot in 1,000 schools.

- **Persistent Gaps:** Implementation challenges prevent benefits from reaching all segments equally.
    - Example: Tribal schools lacking even basic computer infrastructure.

Measures Needed for AI Literacy Growth:

- **Education Integration:** Systematically incorporate AI concepts across school and college curricula nationwide.
    - Example: CBSE's new AI subject for grades 8-10.
- **Public-Private Models:** Combine government resources with industry expertise for scalable solutions.
    - Example: Microsoft's partnership with states for AI labs in colleges.
- **Localized Content:** Develop teaching materials in regional languages to improve accessibility.
    - Example: IIT Madras's Tamil-language AI learning platform.
- **Workforce Programs:** Create targeted upskilling initiatives for professionals across industries.
    - Example: NASSCOM's FutureSkills Prime platform for working adults.
- **Governance Frameworks:** Establish guidelines for ethical AI development and deployment.
    - Example: Draft National AI Strategy's principles for responsible AI.

Conclusion:

India's AI literacy journey will shape its technological sovereignty and economic future. Strategic investments in education, infrastructure and governance can position India as an AI leader rather than follower. The window for action is now - delay risks permanent disadvantage in the global AI race.

PYQ:

"The emergence of the Fourth Industrial Revolution (Digital Revolution) has initiated e-Governance as an integral part of government". Discuss. (UPSC-2020)

14. TECHNICAL TEXTILES IN INDIA

Context:

India is strengthening its position as a global leader in technical textiles through strategic initiatives like the National Technical Textiles Mission (NTTM) and state-level investments, aiming to unlock innovation, exports, and employment.

Data/Stats on Technical Textiles in India:

- **Global Ranking: India** is the **6th largest textile exporter** with a **3.9% share** in global textile trade.
    - **E.g.**: Exports include automotive, healthcare, and industrial textiles.
- **Contribution to GDP:** The textile sector contributes **~2% of India's GDP**, with technical textiles gaining increasing weight.
- **Sectoral Growth Target:** The Indian textile market is projected to reach **USD 350 billion by 2030**, generating **3.5 crore jobs**.
- **Government Funding:** The NTTM was allocated **₹1,480 crore** from 2020–26; **₹517 crore released**, and **₹393.39 crore** utilized till now.
- **R&D Push:** 168 R&D projects worth **₹509 crore** approved under NTTM to develop new materials and market applications.

Potential of Technical Textiles in Indian Economy:

- **Diverse Industrial Application:** Used in **automotive, construction, defence,** agriculture, and healthcare sectors for enhanced functionality.
    - **E.g.**: Use of geotextiles in roads, and agro-textiles for better yield.
- **Employment Generator:** Expected to train and employ **over 50,000 professionals** in niche textile applications.
- **Export Booster:** Dedicated **export promotion council** to tap new markets and meet global demand.
- **Startup Innovation:** Schemes like **GREAT** support early-stage innovations with up to **₹50 lakh** funding.
    - **E.g.**: Mahina, India's first bonded period underwear, launched by Eicher Goodearth.
- **Support for Make in India:** Strong thrust on **local innovation and manufacturing**, aligned with Aatmanirbhar Bharat.

Initiatives to Promote Technical Textiles

1. **National Technical Textiles Mission (NTTM):** Structured across four pillars—R&D, market expansion, exports, and skills.
2. **GREAT Scheme (2023):** Provides funding for startups and research institutes to commercialize prototypes.
3. **GIST 2.0:** Industry-academia internships that promote hands-on learning and innovation in textiles.
4. **Skill Development Drive:** Collaboration with institutes like **SITRA, NITRA, SASMIRA** to train workforce in 12 niche textile areas.
5. **Technotex 2024:** A major expo under Bharat Tex showcasing 71 innovation projects and global partnerships.

Challenges to Technical Textiles:

- **Limited Awareness:** End-users, especially in MSMEs, lack knowledge of technical textiles' utility and scope.
- **Skilled Workforce Gap:** Shortage of trained professionals in advanced textile technologies and applications.
- **High R&D Costs:** Research in advanced fibres and coatings is capital intensive, limiting startup participation.
- **Import Dependency:** Several raw materials and machinery still need to be imported, raising production costs.
- **Market Penetration Issues:** Domestic market acceptance is still slow due to conservative procurement practices.

Way Ahead:

- **Incentivize Domestic Manufacturing**: Expand capital subsidies and tax reliefs to attract investments.
  - **E.g.**: Tamil Nadu increased spinning modernization subsidy from 2% to 6%.
- **Boost Exports via FTAs**: Leverage free trade agreements to reduce entry barriers for Indian tech-textile products.
- **Public Procurement Mandates**: Mandate use of technical textiles in government infrastructure and health projects.
- **Global Collaborations**: Partner with international firms for tech transfer, certifications, and co-development.
- **Awareness Drives**: Conduct nationwide awareness campaigns targeting industries and consumers.

Conclusion:

India's rise in the technical textiles sector reflects a shift from traditional to functional fabrics, aligning with modern industrial needs. Through **policy backing, R&D**, and **startup encouragement**, the nation is on track to emerge as a global hub for technical textiles. With continued focus, this sector can become a cornerstone of India's economic and export strategy.

PYQ:

Analyse the factors for highly decentralized cotton textile industry in India. (UPSC-2013)

15. BATTLING INDIA'S INFODEMIC

Context:

India, with 95.04 crore internet users, is facing an unprecedented rise in fake news and disinformation.

India's Infodemic: Data & Statistics:

- **214% rise** in misinformation during the **COVID-19 pandemic**, with India accounting for **1 in 6 fake news pieces globally**.
- **Over 85% of urban Indians** report encountering **online hate speech**, with **64% blaming social media** (*UNESCO-Ipsos survey*).
- **38% of fake news originates from verified pages**, while **70% spreads through at least one verified handle** (*NewsChecker report*).
- **Deepfakes influenced the 2024 Lok Sabha elections**, reinforcing **biases and swaying voter sentiment**.

Reasons Behind the Rise of Infodemic in India:

- **Unregulated Social Media Platforms:** WhatsApp, Facebook, YouTube, and X serve as primary sources of misinformation.
  Example: False COVID-19 cures spread on WhatsApp, leading to public panic.
- **AI-Driven Disinformation:** Deepfake videos, manipulated audio, and AI-generated propaganda deceive users.
  Example: A deepfake of Ukrainian President Zelenskyy misled viewers about his wartime stance.
- **Political Manipulation & Election Misinformation:** Fake news is weaponized during elections to manipulate voter sentiment.
  Example: 2024 Lok Sabha elections saw AI-driven fake speeches aimed at political polarization.
- **Algorithmic Echo Chambers:** AI-driven recommendation systems reinforce biases and promote fake narratives.
  Example: Users engaging with misogynistic content (e.g., Andrew Tate's videos) see more of the same, amplifying stereotypes.
- **Weak Fact-Checking & Legal Loopholes:** ECI lacks resources to counter election-related fake news.
  Example: Current laws (BNS, IT Act 2000) only address partial aspects of disinformation.

Challenges in Countering the Infodemic:

- **Lack of Comprehensive Law:** Existing laws (BNS, IT Act 2000, DPDP Act 2023) offer only partial solutions.
  Example: Singapore's Protection from Online Falsehoods Act is a model India lacks.
- **Delayed Action by Tech Companies:** Platforms like Meta, X, and YouTube react slowly, allowing disinformation to spread widely.
  Example: X's "Community Notes" failed to counter fake news during global elections.
- **Legal vs. Free Speech Dilemma:** Striking a balance between regulating fake news and protecting freedom of expression is complex.
  Example: France and Germany mandate removal of fake news within 24 hours, but critics call it censorship.
- **Lack of Awareness & Digital Literacy:** Most users struggle to differentiate misinformation from credible news.
- **Example**: Fake WhatsApp forwards led to mob lynchings in India, highlighting the impact of unchecked fake news.

Way Ahead:

- **Comprehensive Fake News Law**: Introduce strict penalties for deliberate disinformation, similar to Singapore's model. Establish an **independent regulatory body** for **fact-checking and oversight**.
- **Accountability for Social Media Platforms:** Mandate 24-hour removal of fake content, with heavy fines for non-compliance.
- **Example**: Germany's NetzDG law holds platforms legally accountable for fake news.
- **AI & Deepfake Regulation:** Enforce mandatory labelling of AI-generated content.
  Example: EU's AI Act mandates watermarks for AI-created media to prevent deception.
- **Boost Digital Literacy Programs:** Launch nationwide media literacy campaigns to help users identify fake news.
- **Example**: Finland's digital literacy program is a global success in fighting misinformation.
- **Stronger Election Monitoring:** Enhance Election Commission resources to tackle AI-driven election propaganda.
- **Example**: The US 2024 elections faced AI-powered misinformation campaigns that fueled division.

Conclusion:

India's growing fake news crisis demands urgent legal intervention to safeguard democracy, public trust, and social harmony. A strong, transparent, and well-regulated framework must balance countering disinformation while preserving free speech. Without decisive action, deepfakes and AI-driven misinformation will continue to threaten public discourse and national security.

PYQ:

In the fight against fake news, how can a balance be achieved between combating misinformation and safeguarding the fundamental right to free speech and expression? (UPSC-2024)

Syllabus: Health

16. OBESITY

Context: Prime Minister Narendra Modi has launched a nationwide anti-obesity campaign, urging Indians to **reduce oil consumption by 10%.**

About Obesity:

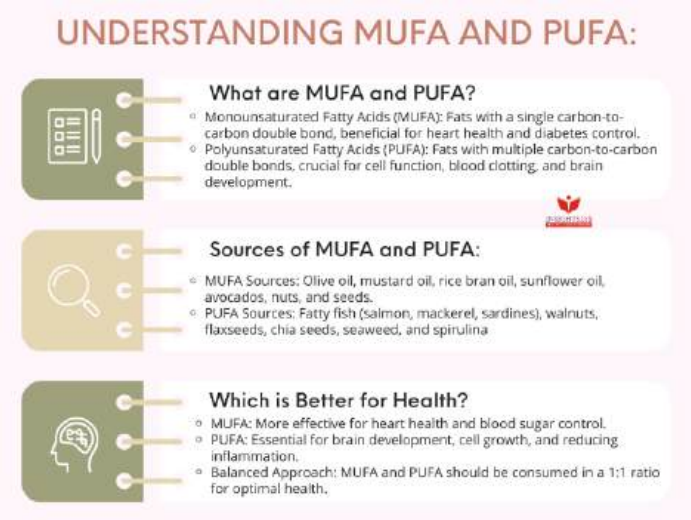
What is Obesity? According to the **World Health Organization (WHO)**, obesity is defined as an **abnormal or excessive fat accumulation that presents a risk to health**.

NOTE: Body Mass Index (BMI), previously known as the **Quetelet index**, is a simple way to check if an adult has a healthy weight. It is calculated by dividing a person's weight in kilograms by their height in meters squared (kg/m^2).

The commonly used metric to classify obesity is **Body Mass Index (BMI)**, where a BMI of **25 or above** is considered overweight, and a BMI of **30 or above** is classified as obese.

In India, a person is considered:

- **Overweight** if their **Body Mass Index (BMI)** is between **23.0 and 24.9 kg/m²**
- **Obese** if their BMI is **25 kg/m² or higher**.
- **Morbid obesity** occurs when a person's **BMI is 35 or more**.



Global and National Obesity Statistics:

Global Obesity Trends:

Between 1990-2022, childhood obesity (ages 5-19) increased **fourfold** from **2% to 8%**.

Adult obesity more than **doubled**, rising from **7% to 16%**.

Obesity in India:

NFHS-5 (2019-21) Data:

- **24% women** and **23% men** are overweight or obese.
- **6.4% women** and **4% men** (aged 15-49) are obese.
- **Overweight children under 5 years** increased from **2.1% (2015-16) to 3.4% (2019-21)**.

Key Drivers Behind Rising Obesity in India

- **Unhealthy Diets:** Increased consumption of **processed foods, high sugar, salt, and trans fats** leads to weight gain.
- **Sedentary Lifestyles:** Technology-driven habits **reduce physical activity**, promoting obesity.
- **Urbanization:** Shift to **fast food and reduced active commuting** contributes to weight gain.
- **Genetic and Metabolic Factors:** **Family history and hormonal imbalances** affect metabolism and fat storage.
- **Mental Stress:** Stress triggers **binge eating and poor dietary habits**, leading to obesity.
- **Lack of Awareness:** **Limited nutritional knowledge** results in unhealthy food choices and lifestyle habits.

Government Initiatives to Counter Obesity:

- **National Health Mission (NHM) - NP-NCD:** Focuses on **screening, early diagnosis, and behavior change** to prevent obesity and related diseases under the National Programme for Prevention and Control of Non-Communicable Diseases (NP-NCD).
- **Fit India Movement & Khelo India Programme:** **Encourages physical activity** in daily life through **Fit India School Certification**, while **Khelo India** promotes **sports participation and athletic excellence** with modern facilities.
- **POSHAN Abhiyaan (2018):** Aims to **combat childhood obesity** by promoting **balanced nutrition** and initiatives like **Poshan Vatikas (Nutri-Gardens)** for homegrown healthy food.
- **Eat Right India Movement (FSSAI):** Includes the **'Aaj Se Thoda Kam' campaign** to reduce fat, salt, and sugar intake, along with **Front-of-Pack Labelling (FOPL)** to identify High-Fat, Salt, and Sugar (HFSS) foods.
- **RUCO Initiative (FSSAI):** **Repurposes Used Cooking Oil** to prevent harmful fat consumption, converting it into **biofuel** instead of allowing reuse in the food chain.

Challenges in Controlling Obesity:

- **Cultural Dietary Habits:** High consumption of **carbs, fried, and sugary foods** leads to excess calorie intake.
- **Limited Policy Implementation:** Awareness programs exist but **lack enforcement and community engagement**.
- **Economic Factors:** **Healthy foods** are costlier than processed and fast foods, making unhealthy options more accessible.
- **Lack of Physical Infrastructure:** **Few parks, walkways, and fitness spaces** discourage active lifestyles.
- **Marketing Influence:** **Aggressive fast-food ads** encourage poor eating habits, especially in children.

Way Forward:

- **Nutritional Education:** Schools and workplaces must promote **healthy eating habits and portion control**.
- **Policy Reforms:** **Tax sugary foods, subsidize healthy options, and improve affordability** of nutritious food.
- **Fitness Promotion:** Mandate **physical activity programs** in schools, offices, and urban planning.
- **Stringent Food Regulations:** Ban trans fats, enforce clear labelling, and **regulate misleading ads**.

Conclusion:

With strategic policies, strong awareness campaigns, and community-driven action, India can reverse obesity trends and build a healthier future. A collective approach integrating nutrition, exercise, and policy enforcement will ensure sustained impact.

PYQ:

The increase in life expectancy in the country has led to newer health challenges in the community. What are those challenges and what steps need to be taken to meet them? (UPSC-2022)

17. PUBLIC HEALTH EDUCATION

Context:

India's public health education sector is facing a crisis due to job scarcity, lack of standardization, and funding constraints.

What is Public Health Education?

- **Definition**: Public health education trains professionals in disease prevention, healthcare management, epidemiology, and health policies.
- **Constitutional Mandate**: Article 47 of the Indian Constitution directs the state to improve public health as a primary duty.

Government Schemes for Public Health Education:

- **National Health Mission (NHM):** Strengthens **public health workforce** through **training and skill development**. Example: **NRHM (2005) introduced non-medical public health roles**.
- **Pradhan Mantri Swasthya Suraksha Yojana (PMSSY):** Enhances medical and public health education by establishing AIIMS-like institutions.
- **National Programme for Prevention & Control of Non-Communicable Diseases (NP-NCD):** Promotes **public health training** in **disease control and prevention strategies**.
- **Fellowship in Public Health Management (FPHM):** Provides specialized training for public health leadership.
- **Integrated Disease Surveillance Programme (IDSP):** Strengthens epidemiology training for public health professionals.

Challenges in Public Health Education in India

- **Job Market Constraints:** Mismatch between demand and supply, with limited government recruitment. **Example:** Entry-level research and program assistant roles receive thousands of applicants.
- **Quality of Education:** Lack of standardization in MPH curricula, leading to inconsistent training.
- **Shortage of Faculty & Practical Exposure:** Many institutions lack experienced faculty with real-world public health exposure.
- **Unequal Distribution of Institutions:** States like Assam, Bihar, and Jharkhand lack sufficient public health schools.
- **Limited Private Sector Opportunities:** Private healthcare prefers hospital administrators over public health specialists.
- **Insufficient Government Funding:** India's public health research and training remain underfunded.
- **Example:** The Data Protection Board was allocated just ₹2 crore, highlighting low investment in regulatory infrastructure.

Way Ahead:

- **Create More Public Health Jobs:** Establish **State Public Health Cadres** for dedicated employment.
- **Increase recruitment** in government **primary, state, and national health systems**.
- **Introduce a Central Regulatory Body:** Set up a Public Health Education Council under UGC or NMC.
- Ensure **uniform training, faculty qualifications, and practical learning mandates**.
- **Expand Public Health Institutions:** Establish **MPH colleges in underserved states**.
- Strengthen **public-private partnerships** to expand training capacity.
- **Integrate Hands-On Training:** Ensure **all MPH programs include fieldwork in government health programs.** **Example:** Compulsory internships in NHM, WHO programs, or IDSP initiatives.

- **Encourage Private Sector Participation:** Create incentives for private hospitals and industries to hire public health graduates.

Conclusion: India's public health education system requires urgent reforms to bridge the gap between education and employment. A standardized curriculum, more government jobs, and better funding are critical to building a skilled public health workforce. Strengthening training, research, and industry collaboration will ensure a sustainable and effective public health system in India.

PYQ:
The increase in life expectancy in the country has led to newer health challenges in the community. What are those challenges and what steps need to be taken to meet them? (UPSC-2022)

18. TB AND EQUITABLE HEALTH COVERAGE

Context:
India has made commendable progress in tuberculosis (TB) care through new strategies including molecular testing, shorter BPaLM regimen, nutrition support via Ni-kshay Poshan Yojana (NPY), and community engagement.

Key Developments in TB Care:

- **Decline in TB incidence:** India reduced TB incidence by 17.7% from 2015 to 2023, showing progress from 237 to 195 cases per lakh population.
- **New interventions:** Introduction of the BPaLM regimen and ₹1,000/month nutritional support under Nikshay Poshan Yojana have strengthened treatment.
- **Community involvement:** TB survivors are now engaged as TB champions to spread awareness and promote treatment adherence at the grassroots level.
- **Integration with Ayushman Bharat:** TB services are integrated into PMJAY and Ayushman Arogya Mandirs, ensuring accessibility at primary healthcare centres.
- **Improved diagnostics:** Sample collection and rapid molecular testing have been optimised at primary care levels for faster and accurate detection.

Different Initiatives to Combat TB:

Global Efforts:

- **Find. Treat. All. #EndTB Initiative:** Launched by WHO with the Global Fund and Stop TB Partnership to ensure universal access to TB care and treatment by 2030.
- **Global Tuberculosis Report:** An annual report by WHO that tracks TB incidence, mortality, funding, and progress toward elimination targets.

India's Efforts:

- **Pradhan Mantri TB Mukt Bharat Abhiyan:** A community-driven initiative encouraging public participation and nutritional support for TB patients to achieve TB elimination by 2025.
- **National Strategic Plan (NSP) for Tuberculosis Elimination (2017-2025):** A comprehensive roadmap focusing on early detection, universal treatment, public-private partnerships, and social support.
- **TB Harega Desh Jeetega Campaign:** A national awareness campaign that promotes early diagnosis, treatment adherence, and community participation in TB eradication.
- **Nikshay Poshan Yojana:** A direct benefit transfer scheme offering ₹1,000 per month to TB patients for nutritional support during treatment.

Challenges in Achieving Equitable TB Care:

Vertical program limitations: Current TB services are siloed; integration into the broader healthcare system is needed for universal reach.

Private sector dependency: Over 50% of TB patients opt for private care, resulting in diagnostic delays and higher out-of-pocket expenses.

Intersectional barriers: Gender, caste, income, and disabilities influence healthcare access and TB outcomes in diverse population groups.

Integrated care gaps: Simultaneous screening for TB, COPD, diabetes, and mental health issues is lacking in the current system.

Stigma and misinformation: Widespread myths and social stigma deter timely testing, diagnosis, and successful TB treatment.

What is a TB Champion?

- A TB Champion is a tuberculosis survivor trained and engaged by the government to promote TB awareness, early detection, and treatment adherence within the community.
- The Meghalaya government has successfully implemented the TB Champion model to combat TB, especially in remote and tribal areas.

Key Features:

- **Community Engagement:** Survivors act as relatable advocates for testing and treatment.
- **Stigma Reduction:** They help dispel myths and fears surrounding TB.
- **Last-Mile Outreach:** Reach far-flung, inaccessible regions to ensure no patient is left behind.
- **Motivational Role:** Encourage continuous treatment and promote government support schemes.
- **Support 100-day Campaigns:** Align efforts with national initiatives for TB elimination.

Way Forward (Recommendations):

- **Person-centred care:** Adopt models like Tamil Nadu's TN-KET to prioritise care for the most vulnerable and critically ill patients.
- **Address intersectionality:** Implement gender-responsive and disability-inclusive approaches to remove social barriers in TB care.
- **Integrated screening:** Introduce combined TB and NCD screenings using AI-based diagnostics for comprehensive community health checks.
- **Financial protection:** Expand wage-loss support, nutrition schemes, and livelihood initiatives for TB-affected families to reduce financial strain.
- **Communication and awareness:** Launch large-scale, multi-platform public education campaigns to dispel TB myths and encourage early treatment.

Conclusion:

India's TB elimination goal aligns with UHC and requires person-centric, equitable, and integrated health strategies. Strengthening public health, addressing vulnerabilities, and community-led awareness can position India as a global leader in TB elimination efforts.

PYQ:

"Besides being a moral imperative of a Welfare State, primary health structure is a necessary precondition for sustainable development." Analyse. (UPSC-2021)

Syllabus: Women

19. FROM BORROWERS TO BUILDERS: WOMEN'S ROLE IN INDIA'S FINANCIAL GROWTH STORY

Context:

NITI Aayog launched the report "From Borrowers to Builders: Women's Role in India's Financial Growth Story" highlighting increased financial participation of women.

The report, published by TransUnion CIBIL, Women Entrepreneurship Platform (WEP), and MicroSave Consulting (MSC), shows a 42% rise in women monitoring their credit as of December 2024.

About Findings on Women and Financial **Growth:**

Increased Credit Participation:

- **Women borrowers tripled between 2019 and 2024**.
- **60% of women borrowers** are from **semi-urban and rural areas**.
- **Women's share in business loans increased by 14%**, and in **gold loans by 6%** since 2019.

Rise in Credit Monitoring & Awareness:

- **27 million women monitored their credit in 2024**, a **42% increase from 2023**.
- **More women in non-metro regions (48%)** are actively monitoring credit than in metro areas (30%).
- **62% of self-monitoring women** fall into **prime or above credit bands**, improving credit health.

Regional Credit Participation:

- **Southern states lead** in financial inclusion, with **Tamil Nadu, Karnataka, and Telangana** having the highest women borrowers.
- **Northern & central states (UP, Rajasthan, MP) saw the fastest growth in live women borrowers** in the past five years.

Success of Financial Inclusion for Women:

- **Women Entrepreneurship Platform (WEP):** Provides mentorship, market access, and financial literacy.
- **Financing Women Collaborative (FWC):** Promotes gender-intelligent financial products and public-private partnerships.
- **Pradhan Mantri Mudra Yojana (PMMY):** ₹2.22 lakh crore in loans disbursed to 4.24 crore women entrepreneurs in FY 2023-24.
- **PM SVANidhi Yojana:** ₹5,939.7 crore disbursed to 30.6 lakh women street vendors by Dec 2024.
- **Udyam Registration:** 40% of MSMEs in India are now women-owned.

Challenges Faced by Women in Financial Access:

- **Credit Aversion**: Fear of loan repayment and financial instability.
- **Collateral & Guarantor Issues:** 79% of women-owned businesses are self-financed, with limited access to formal credit.
- **Poor Banking Experience:** Women face bureaucratic hurdles and lack advisory support in financial institutions.
- **Limited Financial Products for Women:** Rigid loan structures do not cater to women's unique financial needs.
- **Lack of Credit Readiness:** 30% of individual women entrepreneurs lack required documentation and financial records.

Way Ahead:

- **Reimagining Credit Risk Assessment:** Using AI, big data, and alternative scoring models to reduce gender bias.
- **Gender-Intelligent Financial Products:** Offering flexible repayment terms, non-collateral loans, and tailored services.
- **Boosting Credit Readiness:** Promoting digital transactions, bookkeeping, and financial literacy to increase loan accessibility.
- **Strengthening Support Ecosystem:** Expanding WEP and FWC networks to provide mentorship, networking, and access to capital.
- **Increasing Gender Representation in Finance:** Encouraging more women in financial decision-making roles to design inclusive products.

Conclusion:

Women are transitioning from borrowers to economic builders, leveraging financial tools for business growth and financial independence. While credit awareness and participation are rising, gender-based financial barriers persist. Addressing these challenges through inclusive policies, AI-driven credit assessments, and targeted financial products will unlock women's full economic potential, driving India's financial growth and gender equity.

PYQ: Is inclusive growth possible under market economy? State the significance of financial inclusion in achieving economic growth in India. (UPSC-2022)

20. WOMEN'S RIGHTS IN REVIEW 30 YEARS AFTER BEIJING REPORT

Context: UN Women's latest report, "Women's Rights in Review 30 Years After Beijing," was released ahead of the 50th International Women's Day on 8 March 2025.

About Beijing Declaration: Beijing Declaration and Platform for Action (1995) is a global framework adopted by 189 governments at the Fourth World Conference on Women in Beijing, China.

- It remains **the most comprehensive roadmap** for **gender equality and women's empowerment**.
- It focuses on **12 critical areas**, including **women's rights, economic participation, political leadership, education, health, and freedom from violence**.

Achievements in Women Empowerment:

Legal and Institutional Reforms

- Anti-discrimination laws in 162 countries now prohibit **gender-based employment discrimination**.
- **More robust policies on sexual and reproductive rights**, improving access to family planning and maternal health.

Economic Advancements

- **More women in leadership:** Women head 36% of local legislatures and 27% of parliamentary seats.
- **Expansion of digital inclusion:** The proportion of women using the Internet rose from 50% to 65% (2019-2024).
- **Public investments in universal care services** created **millions of new jobs** for women.

Education and Skill Development

- Girls now surpass boys in secondary education completion rates in most regions.
- Significant increase in **STEM education for women**, with many countries funding digital literacy programs.

Women's Role in Climate Action

- **53% of countries** now integrate gender in disaster and climate laws.
- Women's participation in environmental **decision-making remains low** but increasing.

Limitations in Achieving Gender Equality

- **Persistent Gender Wage Gap:** Women earn 20% less than men globally.
- **Limited Political Representation:** Only 23% of cabinet ministers and 27% of parliamentarians are women.
- **Gender-Based Violence Remains High:** 736 million women (1 in 3) experience physical or sexual violence.
- **Slow Legal Implementation:** While many laws exist, enforcement remains weak, and gender biases persist.
- **Digital Gender Divide:** Women remain underrepresented in AI and tech fields, and online harassment is rising.
- **Underfunded Gender Initiatives:** Only 4% of official development assistance is dedicated explicitly to gender equality.

Way Ahead:

- **Strengthen Legal Frameworks:** Implement strict enforcement mechanisms for gender-based violence laws, equal pay policies, and workplace rights.
- **Promote Economic Inclusion:** Expand women's access to finance, land ownership, and digital skills.
- **Increase Women's Political Participation:** Enforce gender quotas in governments, corporations, and global institutions.
- **Tackle Digital and AI Biases:** Develop ethical AI policies that prevent gender discrimination in technology.
- **Close the Gender Data Gap:** Enhance gender-responsive budgeting and policy tracking.
- **Invest in Women's Climate Leadership:** Fund women-led environmental solutions and green jobs.

Conclusion: Despite notable progress, gender disparities persist across political, economic, and social sectors. The Beijing Declaration remains relevant, urging governments and institutions to accelerate gender equality commitments. Achieving full empowerment requires stronger policies, better implementation, and global collaboration.

PYQ: "Micro-Finance as an anti-poverty vaccine, is aimed at asset creation and income security of the rural poor in India". Evaluate the role of Self-Help Groups in achieving the twin objectives along with empowering women in rural India. (UPSC-2020)

21. ASHA WORKERS AND HONORARIUM

Context:

ASHA workers in Kerala have been on strike for over a month, demanding fair wages, formal employment status, and social security benefits.

About Accredited Social Health Activists (ASHA Workers):

What is ASHA?

- **A community-based health worker program** under the **National Rural Health Mission (NRHM)**.
- ASHAs serve as the **link between rural communities and the public health system**.

Established In: 2005, as part of **NRHM**, now under the **National Health Mission (NHM)**.

Ministry Involved: Ministry of Health and Family Welfare (MoHFW)

Aim:

- Improve **maternal, newborn, and child health**.
- Promote **awareness and accessibility of healthcare services** in rural areas.
- Enhance **preventive healthcare measures** at the grassroots level.

Key Functions:

- **Health Monitoring & Record-Keeping:** Track **birth, death, and disease outbreaks**.
- **Maternal & Child Health Services:** Ensure institutional deliveries, immunization, and nutrition support.
- **Disease Control & Prevention:** Implement programs for communicable & non-communicable diseases.
- **Community Sanitation & Hygiene:** Promote clean drinking water and hygiene practices.
- **COVID-19 Response:** Played a crucial role in awareness, vaccination, and disease surveillance.

ASHA Workers' Role **in India's Development:**

- **Improving Maternal & Child Health:** ASHA workers have been instrumental in reducing maternal and infant mortality rates. **E.g.** India's Maternal Mortality Ratio (MMR) dropped from 130 per 100,000 live births in 2014-16 to 97 in 2018-20, largely due to ASHA-led institutional deliveries and antenatal care awareness.
- **Strengthening Rural Healthcare:** With over 10 lakh ASHA workers across India, they serve as the first point of contact for basic healthcare in rural areas, bridging the gap between communities and health facilities.
- **Disease Prevention & Surveillance:** ASHAs played a critical role in COVID-19 management, conducting active case surveillance, community awareness, and vaccination enrollment.
- **Women Empowerment & Livelihood Generation:** ASHAs, 98% of whom are women, have been empowered through income generation and leadership roles in community health.
- **Enhancing Public Health Outreach:** ASHAs assist in sanitation programs, menstrual hygiene awareness, and nutrition initiatives like Poshan Abhiyaan, improving overall community well-being.

Issues Surrounding ASHA Workers' Payments:

- **Low & Irregular Payments:** ASHA workers receive ₹5,000–₹15,000 per month, with only a fixed honorarium and incentives per task.
- **No Fixed Salary:** Unlike other government health workers, ASHAs are not classified as employees, denying them minimum wages, pensions, and social security benefits.
- **Inconsistent State Payments:** Honorariums vary by state, leading to disparities in earnings and frequent delayed payments.
- **No Job Security:** Despite being the backbone of rural healthcare, ASHAs lack formal employment status.

Why the Government Did Not Opt for a Regular Salary?

- **Volunteer-Based Model:** ASHAs were originally designated as volunteers to keep costs low and encourage community participation.
- **Financial Constraints:** Providing fixed salaries and benefits would place a significant financial burden on the central and state governments.
    - **Decentralized Implementation:** State-wise variations in payments allow flexibility but lead to wage disparities and

administrative inefficiencies.
- **Performance-Based Incentives:** The current model encourages task-specific incentives rather than a fixed wage system.

Way Ahead:
- **Grant ASHAs Worker Status:** Recognize ASHAs as government employees to provide fixed salaries and benefits.
- **Ensure Timely Payments:** Strengthen financial mechanisms to avoid payment delays and ensure livelihood security.
- **Improve Incentive Structure:** Offer higher performance-linked bonuses while guaranteeing a base salary.
- **Enhance Social Security:** Provide pension, health insurance, and maternity benefits for long-term financial stability.
- **Increase Budget Allocation:** Allocate higher funds for ASHA programs under the National Health Mission (NHM).

Conclusion: ASHA workers have been the backbone of India's rural healthcare system for nearly two decades. However, their low wages, lack of job security, and informal status continue to be major concerns. Recognizing them as formal employees with fair wages and social security is crucial to ensuring better healthcare delivery and empowering women in the workforce.

PYQ: The increase in life expectancy in the country has led to newer health challenges in the community. What are those challenges and what steps need to be taken to meet them? (UPSC-2022)

22. AI AND CRITICAL THINKING

Context:
With AI tools becoming widespread in classrooms, concerns are rising over their impact on students' critical thinking abilities, as many rely on AI-generated responses instead of independent reasoning.

What is Critical Thinking?
- **Critical thinking** is the **ability to analyze, evaluate, and interpret information logically and independently**.
- It involves questioning assumptions, identifying biases, drawing reasoned conclusions, and making informed decisions.
- Key components include problem-solving, logical reasoning, creativity, and evidence-based analysis.

How AI Can Overpower Critical Thinking?
- **Instant Answers Without Effort:** AI provides quick solutions, reducing students' habit of deep analysis and independent problem-solving.
- **Lack of Questioning Mindset:** Over-reliance on AI-generated content discourages curiosity and intellectual engagement.
- **Bias in AI Models:** AI algorithms reflect biases present in training data, leading to misinformation and one-sided perspectives.
- **Decline in Cognitive Retention:** AI-driven learning may weaken memory retention and analytical skills as users absorb ready-made answers without reflection.
- **Overdependence on AI for Creativity:** Many users rely on AI for content creation, writing, and innovation, limiting human originality and thought-processing skills.

Why Critical Thinking Remains Superior to AI?
- **Contextual Understanding:** Unlike AI, human reasoning considers emotions, ethics, and real-world complexities in decision-making.
- **Ability to Challenge and Adapt:** Critical thinkers challenge assumptions and evolve perspectives, while AI only generates outputs based on patterns.
- **Moral and Ethical Judgment:** AI lacks ethical reasoning; humans assess fairness, justice, and moral dilemmas.
- **Problem-Solving in Unpredictable Situations:** AI operates within predefined rules, while human cognition adapts to novel and uncertain circumstances.
- **Intuition and Emotional Intelligence:** AI lacks human empathy and intuition, which are essential for understanding emotions and making balanced decisions.

Importance of Critical Thinking in Life:

- **Enhances Decision-Making:** Helps individuals make logical, well-informed choices in personal and professional life.
- **Strengthens Problem-Solving Skills:** Equips individuals to analyze situations, evaluate alternatives, and implement effective solutions.
- **Prevents Misinformation Spread:** Encourages fact-checking, questioning sources, and resisting manipulation.
- **Fosters Innovation and Creativity:** Critical thinkers explore new ideas and push intellectual boundaries, leading to groundbreaking innovations.
- **Essential for Leadership and Governance:** Leaders with strong critical thinking skills make rational policies, resolve conflicts, and drive progress.

Conclusion:

While AI enhances efficiency, it should complement rather than replace critical thinking. Education systems must balance AI integration with independent reasoning skills to ensure holistic intellectual development. The future of learning lies in harmonizing technology with human cognition, fostering analytical and ethical decision-making.

PYQ:

Introduce the concept of Artificial Intelligence (AI). How does AI help clinical diagnosis? Do you perceive any threat to privacy of the individual in the use of AI in healthcare? (UPSC-2023)

Syllabus: Structure, organization and functioning of the Executive and the Judiciary.

23. ROLE OF AI IN JUSTICE DELIVERY

Context::

Artificial Intelligence (AI) is transforming governance, with major powers investing heavily in AI-led justice reforms. The **US government's $100 billion Stargate AI Initiative** and **China's rapid AI development with LLMs like QWQ and DeepSeek** showcase the global AI race. India, too, must leverage AI to address its **judicial backlog of over 50 million cases** and improve law enforcement.

AI in Law Enforcement and Crime Prevention

Enhancing Police Operations with AI:

- **AI in SMART Policing:** The **Government of India's SMART policing initiative (Strategic, Meticulous, Adaptable, Reliable, Transparent)** can benefit from AI in crime detection and predictive policing.
- **Automated FIR Registration:** AI chatbots in police stations, like **Mumbai Police's AI-assisted e-FIR system**, can reduce paperwork and speed up case filings.
- **Predictive Policing:** AI-driven **Crime Mapping tools, like those used by the Delhi Police**, analyze **NCRB data trends** to identify high-crime zones.
- **Facial Recognition for Law Enforcement:** AI-powered systems like **"AFRS" (Automated Facial Recognition System)** deployed by the National Crime Records Bureau (NCRB) aid in identifying criminals.

AI in Cybercrime Prevention and Investigation:

- **AI-Based Fraud Detection:** Banks and law enforcement agencies use AI-powered fraud detection, as seen in **RBI's** AI-driven **fraud monitoring system (CRILC)**.
- **Deepfake Detection:** AI tools like **Microsoft's Video Authenticator** help in spotting manipulated content and deepfakes, which are increasingly used for cybercrimes.
- **AI-Powered Cybersecurity:** Agencies like **CERT-In (Indian Computer Emergency Response Team)** use AI to detect phishing, ransomware, and digital threats.

AI in Judicial System and Courtroom Efficiency

1. Reducing Judicial Backlogs with AI

- **E-Courts Initiative:** Under the **Supreme Court's E-Courts Mission Mode Project**, AI tools like SUPACE **(Supreme Court Portal for Assistance in Court Efficiency)** assist judges in case research and legal precedent identification.
- **AI-Powered Document Management:** AI assists in digitizing court records under **Phase III of the e-Courts Project**, reducing paperwork and case delays.

2. AI in Courtroom Operations

- **Real-Time Transcription:** AI-driven tools like **"JudiBot"** being tested in US courts could be adopted in India for automatic transcription of hearings.
- **AI in Bail & Sentencing Decisions:** The **Delhi High Court explored AI-based risk assessment models** to ensure consistency in bail and parole decisions.
- **AI Fraud Detection in Legal Documents:** AI verifies legal document authenticity, reducing delays due to fake affidavits and forged contracts.

Challenges in AI Adoption for Justice Delivery

1. Accuracy & Ethical Issues

- **Bias in AI Models:** AI-driven risk assessment models in the US, like **COMPAS (Correctional Offender Management Profiling for Alternative Sanctions)**, have faced racial bias issues. India must ensure **bias-free AI training data**.
- **Privacy Risks:** AI adoption must comply with **India's Digital Personal Data Protection Act (2023)** to prevent misuse of sensitive citizen data.

2. Implementation & Policy Roadblocks

- **Lack of AI Training in Law Enforcement:** AI in policing requires **massive training programs**, similar to Singapore's **AI for Justice Initiative**.
- **Regulatory Gaps:** The **B.N. Srikrishna Committee on AI Governance** has emphasized the need for a legal framework for AI in the judiciary.

Way Forward

- **Establish an AI Justice Task Force:** A central agency should oversee AI integration in policing and courts.
- **Expand AI Usage in Judiciary:** AI-driven legal analytics should be **mandated across all high courts**.
- **Develop Ethical AI Guidelines:** AI regulations must align with **NITI Aayog's AI strategy** to prevent algorithmic biases.
- **Invest in AI Training Programs:** Law enforcement and judiciary personnel must be trained in AI-based crime and case analysis.

Conclusion::

AI is reshaping the legal landscape worldwide, and India must harness its potential for **faster case resolution, efficient policing, and improved judicial transparency**. While challenges like **bias, data privacy, and ethical concerns** remain, **a structured AI framework and policy-driven implementation** can make AI a powerful tool for justice. India must act swiftly to integrate AI responsibly, ensuring justice is both **timely and fair**.

PYQ::

Introduce the concept of Artificial Intelligence (AI). How does AI help clinical diagnosis? Do you perceive any threat to privacy of the individual in the use of AI in healthcare? (2023)

24. JUDICIAL ACCOUNTABILITY IN INDIA

Context:

Vice-President Jagdeep Dhankhar met key political leaders to discuss judicial accountability amid allegations of large-scale cash recovery from the residence of Delhi High Court Judge Yashwant Varma, with the judiciary's internal probe underway.

What is Judicial Accountability?

Definition: Judicial accountability refers to holding judges answerable for their conduct and decisions within constitutional and legal frameworks.

Features of Judicial Accountability:

- Ensures transparency and integrity in the judiciary.
- Balances independence with public responsibility.
- Includes adherence to ethical codes and judicial discipline.
- Allows inquiry mechanisms for misconduct.
- Prevents misuse of judicial power.

Need for Judicial Accountability in India:

- **Public Trust:** Accountability strengthens public faith in the justice delivery system.
  Example: The *Justice Nirmal Yadav* case highlighted the damage to institutional credibility due to delayed action.
- **Prevention of Corruption:** Curb corruption and misuse of power in the higher judiciary.
- **Checks on Unreviewable Power:** As Justice V.R. Krishna Iyer emphasized, unreviewable power requires more

scrutiny.
- **Enhancing Judicial Efficiency:** Ensures judges uphold efficiency, ethics, and constitutional values.
- **Institutional Integrity:** Prevents misuse of constitutional safeguards to protect personal interests.

Laws and Constitutional Articles to Ensure Judicial Accountability:
- **Articles 124(4) and 218:** Provide for the removal of Supreme Court and High Court judges on grounds of proved misbehaviour or incapacity.
- **Judges (Inquiry) Act, 1968:** Specifies procedures for investigation and impeachment of judges.
- **Articles 227 and 235:** Empower High Courts to supervise subordinate courts.
- **In-house Procedure (1999):** Established by the Supreme Court for internal inquiries against judges.
- **RTI Act:** Intended to promote transparency in judicial functioning, though implementation remains weak.

Challenges to Judicial Accountability:
- **Lack of Transparency:** Outcomes of in-house probes are often kept secret. Example: *Justice Soumitra Sen* resigned before the impeachment motion could reach Lok Sabha.
- **Contempt Powers:** Fear of contempt discourages public discussion on judicial misconduct.
- **Misuse of Constitutional Protection:** Judges sometimes misuse independence clauses for personal shelter.
- **Delays in Proceedings:** Judicial misconduct cases drag on for years, reducing deterrence. Example: The *Justice Nirmal Yadav* case has remained unresolved for over 14 years.
- **No Dedicated Ombudsman:** Absence of an independent judicial accountability authority.

Way Ahead:
- **Establish Judicial Ombudsman:** A dedicated body to independently investigate complaints against judges.
- **Strengthen In-house Procedure:** Ensure findings are made public to foster transparency.
- **Revisit NJAC or Judicial Appointment Reforms:** Balance independence with accountability through transparent judicial appointments.
- **Use of Technology:** Digital monitoring and tracking of case timelines for efficiency.
- **Regular Ethics Training:** Periodic orientation for judges on judicial ethics and public accountability.

Conclusion:
Judicial accountability is key to maintaining the judiciary's integrity, independence, and public trust. Institutional safeguards must adapt to ensure accountability without compromising judicial freedom. Transparent procedures and strong oversight will strengthen democracy and public confidence in the judiciary.

PYQ:
Who are entitled to receive free legal aid? Assess the role of the National Legal Services Authority (NALSA) in rendering free legal aid in India (UPSC-2023)

25. NATIONAL JUDICIAL APPOINTMENTS COMMISSION (NJAC)

Context:
The discovery of cash at the home of Delhi HC Judge Yashwant Varma has renewed debate over judicial appointments. **Vice President** remarked that the situation could have been different had the **National Judicial Appointments Commission (NJAC) not been struck down** by the Supreme Court in 2015.

About National Judicial Appointments Commission (NJAC):
What is NJAC?
Proposed Law: National Judicial Appointments Commission (NJAC) was created through the **99th Constitutional Amendment Act, 2014** and NJAC Act, 2014. It sought to **replace the collegium system** with a **multi-stakeholder body** to appoint judges to the SC and HCs.

Composition of NJAC:
- Chief Justice of India (Chairperson)
- Two senior-most SC judges
- Union Law Minister
- Two eminent persons (selected by PM, CJI, and LoP, with one from SC/ST/OBC/women/minorities)

Why Was NJAC Struck Down?

- In **2015**, a **5-judge Bench (4:1)** ruled NJAC **unconstitutional** as it violated the **Basic Structure Doctrine**.
- The Court observed that **judicial primacy in appointments is part of the basic structure** and NJAC allowed the executive to **interfere via veto powers**.
- Concerns over **independence of judiciary** and possible **3-3 deadlocks** led to the rejection of the law.

Why India Needs NJAC:

- **Opaque Collegium Process:** Justice Ruma Pal termed the collegium as a "well-kept secret", highlighting **lack of transparency and accountability**.
- **Political Consensus on NJAC:** Passed with **overwhelming majority in Parliament** and ratified by **16 state legislatures**, showing rare bipartisan support.
- **Growing Allegations of Nepotism:** Alleged lobbying and favoritism within collegium undermine **merit and fairness** in appointments.
- **Need for Diverse Input:** Inclusion of eminent persons could bring **external perspectives** and help curb internal biases.
- **Dysfunctional Collegium:** Even **Justice Kurian Joseph**, part of the majority in NJAC case, later **regretted striking it down**, citing ongoing flaws in collegium functioning.

Challenges to Reinstating NJAC

- **Judicial Resistance:** Judiciary defends its primacy as part of the **basic structure**, making reversal unlikely without careful negotiation.
- **Veto Provision Issue:** The **veto power** given to non-judicial members led to fears of **executive overreach**.
- **Lack of Clear Selection Criteria:** Ambiguity in how "eminent persons" would be chosen raises concerns over potential politicization.
- **Risk of Deadlock:** Equal representation of judiciary and non-judiciary in NJAC could lead to **stalemates in decision-making**.
- **Constitutional Hurdles:** Any attempt to reinstate NJAC must pass judicial review and maintain **basic structure compliance**.

Way Ahead:

- **Balanced Redesign:** A revised NJAC model must ensure **judicial primacy** while incorporating **transparency and checks**.
- **Constitutional Safeguards:** Amend NJAC provisions to **limit veto powers**, or provide **casting vote to CJI** to avoid deadlock.
- **Transparent Collegium Reforms:** Even if NJAC isn't revived, reforming collegium by **publishing selection criteria and feedback reports** is necessary.
- **Stakeholder Consultation:** Involve judiciary, executive, legal experts, and civil society in designing a **more acceptable framework**.
- **Judicial Accountability Bill:** Enact complementary legislation for **performance review**, **complaint redressal**, and **discipline** of judges.

Conclusion:

NJAC verdict remains a pivotal moment in India's constitutional history. While judicial independence must be preserved, **reforms are essential** to restore public confidence in appointments. A **rebalanced NJAC**, rooted in **transparency and constitutional values**, could be the way forward.

PYQ:

Discuss the desirability of greater representation to women in the higher judiciary to ensure diversity, equity and inclusiveness. (UPSC-2021)

26. CLOSING THE GENDER GAP IN THE HIGHER JUDICIARY

Context::

Indian Judiciary has witnessed notable progress in women's representation over the past century, starting with **Cornelia Sorabji** becoming India's first woman lawyer in **1924**. However, despite increased participation in the legal profession, women remain significantly underrepresented in the **Supreme Court** and **High Courts**, reflecting systemic inequalities and procedural opacity.

Current Status of Women in the Higher Judiciary:

- **High Courts:** Women account for only **14.27%** of judges (109 out of 764). Several High Courts, including **Uttarakhand**, **Meghalaya**, and **Tripura**, have **no women judges**. The **Allahabad High Court**, India's largest High Court, has just **3 women judges out of 79** (approximately 2%).
- **Supreme Court:** The top court currently has only **two women judges — Justice B.V. Nagarathna** and **Justice Bela Trivedi**. With Justice Bela Trivedi's impending retirement in **June 2025**, the Supreme Court will be left with only one woman judge.
- **Age Disparity:** Women judges are appointed at an **average age of 53**, while men are appointed at an average age of **51.8**, reducing their prospects of reaching seniority or leadership roles.
- **Leadership Deficit:** Out of 25 High Courts, only the **Gujarat High Court** has a **woman Chief Justice**.

Challenges Leading to Gender Imbalance

- **Systemic Inequality:** Women lawyers face **heightened scrutiny** in judicial appointments. While men's merit is often presumed, women are frequently required to **prove their competence** to a greater degree.
- **Opaque Collegium System:** The collegium lacks **clear eligibility criteria** and fails to ensure gender-inclusive recommendations. This opacity disproportionately affects women candidates.
- **Gender Bias in Recommendations:** Since **2020**, **nine women** recommended for High Court judgeships were not confirmed by the government. Among these, **five** were the **only names rejected** in their respective lists, underscoring systemic bias.
- **Limited Elevation from the Bar:** Over **75 years**, only **one woman** has been elevated directly from the Bar to the Supreme Court, whereas **nine men** have been elevated via this route.
- **Institutional Barriers:** Women lawyers face fewer networking opportunities, insufficient mentorship, and limited access to senior roles, reinforcing exclusion from higher judicial positions.

Significance of Greater Women's Representation

- **Enhances Judicial Legitimacy:** A gender-balanced judiciary enhances **inclusivity** and aligns courts with the diverse socio-economic realities they adjudicate.
- **Improved Decision-Making:** Greater diversity promotes **balanced perspectives** and fosters judgments that are more reflective of ground realities.
- **Strengthens Public Trust:** Women's presence on the Bench signals greater **fairness and impartiality**, improving citizens' trust in judicial processes.
- **Encourages Gender-Sensitive Jurisprudence:** Women judges are more likely to influence cases involving **gender rights**, **family law**, and **sexual violence**, enriching the court's approach to justice delivery.

Way forward for achieving gender parity

- **Transparent Collegium process:** The collegium must establish **clear criteria** for judicial appointments, including a structured application process for women lawyers to express their interest.
- **Mandatory gender representation:** The judiciary must institutionalize a policy ensuring that **at least one-third** of judges in the higher judiciary are women.
- **Merit-based selection with diversity:** Diversity and merit must be seen as complementary, ensuring selection is based on **excellence and integrity** while prioritizing gender inclusion.
- **Mentorship and leadership support:** Dedicated programs to **mentor and train** women lawyers for leadership roles will help break systemic barriers.
- **Review of rejected recommendations:** The government must adopt a policy requiring **clear explanations** when rejecting candidates recommended by the collegium, especially women.

Conclusion::

Achieving gender parity in the higher judiciary is vital to **upholding constitutional values of equality**, **inclusiveness**, and **justice**. As **Justice Indira Banerjee** rightly emphasized, women's appointments must become **normalized** rather than celebrated as exceptional. By ensuring a transparent, merit-driven, and gender-conscious appointment process, India's higher judiciary can better reflect the diverse society it serves.

PYQ::

Discuss the desirability of greater representation to women in the higher judiciary to ensure diversity, equity and inclusiveness. (10 M) (2021)

Syllabus: Effect of policies and politics of developed and developing countries on India's interests

27. USAID FUNDING CUTS AND THEIR IMPACT ON INDIA

Context::

USAID has been a key contributor to India's health, environmental, and technological sectors, providing **$2.8 billion** in aid since 2001. The US administration's **January 20, 2025, executive order** aims to halt foreign aid, significantly impacting USAID-supported programs in India. A **U.S. Supreme Court ruling on March 5, 2025, upheld the decision**, raising concerns about the future of critical health and development projects.

What is it About?

USAID's Financial Contribution – India received $228 million in 2022, ranking USAID fourth among global donors.

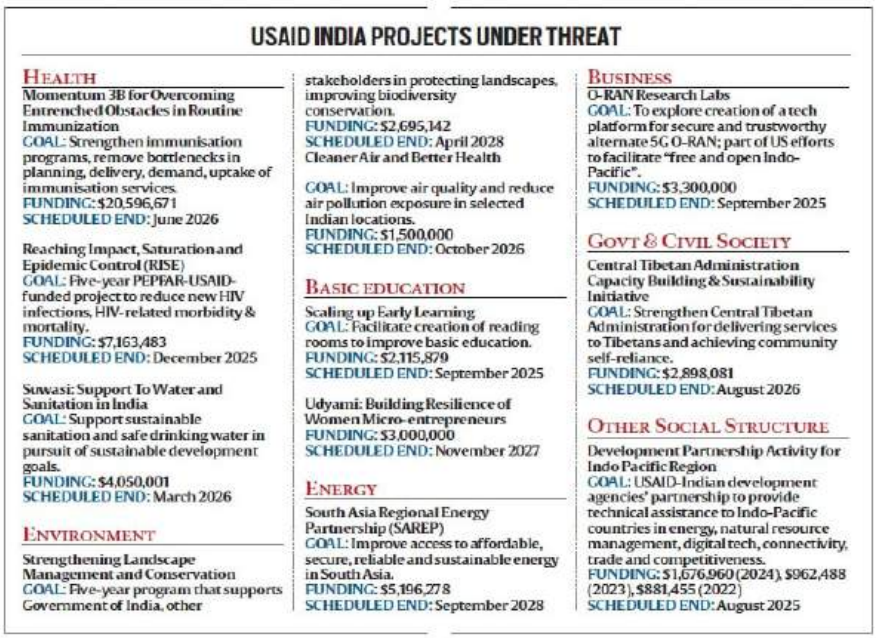
- **Health & Population Programs** – Funding focused on **TB, HIV/AIDS, maternal health, and Covid-19**, with **$180 million allocated in 2022**.
- **Environmental & Technological Aid** – USAID invested **$17.12 million in 2024** for clean air, water, and sustainable development projects.
- **Executive Order on Aid Reduction** – The **U.S. government reassessed 5,800 foreign aid projects**, retaining only **500** to cut spending.
- **Legal Battles Over Funding Cuts** – A **U.S. Federal Court stay on February 13, 2025**, was **overturned by the Supreme Court on March 5, 2025**.
- **Impact on NGOs & Public Health** – Programs like **Breaking the Barriers (TB awareness in India) and HIV/AIDS prevention under PEPFAR** face discontinuation.

Benefits **of USAID in India:**

- **Public Health Strengthening** – Support for **polio eradication, TB control, and HIV/AIDS prevention**, with **$7 million allocated in 2022-23**.
- **Covid-19 Response Enhancement** – USAID provided **$120 million in 2022** for **vaccines, medical infrastructure, and pandemic relief**.
- **Environmental Sustainability** – Funded **pollution control, clean water initiatives, and climate resilience projects**, boosting **India's ecological security**.
- **Economic & Institutional Development** – Strengthened **public health systems, research collaborations, and NGO capacity building**.
- **Technology & Digital Infrastructure** – Supported **secure 5G O-RAN development**, enhancing **India's telecom security and digital sovereignty**.

Challenges **Due to USAID Funding Cuts**

- **Health Sector Crisis** – The sudden halt affects programs addressing **TB, HIV/AIDS, and maternal health**, previously funded with **$180 million in 2022**.
- **Increased Disease Burden** – Loss of **$12.13 million for HIV/AIDS in 2023** could lead to rising infections and mortality rates.
- **NGO Funding Shortfall –** Organizations like **Karnataka Health Promotion Trust (KHPT)** face operational uncertainty and layoffs.
- **Strategic Influence Shift** – The **withdrawal of U.S. aid** could create a **vacuum for China** to expand its economic and geopolitical influence in South Asia.
- **Legal & Policy Instability** – The **March 5, 2025, Supreme Court ruling** causes uncertainty in **global development partnerships** and aid negotiations.



USAID INDIA PROJECTS UNDER THREAT

HEALTH

Momentum 3B for Overcoming Entrenched Obstacles in Routine Immunization
GOAL: Strengthen immunisation programs, remove bottlenecks in planning, delivery, demand, uptake of immunisation services.
FUNDING: $20,596,671
SCHEDULED END: June 2026

Reaching Impact, Saturation and Epidemic Control (RISE)
GOAL: Five-year PEPFAR-USAID-funded project to reduce new HIV infections, HIV-related morbidity & mortality.
FUNDING: $7,163,483
SCHEDULED END: December 2025

Suwasi: Support To Water and Sanitation in India
GOAL: Support sustainable sanitation and safe drinking water in pursuit of sustainable development goals.
FUNDING: $4,050,001
SCHEDULED END: March 2026

ENVIRONMENT

Strengthening Landscape Management and Conservation
GOAL: Five-year program that supports Government of India, other stakeholders in protecting landscapes, improving biodiversity conservation.
FUNDING: $2,695,142
SCHEDULED END: April 2028

Cleaner Air and Better Health
GOAL: Improve air quality and reduce air pollution exposure in selected Indian locations.
FUNDING: $1,500,000
SCHEDULED END: October 2026

BASIC EDUCATION

Scaling up Early Learning
GOAL: Facilitate creation of reading rooms to improve basic education.
FUNDING: $2,115,879
SCHEDULED END: September 2025

Udyami: Building Resilience of Women Micro-entrepreneurs
FUNDING: $3,000,000
SCHEDULED END: November 2027

ENERGY

South Asia Regional Energy Partnership (SAREP)
GOAL: Improve access to affordable, secure, reliable and sustainable energy in South Asia.
FUNDING: $5,196,278
SCHEDULED END: September 2028

BUSINESS

O-RAN Research Labs
GOAL: To explore creation of a tech platform for secure and trustworthy alternate 5G O-RAN; part of US efforts to facilitate "free and open Indo-Pacific".
FUNDING: $3,300,000
SCHEDULED END: September 2025

GOVT & CIVIL SOCIETY

Central Tibetan Administration Capacity Building & Sustainability Initiative
GOAL: Strengthen Central Tibetan Administration for delivering services to Tibetans and achieving community self-reliance.
FUNDING: $2,898,081
SCHEDULED END: August 2026

OTHER SOCIAL STRUCTURE

Development Partnership Activity for Indo Pacific Region
GOAL: USAID-Indian development agencies' partnership to provide technical assistance to Indo-Pacific countries in energy, natural resource management, digital tech, connectivity, trade and competitiveness.
FUNDING: $1,676,960 (2024), $962,488 (2023), $881,455 (2022)
SCHEDULED END: August 2025

Way Forward

- **Diversify Global Funding Sources** – India must **engage with alternative donors like Japan ($2.97B), EU ($383.5M), and Germany ($235M)** to sustain development efforts.
- **Enhance Domestic Investment** – The government should **increase financial allocations for public health, infrastructure, and environmental projects**.
- **Strengthen NGO & Private Partnerships** – Collaboration with **corporations, philanthropic organizations, and CSR initiatives** can fill funding gaps.
- **Develop Indigenous Technological Capabilities** – Boosting **R&D in public health, digital infrastructure, and clean energy** will reduce reliance on external aid.
- **Diplomatic Engagement with the U.S.** – India should **negotiate with policymakers to restore funding for critical programs through alternate diplomatic channels**.

Conclusion::

USAID's funding withdrawal presents a major challenge for India's **healthcare, environmental sustainability, and technological progress**. To mitigate the impact, India must **expand international partnerships, boost domestic investment, and enhance self-reliance**. A proactive approach will ensure **continued progress in public health, environmental resilience, and digital transformation**.

PYQ:

The expansion and strengthening of NATO and a stronger US-Europe strategic partnership works well in India.' What is your opinion about this statement? Give reasons and examples to support your answer. (15 marks) (2023)

28. NORTH EAST CENTRE FOR TECHNOLOGY APPLICATION AND REACH (NECTAR)

Context:

Union Minister laid the foundation stone for NECTAR's permanent campus in Shillong, aiming to boost technology-driven growth in Northeast India.

About North East Centre for Technology Application and Reach (NECTAR):

What is NECTAR?

- An autonomous body under the Department of Science and Technology (DST), Government of India.
- Focuses on technological applications for the development of Northeast India.

Established In: 2014, under the Ministry of Science & Technology.

Headquarters: Shillong, Meghalaya.

Aim:

- **Promote technological advancements** for **socio-economic development** in Northeast India.
- **Bridge the gap** between research institutions and **grassroots innovations**.
- Encourage sustainable agricultural practices like saffron **and bamboo cultivation**.

Functions & Features:

- **Technology Application in Agriculture:** Expanding saffron cultivation in Northeast India, similar to Lavender farming in J&K.
- **Drone Technology for Land Mapping:** Supports the 'Swamitva' program for efficient land records management.
- **Bamboo & Honey Production:** Boosts eco-friendly industries to generate sustainable livelihoods.
- **Infrastructure & Connectivity Enhancement:** Works on scientific and technological interventions to improve rural accessibility.
- **Skill Development & Research:** Establishing a Centre of Excellence in Shillong for advanced tech training and innovation.

Syllabus: International Relations

29. GLOBAL CRISES DEMAND A NEW GOVERNANCE MODEL

Context:

The United Nations (UN) faces criticism for being ineffective in addressing global crises, including climate change, pandemics, and economic instability.

Existing Global Governance System

- **United Nations (UN):** Established in **1945**, it focuses on **peacekeeping, humanitarian aid, and international cooperation**, but struggles with enforcement.
- **Bretton Woods Institutions:** The **World Bank and IMF** were created for **economic stability**, but they favor developed nations.
- **World Trade Organization (WTO):** Regulates global trade but faces **criticism for being slow and biased**.
- **Regional Alliances:** Groups like **EU, ASEAN, BRICS**, and **G20** handle economic and political cooperation but lack a unified global framework.

Need for Reform in Global Governance

- **Borderless Challenges:** Issues like climate change, AI regulation, and pandemics require a supranational approach. **E.g.** COVID-19 exposed the weaknesses of WHO, with unequal vaccine distribution (e.g., Africa received vaccines late compared to Western countries).
- **Outdated Structures:** The UN Security Council's composition does not reflect modern global power dynamics. **E.g.** India, Africa, and Latin America lack permanent representation, despite contributing to global peacekeeping and economy.
- **Inefficiency and Bureaucracy:** Slow decision-making and lack of enforcement mechanisms weaken governance. **E.g.** UN's failure to act swiftly in the Rohingya crisis in Myanmar due to bureaucratic hurdles.
- **Global South's Marginalization:** Developing countries lack representation in major decision-making bodies. **E.g.** IMF and World Bank voting power favors Western nations, where the US alone holds veto power over major decisions.
- **Need for Local-Global Integration:** Strong local governance structures must complement global efforts.

Challenges to Global Governance Reforms:

- **National Sovereignty Conflicts:** Countries are reluctant to cede power to supranational bodies. **E.g.** China and Russia oppose stronger UN intervention, fearing interference in their internal policies (e.g., Hong Kong, Ukraine conflict).
- **Geopolitical Rivalries:** Power struggles between USA, China, Russia, and EU hinder cooperation. **E.g.** US-China trade war and sanctions on Russia disrupt global economic stability and cooperation.
- **Lack of Enforcement Mechanisms:** The UN lacks authority to enforce policies effectively. **E.g.** UN resolutions against North Korea's nuclear program failed due to lack of enforcement.
- **Economic and Political Inequality:** Developing nations face limited influence in global decision-making. **E.g.** Africa's minimal role in global financial policies, despite being resource-rich.
- **Public Distrust in Institutions:** Growing populism and nationalism weaken support for global governance reforms.

Way Ahead:

- **Security Council Reform:** Expand permanent membership to include India, Africa, and Latin America. **E.g.** G4 nations (India, Germany, Japan, Brazil) advocate for UNSC reforms, highlighting their economic and political contributions.
- **Strengthening Multilateral Institutions:** Improve decision-making transparency and accountability. **E.g.** G20's role in pandemic response, coordinating economic relief packages globally.
- **Planetary Governance Model:** Shift from nation-state logic to a supranational framework with local integration. **E.g.** Citizen-led climate initiatives (e.g., Fridays for Future movement) have influenced global climate policies.
- **Public Participation & Trust:** Promote inclusive governance with greater involvement of civil society and local bodies.
- **Technology-Driven Solutions:** Use AI, big data, and blockchain for transparent and efficient governance. **E.g.** WHO's AI-driven pandemic tracking system could improve early crisis intervention.

Conclusion:

The 21st century demands a governance model that transcends national borders and integrates local and global structures. The UN and other international institutions must adapt to planetary realities to address interconnected crises effectively. A hybrid governance approach can balance national sovereignty with global cooperation, ensuring a sustainable future.

PYQ:

What are the key areas of reform if the WTO has to survive in the present context of Trade War', especially keeping in mind the interest of India? (UPSC-2018)

30. INDIA-NEW ZEALAND RELATIONS

Context:

Prime Minister of New Zealand, Christopher Luxon, visited India from 16–20 March 2025. Both nations agreed to strengthen bilateral cooperation across trade, defence, technology, and multilateral engagement.

About India–New Zealand Bilateral Relations: Historical Overview

- **Early connections:** Relations date back to the 1800s, with Indian immigrants settling in New Zealand, particularly in Christchurch by 1850.
- **Wartime cooperation:** Indian troops fought alongside ANZAC forces in Gallipoli in 1915.
- **Diplomatic ties:** India established a trade commission in New Zealand in 1950, later upgraded to a High Commission.
- **Common platforms:** Both countries are members of the Commonwealth and share democratic values and parliamentary governance.
- **Global commitment:** Both support global peace, disarmament, ecological preservation, and combat international terrorism.

Significance of India–New Zealand Bilateral Relationship:

Economic potential: India is New Zealand's 11th largest trading partner; bilateral trade valued at USD 1.80 billion (2020).

Strategic alignment: Shared interest in maintaining a stable Indo-Pacific and freedom of navigation under UNCLOS.

MAJOR OUTCOMES OF THE RECENT INDIA–NEW ZEALAND BILATERAL SUMMIT:

Launch of FTA Negotiations:

- Both leaders agreed to initiate Free Trade Agreement negotiations for a balanced, comprehensive, and mutually beneficial trade pact to enhance bilateral economic integration.

Defence Cooperation Agreement Signed:

- A Memorandum of Understanding (MoU) for Defence Cooperation was signed to deepen defence ties, including naval port calls (INS Tarini in Christchurch and upcoming HMNZS Te Kaha in Mumbai), defence delegation exchanges, and staff college participation.

New Zealand's Entry into the Indo-Pacific Oceans Initiative (IPOI):

- New Zealand expressed interest and was welcomed into the IPOI, promoting regional maritime security, sustainability, and cooperation in the Indo-Pacific.

Refreshed Education Cooperation Agreement:

- An updated Education Cooperation Arrangement was signed between the Ministries of Education to strengthen academic exchange, research collaboration, and student mobility.

Collaboration in Science, Technology, and Climate Resilience:

- Agreements on joint initiatives in horticulture, forestry, climate change mitigation, and earthquake preparedness were discussed, with New Zealand joining India's Coalition for Disaster Resilient Infrastructure (CDRI).

Diaspora connection: Approximately 2,50,000 persons of Indian origin live in New Zealand, strengthening people-to-people ties.

Tourism growth: 67,953 Indian visitors to NZ (2018); direct flight operations between both nations encouraged.

Climate and disaster cooperation: New Zealand supports India in the International Solar Alliance (ISA) and has joined the Coalition for Disaster Resilient Infrastructure (CDRI).

Challenges in India–New Zealand Relations:

Trade imbalances: India primarily imports logs and wood pulp; balanced trade requires diversification and value addition.

FTA delays: Previous attempts for an FTA have seen slow progress despite potential benefits.

Limited defence depth: Although engagements are growing, full-spectrum military cooperation remains limited compared to other Quad members.

Visa and mobility issues: Indian students and skilled workers face procedural hurdles; irregular migration concerns noted.

Underutilised cultural diplomacy: Despite strong diaspora ties, Indian cultural promotion in New Zealand could be more dynamic.

Way Ahead:

- **Accelerate FTA conclusion:** Conclude comprehensive and mutually beneficial FTA negotiations promptly.
- **Boost defence engagements:** Conduct regular bilateral military exercises and staff exchanges.
- **Enhance educational ties:** Promote Indian students' mobility with robust scholarship schemes and simplified visa processes.
- **Strengthen climate partnership:** Joint research in green tech, horticulture, and disaster mitigation must be scaled up.
- **Expand maritime collaboration:** Leverage IPOI membership and bilateral naval dialogues for Indo-Pacific maritime security.

Conclusion:

India and New Zealand relations are rooted in shared democratic values, trade, and strategic alignment in the Indo-Pacific. The recent meeting marks a renewed commitment to expand cooperation in defence, trade, climate, and education. With proactive engagement and addressing key challenges, this partnership can become a model in the Indo-Pacific landscape.

PYQ:

The newly tri-nation partnership AUKUS is aimed at countering China's ambitions in the Indo-Pacific region. Is it going to supersede the existing partnerships in the region? Discuss the strength and impact of AUKUS in the present scenario. (UPSC-2021)

31. INDIA MAURITIUS RELATIONS

Context:

India and Mauritius upgraded their ties to an Enhanced Strategic Partnership during Prime Minister visit to Port Louis.

India-Mauritius Diplomatic History:

Colonial Era & Early Connections (Pre-1947):

Indian indentured labourers formed the foundation of Indo-Mauritian ties under British rule.

Mahatma Gandhi's 1901 visit inspired political consciousness among the **Indian diaspora** in Mauritius.

Post-Independence Era (1947–1968):

India supported Mauritius's **anti-colonial movements** and continues to back its **territorial claim over Chagos Archipelago**.

India established **diplomatic relations** with Mauritius following its **independence in 1968**.

Economic & Strategic Expansion (1983–2020):

DTAA (1983) made Mauritius a key **FDI gateway** for India. India supported **maritime security** (Coast Guard setup), **digital growth**, and **metro infrastructure**.

Mauritius joined **India's SAGAR initiative** in 2020.

Recent Developments (2021-Present):

The **CECPA (2021)** strengthened trade ties, Mauritius joined India's **Indo-Pacific strategy**, and ISRO helped launch **Mauritius' first satellite (2022)**.

In **2024**, India expanded Blue Economy **cooperation** and revised **DTAA to prevent tax treaty abuse**.

Key Highlights of the Joint Declaration

Defence & Maritime Security

- **Refit of Coast Guard Ships:** Victory, Valiant, and Barracuda provided on a grant basis.
- **Joint Maritime Surveillance:** Increased deployment of Indian naval ships and aircraft.
- **Security of EEZ:** Cooperation on the Agalega runway and jetty to counter China's presence in the Indian Ocean.

Infrastructure & Development:

- **100 Electric Buses:** Delivery of e-buses and charging infrastructure for clean transport.
- **Water Pipeline Project:** Replacement of 100 km of water pipelines, backed by a ₹487 crore rupee-denominated line of credit (India's first-ever rupee-based credit line).
- **New Parliament Building:** India to gift a new Mauritius Parliament as a symbol of democracy.

Digital Cooperation & Capacity Building

- **E-Judiciary System:** India to support digitization of judicial services in Mauritius.
- **Police & Civil Services Training:** Training 500 Mauritian civil servants in India over five years.
- **Cybersecurity & ICT:** Collaboration in Digital Public Infrastructure and cyber resilience.

Health & Education

- **Jan Aushadhi Kendras:** Expansion of affordable generic medicine stores in Mauritius.
- **Ayush Centre of Excellence:** Promotion of Indian traditional medicine (AYUSH).
- **Education & Research:** Cooperation on curriculum development, Science & Technology policies, and research exchanges.

Challenges & Differences:

- **China's Influence**: China's increasing strategic footprint in the Indian Ocean challenges India's influence in Mauritius.
- **Double Taxation Avoidance Agreement (DTAA):** Delays in ratifying amendments to the tax treaty, affecting bilateral trade and investment clarity.
- **Geopolitical Balancing:** Mauritius maintains neutral diplomatic ties with multiple global powers, making India's exclusive influence difficult to secure.
- **Economic Dependencies:** Mauritius seeks economic diversification beyond India, limiting full-scale reliance on Indian trade and investments.

Way Ahead:

- **Stronger Defence Cooperation:** Expand joint naval exercises and white shipping agreements for regional security.
- **Trade and Investment Expansion:** Expedite full CECPA implementation to boost bilateral trade and economic diversification.
- **Technology Transfer & Green Energy:** Promote EV technology, solar power projects, and digital governance initiatives.
- **Address Taxation & Economic Concerns:** Speed up DTAA ratification and enhance tax transparency to resolve investor concerns.
- **Regional Leadership:** Strengthen Mauritius-India collaboration in Indian Ocean Rim Association (IORA) & Colombo Security Conclave.

Conclusion:

India's transition from SAGAR (Security and Growth for All in the Region) to MAHASAGAR (Mutual and Holistic Advancement for Security and Growth Across Regions) marks its expanding Indo-Pacific strategy, strengthening maritime security, trade, and sustainable growth. This vision fosters regional stability and economic cooperation across the Indian Ocean and Global South.

PYQ: Project 'Mausam' is considered a unique foreign policy initiative of the Indian Government to improve relationship with its neighbours. Does the project have a strategic dimension? Discuss.

Syllabus: International Relation and Health

32. INDIA PROPOSE SOUTH-EAST ASIA SURVEILLANCE NETWORK

Context:

India has proposed the creation of a **South-East Asia surveillance network** to enhance multi-source collaborative surveillance for better pandemic and health emergency responses.

The proposal will be discussed with the **11 member countries of WHO South-East Asia Region (SEARO)** later this year.

Proposed Vision of the South-East Asia Surveillance Network:

- **Regional Health Security:** Strengthening real-time disease monitoring and early warning systems for rapid response to pandemics and epidemics.
- **Cross-Border Collaboration:** Improving information-sharing mechanisms among SEARO nations to control transboundary health threats.
- **Integrated Surveillance System:** Establishing multi-source surveillance by combining genomic data, wastewater analysis, and public health intelligence.
- **One Health Approach:** Addressing health challenges arising from human-animal-environment interactions, including zoonotic diseases.
- **Capacity Building & Innovation:** Investing in strong laboratory infrastructure, AI-based predictive surveillance, and digital health solutions.

Need to Develop the South-East Asia Surveillance Network:

- **Pandemic Preparedness:** COVID-19 highlighted gaps in real-time data sharing and coordinated response, making multi-source surveillance crucial.
- **Climate Change & Emerging Diseases:** Rising vector-borne and waterborne diseases due to climate change necessitate better monitoring and prediction models.
- **Cross-Border Health Risks:** Frequent disease outbreaks such as Dengue, Nipah, and Zoonotic infections demand collaborative health security frameworks.
- **Antimicrobial Resistance (AMR) Monitoring:** The region faces a growing threat of AMR, which requires stronger genomic surveillance and international cooperation.
- **Strengthening One Health Initiatives:** Unifying human, animal, and environmental health data will improve early detection and mitigation strategies.

Challenges in Implementing the South-East Asia Surveillance Network:

- **Data Sharing Issues:** Countries may hesitate to share sensitive health data due to privacy concerns and geopolitical tensions.
- **Lack of Standardized Systems:** Different surveillance frameworks across nations could lead to data inconsistency and reporting delays.
- **Funding & Infrastructure Gaps:** Developing advanced labs, diagnostic facilities, and digital health tools requires sustained financial investment.
- **Limited Cross-Sectoral Coordination:** Effective surveillance needs cooperation between health, environment, agriculture, and technology sectors, which is often lacking.
- **Regulatory & Legal Barriers:** Amended International Health Regulations (IHR) (2005) must be uniformly adopted for seamless regional integration.

Way Ahead:

- **Strengthen Regional Collaboration:** Develop policy frameworks and legal agreements to ensure transparent data sharing and unified health responses.
- **Enhance Digital Health & AI-Based Monitoring:** Implement AI-driven disease modeling, predictive analytics, and cloud-based surveillance platforms.
- **Improve Laboratory Infrastructure:** Invest in high-tech diagnostic labs, genomic sequencing, and wastewater surveillance for early outbreak detection.
- **Capacity Building & Training:** Train public health professionals, epidemiologists, and data scientists to enhance surveillance capabilities.
- **Sustainable Funding Mechanism:** Establish a regional health emergency fund to support continuous research and

rapid response efforts.

Conclusion:

The South-East Asia surveillance network is a crucial step toward global health security, ensuring faster response to epidemics and public health threats. However, strong political will, technological advancements, and sustainable investments are essential for its success. A collaborative, data-driven approach will help the region tackle emerging health challenges effectively.

PYQ:

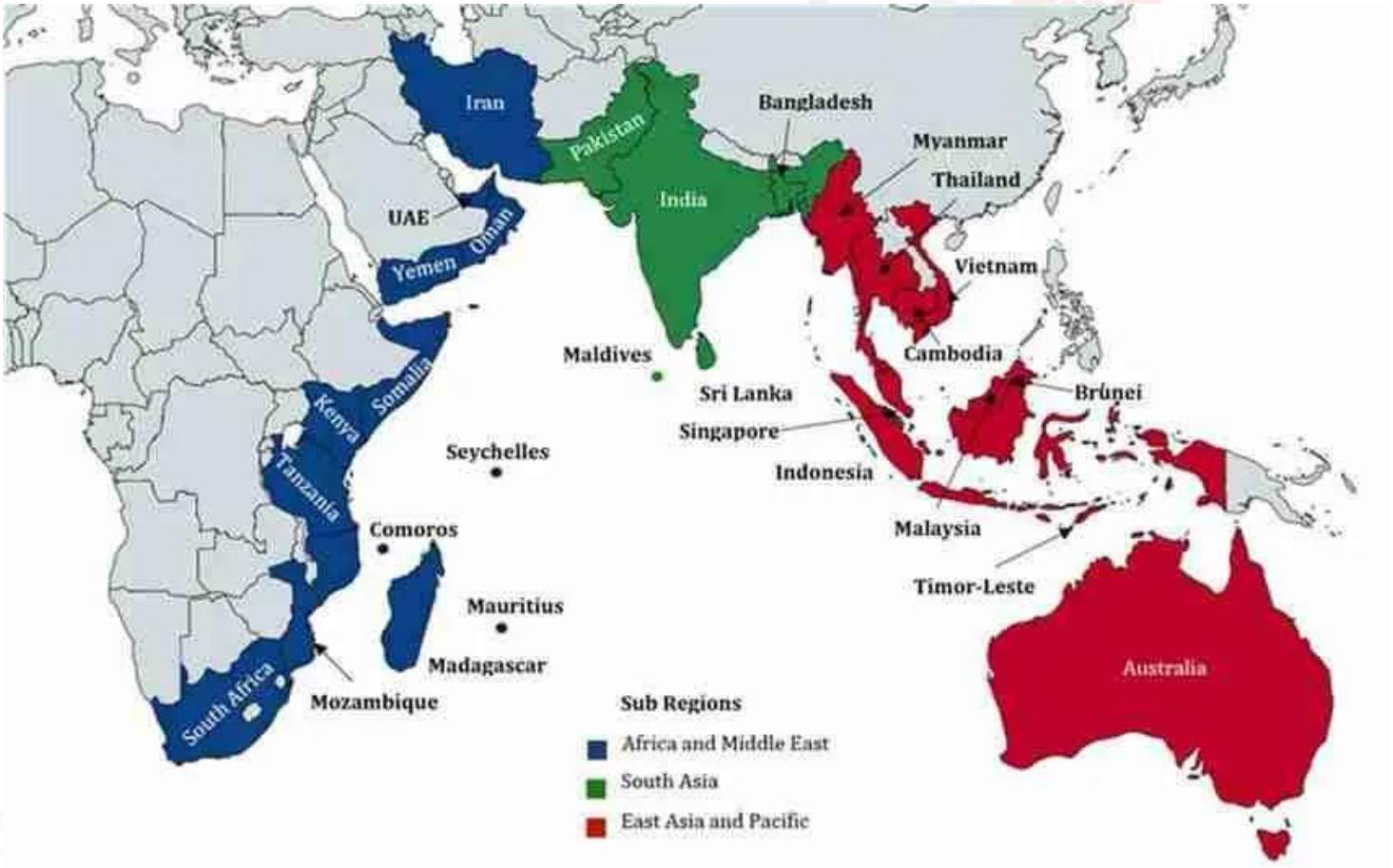
Critically examine the role of WHO in providing global health security during the COVID-19 pandemic. (UPSC-2020)

33. INDIA'S GROWING ROLE AS A UNIFIER IN THE INDIAN OCEAN REGION (IOR)

Context:

India's growing role as a unifier in the Indian Ocean Region (IOR) has gained attention, with recent initiatives like the Indian Ocean Conference (IOC) and SAGAR doctrine highlighting its efforts to foster regional cooperation and maritime security.

About India's growing role as a unifier in The Indian Ocean Region (IOR):



Importance of IOR to India:

- **Strategic Maritime Security:** The Indian Ocean serves as a buffer against threats and a pathway for projecting naval power.
- **Economic Lifeline:** 80% of India's external trade and 90% of energy imports transit through the IOR.
- **Energy Security:** Securing sea lanes of communication (SLOCs) is critical for India's energy needs.
- **Geopolitical Influence:** The IOR is a platform for India to counter China's "String of Pearls" strategy.
- **Environmental and Disaster Management:** The IOR is vital for climate stability and disaster response.

Measures Taken by India in IOR:

- **Maritime Diplomacy:** India conducts 17 multilateral and 20 bilateral naval exercises annually.
- **Infrastructure Development:** The Sagarmala Programme aims to modernize ports and enhance connectivity.
- **Maritime Domain Awareness (MDA):** The Information Fusion Centre - Indian Ocean Region (IFC-IOR) enhances real-

time surveillance.

- **Humanitarian Assistance and Disaster Relief (HADR):** India acts as a "first responder" in regional crises.
- **Blue Economy Initiatives:** India's Deep Ocean Mission explores polymetallic nodules in the Central Indian Ocean Basin.

Challenges to India in Acting as a Unifier in IOR:

- **Growing Chinese Influence**: China's "String of Pearls" strategy and military base in Djibouti challenge India's dominance.
  Example: Chinese investments in Hambantota (Sri Lanka) and Gwadar (Pakistan) encircle India.
- **Maritime Security Threats:** Piracy, terrorism, and illegal fishing persist in the IOR.
  Example: The 2023 attack on MV Chem Pluto highlighted evolving maritime terrorism.
- **Geopolitical Tensions:** Strained relations with neighbors like Maldives and Sri Lanka hinder regional cooperation.
  Example: The Maldives' "India-Out" campaign reflects fragile bilateral ties.
- **Climate Change and Environmental Degradation:** Rising sea levels and cyclones threaten coastal security and economies.
  Example: Cyclone Remal in May 2024 strained India's disaster response capabilities.
- **Non-Traditional Security Threats:** Cyberattacks and drug trafficking pose new challenges.
  Example: A ransomware attack on Jawaharlal Nehru Port Trust in 2017 exposed vulnerabilities.

Way Ahead and Role of India as a Unifier in IOR

- **Enhance Naval Capabilities:** Accelerate the production of indigenous aircraft carriers and submarines.
  Example: INS Vikrant's success should be replicated for a stronger naval presence.
- **Expand Strategic Partnerships:** Strengthen ties with IOR littoral states and major powers like the US and France.
  Example: The India-France-UAE trilateral initiative fosters regional cooperation.
- **Boost Maritime Infrastructure:** Fast-track projects like the Great Nicobar transshipment hub.
  Example: The Sittwe Port in Myanmar enhances connectivity under the Kaladan project.
- **Promote Blue Economy:** Focus on sustainable resource exploitation and marine tourism.
  Example: India's Deep Ocean Mission explores polymetallic nodules for economic gains.
- **Strengthen Disaster Response:** Develop forward operating bases and enhance NDRF capabilities.
  Example: INS Jalashwa's aid delivery to Madagascar showcases India's HADR leadership.

Conclusion:

India's role as a unifier in the IOR is crucial for regional stability and security. By addressing challenges and leveraging its strengths, India can emerge as a net security provider and a leader in maritime diplomacy. A cohesive strategy and enhanced partnerships will ensure India's dominance in the Indian Ocean Region.

PYQ:

'Sea is an important component of the Cosmos'. Discuss in the light of the above statement the role of the IMO (International Maritime Organisation) in protecting environment and enhancing maritime safety and security. (UPSC-2023)

GENERAL STUDIES – 3

Syllabus: Budget

1. TAXING VIRTUAL DIGITAL ASSETS

Context:

The Income Tax Bill, 2025 classifies Virtual Digital Assets (VDAs) as property and capital assets, bringing them under capital gains taxation and regulatory scrutiny. The bill imposes a **30% tax on VDA transfers, 1% TDS on transactions**, and mandates reporting, ensuring transparency and preventing financial misuse.

About Taxing Virtual Digital Assets:

What are Virtual Digital Assets (VDAs)?

- **Virtual Digital Assets (VDAs)** refer to digitally represented assets that use blockchain or cryptographic technology for transactions.

- Defined under **Section 2(111) of the Income Tax Bill, 2025,** VDAs include cryptocurrencies, NFTs, and similar digital assets.

Types of VDAs:

- **Cryptocurrencies:** Bitcoin, Ethereum, Ripple, Solana, etc.
- **Non-Fungible Tokens (NFTs):** Unique digital collectibles and assets.
- **Stablecoins:** Crypto assets pegged to fiat currencies (e.g., USDT, USDC).
- **Tokenized Assets:** Digital representations of real-world assets (e.g., tokenized stocks, real estate).

Reasons Behind the Proposal to Tax Virtual Digital Assets:

- **Aligning with Global Practices**: Countries like the U.K., U.S., Australia, and New Zealand tax crypto assets as property or securities.
- **Revenue Generation**: High trading volumes in crypto markets present a new tax revenue stream for the government.
- **Preventing Tax Evasion**: Unreported crypto gains pose a risk of black money accumulation and illicit transactions.
- **Ensuring Regulatory Oversight**: Tracking large crypto transactions through 1% TDS and mandatory reporting reduces financial misuse.
- **Reducing Financial Fraud & Risks**: Unregulated crypto trading can lead to fraud, Ponzi schemes, and investor losses.

Challenges in Taxing Virtual Digital Assets:

- **Lack of Comprehensive Regulations**: Taxation is in place, but market regulation, investor protection, and enforcement mechanisms remain weak.
- **Absence of Deductions:** Unlike other assets, crypto investors cannot claim deductions for transaction fees, mining costs, or commissions.
- **High Tax Burden:** Flat 30% tax discourages retail investors and crypto startups from participating in the market.
- **Compliance Complexity:** Mandatory TDS and reporting requirements increase the burden on traders, exchanges, and businesses.
- **Global Crypto Mobility:** Investors may move funds to tax-friendly countries, reducing India's potential tax revenue.

Way Ahead:

- **Comprehensive Regulatory Framework:** Establish clear rules for investor protection, fraud prevention, and stablecoin regulations.
- **Balanced Taxation:** Introduce progressive tax rates and allow deductions for transaction costs to improve compliance.
- **Strengthening Enforcement:** Enhance AML (Anti-Money Laundering) and KYC (Know Your Customer) norms to prevent misuse.
- **International Collaboration:** Align policies with G20 and FATF recommendations to create a harmonized global crypto taxation model.
- **Consumer Awareness & Protection:** Educate investors on risks, legal obligations, and compliance requirements for safer participation.

Conclusion:

The taxation of Virtual Digital Assets under the Income Tax Bill, 2025 is a major step toward regulatory clarity, ensuring financial transparency and government oversight. A balanced approach integrating taxation, financial regulation, and consumer rights is necessary to build a secure and inclusive digital asset ecosystem.

PYQ:

Comment on the important changes introduced in respect of the Long-term Capital Gains Tax (LCGT) and Dividend Distribution Tax (DDT) in the Union Budget for 2018-2019. (UPSC-2018)

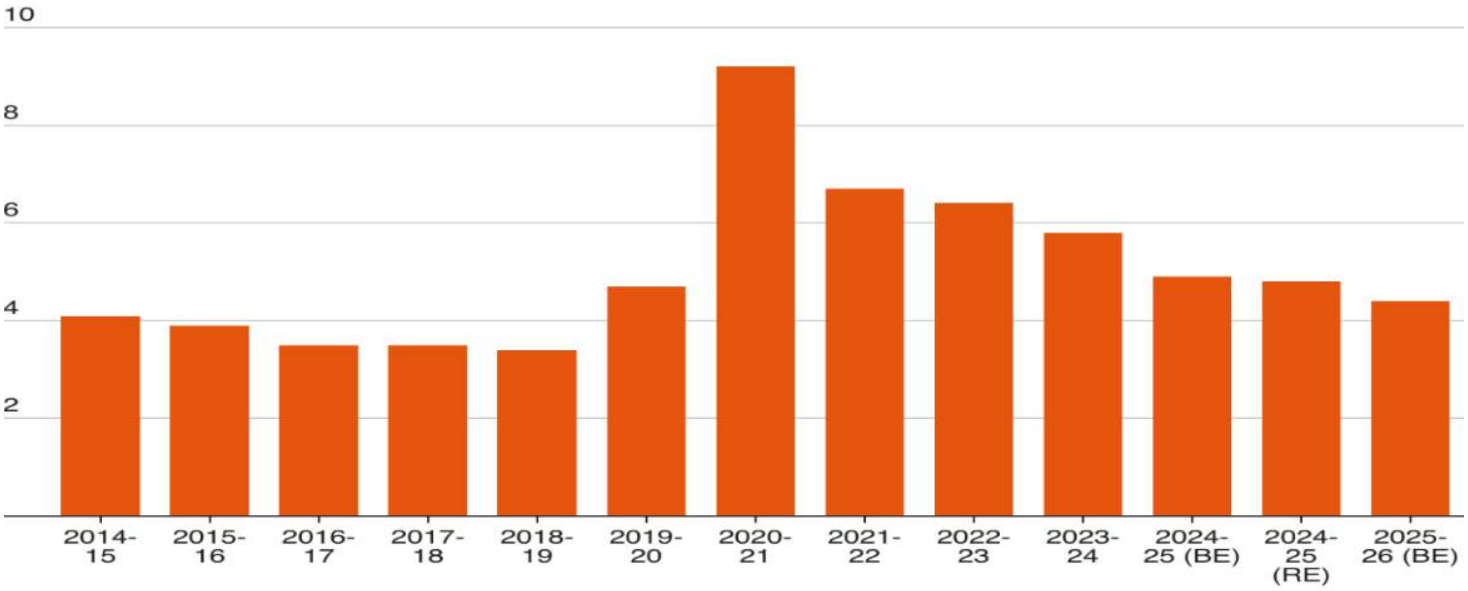
2. INDIA NEEDS TO KEEP ITS DEFICIT TARGET FLEXIBLE

Context::

India's **Fiscal Responsibility and Budget Management (FRBM) Act** enforces a **3%** fiscal deficit limit to ensure economic stability. While this cap aims to prevent excessive borrowing, it often hampers **growth-oriented spending**. Given India's ambition to become a **developed economy by 2047**, adopting a **flexible fiscal policy** is crucial to ensure **long-term investments** without compromising fiscal prudence.

India aims to trim its fiscal deficit in FY26

The Indian government aims to narrow the fiscal deficit to 4.4% of GDP in next fiscal year.
Fiscal deficit as a percentage of GDP



Note: BE is budget estimate, RE is revise estimate
Source: RBI, India Budget documents

Why a rigid 3% fiscal deficit rule is problematic?

- **Distortion of budget priorities:** The 3% limit forces governments to prioritize **revenue expenditure** (e.g., salaries, subsidies) over **capital expenditure** (e.g., infrastructure, healthcare), reducing investment in growth sectors.
- **State-level fiscal constraints:** Indian states manage **60% of public expenditure**, yet the uniform deficit cap ignores **region-specific needs**, limiting their development potential.
- **Inadequate counter-cyclical support:** Developed nations adopt **flexible deficit policies** during economic downturns, but India's rigid deficit rule restricts fiscal expansion during slowdowns.
- **Increased debt burden:** Revenue-deficit states like **Punjab** and **Kerala** rely on **market borrowings** due to limited fiscal space, exacerbating their debt-to-GSDP ratios (over **40%** in some cases).

Sector-specific consequences of the fiscal framework:

- **Infrastructure delays:** Limited fiscal flexibility slows investment in critical sectors such as **transportation**, **energy**, and **urban development**, delaying economic expansion.
- **Welfare programme constraints:** States with extensive welfare models, like **Kerala** and **Tamil Nadu**, struggle to expand services like **healthcare** and **education**.
- **Rising regional disparities:** High-growth states like **Maharashtra** and **Gujarat** require greater fiscal flexibility to sustain infrastructure expansion, while poorer states struggle with basic services.

International Best Practices for Flexible Fiscal Deficit Management

- **United States:** Maintains an average deficit of **5-6%** with targeted investments in **infrastructure** and **R&D**.
- **Germany:** Temporarily relaxes its fiscal limits during **economic crises** to sustain public investment.
- **Japan:** Despite a **200% debt-to-GDP ratio**, Japan continues investing in **technology** and **public services** to secure long-term gains.
- **Australia:** Uses **public-private partnerships (PPP)** to finance infrastructure, reducing its reliance on public debt.

Recommended Measures for a Flexible and Sustainable Fiscal Policy:

- **Flexible Deficit Range:** Adopting a **3.5% to 4.5% range** allows deficit adjustments based on economic conditions and investment requirements.
- **Increased Capital Expenditure:** Allocating funds to **infrastructure**, **healthcare**, and **education** ensures sustainable growth and productivity.
- **Zero-Based Budgeting (ZBB):** Implementing ZBB requires justifying all expenditures annually, minimizing waste and improving resource allocation.
- **Sovereign Wealth Fund (SWF):** India can divert part of its **$615 billion forex reserves** into an SWF to finance

infrastructure and technology projects.

- **Asset Monetization:** Expanding the **National Monetisation Pipeline (NMP)** can generate non-debt revenue by leasing underutilized public assets.
- **Enhanced GST Framework:** Improving GST efficiency through compliance reforms can strengthen state revenues and reduce borrowing needs.
- **Independent Audits and Transparency:** Introducing third-party audits and public reporting can ensure **fiscal accountability** and curb fund mismanagement.

Conclusion:

India's fiscal deficit framework must evolve to accommodate **regional needs**, **economic cycles**, and **development priorities**. By adopting a flexible deficit range, increasing capital investment, and implementing innovative financing solutions such as **Sovereign Wealth Funds** and **Asset Monetization**, India can achieve a **balanced fiscal strategy**. Such reforms will foster **economic stability**, encourage **long-term investments**, and help India achieve its goal of becoming a **developed economy by 2047**.

PYQ:

What were the reasons for the introduction of Fiscal Responsibility and Budget Management (FRBM) Act, 2003? Discuss critically its salient features and their effectiveness. (10 M) (2013)

Syllabus: Indian Economy and issues relating to planning, mobilization of resources

3. INCOME-TAX BILL, 2025

Context::

Income-Tax Bill, 2025, was introduced in Parliament to **replace the Income-Tax Act, 1961**, aiming for a **simplified structure, clearer language, and reduced litigation**. A key highlight is the **introduction of the 'tax year' concept**, replacing the existing 'assessment year.' However, while the Bill streamlines provisions, **experts argue that it lacks major structural changes in compliance and penalties**.

Key Provisions of the Bill

- **Introduction of the 'Tax Year' Concept** – The **'assessment year' has been removed**, and the 'tax year' now aligns with the **financial year (April 1 - March 31)**. For businesses or newly set up professions, the tax year begins from their establishment date.
- **Expanded Definition of Income** – Virtual digital assets (VDAs) like **cryptocurrency and NFTs** are now considered **capital assets**, similar to land, shares, and bullion, affecting tax calculations.

INSIDE BILL INTRODUCED IN PARLIAMENT

Particulars	Income-tax Act, 1961	Bill tabled in LS
Chapters	47	23
Sections	819*	536
Words	5.12 lakh	2.60 lakh

*Effective sections. About 1,200 provisos and 900 sections have been removed in the new Bill.

SCHEDULE II (16 ROWS) Incomes exempt, such as agricultural income

SCHEDULE III (39 ROWS) Certain persons eligible for exemption on certain income such as partners of firms and HUF, etc.

SCHEDULE IV (14 ROWS) Exemptions to non-residents

SCHEDULE V (8 ROWS) Exemption to business trusts, Sovereign Wealth Funds, etc.

SCHEDULE VI (12 ROWS) Exemptions to IFSC units

SCHEDULE VII (48 ROWS) Persons exempt from tax

- **Simplified and Concise Drafting** – The Bill **reduces the number of provisos and cross-references**, making it easier to interpret without relying on multiple sections and rules.
- **Consolidation of Tax Compliance Requirements** – Provisions related to **TDS, assessment timelines, dispute resolution, and deductions** have been tabulated for easier access.
- **Removal of Outdated Exemptions** – Provisions like **Section 54E (capital gains exemption for pre-1992 asset transfers)** and redundant sections from past amendments have been **eliminated**.
- **Integration of Other Tax Laws** – Provisions from **Wealth Tax** and rules for **inventory valuation and revenue recognition for service contracts** have been incorporated within the Bill for uniformity.

Advantages associated with the Bill

- **Better Readability and Clarity** – The **removal of complex legal language and cross-references** makes it easier for taxpayers to understand their liabilities.
- **More Organized Tax Structure** – Tax deductions, exemptions, and compliance timelines are now **grouped into**

schedules and tables, reducing confusion.

- **Alignment with Digital Economy** – Tax laws now recognize **virtual digital assets (VDAs)** as taxable capital assets, making tax regulations more contemporary.
- **Faster Compliance and Processing** – Consolidation of tax rules reduces **administrative delays**, making compliance **more efficient**.
- **More Comprehensive Framework** – The Bill integrates **rules from other tax laws**, such as **wealth tax and inventory valuation**, avoiding the need for separate legislation.

Challenges and Concerns

- **Minimal Structural Reforms** – The Bill largely **retains existing tax policies**, offering no significant changes in compliance burdens or penalty structures.
- **Potential for Increased Litigation** – While the Bill simplifies text, **some broad terms remain undefined**, leaving scope for **legal disputes**.
- **Digital Privacy Concerns** – Authorities now have **expanded search and seizure powers**, including the ability to **override passwords to access emails and digital accounts**.
- **Lack of Taxpayer Relief Measures** – The Bill **does not address concerns** related to **high compliance costs, dispute resolution inefficiencies, or tax burden reductions**.
- **Uncertainty Over Implementation** – The transition from 'assessment year' to 'tax year' **could create confusion**, requiring businesses to **adjust their tax planning strategies**.

Way Forward

- **Strengthen Digital Privacy Protections** – The Bill should include **judicial oversight for digital searches** to prevent misuse of government powers.
- **Improve Dispute Resolution Frameworks** – Mediation mechanisms should be introduced to **reduce tax litigation and resolve cases faster**.
- **Clarify Tax Definitions** – Key terms like **"risk management strategy" in assessments** should be clearly defined to avoid legal ambiguity.
- **Introduce Compliance Relief Measures** – **Reducing documentation requirements** and providing **simpler tax return processes** can ease taxpayer burdens.
- **Ensure Smooth Transition to Tax Year System** – Clear guidelines are needed to help businesses **adjust to the new tax year model** without compliance confusion.

Conclusion::

The **Income-Tax Bill, 2025**, marks a shift toward **simplification and modernization**, but it **lacks deep structural reforms**. The **new tax year concept** and **removal of outdated provisions** are steps forward, yet **privacy concerns and litigation risks remain**. To maximize its effectiveness, the government must **ensure transparency, reduce compliance burdens, and introduce stronger taxpayer protections**.

PYQ::

Comment on the important changes introduced in respect of the Long-term Capital Gains Tax (LCGT) and Dividend Distribution Tax (DDT) in the Union Budget for 2018-2019. (UPSC-2018)

Syllabus: Economics

4. WORLD BANK RECOMMENDATIONS FOR INDIA TO ACHIEVE DEVELOPED STATUS BY 2047

Context:

The World Bank's India Country Economic Memorandum (2025) states that India needs an average growth rate of 7.8% until 2047 to achieve high-income status.

About World Bank Recommendations for India to Achieve Developed Status by 2047:

1.Increase Investment & Capital Formation:

- **Raise investment from 33.5% to 40% of GDP by 2035** through private and public sector participation.
- **Improve financial sector regulations** and ease **FDI restrictions**.
- **Boost MSME credit access** and streamline business regulations.

2.Enhance Labor Force Participation:

- **Increase overall labour force participation from 56.4% to 65%**.
- **Raise female workforce participation from 35.6% to 50%**.
- Encourage **job-rich sectors** like **manufacturing, hospitality, transportation, and the care economy**.

3.Boost Structural Transformation & Trade Integration:

- **Reduce agriculture employment from 45%** by shifting labor towards manufacturing & services.
- **Strengthen infrastructure, adopt new technology, and** simplify labor regulations.

GOVERNMENT INITIATIVES TO ACHIEVE HIGH-INCOME STATUS

Investment & Infrastructure:

- PM Gati Shakti: Boosts multimodal connectivity for seamless trade.
- Make in India & PLI Schemes: Encourages manufacturing growth & industrialization.

Labor & Employment Reforms:

- New Labor Codes: Simplify compliance and promote ease of doing business.
- Skill India Mission: Enhances workforce productivity through training programs.

Structural Transformation & Trade:

- National Logistics Policy (NLP): Reduces supply chain inefficiencies.
- Bharatmala & Sagarmala Projects: Improves Road and port infrastructure to enhance trade.

State-Level Development:

- Aspirational Districts Programme: Focuses on socio-economic development in backward regions.
- Urban Challenge Fund: Provides financial support for lagging states to enhance governance & economic activity.

- **Enhance Global Value Chain (GVC) participation** to compete with **Vietnam, Thailand, and China**.

4.Promote Balanced Growth Among States:

- Support **less developed states in improving health, education, and infrastructure**.
- Encourage **industrialized states to deepen business reforms & GVC participation**.
- Expand **incentive-driven federal programs like the Urban Challenge Fund**.

Challenges to Achieving High-Income Status:

- **Slow Employment Growth:** Job creation has not kept pace with GDP growth, leading to high informal sector dependency.
- **Low Female Workforce Participation:** Cultural and economic barriers restrict women's workforce engagement, limiting economic expansion. **E.g.** Female LFPR in urban areas (Oct-Dec 2024) was 25.2%, far below male LFPR at 75.4%.
- **Investment & Infrastructure Bottlenecks:** Slow industrial growth, land acquisition issues, and infrastructure deficits hinder long-term investments. **E.g.** GDP growth slowed to 5.4% in Q2 FY 2024-25 from 8.1% a year earlier.
- **Unequal Growth Among States:** Low-income states lag behind in productivity and human capital development.
- **Trade & Productivity Gaps:** India's Global Value Chain (GVC) participation is lower than peers like China & Vietnam, limiting global trade integration.

Way Ahead:

- **Accelerate Infrastructure & Investment Reforms:** Improve land & labor laws, ease FDI norms, and reduce compliance burden for businesses.

- **Expand Employment & Women's Workforce Participation:** Implement targeted policies to boost job-rich sectors and enhance childcare & safety measures for women.
- **Strengthen Global Trade & Manufacturing:** Increase export competitiveness by integrating into Global Value Chains (GVCs).
- **Ensure Equitable Growth Among States:** Improve health, education, and infrastructure in lagging states while empowering developed states with advanced reforms.
- **Promote Technology & Innovation:** Enhance AI, automation, and digital transformation to boost productivity and economic efficiency.

Conclusion:
India's goal of achieving high-income status by 2047 is ambitious but achievable with strategic reforms in investment, labor markets, trade, and state-level development. A balanced growth model, supported by strong governance and global integration, will be key to transitioning into a developed economy.

PYQ:
Capitalism has guided the world economy to unprecedented prosperity. However, it often encourages short-sightedness and contributes to wide disparities between the rich and the poor. In this light, would it be correct to believe and adopt capitalism for bringing inclusive growth in India? Discuss (UPSC-2014)

Syllabus: Power sector

5. INDIA TO FACE IMMINENT POWER SHORTAGES

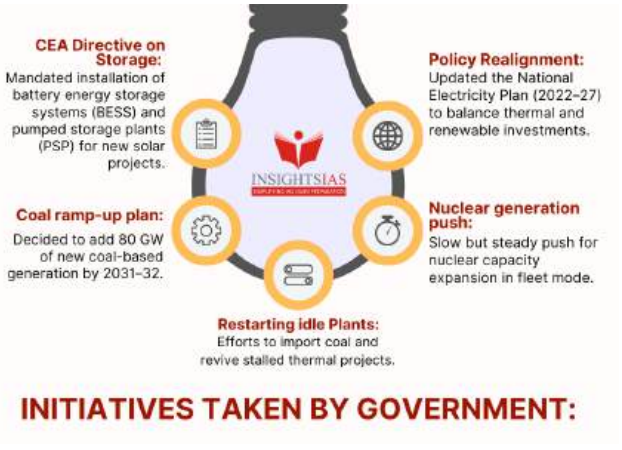
Context:
The National Load Despatch Centre (NLDC) has warned that India is set to face imminent power shortages in the high-demand months of May and June 2025, with projected unmet electricity demand ranging between 15–20 GW, particularly during non-solar hours.

Forecast by the National Load Despatch Centre (NLDC):

- **High-risk months identified:** May 2025 flagged as most critical, followed by June, with projected shortages during non-solar hours.
- **Unserved demand projection:** Anticipates power shortfalls exceeding **15 GW**, particularly in May and July 2025.
- **Loss of Load Probability (LOLP):** For May, LOLP ranges from **19% (best-case)** to **31% (median scenario)**, indicating severe reliability challenges.
- **Peak demand projection:** Estimated at **270 GW in summer 2025**, up from **250 GW in 2024**.

Existing Status of Power Sector:

- **Stagnant baseload capacity:** No major growth in coal-based baseload capacity, leading to supply constraints during non-solar hours.
- **Dependence on renewables:** India's installed renewable capacity has reached **200 GW**, but with limited **storage capacity of only 4.86 GW**.
- **Intermittency issues:** Solar generation meets daytime demand but leaves a significant gap in evening hours.
- **Thermal plants under strain:** Delays in **under-construction thermal plants** due to theft, fire, and raw material shortages.
- **Policy lapses:** The **2017–22 National Electricity Plan** deprioritized fresh thermal additions, creating a structural deficit.



Need for Demand-Side Reforms in Power Sector:

- **Load shifting strategies**: Encourage industries and large consumers to **shift consumption to off-peak hours** to avoid grid stress.
- **Demand response mechanisms:** Introduce incentive-based programs for consumers to **reduce demand during**

peak periods. Example: Singapore's demand response program.

- **Smart metering rollout:** Implement nationwide smart meters for **real-time monitoring** and consumption optimization.
- **Public awareness campaigns:** Educate consumers on **peak-hour energy conservation**, like Delhi's "Save Power" initiative.
- **Dynamic pricing:** Introduce **time-of-day tariffs** to discourage consumption during high-demand windows.

Way Ahead:

Accelerate storage capacity: Expedite commissioning of **BESS and PSPs** to manage evening demand surges.

Private sector participation: Create incentives to revive **private investment in thermal generation**.

Thermal maintenance management: Shift planned outages to **low-demand months (November–January)** to avoid summer shortfalls.

Strengthen grid infrastructure: Invest in **transmission upgrades** for reliable power distribution across states.

Integrated energy planning: Balance **renewable scaling with adequate baseload and storage solutions** for year-round reliability.

Conclusion:

The NLDC report highlights India's urgent need to balance renewable growth with reliable baseload capacity. Demand-side reforms and storage infrastructure are essential to avoid power shortages during peak months. Strategic energy planning, infrastructure investment, and public participation will ensure sustained grid stability.

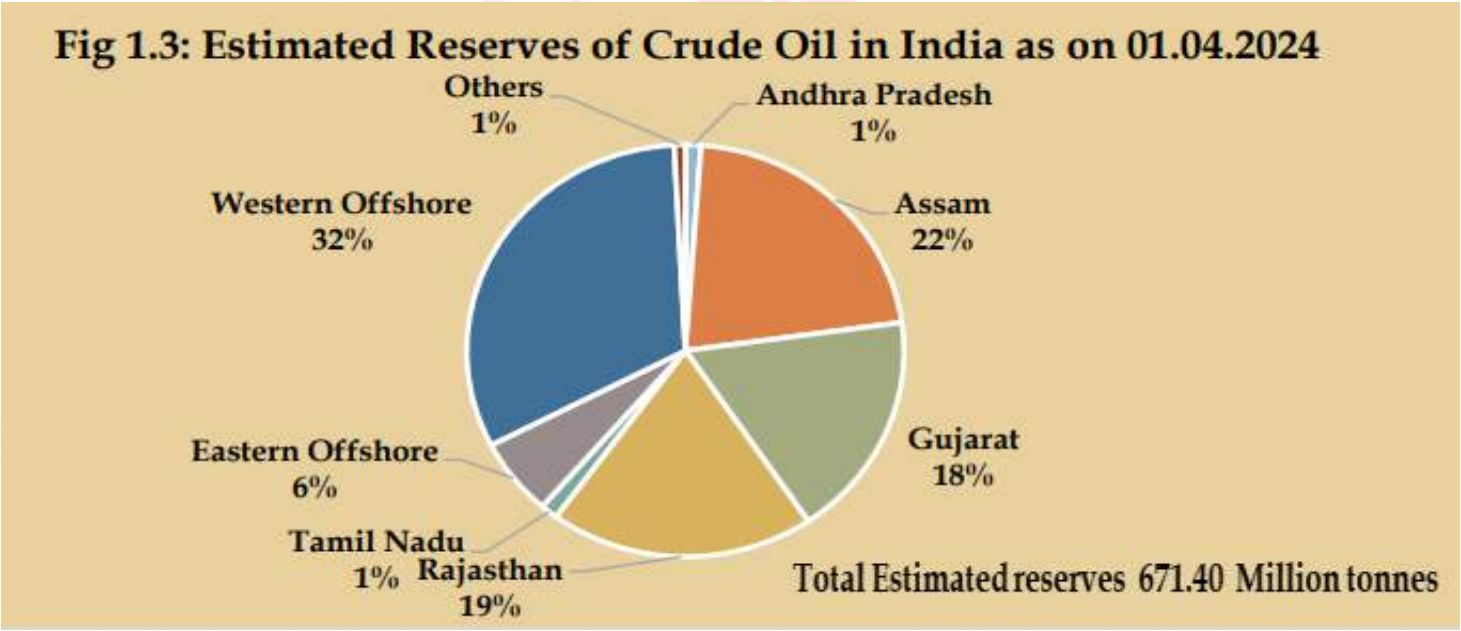
PYQ:

To what factors can the recent dramatic fall in equipment costs and tariff of solar energy be attributed? What implications does the trend have for the thermal power producers and the related industry? (UPSC-2015)

6. ENERGY STATISTICS INDIA 2025

Context:

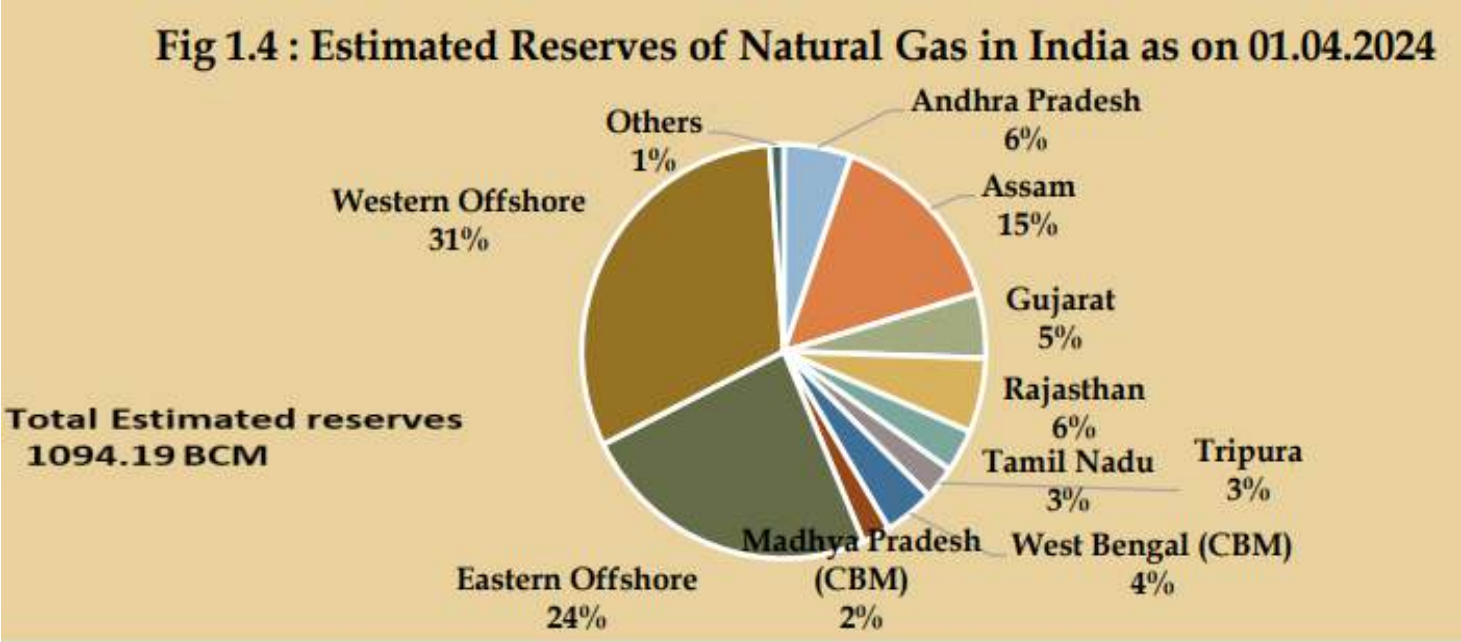
The National Statistics Office (NSO) released the Energy Statistics India 2025, detailing energy production, consumption, and import trends for FY 2023–24.



The data shows India's strong energy recovery post-COVID and reflects efforts toward Viksit Bharat 2047 vision.

Summary of Energy Statistics India 2025:

- **Primary Energy Supply** rose by **7.8%**, reaching **9,03,158 KToE**, showcasing resilience and recovery.
- **Coal remains dominant**, with 79% of total domestic energy supplied and 60.21% share in TPES.
- **Renewable energy potential** reached **21,09,655 MW**, with wind and solar leading.
- **Electricity from renewables** rose from **2,05,608 GWh (2014-15)** to **3,70,320 GWh (2023-24)** at a **6.76% CAGR**.
- **Per capita energy consumption** increased to **18,410 MJ/person**, a 25% rise in 10 years.



Positives in the Report:

- **Renewables expanding fast:** Installed capacity rose from 81,593 MW in 2015 to 1,98,213 MW in 2024, CAGR of 10.36%.
  E.g., Rajasthan, Gujarat, Maharashtra lead in wind and solar installations.
- **Industry-led growth:** Final energy use by industry rose by 13.2%, driving economic productivity.
  E.g., From 2.4 lakh KToE (2014-15) to 3.1 lakh KToE (2023-24).
- **Reduced T&D losses:** Losses fell from 23% (2014-15) to 17% (2023-24), improving efficiency.
- **Renewables outperform fossil fuels in pace:** Non-hydro renewables grew by over 210% in 10 years.
- **Improved energy intensity:** Energy required per INR of GDP dropped to 0.2180 MJ/INR, showing decoupling of energy from growth.

Negatives in the Report:

- **High coal dependency:** Coal still contributes 79% of energy supply and 60% of TPES.
  E.g, Non-coking coal alone accounts for 93.3% of coal production.
- **Heavy import reliance:** India imports 89% crude oil, 46.6% natural gas, and 25.86% coal.
- **Per capita electricity uses still low:** At 1,106 kWh/person, India trails global average (~3,000 kWh).
- **Slow renewable share in actual generation:** Despite capacity growth, renewables still not mainstream in total energy mix.
- **Urban-rural divide:** Rural consumption and accessibility lag behind urban industrial and residential demand.

Way Ahead:

- **Diversify energy mix:** Reduce coal dependence by accelerating green hydrogen, offshore wind, and battery storage.
- **Localised energy models:** Promote decentralised solar, especially in rural/agricultural sectors.
- **Improve grid infrastructure:** Invest in smart grids and regional interconnectivity to reduce losses.
- **Boost domestic production:** Enhance exploration of oil & gas reserves in Assam, Rajasthan, and offshore zones.
- **Align with SDG & Net Zero:** Use SEEA framework and energy indicators to guide climate-compatible development.

Conclusion:

The Energy Statistics India 2025 reflects India's robust progress toward energy security, renewable transition, and higher efficiency. However, challenges remain in balancing growth with sustainability. A coherent long-term energy policy, rooted in equity and innovation, is essential for India's Viksit Bharat 2047 ambition.

PYQ:

Do you think India will meet 50 percent of its energy needs from renewable energy by 2030? Justify your answer. How will the shift of subsidies from fossil fuels to renewables help achieve the above objectives? Explain. (UPSC-2022)

Syllabus: Agriculture

7. GREEN REVOLUTION

Context:
The term 'Green Revolution', coined 57 years ago, transformed global agriculture and secured India's food self-sufficiency.

What is the Green Revolution?
A **scientific and policy-driven agricultural movement** launched in the **1960s** to **increase food production** through **High-Yielding Variety (HYV) seeds, mechanization, and chemical inputs**.

Coined by: William S. Gaud in 1968.

India's Architect: M.S. Swaminathan (Father of the Green Revolution).

Supported by: Chidambaram Subramaniam (then Food and Agriculture Minister).

Need for the Green Revolution in India:

- **Food Insecurity:** Post-independence India faced severe **food shortages** and relied on imports under **PL-480 from the U.S.**
- **Bengal Famine Legacy:** The **1943 famine** exposed India's vulnerability to crop failures.
- **Growing Population:** Rising food demand required a **sustainable increase in production**.
- **Economic Stability:** Reducing dependency on imports was crucial for **national security and economic sovereignty**.

Green Revolution Transformed Indian Agriculture:

- **Increase in Food Production:** Wheat output rose from **12 million tonnes (1965) to 110 million tonnes (2023)**, and rice from **35 million tonnes (1960) to 138 million tonnes**.
- **Introduction of HYV Seeds:** Boosted **wheat and rice yields** in **Punjab, Haryana, and western Uttar Pradesh**.
- **Irrigation Expansion:** Major projects like **Bhakra-Nangal Dam** ensured year-round farming.
- **Farm Mechanization:** Increased use of **tractors, harvesters, and tube wells** improved efficiency.
- **Minimum Support Price (MSP):** Assured income security for farmers and promoted **market stability**.
- **Institutional Credit:** **NABARD and cooperative banks** replaced exploitative moneylenders, facilitating farm investments.

Unintended Consequences of the Green Revolution:

- **Groundwater Depletion:** Excessive irrigation led to **80% of Punjab's water units being overexploited** (CGWB, 2023).
- **Soil Degradation:** Overuse of **chemical fertilizers and pesticides** reduced soil fertility.
- **Regional Disparities:** Benefited **irrigated states** (Punjab, Haryana) while **rain-fed regions** (e.g., eastern India) lagged behind.
- **Debt & Farmer Suicides:** Small farmers struggled with rising costs, **leading to financial distress**.
- **Biodiversity Loss:** Monoculture of wheat and rice **reduced crop diversity**, making agriculture less resilient.

Way Ahead: Sustainable Agricultural Reforms

- **Second Green Revolution (GR 2.0):** Focus on **sustainable farming, crop diversification, and climate resilience**.
- **Efficient Water Management:** Promote **micro-irrigation, rainwater harvesting, and solar-powered irrigation**.
- **Organic & Natural Farming:** Encourage **zero-budget natural farming (ZBNF)** to reduce chemical dependency.
- **Income Support for Farmers:** Strengthen **crop insurance (PMFBY), MSP reforms, and direct income transfers**.
- **Agroforestry & Renewable Energy:** Integrate **agrivoltaics** and inland aquaculture to **increase farm incomes**.

Conclusion:

India's Green Revolution ensured food security but came at a high environmental and social cost. A balanced approach integrating sustainability, farmer welfare, and technological advancements is needed to secure India's agricultural future while protecting its natural resources.

PYQ: Explain various types of revolutions, took place in Agriculture after Independence in India. How these revolutions have helped in poverty alleviation and food security in India? (UPSC-2017)

8. IMPACT OF DEEP-SEA MINING

Context:

A new study published in Nature reveals that a Pacific Ocean seabed mined in 1979 has not recovered after 40+ years, raising alarm over the long-term ecological impact. This comes amid global discussions at the **UN's International Seabed Authority (ISA)** on regulating or halting deep sea mining activities.

What is Deep Sea Mining?

Definition: Extraction of mineral-rich nodules, sulphides, and crusts from the ocean floor at depths of over 200 meters.

Methods:

- Using robotic vehicles to collect polymetallic nodules like a plough.
- Employing AI-controlled machines and vacuum pumps to extract minerals.
- Processing is done on surface vessels; waste discharge is often returned to the sea.
- Resources Targeted: Cobalt, nickel, lithium, rare earths, gold, copper—essential for EVs, solar panels, wind turbines, and electronics.
- Distribution:
- Richest deposits in Clarion-Clipperton Zone (Pacific Ocean).
- Also found near hydrothermal vents and seamounts.
- Technological Frontier: Techniques are still experimental; most operations remain in exploratory phase.

Current Status of Deep-Sea Mining:

- **Commercial mining not yet started**; only small-scale tests have been conducted.
- **ISA Regulation pending:** Deadline to finalize rules is set for **2025**.
- **UNCLOS Oversight:** High-seas mineral wealth is designated as the **"common heritage of mankind"**.

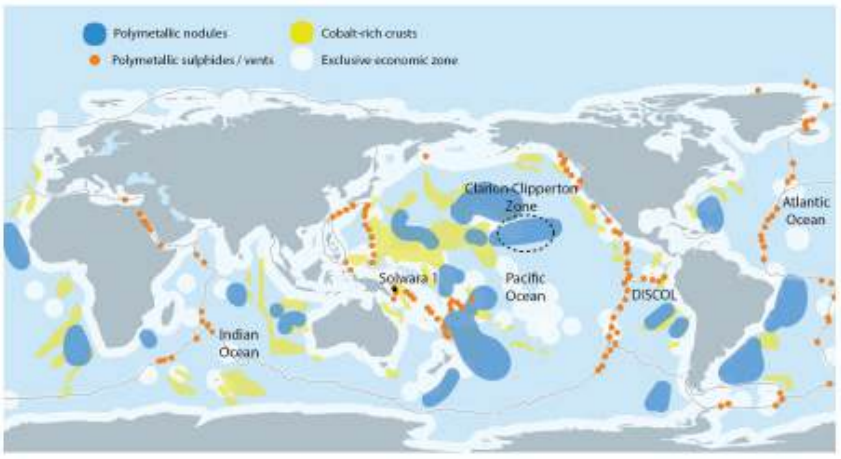
Benefits of Deep-Sea Mining:

- **Critical Mineral Supply:** Can meet surging global demand for EVs and green tech.
- **Alternative to Land Mining:** Avoids deforestation and freshwater contamination from terrestrial mining.
- **Controlled Labor Conditions:** Offshore mining could reduce human rights violations seen in land-based mining.
- **Strategic Security:** Reduces reliance on geopolitically sensitive land reserves.
    - **E.g.** Demand for cobalt is expected to rise by 400-600% by 2040 due to clean energy transitions.
- High Resource Concentration: Polymetallic nodules offer rich deposits in compact areas.

Impacts of Deep Sea Mining:

- **Ecological Damage:** Physical disturbance can destroy fragile ecosystems and smother marine life.
    - E.g. The new study found no biological recovery after 44 years in an 8-metre-wide mining site in the Pacific.
- **Species Loss:** Many deep-sea species are rare, slow-reproducing, and nodule-dependent—mining risks extinction.
- **Food Chain Disruption:** Waste plumes can affect fish species crucial for fisheries in Pacific Island nations.
- Carbon Cycle Threat: Disturbance of deep-sea life can reduce ocean's carbon absorption capacity.
- Social Inequity: Benefits may be skewed towards developed nations or private corporations.

Distribution of critical mineral resources in the deep sea



Note: The white area around Antarctica is not an exclusive economic zone but rather governed by an international commission.
Source: Miller et al. 2018; Hein et al. 2013.

WORLD RESOURCES INSTITUTE

Way Ahead:

- **Scientific Pause & Research First:** Impose a precautionary moratorium until robust ecological data is available.
- **Develop Inclusive Regulations:** ISA must create transparent, enforceable laws with equitable benefit sharing.

- **Promote Circular Economy:** Boost battery recycling and recover minerals from e-waste and mine tailings.
- **Explore Alternate Tech:** Support sodium-ion batteries and LFP batteries that reduce need for cobalt/nickel.
- **Global Collaboration:** Engage all stakeholders—scientists, policymakers, coastal nations—for sustainable ocean governance.

Conclusion:

Deep sea mining presents a paradox—promising resources for green energy but risking irreversible ecological damage. The world must balance economic ambition with planetary responsibility. Only a science-led, equitable, and precautionary approach can safeguard ocean ecosystems while meeting global energy goals.

PYQ:

Critically evaluate the various resources of the oceans which can be harnessed to meet the resource crisis in the world. (UPSC-2014)

9. THIRD REPORT ON THE STATE OF THE WORLD'S PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Context:

The FAO released the Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture on March 24, 2025. The report highlighted alarming dependency on nine crops and threats to global plant genetic diversity.

About State of the World's Plant Genetic Resources for Food and Agriculture **(SoW-PGRFA):**

What it is: A comprehensive assessment of the conservation, use, and status of **plant genetic resources for food and agriculture (PGRFA)** at global, regional, and national levels.

Report released by: Published by the **Food and Agriculture Organization (FAO) of the United Nations**.

Aim:

To evaluate trends, gaps, and priorities in **in situ and ex situ conservation** of plant genetic resources.

To guide **global action plans** for safeguarding plant biodiversity and food security.

History of the Report:

First Report (1998)

- Presented at the Fourth International Technical Conference in Leipzig, Germany (1996).
- Based on inputs from 154 countries and 12 regional consultations.
- First global assessment of PGRFA conservation status and management practices.

Second Report (2010):

- Updated findings of the first report.
- Highlighted changes since 1996 and focused on global conservation needs and gaps.
- Emphasized linking conservation with climate resilience and food security.

Key Insights in the Third Report (2025):

- **Crop concentration:** 60% of global food comes from just nine crops (sugarcane, maize, rice, wheat, potatoes, soybeans, oil palm, sugar beet, cassava).
- **Threatened diversity:** Globally, **6% of farmers' varieties (FV/LR)** are threatened; in nine sub-regions, this exceeds **18%**.
- **Highest risk regions:** Southern Africa, Caribbean, and Western Asia face the highest loss of genetic diversity.
- **India's scenario:** Over **50%** of documented FV/LRs across five agroecological zones are under threat.
- **Ex situ collections:** Over **5.9 million accessions** conserved globally, with **41%** safety-duplicated, many in the **Svalbard Global Seed Vault.**
- **On-farm efforts:** Around **35 million hectares in 51 countries** cultivated with FV/LR to conserve genetic diversity.
- **Climate threat:** Frequent disasters impact crop diversity, with poor germplasm adaptation to local conditions post-disasters.

Challenges:

- **Genetic erosion:** Traditional crop varieties decline due to climate change, monoculture, and urbanization, threatening biodiversity.
- **Funding gaps:** Inconsistent financial support weakens gene bank operations and long-term conservation efforts.
- **Lack of expertise:** Shortage of skilled taxonomists and plant breeders hampers genetic resource management.
- **Poor documentation:** Incomplete data on plant genetic resources limits research and crop improvement.
- **Seed system challenges:** Limited access to quality, locally adapted seeds affects post-disaster recovery.

Way Ahead:

- **Strengthen conservation:** Integrate in-situ and ex-situ methods with community participation.
- **Enhance funding:** Boost investments in genebanks and explore public-private partnerships.
- **Capacity building:** Train professionals in plant breeding and genebank management.
- **Participatory breeding:** Engage farmers and Indigenous communities in developing resilient crops.
- **Policy support:** Promote crop diversification, local seed banks, and climate-adapted varieties.

Conclusion:

The third SoWPGRFA report underscores the urgent need to preserve crop genetic diversity for food security. Global collaboration, adequate investment, and community engagement are essential. Strengthening national systems will secure biodiversity for future generations.

PYQ:

Define the concept of carrying capacity of an ecosystem as relevant to an environment. Explain how understanding this concept is vital while planning for sustainable development of a region. (UPSC-2019)

10. INDIA-U.S. TRADE AGREEMENT AND THE TEST OF WTO LAWS

Context::

India and the United States have agreed to negotiate a **Bilateral Trade Agreement (BTA)** during Prime Minister's visit **to the U.S**. The agreement aims to improve bilateral trade relations but raises concerns about its compliance with **WTO laws** and potential risks for India's economic interests.

What is it About?

- **Unclear scope and structure:** The **U.S.-India Joint Leaders Statement** announced a **multi-sector BTA** but did not specify which sectors or products would be included.
- **Not labelled as an FTA but requires WTO compliance:** Although the BTA is not formally identified as a **Free Trade Agreement (FTA)**, WTO rules require such bilateral deals to cover "**substantially all trade**" to comply with **Article XXIV.8(b)** of **GATT**.
- **India's tariff reduction for U.S. products:** The **Joint Leaders Statement** welcomed India's recent tariff cuts on U.S. products — a move that risks breaching WTO's **Most Favoured Nation (MFN)** principle if similar reductions are not extended to other WTO members.
- **Possibility of an interim agreement:** The BTA may be notified as an '**interim agreement**' under **Article XXIV.5** of GATT, which requires a defined timeline (typically within **10 years**) for establishing a comprehensive FTA.

Implications:

Aspect	Positive Implications	Negative Implications
1. Trade Expansion	The BTA could expand India's access to U.S. markets in sectors like **technology**, **pharmaceuticals**, and **agriculture**.	India's recent tariff reductions, which the U.S. welcomed in the **Joint Statement**, may increase imports from the U.S., risking trade imbalances.
2. Investment Growth	The BTA could promote U.S. investments in sectors like **digital services**, **energy**, and **manufacturing**, supporting India's economic growth.	By improving access for U.S. products, India's **MSMEs** and domestic producers may face increased competition.

Aspect	Positive Implications	Negative Implications
3. Strategic Cooperation	The BTA could strengthen bilateral ties in areas like **technology transfer**, **defence partnerships**, and **supply chain security**.	The U.S. emphasis on **reciprocal tariffs** contradicts WTO norms and may undermine India's strategic flexibility in trade negotiations.
4. WTO Compliance	The BTA can meet WTO standards if structured as an **interim agreement** with a clear FTA roadmap.	Without covering "**substantially all trade**," the BTA risks violating WTO's **MFN principle**, which prohibits selective tariff reductions.

Challenges:

- **Unclear structure and compliance risk:** The absence of defined terms in the BTA's framework creates uncertainty about its alignment with WTO's **"substantially all trade"** condition.
- **Pressure for reciprocal tariffs:** The U.S.'s push for **reciprocal tariffs** contradicts WTO's principles of **bound tariff rates** and violates the **special and differential treatment (S&DT)** provision that allows developing nations to impose differentiated tariffs.
- **Exclusion from WTO's enabling clause:** Since India's tariff reductions are designed to favour U.S. exports rather than supporting developing nations, the BTA cannot be justified under the **enabling clause** framework.
- **Potential misuse of the interim agreement route:** Using an **'interim agreement'** as a strategy to bypass WTO obligations without genuine intent to establish an FTA may lead to legal challenges and weaken India's global trade credibility.

Way Forward

- **Define a comprehensive BTA framework:** India must ensure the BTA includes a broad range of trade sectors to comply with WTO's **"substantially all trade"** requirement.
- **Resist pressure for unilateral concessions:** India must adopt a firm stance to prevent U.S. demands for **reciprocal tariffs** that contradict WTO norms.
- **Strengthen domestic competitiveness:** India should expand initiatives like the **Production-Linked Incentive (PLI)** scheme and improve export strategies to safeguard vulnerable sectors from import surges.
- **Leverage WTO platforms:** As a prominent advocate of **rule-based trade**, India must actively participate in WTO discussions to reinforce fair trade practices while protecting its economic interests.

Conclusion::

The proposed **India-U.S. Bilateral Trade Agreement** offers potential economic benefits, including improved market access, increased investments, and strategic cooperation. However, India must ensure the BTA aligns with **WTO principles**, protects its **MSMEs**, and avoids unequal trade concessions. By adopting a **transparent framework**, **strategic diplomacy**, and **strong domestic trade policies**, India can ensure the BTA supports sustainable growth without compromising its global trade position.

PYQ::

What are the direct and indirect subsidies provided to farm sector in India? Discuss the issues raised by the World Trade Organization (WTO) in relation to agricultural subsidies. (10 M) (2023)

Syllabus: Water

11. INCREASING WATER GAP IN INDIA

Context:

India is grappling with a severe water crisis exacerbated by rising temperatures, with 2024 being the hottest year since 1901, intensifying heatwaves and widening the water gap.

What is Water Gap? The water gap refers to the difference between renewable water availability and water consumption in a specific region, indicating unsustainable water use when demand exceeds supply.

Data Insight: Heat's Role in Water Gap

- 2024 was India's hottest year since 1901, with temperatures rising by 0.9°C in January 2025 compared to the previous year.
- Heatwaves caused 733 deaths in 2024, highlighting the extreme stress on water resources.

- Under 1.5°C warming, India's water gap is projected to increase by 11.1 cubic km/year, worsening to 17.2 cubic km/year at 3°C warming.

Causes of Increasing Water Gap:

- **Climate Change:** Rising temperatures disrupt rainfall patterns, leading to **reduced water availability and prolonged droughts**. Example: In 2024, India recorded its hottest year since 1901, with heatwaves causing a 0.9°C temperature rise in January 2025.
- **Overexploitation: Excessive groundwater extraction** for irrigation and urban expansion depletes natural reserves. Example: India accounts for 25% of global groundwater extraction, with 21 major cities expected to run out of groundwater by 2030.
- **Population Growth:** Rapid **urbanization and industrialization** increase water demand, worsening scarcity.
- **Inefficient Water Management:** Poor infrastructure and **wastage in supply systems** lead to significant water loss. Example: Only 8% of wastewater in India is treated, leading to significant water loss and pollution.
- **Pollution:** Industrial and agricultural runoff **contaminate rivers and lakes**, reducing usable freshwater resources. Example: The Central Pollution Control Board states that 75% of India's rivers are unfit for drinking due to contamination.

Consequences of Water Gap:

- **Agricultural Stress:** Reduced irrigation water **lowers crop yields**, threatening food security and farmers' livelihoods. Example*:* In 2024, 60% of India's districts faced drought-like conditions, affecting crop yields and increasing food prices.
- **Health Risks:** Water scarcity **compromises sanitation**, increasing cases of **waterborne diseases**. Example*:* Over 163 million Indians lack access to clean water, contributing to 21% of communicable diseases.
- **Economic Losses:** Water shortages disrupt industries, **halting production** and causing financial losses.
- **Ecological Damage:** Overuse of water bodies **dries up rivers and** wetlands, harming biodiversity. Example*:* The Ganga-Brahmaputra basin, home to 10% of the world's biodiversity, faces a water gap of 56.1 cubic km/year.

Measures to Counter Water Gap:

- **Sustainable Water Use: Adopt efficient irrigation techniques** and promote **rainwater harvesting** for conservation. Example*:* Tamil Nadu's rainwater harvesting mandate increased groundwater levels by 50% in urban areas.
- **Policy Interventions:** Implement **stricter regulations on groundwater extraction** to prevent overuse.
- **Infrastructure Development:** Construct **reservoirs, check dams, and recharge wells** to improve water storage. Example*:* The Jal Shakti Ministry reported a 15 billion cubic metre increase in groundwater recharge in 2024 due to government initiatives.
- **Public Awareness:** Educate citizens on **water-saving techniques** and responsible consumption.
- **Climate Adaptation:** Develop **resilient strategies** to mitigate the effects of **rising temperatures on water availability**. Example*:* The National Action Plan on Climate Change focuses on water resource management to combat climate-induced water stress.

Conclusion:

Water scarcity is one of India's biggest climate challenges. Immediate policy interventions and sustainable water management are critical to closing the water gap. Strong adaptation strategies can mitigate risks and protect vulnerable communities.

PYQ:

What are the salient features of the Jal Shakti Abhiyan launched by the Government of India for water conservation and water security? (UPSC-2020)

Syllabus: Science and Technology

12. SPACE DEBRIS

Context:

A 500-kg metal object, suspected to be space debris, crashed in Kenya, raising concerns over accountability and legal gaps in space governance.

Understanding Space Debris:

What is Space Debris?

- **Man-made objects** in **Earth's orbit or re-entering the atmosphere** that are **non-functional**.
- Includes **defunct satellites, spent rocket stages, and collision fragments**.

Types of Space Debris:

- **Large Debris:** Defunct satellites, rocket boosters, fuel **tanks** that survive reentry.
- **Small Debris:** Fragments from satellite collisions, disintegrated spacecraft.
- **Microscopic Debris:** Paint flakes, dust particles, and metal fragments from damaged satellites.

Laws Governing Space Debris:

- **Outer Space Treaty (1967):** Holds states responsible for national space activities by both government and private entities.
- **Liability Convention (1972):** Imposes absolute liability on launching states for damage caused by space objects on Earth.
- **Space Debris Mitigation Guidelines (UN COPUOS):** Encourages safe disposal of satellites but remains non-binding.
- **25-Year Rule (UN & IADC):** Recommends deorbiting satellites within 25 years, with only 30% compliance globally.
- **National Regulations (U.S., EU, China):** Mandate tracking, disposal, and deorbiting plans, but enforcement is weak.

Challenges in Space Debris Governance:

- Lack of Binding International Regulations: No enforceable global framework for debris mitigation and liability enforcement.
- Attribution Issues: Difficulty in identifying the source of debris, especially for older, fragmented objects.
- Rising Space Traffic: Increasing satellite mega-constellations (Starlink, OneWeb, Kuiper) escalate the risk of collisions.
- Uncontrolled Reentries: No penalties for countries allowing uncontrolled descents of space objects.
- Enforcement & Compensation Gaps: Past incidents (e.g., Cosmos 954 crash in Canada, 1978) show delays in compensation settlements.

India's Initiatives for Space Debris Management:

- **ISRO System for Safe & Sustainable Operations Management (IS4OM) (2022):** Monitors space objects that pose collision threats to Indian satellites.
- **Project Netra (Network for Space Object Tracking and Analysis):** Detects, tracks, and catalogs debris as small as 10 cm up to a range of 3,400 km.
- **Collision Avoidance Manoeuvres:** ISRO performed 21 collision avoidance manoeuvres in 2022 to prevent space debris impact.
- **Space Situational Awareness (SSA) Control Centre (2020):** Functions as India's central hub for monitoring and managing space traffic.
- **International Collaboration:** India actively engages in UN discussions on space debris mitigation and sustainability.

Way Ahead:

- **Binding Global Regulations:** UN COPUOS must introduce mandatory disposal rules for satellites and penalties for uncontrolled re-entries.
- **Enhanced Tracking & Prediction Systems:** Expanding advanced monitoring networks (e.g., Space Fence, AI-based tracking) to trace debris origins.
- **Mandatory Deorbiting Plans:** Launch approvals must require clear disposal strategies such as controlled re-entry or graveyard orbits.
- **Independent Liability Tribunal:** A global arbitration body should ensure quick compensation settlements for damage caused by space debris.
- **Sustainable Space Practices:** Promote reusable rocket technology, debris-removal missions, and cleaner propulsion systems.

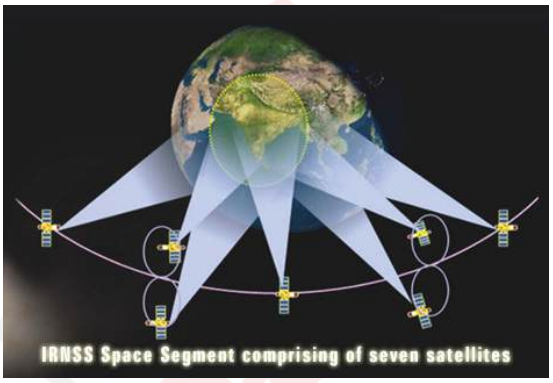
Conclusion:

With rising space activity, uncontrolled reentries pose increasing risks to Earth. The lack of binding international rules has left affected communities without legal recourse. Strengthening global cooperation, enforcing strict disposal rules, and establishing a liability framework are crucial to ensuring long-term space sustainability.

PYQ:

International civil aviation laws provide all countries complete and exclusive sovereignty over the airspace above their territory. What do you understand by 'airspace'? What are the implications of these laws on the space above this airspace? Discuss the challenges which this poses and suggest ways to contain the threat. (UPSC-2014)

13. MAPPING INDIA'S GEOSPATIAL INTELLIGENCE



Context:

China recently launched two high-resolution satellites under its Siwei Commercial Remote Sensing Satellite System, enhancing its geospatial capabilities. This development raises concerns for India, given its border disputes and economic tensions with China, highlighting the need for robust indigenous geospatial intelligence.

India and Its Geospatial Intelligence:

- **Strategic Importance:** Geospatial intelligence (GEOINT) is critical for national security, economic growth, and environmental management. It aids in monitoring border areas, tracking troop movements, and managing natural resources.
- **Indigenous Systems:** India developed NavIC (Navigation with Indian Constellation), positioning itself as the sixth nation with its own navigation system.
- **Global Positioning:** While the US's GPS and China's BeiDou dominate, India aims to carve a niche with NavIC, despite challenges in coverage and compatibility.
- **Economic Applications:** Geospatial data supports infrastructure development, agriculture, and urban planning.
- **Security Concerns:** Over-reliance on foreign systems like GPS poses risks, as seen in Russia's GPS jamming during the Ukraine conflict.

Progress So Far:

- **Policy Framework:** The 2022 National Geospatial Policy eased data restrictions and encouraged private sector participation.
  Example: Increased private investment in startups like Pixxel for hyperspectral imaging.
- **Mission Integration:** Geospatial technology is integrated into national missions like PM SVAMITVA for land digitization and Mission Mausam for weather monitoring.
  Example: SVAMITVA's success in mapping rural land parcels.
- **Funding Allocation:** The National Geospatial Mission received Rs 100 crore for 2025-26, signalling government commitment.
  Example: Funds allocated for high-resolution satellite development.
- **Private Sector Growth:** Startups like SatSure and Dhruva Space are emerging as key players in the geospatial domain.
  Example: SatSure's use of satellite data for agricultural analytics.
- **International Collaboration:** India collaborates with agencies like NASA and ISRO for satellite launches and data sharing.
  Example: NISAR, a joint NASA-ISRO satellite for Earth observation.

Challenges:

- **Limited Investment:** India's geospatial budget is significantly lower than China's and the US's.
  Example: China's $1.4 trillion investment in geospatial technology.
- **Data Policy Ambiguities:** Unclear data-sharing policies hinder private sector growth.
  Example: Delays in Pixxel's satellite launches due to regulatory hurdles.
- **Coordination Gaps:** Multiple ministries oversee geospatial initiatives, leading to inefficiencies.
  Example: Overlapping roles in PM Gati Shakti and SVAMITVA schemes.
- **Technological Lag:** India lags in high-resolution imaging and real-time analytics.
  Example: China's lead in multispectral and infrared sensing capabilities.
- **Skill Gap:** A shortage of skilled professionals in geospatial intelligence limits innovation.
  Example: Limited specialized courses in Indian universities.

Way Ahead:

- **Boost Investment:** Increase funding for high-resolution satellite technology and AI-driven data processing.

Example: Allocate funds akin to China's BRI for geospatial projects.

- **Streamline Policies:** Develop clear data-sharing frameworks to encourage private sector participation.
  Example: Simplify licensing for satellite launches.
- **Enhance Coordination:** Establish a single nodal agency for geospatial initiatives to improve efficiency.
  Example: Create a Geospatial Development Authority.
- **Skill Development:** Introduce specialized courses and training programs in geospatial intelligence.
  Example: Collaborate with institutions like IIRS for skill development.
- **Public Awareness:** Promote the use of geospatial data in sectors like agriculture, urban planning, and disaster management.
  Example: Launch campaigns to educate farmers on satellite-based crop monitoring.

Conclusion:

India's geospatial capabilities are crucial for national security, economic growth, and global competitiveness. By addressing challenges like investment gaps, policy ambiguities, and skill shortages, India can strengthen its position in the global geospatial market. A focused approach, coupled with private sector innovation, will ensure India's strategic autonomy and technological advancement.

PYQ:

What do you understand by 'Standard Positioning Systems' and 'Precision Positioning Systems' in the GPS era? Discuss the advantages India perceives from its ambitious IRNSS programme employing just seven satellites. (UPSC-2015)

Syllabus: Technology and Defence

14. QUANTUM TECHNOLOGY IN DEFENSE

Context:

Niti Aayog has released a strategic paper on the rapid evolution of quantum computing and its implications on national security in New Delhi.

What is Quantum Computing?

- Quantum computing leverages **quantum bits (qubits)**, which exist in multiple states simultaneously due to **superposition and entanglement**.
- Unlike classical computers that process bits as **0 or 1**, quantum computers **perform parallel computations**, exponentially increasing processing power.

Recent Advancements & Breakthroughs:

- **Longer Qubit Coherence:** Innovations by Atom Computing and ColdQuanta have improved qubit stability, allowing longer computations.
- **High-Fidelity Qubit Control:** IBM and Quantinuum are enhancing qubit accuracy, reducing errors.
- **Error Correction Progress:** Google's Willow chip introduced a self-correcting quantum system, accelerating fault-tolerant quantum computing.
- **Topological Qubits:** Microsoft's Majorana-1 improves stability, reducing the need for complex error correction.
- **Diverse Qubit Modalities:** Superconducting circuits, trapped ions, photonic qubits, and neutral atoms create a multi-approach ecosystem.

India's Quantum Journey:

- **Early Developments:** India has a strong theoretical foundation in quantum physics but lags in commercial applications.
- **National Quantum Mission (2023):** ₹6,003 crore allocated to boost quantum computing, communication, cryptography, and workforce development.
- **Quantum Startups**: Indian startups like QpiAI, BosonQ Psi, and TCS Quantum Computing Lab are driving innovation.
- **Public-Private Collaboration:** Partnerships between academia, industry, and government to enhance quantum capabilities.

- **International Engagements:** India collaborates with US, Europe, and Japan on quantum research.

Role of Quantum Technology in Defense:

- **Cybersecurity & Cryptography:** Quantum computing can **break current encryption standards**, making **Post-Quantum Cryptography (PQC)** essential.
- **Intelligence & Surveillance:** Enables advanced **signals intelligence (SIGINT)** by processing vast amounts of data in real-time.
- **Military Hardware:** Quantum materials enhance **stealth detection, autonomous weapons, and precision navigation**.
- **Defense Logistics Optimization:** Quantum AI improves **battlefield resource allocation and strategic planning**.
- **Economic Warfare Protection:** Secures **financial markets, critical infrastructure, and government data**.

Challenges in Quantum Computing:

- **High Error Rates:** Quantum computations are **susceptible to noise**, requiring complex **error correction**.
- **Hardware Scalability:** Developing large-scale **fault-tolerant qubit systems** remains a challenge.
- **High Cost & Infrastructure Needs:** Requires **cryogenic cooling, precision control, and extensive research funding**.
- **Cybersecurity Risks:** Nations must transition to **quantum-safe encryption** before quantum decryption capabilities emerge.
- **Geopolitical Competition:** The **US, China, and Europe** are investing heavily, leading to **export restrictions and technology protectionism**.

Way Ahead for India:

- **Strengthen National Quantum Mission:** Increase funding, foster **indigenous R&D, and enhance public-private partnerships**.
- **Invest in Quantum Cryptography:** Accelerate **Post-Quantum Cryptography (PQC) adoption** across critical infrastructure.
- **Develop Quantum Workforce:** Expand **quantum education and training programs** to build skilled talent.
- **Boost Indigenous Quantum Hardware:** Support domestic quantum chip **fabrication and supply chain**.
- **International Collaboration:** Engage in **technology-sharing agreements** to stay competitive in the quantum race.

Conclusion:

Quantum computing is no longer a futuristic concept—it is a strategic necessity. With breakthroughs in qubit stability, error correction, and quantum AI, nations are racing to secure technological supremacy. India's National Quantum Mission must ensure self-reliance in quantum technologies to safeguard national security, defense, and economic stability.

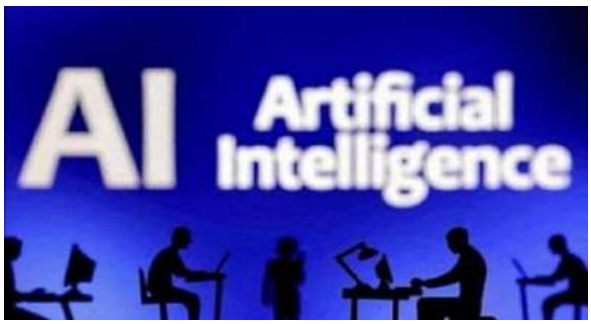
PYQ:

Discuss the work of 'Bose-Einstein Statistics' done by Prof. Satyendra Nath Bose and show how it revolutionized the field of Physics. (UPSC-2018)

Syllabus: Awareness in the fields of IT, Space, Computers

15. REGULATING AI IS ALREADY PROVING DIFFICULT

Context::



Artificial Intelligence (AI) is revolutionizing industries globally, yet regulating its development presents significant hurdles. Geopolitical rivalries, fragmented legal frameworks, and ambiguous accountability raise concerns, necessitating comprehensive governance strategies.

Complexities involved **in AI regulation**

- **Geopolitical tensions:** Major nations like the **US**, **China**, and the **UK** prioritize dominance in AI innovation, hampering cooperative governance efforts.
- **Divergent development goals:** While advanced economies focus on AI leadership, developing countries like **India**, **Brazil**, and **South Africa** prioritize AI for **local challenges** such as healthcare and economic growth.

- **Inconsistent legal frameworks:** The **EU AI Act** enforces strict controls on high-risk AI but lacks clarity on **bias identification**. The **US** faces regulatory inconsistencies across federal and state levels.
- **Unclear liability mechanisms:** Ambiguities persist in determining **accountability for AI failures**, resulting in varied legal interpretations.
- **Intellectual property confusion:** Debates over recognizing **AI as an inventor** create legal uncertainty regarding patents, licensing, and ownership rights.

Implications of Poorly Regulated AI:

- **Manipulation risks:** AI systems, if unchecked, may manipulate user behaviour, fostering **disinformation** and harmful decision-making.
- **Bias and discrimination:** Inadequate oversight may result in AI models reinforcing **social inequalities** and prejudices.
- **Economic instability:** Unregulated AI tools may engage in **price manipulation** or exploit consumer vulnerabilities.
- **Privacy violations:** AI-driven surveillance systems risk infringing on **civil liberties** and facilitating invasive monitoring.
- **Security threats:** Without robust security protocols, AI systems may become susceptible to **cyberattacks** or malicious exploitation.

Measures required **for effective AI regulation**

- **Global regulatory framework:** Establish a comprehensive platform inspired by the **AI Action Summit (2025)** and the **UN AI for Good Global Summit (2024)** to promote unified standards.
- **Risk-based regulation:** Adopt a **tiered framework** like the **EU AI Act**, ensuring strict controls on high-risk AI while allowing innovation in low-risk domains.
- **Ethics integration:** Implement frameworks like the **Montreal Declaration on Responsible AI (2018)** to uphold **transparency**, **fairness**, and **accountability**.
- **Stronger accountability standards:** Introduce mandatory **bias detection tools**, ensuring fairness and reducing discrimination risks.
- **Enhanced global cooperation:** Foster **public-private partnerships** and promote cross-border collaboration to create consistent AI standards.

Conclusion::

With AI's projected **29% CAGR** growth from 2025 to 2030 and its potential contribution of **14% to global GDP**, effective regulation is crucial. A harmonized international framework that balances **innovation**, **security**, and **fairness** is key to ensuring AI's responsible development and maximizing its societal benefits.

PYQ::

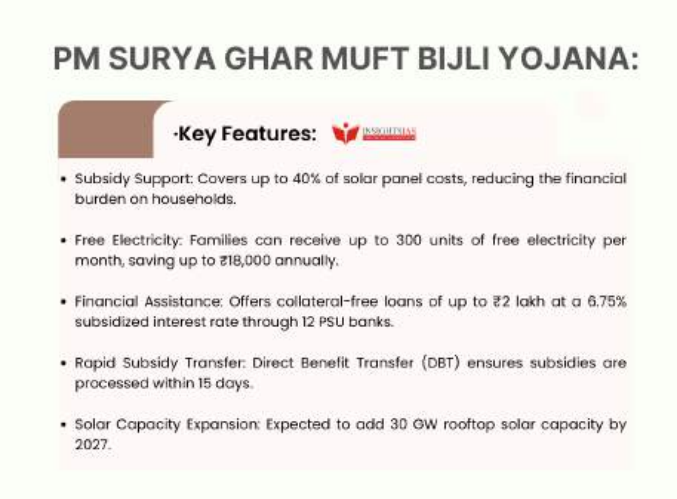
Introduce the concept of Artificial Intelligence (AI). How does AI help clinical diagnosis? Do you perceive any threat to privacy of the individual in the use of AI in healthcare? (10 M) (2023)

Syllabus: Renewable Energy

16. PM SURYA GHAR MUFT BIJLI YOJANA

Context:

The PM Surya Ghar Muft Bijli Yojana has crossed a milestone of 10 lakh solar-powered homes, with ₹4,770 crore in subsidies disbursed.



Achievements of PM Surya Ghar Muft Bijli Yojana:

- **10 Lakh Homes Powered:** As of **March 10, 2025**, **10 lakh households** have installed **rooftop solar systems**, reducing reliance on conventional electricity.
- **47.3 Lakh Applications:** Over **47 lakh households** have applied, showcasing **high public demand** and growing interest in **solar energy adoption**.
- **₹4,770 Crore Disbursed:** Subsidies worth **₹4,770 crore** have been allocated, benefiting **6.13 lakh households** under the Direct Benefit Transfer (DBT) mechanism.

- **Statewise Performance:** Gujarat leads with 3.51 lakh installations (41.47%), followed by Uttar Pradesh (73,602) and Kerala (65,423), highlighting regional progress.

Key Benefits:

- **Reduced Electricity Bills:** Households generate **solar energy for self-consumption**, leading to **significant reductions in monthly electricity expenses**.
- **Government Savings:** The scheme helps **save ₹75,000 crore annually**, reducing the **government's electricity subsidy burden** and power procurement costs.
- **Environmental Impact:** Expected to **reduce CO_2 emissions by 720 million tonnes** over **25 years**, supporting India's climate action goals.
- **Job Creation:** Generates **17 lakh direct jobs** in **solar installation, maintenance, and manufacturing**, boosting employment in the renewable energy sector.
- **Boost to Domestic Industry:** Encourages **'Make in India'** by mandating the use of domestically produced solar modules and cells, strengthening India's renewable supply chain.

Challenges to the Scheme:

- **High Initial Cost:** Despite **subsidies**, the **upfront cost** of solar panel installation **remains high**, deterring low-income households from adoption.
- **Awareness & Outreach:** Many households **lack awareness** about the scheme's **benefits, application process,** and long-term savings potential.
- **Grid Integration Issues:** The **existing power grid lacks infrastructure** to effectively manage distributed solar power generation, affecting energy distribution.
- **Slow Loan Disbursement:** Though **3.10 lakh applications were received**, only **1.28 lakh loans** have been disbursed, slowing financial accessibility.
- **Technical Challenges:** Solar power is **intermittent**, requiring **advanced energy storage solutions** and better grid connectivity for reliability.

Way Ahead:

- **Strengthen Awareness Campaigns:** Expand **outreach through digital platforms, NGOs, and local governance** to educate citizens about scheme benefits.
- **Ease Financial Accessibility:** Introduce **zero-interest loans** and **faster disbursal mechanisms** to encourage wider solar adoption.
- **Enhance Grid Infrastructure:** Invest in **smart grids and energy storage solutions** to ensure seamless integration of solar power into the electricity grid.
- **Expand Beneficiary Base:** Simplify **application and subsidy processes**, ensuring faster approvals and transparent tracking for applicants.
- **Encourage Private Sector Participation:** Provide **incentives to solar companies** to expand **affordable solutions**, making rooftop solar more accessible and cost-effective.

Conclusion:

The PM Surya Ghar Muft Bijli Yojana is a landmark initiative in India's transition to renewable energy, making solar power accessible to millions of households. With strong policy support and public participation, it can redefine India's clean energy future.

PYQ:

India has immense potential for solar energy though there are regional variations in its development. Elaborate. (UPSC-2020)

17. VIKSIT BHARAT MEETS GREEN GROWTH

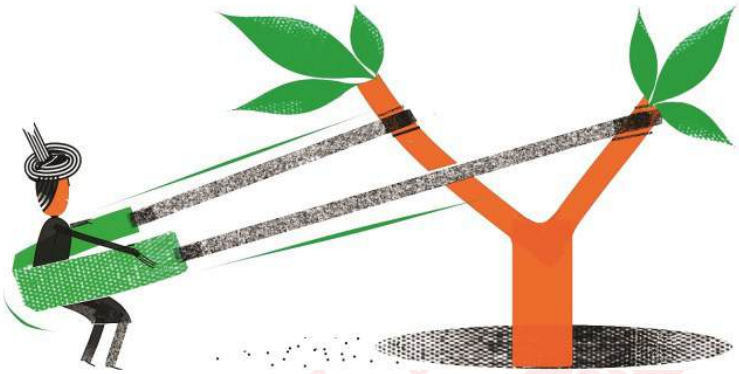
Context:

India's ambitious goal of becoming a developed nation (Viksit Bharat) by 2047 and achieving net-zero emissions by 2070 has brought green growth into focus.

Balancing rapid economic development with sustainable practices is critical to ensuring long-term prosperity and environmental resilience.

Idea of Viksit Bharat:

- **Goal:** Transform India into a fully developed economy by 2047, with sustained high growth and inclusive development.
- **Key objectives:** High GDP growth (over 8%), world-class infrastructure, poverty elimination, and social equity.
- **Pillars:** Digital revolution, industrial strength, innovation, and climate resilience.
- **Global positioning:** Aim for India to become a leading geopolitical power and technology hub.



How Green Growth Fuels India to Viksit Bharat:

- **Job creation:** Green sectors are expected to generate 50 million new jobs by 2070 (WEF's Mission 2070 report).
- **Economic value addition:** Estimated $1 trillion in additional economic value by 2030 from green investments.
- **Energy security:** Reduces dependency on 85% crude oil imports, stabilizing the economy.
- **Export competitiveness:** Decarbonized manufacturing helps avoid future carbon penalties (potential $150 billion annual loss by 2040).

Measures Taken by Government So Far:

- National Green Hydrogen Mission: Targets 5 MMT of green hydrogen production annually by 2030.
- 500 GW renewable energy goal: To be achieved by 2030; currently progressing with 180+ GW installed.
- Production Linked Incentive (PLI): Launched for solar modules, advanced battery storage, and green technologies.
- Budget 2025 provisions: Announced 100 GW nuclear energy plan, grid-scale battery production support.

Challenges:

- **High Carbon Dependency:** Coal accounts for 55-60% of power generation, with demand peaking only by 2030-2035.
- **Funding Gaps:** Requires $290 billion in renewable energy investments by 2030, posing financial challenges.
- **Skill Deficit:** Need to train 3.7 million skilled workers for the renewables sector by 2030.
- **Climate Risks:** Extreme heat could reduce GDP by 2.5-4.5% by 2030, impacting agriculture and labor productivity.
- **Policy Implementation:** Balancing fast growth with green transition requires careful planning and execution.

Way Ahead:

- **Holistic Strategy:** Combine renewable energy capacity-building with climate adaptation measures and ecosystem development.
- **Demand-Side Focus:** Provide farmers and MSMEs access to affordable, climate-resilient technologies and green finance.
- **International Collaboration:** Partner with global experts for technical support, skill development, and innovative financing.
- **Innovation:** Invest in green hydrogen, grid modernization, and carbon capture technologies to drive sustainable growth.
- **Policy Tools:** Use carbon pricing, green bonds, and blended finance models to incentivize decarbonization.

Conclusion:

Green growth and the vision of Viksit Bharat are not opposing paths but complementary goals. Accelerating green investments and building resilient infrastructure will drive sustainable growth. A well-planned green transition will place India on a stronger global footing by 2047.

PYQ:

"Access to affordable, reliable, sustainable and modern energy is the sine qua non to achieve Sustainable Development Goals (SDGs)". Comment on the progress made in India in this regard. (UPSC-2018)

Syllabus: Major crops cropping patterns in various parts of the country

18. IMPACT OF CLIMATE CHANGE ON INDIA'S WHEAT PRODUCTION

Context:

India's wheat production faces severe risks due to climate change, with February 2025 recorded as the hottest in 124 years. Rising temperatures during critical growth stages threaten yield, quality, and food security.

Stages	Optimum Temperature (°C)	Minimum Temperature (°C)	Maximum Temperature (°C)
Seed germination	20–25 ± 1.2	3.5–5.5 ± 0.44	35 ± 1.02
Root growth	17.2 ± 0.87	3.50 ± 0.73	24.0 ± 1.21
Shoot growth	18.5 ± 1.90	4.50 ± 0.76	20.1 ± 0.64
Leaf initiation	20.5 ± 1.25	1.50 ± 0.52	23.5 ± 0.95
Terminal spikelet	16.0 ± 2.30	2.50 ± 0.49	20.0 ± 1.60
Anthesis	23.0 ± 1.75	10.0 ± 1.12	26.0 ± 1.01
Grain filling duration	26.0 ± 1.53	13.0 ± 1.45	30.0 ± 2.13

What's Happening and Why?

- **Record-Breaking Temperatures:** February 2025 was India's hottest February in 124 years, with March expected to see excessive heat waves.
- **Delayed Sowing Patterns:** Indian Ocean warming has disrupted the kharif season, delaying wheat sowing and exposing crops to early-season heat stress.
- **Frequent Marine Heat Waves:** IITM forecasts up to **250 marine heat wave days per year** by the century's end, intensifying climate risks.
- **Lower Procurement Targets:** Despite a **115 million tonnes** production target for 2024-2025, the government reduced procurement expectations to **30 million tonnes** due to climate concerns.
- **Export Restrictions:** Wheat exports were banned in May 2022 to control domestic supply after reduced production from climate impacts and geopolitical disruptions.

Impact of Climate Change on Wheat Production

- **Reduced Yield:** Rising temperatures accelerate ripening, causing **early flowering** and **shorter grain-filling periods**, reducing yield.
- **Degraded Grain Quality:** Heat stress reduces starch content, producing harder grains with lower milling value and reduced market demand.
- **Resource Misuse:** Farmers' overuse of **fertilisers**, **pesticides**, and **fungicides** to counter climate stress leads to soil degradation.
- **Economic Distress:** Wheat procurement in 2024-2025 was **26.6 million tonnes**, below the **34.15 million tonnes** target, causing farmer income loss.
- **Threat to Food Security:** Lower wheat availability strains the **Public Distribution System (PDS)** and risks domestic price inflation.

Adaptation and Mitigation Strategies

- **Heat-Resilient Crop Varieties:** Developing wheat varieties with **shorter growth cycles** reduces exposure to peak heat periods.
- **Early Sowing Practices:** Encouraging earlier sowing in heat-vulnerable regions can prevent crops from maturing during extreme temperatures.
- **Enhanced Weather Monitoring:** Strengthening **real-time advisory systems** helps farmers make informed decisions on sowing and irrigation.
- **Precision Farming Techniques:** Techniques such as **drip irrigation**, **soil sensors**, and controlled fertiliser use improve efficiency.
- **Policy Support:** Expanding **compensation schemes**, **climate-specific insurance**, and **credit facilities** can protect farmers from climate-induced losses.

Conclusion::

Climate change is increasingly threatening India's wheat production, reducing yields, compromising quality, and straining farmer incomes. While immediate financial aid is crucial, long-term solutions such as climate-resilient crops, improved weather advisories, and precision farming methods are vital for sustaining wheat production and ensuring food security.

PYQ:: Give the vulnerability of Indian agriculture to vagaries of nature, discuss the need for crop insurance and bring out the salient features of the Pradhan Mantri Fasal Bima Yojana (PMFBY). (12.5 M) (2016)

19. MARINE LITTER

Context:

A study published in the Journal of Environmental Management (Elsevier) has highlighted a growing marine litter crisis in Lakshadweep, with plastic pollution posing an existential threat to coral reef ecosystems.

About Marine Litter:

What is Marine Litter?

- **Persistent, human-made waste that accumulates in the marine and coastal environment**, affecting marine biodiversity and human livelihoods.
- Includes **macroplastics (large plastic debris)** and **microplastics (small plastic particles <5mm)**.
- **Major sources:** Land-based waste, fishing gear, ship discharges, and ocean dumping.

Causes of Marine Litter:

- **Plastic Pollution**: Over 80% of marine litter consists of plastic waste, with an estimated 5.25 trillion plastic particles floating in the oceans (UNEP Report).
- **Improper Waste Disposal**: Poor solid waste management leads to unregulated dumping into rivers and seas.
- **Maritime & Fishing Industry**: Lost fishing gear ("ghost nets") and oil spills contribute to ocean pollution.
- **Tourism & Coastal Activities**: Plastic bottles, food packaging, and discarded items from tourists severely impact marine ecosystems.
- **Shipping Industry & Offshore Activities**: Discharges from cargo ships, oil rigs, and container losses at sea add to marine litter.

Consequences of Marine Litter:

Economic Impact

- **Loss of fisheries & tourism revenue**: The **global fishing industry loses $1.3 billion annually** due to marine plastic pollution (FAO 2023).
- **Increased port & shipping costs**: Ports spend **millions cleaning up plastic waste**, affecting trade efficiency.

Human Health Risks

- **Microplastics in food chain**: A 2021 study found **microplastics in 114 marine species**, many of which are consumed by humans (GESAMP 2021).
- **Water contamination**: Plastic chemicals **leach into water sources**, leading to health issues.
- **Navigation hazards**: Floating plastic debris damages **ship engines and fishing nets**, endangering livelihoods.

Global Actions to Counter Marine Litter

1. **IMO Strategy on Marine Plastic Litter (2021)** – Aims for zero plastic waste discharges from ships by 2025.
2. **MARPOL Annex V (1988)** – Prohibits plastic dumping at sea, requiring proper port reception facilities.
3. **GloLitter Partnerships (FAO & IMO, 2019)** – Assists developing countries in reducing plastic pollution in maritime industries.
4. **UN SDG 14 (Life Below Water)** – Calls for preventing & reducing marine pollution by 2025.
5. **EU Plastic Strategy (2018)** – Bans single-use plastics and mandates 100% recyclability by 2030.

India's Actions to Remove Marine Litter:

1. **Ban on Single-Use Plastics (2022)** – India prohibited 19 types of single-use plastics to curb ocean pollution.
2. **National Marine Litter Policy (Draft, 2023)** – Focuses on waste management, coastal clean-ups, and reducing plastic inflow into oceans.
3. **Swachh Sagar, Surakshit Sagar Campaign (2022)** – India's largest coastal clean-up drive, covering 75 beaches across 75 days.
4. **Blue Flag Certification for Eco-Beaches** – Promotes waste-free, sustainable coastal tourism.

Challenges in Eradicating Marine Litter:

- **Lack of Waste Management Infrastructure:** 90% of India's plastic waste is mismanaged, leading to ocean dumping.
- **Limited Enforcement of Regulations:** Illegal dumping and non-compliance with MARPOL Annex V remain concerns.
- **High Plastic Dependency:** India produces 3.5 million tons of plastic waste annually, with low recycling rates.
- **Rising Coastal Tourism & Urbanization:** Unregulated tourism growth leads to increased plastic pollution in coastal areas.
- **Climate Change & Rising Sea Levels:** Ocean currents redistribute marine litter, making cleanup difficult.

Way Ahead:

- **Strengthen Policy Enforcement**: Implement marine litter laws at ports and coastal areas, with strict penalties for violations.
- **Enhance Recycling & Waste Infrastructure**: Establish Ocean waste recycling centers and promote biodegradable alternatives.
- **Expand Community-Based Clean-up Programs**: Increase public participation in coastal clean-up drives and awareness campaigns.
- **Adopt Circular Economy Principles**: Encourage extended producer responsibility (EPR) for plastic manufacturers.
- **International Cooperation**: Strengthen India's partnerships with IMO, UNEP, and FAO for global best practices in marine waste reduction.

Conclusion:

Marine litter is a growing threat to ocean ecosystems, economies, and human health. India must strengthen its waste management, enforce stricter regulations, and promote eco-friendly alternatives to curb marine pollution. A collective approach involving global cooperation, industry participation, and local engagement is essential for safeguarding India's coastal and marine environments.

PYQ:

What is oil pollution? What are its impacts on the marine ecosystem? In what way is oil pollution particularly harmful for a country like India? (UPSC-2023)

Syllabus: Ecology

20. TRANSFORMING FOREST FINANCE: BRIDGING THE GAP BETWEEN CONSERVATION AND DESTRUCTION

Context:

A UNDP report highlights a significant funding imbalance, revealing that for every $1 invested in forest conservation, $6 is funnelled into industries that contribute to deforestation.

Key Insights from UNDP Report on Forest Conservation Funding:

- **Funding Gap:** $460 billion per year is required to stop deforestation, but current funding falls far short.
- **Misaligned Investments:** For every $1 spent on forest protection, $6 is directed toward deforestation-causing industries such as industrial agriculture and logging.
- **Ineffective REDD+:** Current payments under the REDD+ program range from $5–10 per tonne of CO_2, while the actual mitigation cost is $30–50 per tonne.
- **Debt Burden on Developing Nations:** With $11 trillion in debt, developing countries are pressured to exploit forests for short-term financial relief.
- **Successful Models:** Direct funding to Indigenous communities, like the Mesoamerican Territorial Fund, has proven to deliver stronger forest conservation outcomes.

Governments Are Funding Destruction:

- Harmful Subsidies: Governments provide $500 billion annually in subsidies to industries driving deforestation. Example: Subsidies for palm oil and soy production in Southeast Asia and South America.

- **Debt-Driven Exploitation:** High sovereign debt forces nations to prioritize economic gains over conservation. Example: Debt-ridden countries like the Democratic Republic of Congo exploit forests for timber.
- **Weak Regulations:** Lack of stringent financial regulations allows banks to invest in deforestation-linked sectors. Example: Major banks funding agribusinesses in the Amazon.
- **Inadequate REDD+ Funding:** Low payments under REDD+ fail to incentivize forest conservation. Example: Brazil's Amazon deforestation rates remain high despite REDD+ initiatives.
- **Misallocation of Funds:** Climate finance often bypasses local communities and Indigenous groups. Example: Only 1% of global climate finance reaches Indigenous Forest stewards.

Consequences of Funds Fuelling Deforestation:

- **Biodiversity Loss:** Deforestation destroys habitats, leading to species extinction.
  Example: Orangutans in Indonesia are critically endangered due to palm oil expansion.
- **Climate Change:** Forests act as carbon sinks; their destruction exacerbates global warming.
  Example: Amazon deforestation contributes to rising CO2 levels.
- **Economic Instability:** Short-term gains from deforestation lead to long-term economic losses.
  Example: Soil degradation from deforestation reduces agricultural productivity.
- **Social Conflicts:** Exploitation of forests displaces Indigenous communities.
- **Water Cycle Disruption:** Deforestation affects rainfall patterns and water availability.
  Example: Reduced rainfall in the Congo Basin due to forest loss.

Way Ahead:

- **Reform Public Finance**: Increase funding for forest conservation through multilateral institutions like the World Bank.
  Example: Redirect funds from harmful subsidies to sustainable alternatives.
- **Overhaul Debt Systems:** Address sovereign debt to reduce pressure on forest exploitation.
  Example: Debt-for-nature swaps in countries like Ecuador.
- **Strengthen Regulations:** Mandate banks and investors to account for deforestation risks.
  Example: EU's deforestation-free supply chain regulations.
- **Direct Funding to Communities**: Ensure Indigenous and local communities receive financial support.
  Example: Success of the Podáali Fund in Brazil.
- **Innovative Financing Models:** Establish long-term funding mechanisms like the Tropical Forest Forever Facility.
  Example: Global funds for forest conservation similar to the Green Climate Fund.

Conclusion:

UNDP report underscores the urgent need to realign global finance to protect forests. By reforming subsidies, strengthening regulations, and supporting Indigenous communities, the world can address deforestation and its devastating impacts. Immediate action is essential to safeguard forests, biodiversity, and climate stability.

PYQ:

"The most significant achievement of modern law in India is the constitutionalization of environmental problems by the Supreme Court." Discuss this statement with the help of relevant case laws. (UPSC-2022)

21. INDIAN COASTAL CRISIS

Context:

India's coastal regions face a dual crisis—**illegal light fishing depleting marine life and erosion threatening 33.6% of the coastline**, as revealed by recent government data.

About India's Coastal Region:

- **Extensive Coastline:** India has **7,500 km of coastline**, spanning 9 states and 4 UTs, supporting livelihoods, trade, and biodiversity.
- **Economic Hub:** Contributes **4% to India's GDP through fisheries, tourism, and shipping.**
  E.g., Mumbai and Chennai ports handle 70% of trade.
- **Biodiversity Hotspots:** Home to **mangroves (Sundarbans), coral reefs (Gulf of Kutch)**, and endangered species like Olive Ridley turtles.
- **Population Pressure:** Over **250 million people live within 50 km of the coast, increasing vulnerability to disasters.**
- **Climate Vulnerability:** Faces rising sea levels (3.2 mm/year) and cyclones.

Significance of Coastal Ecosystems:

- **Carbon Sequestration:** Mangroves absorb and store **4x more carbon than terrestrial forests, mitigating climate change.**
  Example: Bhitarkanika mangroves (Odisha) act as a major carbon sink.
- **Fisheries Support:** Coastal waters contribute **70% of India's fish production**, sustaining millions of livelihoods.
  E.g., 16 million fishers depend on coastal fishing for income.
- **Natural Barriers:** Coral reefs and sand dunes reduce wave impact, preventing coastal erosion.
  E.g., Gulf of Mannar's reefs protect Tamil Nadu's shoreline.
- **Tourism Revenue:** Coastal tourism generates **$11 billion annually**, boosting local economies.
  E.g., Goa and Puri beaches attract millions of tourists yearly.
- **Cultural Heritage:** Coastal regions host UNESCO sites and indigenous fishing traditions.
  E.g., Chola temples (Tamil Nadu) and Koli fishing communities.

Government Initiatives to Protect Coastal Ecosystems:

1. **Coastal Regulation Zone (CRZ) 2019:** Restricts construction, promotes sustainable development.
2. **Integrated Coastal Zone Management (ICZM):** World Bank-funded projects in Gujarat, Odisha, and West Bengal.
3. **Mangrove Initiative (MISHTI):** Aims to plant mangroves across 540 sq km by 2030.
4. **National Centre for Coastal Research (NCCR):** Monitors erosion using satellite data (e.g., 33.6% erosion mapped).
5. **Blue Economy Policy:** Focuses on sustainable marine resource use (e.g., deep-sea fishing guidelines).

Issues Plaguing Indian Coastal Systems:

- **Illegal Light Fishing:** Despite bans, mechanized boats use bright LED lights to attract fish, depleting juvenile populations.
  E.g., Maharashtra and Andhra Pradesh face rampant violations, harming traditional fishers' livelihoods.
- **Coastal Erosion:** Rising sea levels and human activities like sand mining accelerate shoreline loss.
  E.g., Dakshina Kannada (Karnataka) lost 48.4% of its coast in 30 years.
- **Pollution:** Plastic waste and industrial effluents choke marine life and degrade water quality.
  E.g., Versova Beach (Mumbai) required massive cleanups to restore ecosystems.
- **Habitat Destruction:** Mangroves and wetlands are cleared for infrastructure, reducing natural storm buffers.
  E.g., Mumbai lost 40% of its mangroves since 1987 due to urban expansion.
- **Weak Enforcement:** Lack of monitoring allows illegal construction and fishing to thrive unchecked.
  E.g., Adani port in Kerala faced CRZ violations due to poor oversight.

Way Forward:

- **Strict Enforcement:** Deploy AI drones and increase Coast Guard patrols to detect illegal activities.
  E.g., Kerala's crackdown on LED-equipped boats reduced light fishing.
- **Eco-Friendly Infrastructure:** Artificial reefs and sand replenishment can stabilize eroding coastlines.
  E.g., Puducherry's submerged breakwaters reduced erosion by 30%.
- **Community Participation:** Engage local fishers in conservation to ensure sustainable fishing practices.
  E.g., Tamil Nadu's fisher unions actively patrol against illegal trawling.
- **Climate Adaptation:** Relocate high-risk coastal settlements to safer inland areas.
  E.g., Odisha built cyclone-resistant homes for vulnerable communities.
- **Research & Funding:** Expand scientific studies on erosion and allocate budgets for mangrove restoration.
  E.g., NCCR's satellite mapping helps track erosion hotspots.

Conclusion:

India's coasts are vital for ecology, economy, and culture, but face threats from erosion, pollution, and overfishing. Stricter enforcement, community involvement, and sustainable policies can safeguard these ecosystems for future generations.

PYQ:

Coastal sand mining, whether legal or illegal, poses one of the biggest threats to our environment. Analyse the impact of sand mining along the Indian coasts, citing specific examples. (UPSC-2019)

Syllabus: Biotechnology

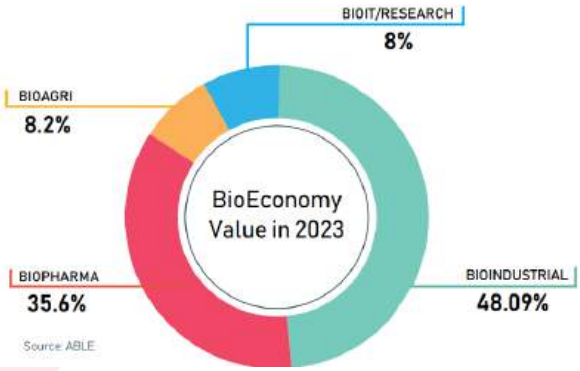
22. INDIA BIOECONOMY

Context:

The India BioEconomy Report 2024, released by the Department of Biotechnology, highlighted that India's **bioeconomy crossed $165 billion**, contributing 4.2% of GDP. It charts a roadmap to reach $300 billion by 2030 and $1 trillion by 2047.

Key Insights from India BioEconomy Report 2024:

- **Rapid Market Growth:** Bioeconomy doubled from **$86 billion (2020)** to **$165 billion (2024)**, with projections of **$1 trillion by 2047**.
- **Industrial & Pharma Dominance: 48%** value came from **industrial bioeconomy** (biofuels, bioplastics); **35%** from pharma, majorly **vaccines**.
- **Start-up Surge:** Number of companies grew from **5,365 in 2021** to **10,075 in 2024**, expected to double again by 2030.
- **Employment Potential:** Projected to generate **35 million jobs** by 2030 through biotech research, IT, and bio-manufacturing.
- Regional Disparities: 5 states (MH, KA, TG, GJ, AP) contribute two-thirds of total value; NE and Eastern India underperform (<6%).
- Fastest Growing Segment: Research & IT—including bioinformatics, clinical trials, and biotech software—is seeing the highest annual growth.



About India's Achievements in Bioeconomy:

- Vaccine Revolution: India became a global leader in vaccine production post-COVID-19, boosting biotech infrastructure and innovation.
- Biofuel Expansion: Ethanol blending programs and fermentation-based fuel production have surged, reducing fossil fuel dependency.
- Global Recognition: India's bioeconomy (4.2% of GDP) now compares well with US and China, although lagging behind EU nations like Spain (20%).
- Academic & Research Ecosystem: Premier institutes like IISc, NCBS, NIBMG have expanded biotech R&D.
- Digital Bio Solutions: AI-powered platforms for genome mapping, diagnostics, and precision farming are scaling rapidly.

Key Government Initiatives

- **BioE3 Policy (2024):** Launched to drive bio-based Economy, Environment, and Employment. Focus: biomanufacturing and research.
- **National Bioeconomy Mission (Proposed):** Suggested in the report to coordinate policy and funding under one umbrella.
- **Single-Window Clearance:** Recommended to ease biotech project approvals and remove regulatory delays.
- **Startup Ecosystem Boost:** Bio-incubators and funding support for biotech startups are growing under DBT's BIRAC.
- **Focus on Priority Areas:** Marine biotech, functional foods, bioenzymes, space bio-research, and climate-resilient crops are key thrust zones.

Challenges in Indian Bioeconomy

- **Regulatory Uncertainty:** Delay in approval for GM crops hinders agricultural biotechnology despite proven productivity gains.
- **Infrastructure Gaps:** Labs and processing units in Eastern & NE India lack basic facilities and funding.
- **Skilled Workforce Shortage:** Need for biotech-ready manpower across domains like bioinformatics, fermentation

tech, and IP law.

- **Low Private Investment:** Bioeconomy lags behind IT and pharma in attracting venture capital and FDI.
- **Data and Standardization Issues:** Lack of bioresource inventories and absence of quality assurance frameworks reduce export potential.

Measures & Way Forward:

- **Enhance Policy Cohesion:** Launch National Bioeconomy Mission for unified policy design, funding, and implementation.
- **Promote GM Crop Adoption:** Create evidence-based policies to approve safe GM varieties and improve yield outcomes.
- **Address Regional Disparity:** Incentivize biotech parks, PPPs, and academic-industry linkages in backward zones.
- **Upskill Workforce:** Establish training hubs in **bioinformatics, synthetic biology, and AI** in biotech.
- **Scale Public-Private Partnerships:** Collaborate with industries for R&D in clean bio-based technologies and scale global patents.

Conclusion:

India's bioeconomy stands at a transformational juncture. With the right policy, infrastructure, and regulatory reforms, India can evolve into a global bio-manufacturing and innovation hub. Sustained efforts are vital to realize the vision of $1 trillion bioeconomy by 2047.

PYQ:

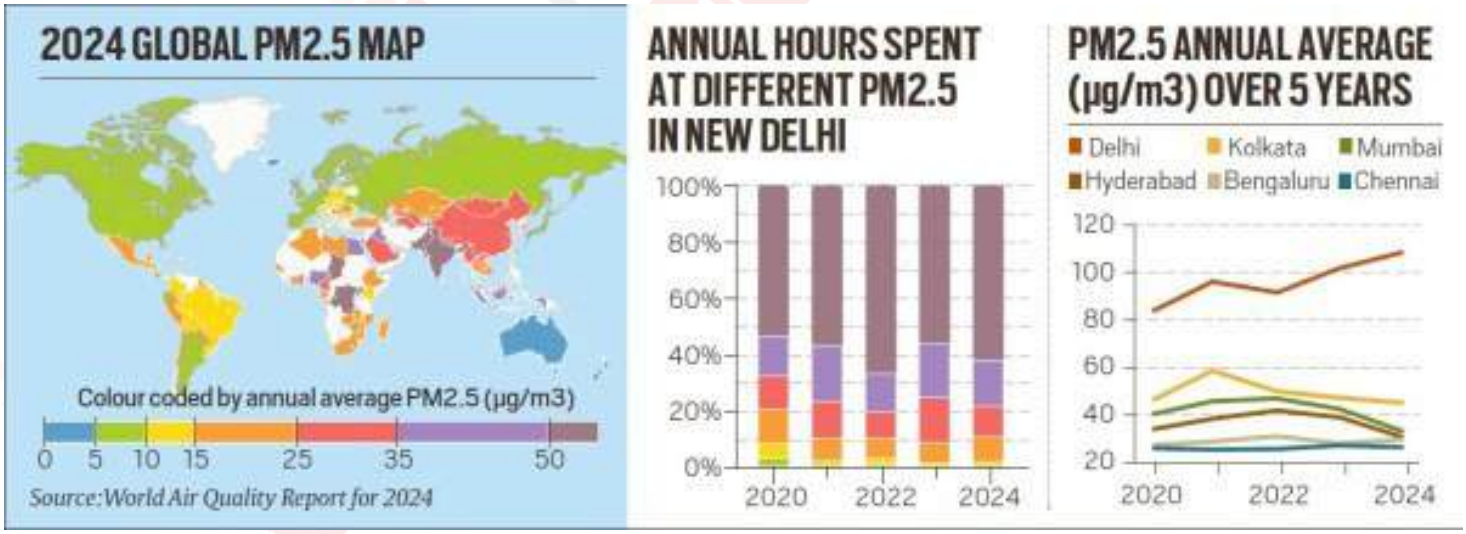
Why is there so much activity in the field of biotechnology in our country? How has this activity benefitted the field of biopharma? (UPSC-2018)

Syllabus: Air Pollution

23. WORLD AIR QUALITY REPORT 2024

Context:

The World Air Quality Report 2024 which was published by Swiss air technology firm IQAir, gives a detailed analysis of global air pollution levels, bringing to light the alarming trends and some important information.



Status of Air Pollution in India

- **High PM2.5 Levels:** India's average PM2.5 concentration in 2024 was 50.6 µg/m³, exceeding the WHO safe limit (5 µg/m³) by 10 times.
- **Most Polluted Cities:** 13 out of the world's 20 most polluted cities are in India, with Byrnihat (128.2 µg/m³) and Delhi (91.6 µg/m³) ranking among the worst.
- **Health Impact:** Air pollution contributed to 2.1 million deaths in India in 2021, making it a leading cause of premature mortality.
- **Regional Crisis:** Northern states (Delhi, Punjab, Haryana, Uttar Pradesh) experience severe pollution due to crop

burning, industrial emissions, and vehicular traffic.

Status of Air Pollution in the World

- **Global Air Pollution Crisis:** 99% of the world's population breathes air that exceeds WHO's PM2.5 limit (5 µg/m³), with only 12 countries meeting safe levels.
- **Most Polluted Countries:** Chad (91.8 µg/m³), Bangladesh (78 µg/m³), Pakistan (73.7 µg/m³), Congo (58.2 µg/m³), and India (50.6 µg/m³) rank as the world's most polluted nations.
- **Health Impact:** Air pollution caused 1 million deaths worldwide in 2021, making it the second largest global risk factor for mortality after high blood pressure.
- **Unequal Burden:** South Asia, Africa, and the Middle East face the highest pollution levels, while Europe and Oceania have the cleanest air due to strict regulations and renewable energy adoption.

Major Causes of Air Pollution:

- **Fossil Fuel Combustion**: Power plants, industries, and vehicles release **high levels of PM2.5**, worsening air quality.
- **Crop Burning**: Stubble burning in **Punjab, Haryana, and UP** causes **60% of Delhi's winter pollution.**
- **Industrial Emissions**: Cities like **Byrnihat face severe air pollution** due to **factories, distilleries, and steel plants.**
- **Construction Dust**: **Unregulated urban expansion** leads to **high particulate matter pollution** in cities.

Challenges in Tackling Air Pollution:

- **Weak Policy Enforcement:** Lack of strict penalties and poor GRAP implementation weaken pollution control.
- **Lack of Coordination:** Different states adopt varied pollution measures, creating inconsistent results.
- **Public Apathy:** Low awareness and poor compliance hinder effective air pollution mitigation.
- **Rising Vehicular Emissions:** Urban traffic congestion and fossil fuel dependence increase air pollution.
- **Limited Air Quality Monitoring:** Many Tier-2 and Tier-3 cities lack real-time air quality tracking systems.

Way Ahead:

- **Strict Implementation of GRAP:** Enforce bans on stubble burning and limit industrial emissions.
- **Investment in Public Transport:** Promote electric vehicles (EVs) and expand metro networks.
- **Green Energy Transition:** Shift from coal-based power plants to renewable energy sources.
- **Better Urban Planning:** Develop green belts, regulate construction dust, and improve air filtration.
- **Community Awareness Programs:** Educate people on air pollution's health risks and mitigation strategies.

Conclusion:

The World Air Quality Report 2024 highlights India's worsening air crisis, with multiple cities ranking among the most polluted. While government policies exist, their weak enforcement has resulted in little improvement. Urgent policy interventions, technological innovations, and community engagement are necessary to mitigate India's air pollution crisis.

PYQ:

Describe the key points of the revised Global Air Quality Guidelines (AQGs) recently released by the World Health Organisation (WHO). How are these different from its last update in 2005? What changes in India's National Clean Air Programme are required to achieve these revised standards?

Syllabus: Disaster Management

24. DISASTER MANAGEMENT (AMENDMENT) BILL, 2024

Context:

The Parliament has passed the **Disaster Management (Amendment) Bill, 2024**, aiming to strengthen disaster response mechanisms.

About Disaster Management (Amendment) Bill, 2024:

Key Features and Amendments:

Disaster management plans: NDMA and SDMA will now prepare plans, replacing previous delegation to executive committees.

Expanded functions of NDMA and SDMA:

- Periodic disaster risk assessments, including climate-related risks.
- Providing technical guidance and minimum relief standards.
- Preparing national and state-level disaster databases.
- Conducting post-disaster audits and assessing state preparedness.

Urban Disaster Management Authorities:

- To be set up in state capitals and cities with municipal corporations.
- Headed by the Municipal Commissioner with District Collector as Vice-Chairperson.

State Disaster Response Force (SDRF): Empowering states to form SDRFs with defined roles and service conditions.
Statutory status: Given to the National Crisis Management Committee **(NCMC)** and the **High-Level Committee (HLC)** for disaster financial oversight.
NDMA appointments: NDMA can now specify staffing needs and appoint experts with Centre's approval.

Need for the Amendment:

- **Climate change:** Rise in extreme climate events necessitates proactive disaster planning.
- **Decentralization gaps:** States faced difficulties with the 2005 Act's execution framework.
- **Strengthening institutions:** Aims to create accountable, well-defined structures at national and sub-national levels.
- **Data and tech integration:** Need for real-time disaster databases and post-disaster audits.

Issues with New Disaster Management Bill, 2024

- **Centralization concerns:** Opposition claims excessive powers given to the Centre, undermining federal balance.
- **Overlap with state powers:** Potential encroachment on state authority in disaster planning and fund utilization.
- **NDRF allocation control:** Greater central monitoring may delay decentralized relief efforts.
- **Omission of climate-induced disasters:** Exclusion of phenomena like heatwaves from disaster definitions.
- **Lack of dedicated state-specific relief budgets:** States like Bihar demand region-focused disaster funding.

Way Ahead:

- **Ensure federal balance:** Respect state autonomy in disaster management execution.
- **Incorporate climate change disasters**: Update definitions to cover emerging threats.
- **Transparent fund usage:** Clear guidelines for state and district-level fund allocations.
- **Strengthen local bodies:** Capacity-building for District and Urban Disaster Management Authorities.
- **Regular post-disaster audits:** Transparent evaluations to improve readiness.

Conclusion:

The Disaster Management (Amendment) Bill, 2024, is a step toward strengthening disaster resilience in India. However, addressing federal concerns and climate realities is crucial. Collaborative, transparent, and proactive disaster governance will be key in safeguarding lives and livelihoods.

PYQ:

With reference to National Disaster Management Authority (NDMA) guidelines, discuss the measures to be adopted to mitigate the impact of recent incidents of cloudbursts in many places of Uttarakhand. (UPSC-2016)

25. HEATWAVE

Context:

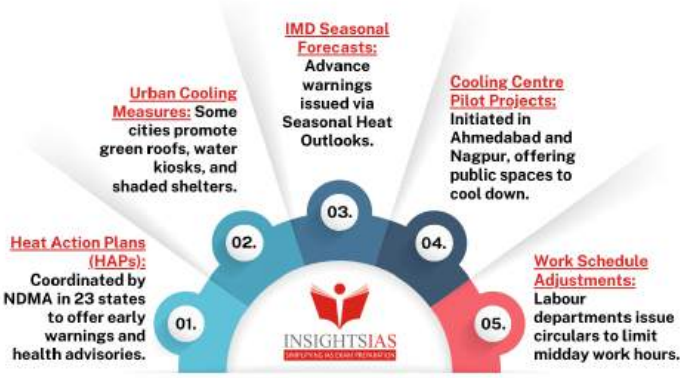
The India Meteorological Department (IMD) has forecast 10–12 heatwave days in northwest India this summer, nearly double the usual average of 5–6 days. A recent study found that many Indian cities lack long-term strategies in their Heat Action Plans (HAPs) to address rising heat stress.

About Heatwaves:

Temperature Threshold: Heatwaves occur when temperatures cross **40°C in plains or 30°C in hills**, persisting for ≥2 days.
Geographic Hotspots: Northwest India (Rajasthan, Delhi) faces highest frequency due to arid climate and urbanization.
Humidity Impact: Coastal areas face "wet bulb" threats where high humidity makes 35°C feel like 50°C.

Climate Change Link: Rising global temperatures and El Niño events intensify heatwave frequency/duration.

Urban Heat Islands: Concrete-dominated cities are 4-5°C hotter than rural areas due to heat absorption.



GOVERNMENT INITIATIVES ON HEATWAVE MANAGEMENT

Effects of Heatwaves:

On People:

- **Heatstroke & Dehydration:** Can cause **fainting, organ failure**, and even **death**.
- E.g. 733 heatstroke deaths were reported across 17 states in 2024 (HeatWatch).
- **Mental Health Stress:** Sleep disturbances and heat anxiety increase during extreme heat spells.
- **Reduced Work Productivity:** Affects **daily wage workers**, especially in agriculture and construction.

On Ecology:

- **Water Stress:** Increased **evaporation** leads to **dry rivers and lakes**.
- **Forest Fires:** Drought-like conditions promote the spread of **wildfires**, especially in central India.
- **Crop Failure:** Heatwaves during flowering stages harm **wheat, pulses, and vegetables**.

On Wildlife:

- **Mass Bird Deaths:** Birds die due to **dehydration and heat stress** (e.g., 100+ birds died in Gujarat, 2023).
- **Aquatic Mortality:** **Fish kills** occur due to oxygen depletion in warm water bodies.
- **Human-Wildlife Conflict:** Animals enter cities in search of **shade and water**.

Loopholes and Challenges:

- **Lack of Long-Term Strategies:** Most HAPs focus on **emergency response**, not **resilience building**.
    a. E.g. The SFC study found no long-term cooling or insurance initiatives in 9 major cities.
- **Poor Implementation:** Even well-drafted plans **fail in execution** due to poor inter-agency coordination.
- **Urban Planning Gaps:** Lack of **green spaces**, poor building design, and inadequate ventilation.
- **Insufficient Data Tracking:** Underreporting of **heat-related deaths** distorts real impact (e.g., 2024 NDMA vs HeatWatch gap).
- **Limited Budget Allocation:** No **dedicated funding lines** for HAPs in many municipalities.

Way Forward:

- **Integrate HAPs into Master Plans:** Make **heat resilience** part of city development frameworks.
- **Expand Green Infrastructure:** Promote **urban forests, reflective rooftops**, and water conservation systems.
- **Strengthen Data Systems:** Create a unified **national database** for heatwave mortality and hospitalizations.
- **Community Awareness Programs:** Launch **heat literacy drives** and targeted awareness campaigns.
- **Climate-Smart Infrastructure:** Retrofit buildings with **passive cooling**, improve **electricity access** and backup systems.

Conclusion:

The rise in heatwave frequency is a stark warning of the climate crisis unfolding in India. Without robust long-term planning, vulnerable populations will bear the brunt of this avoidable public health emergency. A proactive, inclusive, and science-based approach is the only sustainable solution.

PYQ:

Discuss the recent measures initiated in disaster management by the Government of India departing from the earlier reactive approach. (UPSC-2020)

26. AVALANCHE

Context:

A massive avalanche struck a BRO project site near Mana village in Chamoli district, Uttarakhand, trapping 22 workers under ice, with ongoing rescue operations by the Indian Army and ITBP.

About Avalanche:

What is an Avalanche?

- A sudden and rapid descent of snow, ice, and debris down a mountain slope, triggered by natural or human-induced factors.
- Can cause **widespread destruction** by **burying people, structures, and transport routes** under tons of snow.

NDMA GUIDELINES ON AVALANCHE MANAGEMENT:

1.Risk Zonation & Mapping
Identification of High-Risk Avalanche Zones in J&K, Ladakh, Himachal Pradesh, & Uttarakhand.

2.Search & Rescue Preparedness
·Formation of Quick Response Teams (QRTs) with NDRF & BRO.
·Equipped with snow probes, transceivers, and avalanche rescue dogs.

3.Training & Awareness
·Snow & Avalanche Study Establishment (SASE) & IMD to conduct training for Army, ITBP, and Skiers on avalanche safety.
·Public awareness programs for locals & tourists in snow-covered regions.

4.Infrastructure Protection & Warning Systems
·Use of Remote Sensing, GPS & AI for real-time avalanche warnings.
·Installation of Avalanche Protection Structures in BRO Project Sites.

Types of Avalanches:

- Loose Snow Avalanche:
  a. Forms when **loosely bonded snow** starts sliding from a single point.
  b. Common in **steep slopes (>40°)** with fresh snowfall.
- Slab Avalanche:
  a. Occurs when a **cohesive layer of snow breaks away as a single slab**.
  b. Responsible for **most fatalities**, reaching speeds of **100 km/h**.
- Gliding Avalanche:
  a. Involves **entire snowpack sliding over a smooth surface** (grass, rock).
  b. Occurs at **slopes >15°** and leads to **large-scale destruction**.
- Powder Avalanche:
  a. High-speed avalanches **suspending snow particles in air**, creating a **powder cloud**.
  b. Can reach **speeds of 300 km/h**, causing severe **shockwave impact**.
- Wet Snow Avalanche
  a. Triggered by **melting snow due to temperature rise or rain**.
  b. Slower but more destructive due to its **high density and force**.

Causes of Avalanches

- Natural Causes:
  - **Heavy Snowfall & Wind Direction**: Unstable snowpack due to **uneven accumulation**.
  - **Steep Slopes**: Avalanches commonly occur at **30°-45° inclinations**.
  - **Temperature Fluctuations**: Melting snow weakens **internal layers**, increasing instability.
  - **Earthquakes & Vibrations**: Trigger **snow movement** on unstable slopes.
- Human-Induced Causes:
  - **Winter Sports & Tourism**: Skiing, snowmobiling, and trekking **destabilize snow layers**.
  - **Construction & Deforestation**: Removal of trees **weakens slope stability**.
  - **Military Operations**: High-altitude warfare and detonations can **trigger slides**.

Consequences & Impact of Avalanches:

- **Loss of Life & Injuries:** Avalanches cause suffocation, hypothermia, and fatal trauma, with survival chances dropping significantly after 15 minutes of burial.
- **Destruction of Infrastructure:** Snow slides block roads, railways, and highways, cutting off access and burying homes, BRO camps, and tourist shelters under heavy snow.
- **Disruptions in Communication & Utilities:** Avalanches damage power lines, water supply, and communication networks, delaying rescue operations and emergency responses.
- **Environmental Hazards:** Melting avalanche snow can trigger landslides and flash floods, leading to severe ecological damage and displacement of local communities.
- **Economic Impact:** Avalanches cripple winter tourism, disrupt livelihoods, and result in economic losses, requiring huge recovery costs for damaged infrastructure and services.

Precautionary & Control Strategies:

- Avalanche Early Warning Systems:
- **IMD Avalanche Forecasting**: Tracks snowfall, slope stability, and temperature fluctuations.
- **Remote Sensing & AI-Based Prediction Models**: Used for real-time avalanche detection.

- Structural Protection Measures:
  - **Snow Barriers & Fences**: Installed on **avalanche-prone slopes** to prevent snow buildup.
  - **Deflecting Structures**: Direct the **avalanche path away from inhabited zones**.
- **Artificial Avalanche Triggers:**
- **Controlled Explosions**: Initiates **small avalanches to prevent larger, unmanageable ones**.
- **Zoning & Land Use Planning**
  - **Avoidance of Construction** in Avalanche-Prone Areas.
  - **Ski Resorts & Highways** Must Follow Risk Assessment Reports.

Way Ahead:

- **Enhancing Real-Time Avalanche Forecasting:** Strengthening satellite-based avalanche monitoring systems for early warnings.
- **Improving Infrastructure Resilience:** Constructing avalanche protection tunnels and snow-retention fences along highways.
- **Stronger Coordination Between Agencies:** Integrating IMD, BRO, NDMA, and ITBP efforts for better disaster response.
- **Community Training & Awareness Programs:** Educating local residents, trekkers, and military personnel on avalanche survival skills.
- **Encouraging Climate-Resilient Development:** Limiting deforestation and unplanned construction in high-risk zones.

Conclusion:

Avalanches pose a significant threat in India's Himalayan region, impacting human lives, infrastructure, and economic activities. Advanced forecasting, structural protection, and rescue preparedness are critical for minimizing avalanche disasters. Strengthening inter-agency collaboration and public awareness will further enhance India's avalanche resilience.

PYQ:

Explain the mechanism and occurrence of cloudburst in the context of the Indian subcontinent. Discuss two recent examples. (UPSC-2022)

FACTS FOR PRELIMS (FFP)

1. DHOLAVIRA

Context:

President Droupadi Murmu visited the UNESCO World Heritage Site of Dholavira in Gujarat, appreciating the conservation efforts of the Archaeological Survey of India (ASI).

About Dholavira:

Location: Situated on Khadir Bet Island in the **Great Rann of Kutch**, Gujarat. Lies within the **Kutch Desert Wildlife Sanctuary** and **on the Tropic of Cancer**.

Key Features of Dholavira:

- **City Layout:** Divided into **three sections** – Citadel, Middle Town, and Lower Town, unlike other Harappan sites.
- **Material Usage:** Unlike Harappa and Mohenjo-Daro, which primarily used bricks, **Dholavira extensively used stone in construction**.
- **Multi-Purpose Grounds:** Included a **festive ground** and a **marketplace**.

Discovered by:

Discovered **in 1967** by archaeologist **Jagat Pati Joshi.** Excavations were systematically conducted **from 1990 to 2005** under **Dr. Ravindra Singh Bisht** of ASI.

Unique Features of Dholavira:

Advanced Water Conservation System:

- 16 **massive reservoirs** for rainwater harvesting, stepwells, check dams, and underground water storage.
- Known as **Jal Durga (Water Fort)** due to its superior water management techniques.

Funerary Architecture: Unique **hemispherical structures**,

unlike the rectangular burial sites found in Harappa.

Trade and Commerce: Connected to the **Magan (Oman Peninsula) and Mesopotamian regions**.

Dholavira, one of the most significant Indus Valley Civilization sites, was inscribed as a **UNESCO World Heritage Site in 2021** and showcases advanced town planning and water conservation systems.

2. BODH GAYA

Context:

Bodh Gaya is witnessing widespread protests by Buddhist groups demanding full control of the Mahabodhi Temple, objecting to Hindu participation in the temple's administration under the Bodh Gaya Temple Act, 1949.

About Bodh Gaya:

Location: Situated in **Gaya district, Bihar, India**, near the **Falgu River**.One of the **four major Buddhist pilgrimage sites** (alongside Lumbini, Sarnath, and Kushinagar).

Kings Associated:

- Emperor Ashoka **(3rd century BCE)**: Built the first temple at the site.
- **King Harshavardhana (7th century CE)**: Expanded Buddhist structures.
- **British Colonial Era (19th century)**: Restored the temple under Alexander Cunningham.

History of Bodh Gaya:

- **6th century BCE**: Prince Siddhartha attained enlightenment under the **Bodhi Tree**, becoming **Buddha**.
- **3rd century BCE**: Ashoka constructed a **diamond throne (Vajrasana)** and a shrine.
- **12th century CE**: Declined due to Islamic invasions but revived in the **19th century** under British archaeologists.

Key Features:

- **Mahabodhi Temple:** 52-meter-tall pyramidal structure with intricate carvings.
- **Bodhi Tree:** Direct descendant of the original tree under which Buddha meditated.
- **Vajrasana (Diamond Throne):** Marks the exact spot of Buddha's enlightenment.
- **Animesh Lochana Chaitya:** Where Buddha spent the second week in meditation.

Significance:

- **Spiritual Epicenter:** Most sacred site in Buddhism, symbolizing enlightenment (Nirvana).
- **Cultural Influence:** Shaped Buddhist art, architecture, and philosophy globally.
- **Interfaith Harmony:** Attracts pilgrims and scholars from Theravada, Mahayana, and Vajrayana traditions.

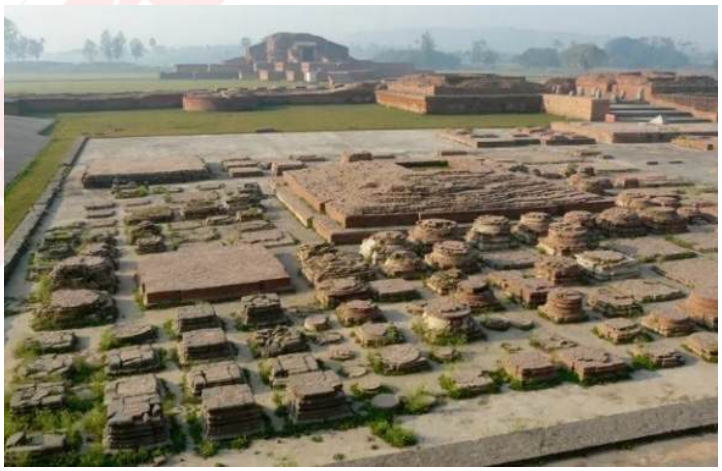
UNESCO **Recognition:**

- Declared a **World Heritage Site in 2002** for its outstanding universal value.
- Recognized for its **architectural brilliance** and **historical association with Buddha's life**.

3. VIKRAMASHILA UNIVERSITY

Context:

Vikramshila University has recently drawn attention due to renewed efforts aimed at reviving and transforming this ancient Buddhist learning centre into a prominent educational hub.



About Vikramashila University:

- It is an ancient Buddhist monastery and leading centre of learning in medieval India.
- **Location:** Situated at Antichak village near Kahalgaon, Bhagalpur district, Bihar.
- **Established by:** Founded by **King Dharmapala** of the Pala dynasty in the late 8th or early 9th century CE.

Historical Significance:

- Vikramashila ranks among India's most distinguished Buddhist mahaviharas, alongside **Nalanda and Odantapuri** (Bihar).
- Primarily known through Tibetan historical accounts, especially those authored by **Tāranātha**, a renowned

Tibetan monk-historian (16th–17th century).
- Noted for scholars like Atisha Dipankara, founder of the Sarma traditions in Tibetan Buddhism.
- At its height during **King Chanaka's reign (955–983 CE)**, Vikramashila gained prominence for its structured hierarchy, as highlighted by historian **Sukumar Dutt**.

Major Academic and Cultural Features:
- Renowned as a prominent centre of Vajrayana Buddhism, employing eminent Tantric teachers such as **Buddhajñānapāda**, **Dīpaṁkarabhadra**, and **Jayabhadra**.
- Specialized in Buddhist Tantra, philosophy, grammar, metaphysics, logic, and occult studies.

Architectural Highlights:
- Features a central cruciform stupa surrounded by 208 cells (52 cells on each side) for monks.
- Hosted an advanced library with a cooling system designed for manuscript preservation.

4. AMIR KHUSRAU

Context:
Prime Minister of India attended the 25th edition of Jahan-e-Khusrau, a Sufi music festival honouring Amir Khusrau, highlighting his contributions to India's pluralistic Sufi tradition.

Amir Khusrau is revered for **pioneering Hindavi (precursor to Hindi and Urdu),** shaping Indian classical music, and popularizing qawwali in South Asia.

About Amir Khusrau:

Who Was Amir Khusrau?
- **13th-century Persian and Hindavi poet, musician, and scholar**.
- Known as **"Tuti-yi-Hind" (Parrot of India)** for his eloquence in poetry.
- A disciple of **Sufi saint Nizamuddin Auliya**, he balanced his role as a **court poet** with devotion to the Chishti Sufi order.

Period & Patronage:
a. **Lived from 1253 to 1325 CE**, during the Delhi Sultanate.
b. Served under **five Delhi Sultans:** Muizuddin Qaiqabad, **Jalaluddin Khalji (bestowed the title *Amir*),** Alauddin Khalji, Qutbuddin Mubarak Shah and Ghiyasuddin Tughlaq

Family Background:
a. Born in **Patiyali, Etah (present-day Uttar Pradesh)**.
b. Father was **a Turkic noble from Central Asia**, and mother was **Indian Muslim**.
c. Came to India due to the **Mongol invasions of Transoxiana**.

Contributions of Amir Khusrau:
Literary Contributions:
- Wrote in **Persian and Hindavi**, blending **Turkic, Persian, and Indian cultural influences**.
- His works include **Masnavi (Nuh Siphir, Qiran-us-Saadain), ghazals, riddles, and folk poetry**.
- Developed **riddles, proverbs, and playful verses**, influencing early Hindi and Urdu literature.

Musical Legacy
- **Introduced and popularized** qawwali, merging Persian, Arabic, and Indian musical traditions.
- Credited with crafting **several ragas, khayal singing style, and bol-bant in Hindustani classical music**.
- Believed to have **invented the sitar and tabla**, though historical evidence is debated.

Influence on Sufi Tradition & Ganga-Jamuni Tehzeeb:
- Advocated for **Hindu-Muslim unity**, fostering India's **syncretic culture**.
- Revered in Sufi traditions, his compositions are sung at Sufi **dargahs** and religious gatherings.

Legacy & Enduring Influence:
- His qawwalis, including **Chhaap Tilak, Zehal-e-Maskeen, and Sakal Ban Phool Rahi Sarson**, remain popular today.
- His **poetry influenced later Persian, Urdu, and Hindi poets**, shaping **India's composite cultural identity**.
- **Khusrau's grave is near Nizamuddin Auliya's dargah in Delhi**, a testament to their spiritual bond.

5. UNESCO TENTATIVE LIST

Context: UNESCO added six new sites from India to its Tentative List, increasing the total to 62 sites. This inclusion is a mandatory step before nomination for the World Heritage List in the future

About UNESCO Tentative List:

What is the Tentative List?

An **inventory of cultural and natural heritage sites** that a country **intends to nominate** for UNESCO World Heritage status.

How Are Sites Added?

- Countries submit **Tentative Lists** to the **World Heritage Centre**.
- A site must demonstrate **Outstanding Universal Value (OUV)**.
- The list must be submitted **at least one year before official nomination**.
- Periodic revisions are encouraged **every 10 years**.

About Six New Sites Added to India's UNESCO Tentative List:

Kanger Valley National Park *(Chhattisgarh)*

- A **biodiversity hotspot** with **rare limestone caves and dense forests**.
- Home to **endemic species like the Bastar Hill Myna**.

Mudumal Megalithic Menhirs *(Telangana)*

- **Ancient burial site** featuring **prehistoric megalithic structures**.
- Dates back to **Iron Age (1000 BCE – 300 CE)**, providing insights into **early human settlements**.

Ashokan Edict Sites:

- **Pillars and rock edicts** commissioned by **Emperor Ashoka**.
- Spread across **Bihar, Madhya Pradesh, Odisha, and Karnataka**, reflecting **Mauryan governance and Buddhist teachings**.

Chausath Yogini Temples (Serial Nomination) *(Multiple States)*

- Circular temples housing 64 Yogini deities, known for their tantric significance.
- Found in Madhya Pradesh, Odisha, and Uttar Pradesh.

Gupta Temples (Serial Nomination) *(Northern India)*

- Represents **classical Indian temple architecture** from the **Gupta period (4th–6th century CE)**.
- Temples feature **intricate carvings, shikharas, and artistic excellence**.

Palace-Fortresses of the Bundelas ***(Madhya Pradesh & Uttar Pradesh)***

- **Medieval fort-palaces** built by the **Bundela Rajputs**.
- Notable structures include **Orchha Fort and Datia Palace**, showcasing **Rajput and Mughal architectural fusion**.

6. HERITAGE REPATRIATION FUND

Context:

A Parliamentary panel recently proposed establishing a 'Heritage Repatriation Fund' to assist in recovering Indian antiquities stolen and smuggled overseas.

About Heritage Repatriation Fund:

What is Heritage Repatriation Fund?

A proposed financial initiative to facilitate the recovery and return of stolen Indian cultural artifacts from abroad.

Proposed by: Department-related Parliamentary Standing Committee on Transport, Tourism, and Culture.

Ministry: Under the Ministry of Culture, Government of India.

Aim: To support efforts in reclaiming India's stolen or illegally exported antiquities from other nations.

Features and Functions:

Funding Sources: Accept contributions from corporations, wealthy individuals, and Indian diaspora through Public-Private Partnerships (PPP).

Legal Support: Finance legal actions, negotiations, and purchases of disputed cultural objects.

Technological Integration: Use advanced imaging, DNA testing, and AI databases to authenticate and establish the provenance of artifacts.

Logistics & Conservation: Fund safe transportation and proper conservation of repatriated items.

Heritage Recovery Task Force: A dedicated multidisciplinary team comprising diplomats, legal experts, and art historians to identify and recover artifacts worldwide.

International Agreements: Advocate more Cultural Property Agreements (CPAs) to prevent illicit trafficking, similar to recent agreements with the USA.

7. MENHIR

Context:

The Mudumal megalithic menhirs in Telangana's Narayanpet district have been included in UNESCO's tentative list for World Heritage Sites in 2025.

About Menhir:

What is a Menhir?

- A **menhir** is a **large, upright standing stone** placed by humans, often **tapered at the top**.
- **Etymology:** The term comes from **Brittonic languages**, where *"maen"* means **stone** and *"hîr"* means **long**.
- 
- **Discovery:** First used in the **18th century** by **French antiquarian Théophile Corret de la Tour d'Auvergne**.

History of Menhirs:

Time Period:

- **Europe:** The **oldest menhirs date back to 7,000 BP**, linked to the **Beaker culture** of the **Neolithic and Bronze Age**.
- **India:** The **Mudumal menhirs (3,500–4,000 BP)** are **India's oldest known menhirs**.

Associated Cultures:

- Linked to **prehistoric civilizations** who practiced **stone monument construction**.
- Often found in megalithic complexes with other structures.

Locations of Menhirs:

- **Europe**: Found in **France, Spain, Portugal, and Britain** (e.g., **Grand Menhir Brisé in Brittany, France**).
- **India**: Mainly in **Telangana, Karnataka, Chhattisgarh, and Northeast India**.
- Mudumal Menhirs, Telangana:
  a. Considered **India's largest megalithic observatory**.
  b. Some align with **solar positions on solstices**, hinting at **astronomical significance**.

Features of Menhirs:

- **Man-Made Structures:** Carved, sculpted, and positioned by humans.
- **Size:** Can be **several meters tall** (e.g., **Grand Menhir Brisé was 20.6m tall**).
- **Functionality:** Used for **ceremonial, astronomical, or burial purposes**.
- **Sacred Value:** Some menhirs are **worshipped as deities**, such as the Goddess Yellamma in Mudumal.

8. KAMBA RAMAYANA

Context:

The Ministry of Culture has launched a comprehensive initiative to preserve and promote Kamba Ramayana recitals in Tamil Nadu.

About Kamba Ramayana:

What it is:

- Kamba Ramayana, also known as Ramavataram, is a Tamil epic based on the Sanskrit Valmiki Ramayana.
- It is celebrated for its poetic excellence and spiritual interpretations unique to Tamil culture.

Written by:

- Composed by Tamil poet Kambar in the 12th century CE.
- Patronized by Thiruvennai Nallur Sadayappa Vallal, whose name appears every 1,000 verses in gratitude.

Year: Written during the 12th century CE.

State associated: Strongly associated with Tamil Nadu, especially the poet's birthplace, Kambar Medu in Theraazhundur.

Key Features:

- **Structure:** Divided into 6 Kandams (chapters), 113 Padalams (sections), and around 10,569 verses.
- **Language:** Written in classical Tamil, highlighting regional devotion and cultural values.
- **Cultural Integration:** Combines Tamil folk elements with deep philosophical and spiritual symbolism.
- **Performance Tradition:** Traditionally recited by Kamba Ramayana Mandali in temples; now being revived through state initiatives.

About Kambar: Who he is:

- Kambar, also known as Kavichakravarthy Kamban, was a renowned Tamil poet.
- He is celebrated for composing the Ramavataram (Kamba Ramayanam), the Tamil adaptation of the Ramayana.

Birth: Born in Therazhundur, located in the present-day Mayiladuthurai district, Tamil Nadu.

Kingdom associated:

- Kambar lived and flourished in the Chola Empire during the reign of Kulothunga III.
- He received royal recognition and was bestowed the title Kavi Chakravarthy (Emperor of Poets).

Period:

- His lifetime is generally dated between 1180 CE and 1250 CE.
- He lived after Vaishnavite philosopher Ramanuja, whom he references in his works.

Significant contributions:

Kamba Ramayanam: Tamil version of the Ramayana, merging classical poetry with Tamil cultural depth.

Other works:

- Tirukkai Valakkam – Ethical and moral verses.
- Erelupatu and Silai Elupatu – Spiritual compositions.
- Kangai Puranam – Temple-based mythological narrative.
- Sadagopar Antati and Saraswati Antati – Devotional compositions.

9. AURANGZEB

Context: Recent violent clashes erupted in Nagpur over demands for the removal of Mughal Emperor Aurangzeb's tomb.

About Aurangzeb:

Muhi-ud-Din Muhammad Aurangzeb (Alamgir I) — Known for his military expansion and strict adherence to Islamic principles.

Born: November 3, 1618, in Dahod, Gujarat — Born to Shah Jahan and Mumtaz Mahal.

Reign: 1658–1707 — His 50-year rule was the longest and marked by territorial expansion and religious conservatism.

Death: March 3, 1707 — Died in Ahmednagar while managing the Deccan campaigns.

Aurangzeb's Administration & Governance:

- **Centralized Administration:** He directly supervised every policy and order, reducing ministerial autonomy.
- **Revenue System:** Introduced revenue farming, where middlemen collected taxes, causing corruption and inefficiency.
- **Legal Reforms:** Appointed **Muhtasibs** to enforce Sharia law and ensure public morality.
- **Military Expansion:** Expanded the empire to its largest geographical extent, covering nearly 4 million sq. km.

Aurangzeb's Contributions:

Art and Architecture:

- **Badshahi Mosque (1673):** Built in Lahore; known for its massive structure and grandeur.
- **Bibi Ka Maqbara (1678):** Monument in Aurangabad resembling the Taj Mahal, built in memory of his wife.
- **Idgah in Mathura:** Constructed on the ruins of a temple to assert Mughal authority over rebellious Jats.

Literature & Education:

- **Fatawa-e-Alamgiri:** A collection of Islamic laws that guided governance and personal conduct.
- **Patronage to Scholars:** Supported Persian and Arabic literature development to spread Islamic knowledge.
- **Quran Copying:** He personally copied the Quran, reflecting his piety and devotion.

Religious Policies:

- Imposed Jizya tax (1679): Reintroduced tax on non-Muslims, seen as both revenue generation and religious assertion.
- Temple Destruction: Ordered selective temple demolitions, though some scholars argue they were politically motivated.
- Execution of Guru Tegh Bahadur (1675): Ordered due to refusal to convert and growing Sikh influence.

10. THIRD BATTLE OF PANIPAT

Context:

Maharashtra Chief Minister called the Third Battle of Panipat a symbol of Maratha bravery during a debate in the State Assembly.

The Maharashtra government plans to build memorials in Agra and Panipat to honour Maratha valour.

About Third Battle of Panipat:

What it is: The Third Battle of Panipat was one of the largest 18th-century battles, fought between the Maratha Empire and the Afghan forces led by Ahmad Shah Abdali.

Fought in: The battle took place on **14 January 1761** near **Panipat, Haryana**, around 95 km from Delhi.

Fought between:

- **Maratha Empire**, led by Sadashivrao Bhau and Vishwasrao.
- **Afghan forces**, led by Ahmad Shah Abdali, supported by the Rohilla Afghans and Shuja-ud-Daula of Awadh.

Causes of the Battle:

- **Maratha expansion:** Rapid northward expansion under Peshwa Baji Rao and Nana Saheb.
- **Conflict over Punjab:** Maratha invasion of Punjab in 1758 brought them into direct confrontation with Abdali.
- **Formation of anti-Maratha coalition:** Abdali allied with Rohillas and Shuja-ud-Daula.
- **Religious and political power struggle:** Islamic coalition vs. expanding Hindu Maratha influence.

Key Events:

- Marathas captured Delhi in **August 1760**.
- Skirmishes along Yamuna; Marathas won at **Kunjpura**.
- Abdali crossed Yamuna, cut off Maratha supplies, leading to siege and starvation.
- On **13 January 1761**, Maratha chiefs chose to battle instead of dying of hunger.
- The final battle occurred on **14 January 1761**; lasted all day, with heavy Maratha losses.

Outcome:

- **Decisive Afghan victory:** The battle ended with a clear win for Ahmad Shah Abdali's forces.
- **Massacre of prisoners:** After the battle, Afghan forces carried out a brutal slaughter. Nearly **40,000 captured Maratha soldiers** were killed in cold blood.
- **Impact on Maratha expansion:** The defeat halted Maratha advances in North India. For the next **10 years**, Maratha political influence in the north weakened significantly.
- **Revival under Peshwa Madhavrao:** In 1771, Madhavrao launched a strong comeback campaign. He successfully **restored Maratha dominance** in North India through strategic conquests.

Syllabus: Geography:: Glaciers

11. UN WATER DEVELOPMENT REPORT 2025

Context:

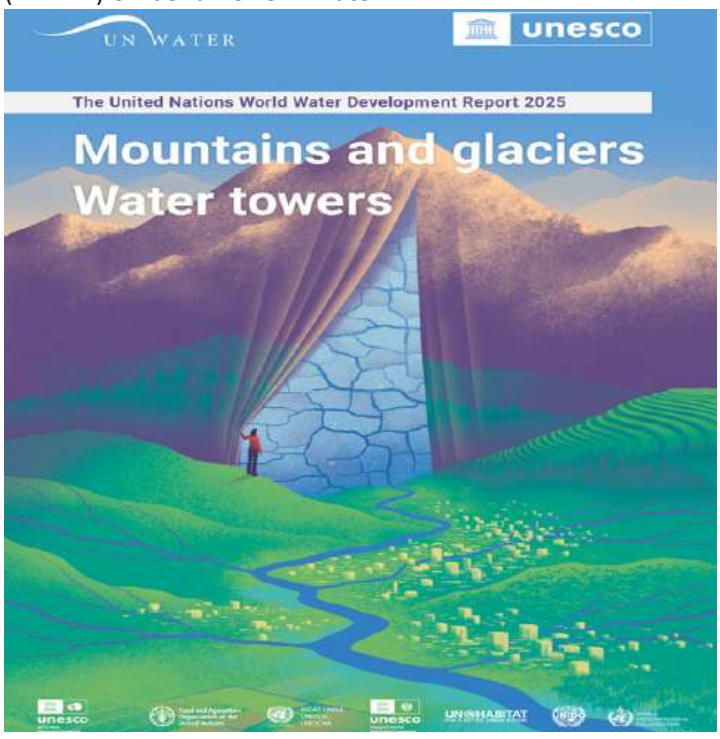
The United Nations released the UN Water Development Report 2025, highlighting glacier preservation as a global priority.

About UN Water Development Report 2025:

What it is: A flagship report published annually by UN-Water providing policy insights and data on global water and sanitation issues.

Report Name: "Water Towers: Mountains and Glaciers" (2025 Edition).

Published by: UNESCO World Water Assessment Programme (WWAP) on behalf of UN-Water.



Key Insights in the Report:

- Highlights the role of mountains and glaciers as key water sources supporting billions worldwide.
- Warns of glacial retreat due to climate change and its cascading effects on water scarcity.
- Calls for integrated water resource management (IWRM) and transboundary cooperation to address water crises.
- Advocates for mountain-specific policies, better monitoring infrastructure, and community engagement.
- Emphasizes the need for innovative climate adaptation financing to protect water towers globally.

About World Water Day 2025:

Date Celebrated: Annually on **March 22**.

Theme for 2025: "Glacier Preservation" – focusing on safeguarding glaciers as vital freshwater reserves.

History:

First proposed at the **1992 UN Conference on Environment and Development (UNCED)** in Rio de Janeiro.

Officially established by the **United Nations General Assembly in 1993**.

Significance:

Raises awareness about global water challenges and the need for **sustainable water management**.

Highlights **climate impacts**, water scarcity, and pollution threats to freshwater resources.

12. SWAVALAMBINI SCHEME

Context:

Swavalambini, a Women Entrepreneurship Programme, was launched at Chaudhary Charan Singh University, Meerut, to empower female entrepreneurs across India.

About Swavalambini:

What is Swavalambini?

- A **structured entrepreneurship initiative** for young women in **Higher Education Institutions (HEIs)**.
- **Provides skill development, mentorship, funding support, and incubation opportunities**.

Implemented by: National Institute for Entrepreneurship and Small Business Development **(NIESBUD)** and **NITI Aayog.**

Ministry: Ministry of Skill Development and Entrepreneurship (MSDE).

Aim of the Initiative:

- Enhance women's participation in entrepreneurship through structured training and mentorship.
- Promote self-employment and economic independence among young women.
- Encourage at least 10% of trained participants to establish successful enterprises.

Key Features of Swavalambini:

Multi-Stage Training Approach:

- **Entrepreneurship Awareness Programme (EAP)**: 2-day workshop for 600 students on business fundamentals.
- **Entrepreneurship Development Programme (EDP)**: 40-hour advanced training for 300 students covering finance, market linkages, compliance, and legal aspects.
- **Six-Month Mentorship Support**: Helps participants transition from **ideation to enterprise creation**.

Faculty Development Programme (FDP): Trains educators to mentor and guide women entrepreneurs within HEIs.

Recognition & Rewards: Award to Rewards Initiative: Recognizes **top-performing women entrepreneurs**.

Nationwide Implementation:

- **Initially launched in Eastern HEIs** (IIT Bhubaneswar, NEHU Shillong, Gauhati University, etc.).
- **Now expanded to BHU, University of Hyderabad, Maulana Azad National Urdu University, and more**.

13. UN REPORT ON GENDER EQUALITY

Context: A United Nations report has revealed that **women's rights have been weakened in nearly 25% of countries**, with growing gender discrimination in **political, economic, and social spheres**.

The report highlights alarming statistics, including **a 50% rise in conflict-related sexual violence since 2022** and persistent **gender-based inequality in governance and resources**.

About UN Report on Gender Equality:

What is This Report?

- A comprehensive assessment of gender equality and women's rights worldwide, marking 30 years since the 1995 Beijing Declaration.
- Evaluates progress, setbacks, and threats to women's rights, legal protections, and policy advancements.

Published By:

- UN Women, the **United Nations entity for gender equality and women's empowerment**.
- Released ahead of **International Women's Day 2025**.

Key Findings of the Report:

Widespread Gender Discrimination: Women have only **64% of the legal rights** that men have globally.

Increase in Gender-Based Violence:

- A **woman or girl is killed every 10 minutes** by a **partner or family member**.
- **Conflict-related sexual violence** has surged by **50% since 2022**, with **95% of victims being women and girls**.

Limited Representation in Leadership:

- Only **87 countries have ever had a female head of state**.
- Women hold just **26% of parliamentary seats worldwide**.

Educational and Workplace Progress:

- **88% of countries** have enacted **laws against violence** towards women.
- **44% of nations** are improving **education and training for women**.

Persisting Economic Disparities:

- **10% of women and girls** live in **extreme poverty**.
- Female youth (ages **15-24**) have **limited access to modern family planning**.

14. NATIONAL COMMISSION FOR WOMEN

Context:

The National Commission for Women (NCW) will launch 21 pre-marital communication centres across nine states to provide counselling and guidance on marriage-related issues.

About National Commission for Women (NCW):

- The **National Commission for Women (NCW)** is an **autonomous statutory body** established to **protect and promote women's rights** in India.
- Formed under the **National Commission for Women Act, 1990**, it plays a crucial role in **policy advocacy, legal reforms, and women's welfare initiatives**.

Established In: January 31, 1992, under the Ministry of Women and Child Development.

Powers and Functions of NCW:

Legal and Constitutional Safeguards:

- **Reviews laws affecting women** and recommends **amendments** to improve gender justice.
- **Investigates complaints** related to women's rights violations.

Policy Advocacy and Research:

- Conducts **research on gender issues** and provides **policy recommendations**.
- Works with the **government to improve women's socio-economic status**.

Monitoring and Oversight:

- **Takes suo moto action** in cases of **women's rights violations**.
- Reviews **government programs and legal safeguards** for effective implementation.

Social Awareness and Counselling:

- Organizes **awareness programs, legal aid camps, and counselling services**.
- Runs **support initiatives for victims of domestic violence and workplace harassment**.

Coordination with Law Enforcement:

- Works with **police, courts, and legal authorities** to ensure **speedy justice for women**.
- Monitors **implementation of gender-sensitive laws** like **POCSO, Domestic Violence Act, and Dowry Prohibition Act**.

15. CONVENTION ON CLUSTER MUNITIONS (CCM)

Context:

Lithuania officially withdrew from the Convention on Cluster Munitions (CCM), becoming the first country to exit the treaty since its adoption.

About Convention on Cluster Munitions (CCM):

- The CCM is an international treaty that prohibits the **use, transfer, production, and stockpiling** of cluster munitions due to their long-term humanitarian risks.
- **Adopted in 2008**, the treaty entered into force on 1 August 2010.
- It aims to eliminate cluster bombs, which pose a grave threat to civilians even after conflicts end.

CONVENTION ON CLUSTER MUNITIONS

Members & Non-Members:

- **112 states are parties to the convention**, with 12 additional signatories yet to ratify it.
- **India,** the U.S., Russia, China, Ukraine, and Israel have not signed the treaty, citing military and strategic concerns.

Key Features of the CCM

- **Comprehensive Ban:** Prohibits the use, development, stockpiling, transfer, and production of cluster munitions.
- **Assistance to Affected Areas:** Requires members to clear contaminated areas and provide aid to victims.
- **Destruction of Stockpiles:** Signatories must destroy existing cluster munition stockpiles within eight years of joining.
- **Prevention of Assistance**: Member states cannot assist, encourage, or induce any nation to engage in banned activities.
- **International Cooperation:** Promotes collaboration in demining, victim support, and destruction of stockpiles.

What are Cluster Munitions?

Cluster munitions are explosive weapons that release multiple smaller bomblets (submunitions) over a wide area. They are used to target dispersed military assets like tanks, infantry, and artillery formations.

Features of Cluster Munitions:

- **High Submunition Count:** A single cluster bomb can contain several to 600+ bomblets.
- **Delivery Mechanisms:** Launched via aircraft, artillery, or missiles, they scatter bomblets mid-air before impact.
- **Lack of Precision:** Most bomblets are free-falling and unguided, leading to widespread unintended destruction.
- **Unexploded Ordnance (UXO) Risk:** Many bomblets fail to detonate on impact, remaining dangerous for decades, similar to landmines.

16. INDIA'S FIRST PPP-BASED GREEN WASTE PROCESSING PLANT

Context:

Indore is set to launch India's first PPP-based green waste processing plant under Swachh Bharat Mission-Urban.

The initiative aims to convert green waste into eco-friendly products and promote sustainable waste management.

About India's first PPP-based green waste processing plant:

What it is: A Public-Private Partnership (PPP) model waste processing facility for converting green waste into eco-resources.

Aim of the initiative: To process green waste (wood, leaves, branches, flowers) into pellets and sawdust, replacing coal and supporting clean energy goals.

Key features:

- Partnered with **Astronomical Industries Private Limited.**
- Converts waste into wooden pellets, sawdust, and biodegradable products.
- **End products:** eco-friendly fuels, packaging materials, biodegradable plates, fertilizers.
- Reduces pollution, improves Air Quality Index (AQI), and contributes to energy conservation.

About Swachh Bharat Mission-Urban (SBM-Urban):

- **Launched in:** Launched on 2nd October 2014.
- **Ministry:** Implemented by the Ministry of Housing and Urban Affairs (MoHUA).
- **Aim:** To achieve universal sanitation coverage and maintain cleanliness across urban areas.

Features:

- Focus on waste management, open-defecation free (ODF) cities, and sanitation infrastructure.
- Promotes construction of gender-specific toilets in public spaces to address gender disparity.
- **Indirect benefits:** improved health, increased girl child enrolment in schools.

Components:

- **SBM-Urban 1.0 (2014–2019):** Focused on making all urban areas ODF.
- **SBM-Urban 2.0 (launched 2021):** Targeting bioremediation of 2,400 legacy landfill sites by 2025–26.
  - Legacy waste is converted into refuse derived fuel (RDF), recyclable material, and bio-soil for road construction.

17. MAASAI TRIBE

Context:
Maasai tribe in Tanzania are resisting international carbon credit projects, fearing land dispossession and erosion of their traditional way of life.

About the Maasai Tribe: Who They Are:

- The **Maasai** are **semi-nomadic pastoralists** and one of the most prominent indigenous communities of **East Africa**.
- They speak **Maa**, a language from the **Eastern Sudanic branch** of the Nilo-Saharan language family.

Found In: Tanzania and Kenya, particularly along the **Great Rift Valley** and semi-arid savannas.

Key Features:

Physical Characteristics & Identity:

- Known for their **distinct dress**, beadwork, and warrior traditions.
- **Morans** (young men aged 14–30) undergo bush training to build **courage, endurance**, and **tribal discipline**.

Social Structure:

- Society is **patrilineal** with clans divided into **two moieties**.
- Operates through **age-set systems**, with stages from **junior warriors to senior elders** over ~15-year intervals.

Livelihood:

- Dependent on **livestock**—mainly **cattle, sheep, and goats**—for meat, milk, and blood.
- Traditional Maasai pastoralists do **consume blood** as part of their **cultural diet**.
- Practice **transhumance**, moving in search of pasture and water throughout the year.
- Reside in **kraals**, circular enclosures with mud-dung houses and thorn fences.

18. SARHUL FESTIVAL

Context: The tribal communities of Jharkhand and Chhotanagpur region are celebrating Sarhul, a New Year and spring festival rooted in nature worship.

About Sarhul Festival:

What is Sarhul?

- **Sarhul** literally means **'worship of the Sal tree'** and marks the **onset of spring** and the **Adivasi New Year**.
- It symbolizes the **cosmic union** of the Sun and Earth, essential for the **cycle of life and agriculture**.

Tribes Associated:

- Celebrated by Adivasi groups such as the: Oraon, Munda, Santal, Khadia, and Ho.
- The festival is observed across **Jharkhand**, **Chhattisgarh**, **Odisha**, **Bihar**, and also by **tribal diaspora** in **Assam**, **Andaman**, **Nepal**, **Bangladesh**, and **Bhutan**.

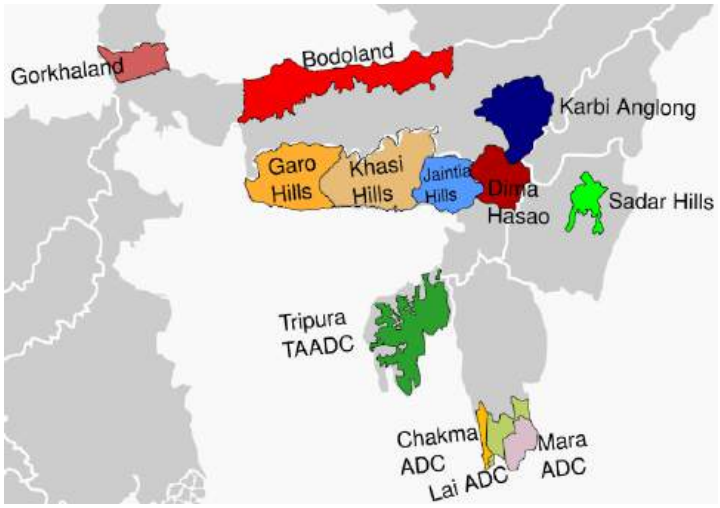
Features of the Festival:

- **Three-day celebration** held at **Sarna Sthals** (sacred groves).
- **Sal flowers** are offered to the village deity, **Sarna Maa**.
- **Traditional dances** like **Jadur, Gena, and Por Jadur** are performed.
- A **community feast** and consumption of **Handia (rice beer)** mark the final day.
- Ploughing and agricultural activities begin **only after the rituals** conclude.

Cultural Importance & Significance:

- Demonstrates the **spiritual connection** between humans and forests, especially the **Sal tree**.
- An occasion for **community bonding**, **ritual purity**, and **cultural expression**.

19. AUTONOMOUS DISTRICT COUNCILS



Context:

The **Assam Assembly** passed amendments allowing the **Governor to assume control** over seven **autonomous councils** if elections remain unfeasible even after the mandated extension period. These amendments impact tribal councils like **Mising, Bodo Kachari, Thengal Kachari, Deori, Sonowal Kachari, Rabha Hasong, and Tiwa Autonomous Councils**.

About Autonomous District Councils (ADCs):

ADCs are **self-governing tribal administrative bodies** established under **the Sixth Schedule of the Indian Constitution**.

They provide **autonomy in governance, land management, and cultural preservation** for **Scheduled Tribes (STs)** in **Assam, Meghalaya, Mizoram, and Tripura.**

Membership of Autonomous Councils

- **Elected Members**: The majority of members are **democratically elected** for a **five-year term**.
- **Nominated Members**: The **Governor nominates** a limited number of members to ensure representation of marginalized groups.

Powers of ADCs::

Legislative Powers:

- Can frame laws on **land, forests, water resources, agriculture, public health, sanitation, and social customs**.
- Have judicial powers to **settle disputes among tribal communities**.

Executive Powers:

- Administer **village councils, traditional chiefs, policing, inheritance laws, and local governance**.

Judicial Powers:

- Can establish **tribal courts** to handle disputes where both parties belong to **Scheduled Tribes**, provided the sentence is **under five years of imprisonment**.

Functions of ADCs

- **Govern tribal areas** while preserving **traditional customs and practices**.
- **Manage resources** such as **forests, water bodies, and minerals**.
- **Develop local infrastructure**, including **education, healthcare, and rural roads**.
- **Promote local governance** through the formation of **village councils**.

Revenue Sources of ADCs::

Power to **levy taxes, fees, and tolls** on:

- Land, buildings, vehicles, boats, and animals.
- Goods entering the district.
- Ferries, roads, and employment-based income.
- General taxation for the maintenance of local infrastructure.

20. IN-HOUSE JUDICIAL ENQUIRY

Context:

Chief Justice of India Sanjiv Khanna has formed a three-member in-house inquiry panel to investigate allegations of cash recovery from the residence of Delhi High Court Judge Yashwant Varma.

About In-House Judicial Enquiry:

What it is: An internal mechanism to examine complaints against sitting High Court or Supreme Court judges for misconduct not meeting the threshold of impeachment.

Established by: Supreme Court of India in 1999, following recommendations of a five-member committee formed in 1997. ***(Ravichandran Iyer v. Justice A.M. Bhattacharjee* case.)**

Members:

- **For High Court judges:** 2 Chief Justices of High Courts + 1 High Court judge.
- **For Supreme Court judges:** 3 sitting Supreme Court judges.

How it works:

- Complaint is received by the Chief Justice of India (CJI) or the Chief Justice of the concerned High Court.
- Preliminary report is sought from the respective Chief Justice.
- If required, a three-member inquiry committee is formed.
- The committee follows principles of natural justice, allowing the judge to respond.

Report Submission:

The committee submits its findings to the Chief Justice of India for further action.

This report must state whether:

- There is any substance to the allegations against the concerned judge and,
- If there is sufficient substance to the allegations, whether they are serious enough that they require initiation of removal proceedings against the judge.

About Process of Judge Removal:

Constitutional Article: Article 124(4) and Article 218 lay down provisions for removal of SC and HC judges on grounds of "proved misbehaviour" or "incapacity."

Role of In-House Enquiry Committee:

- Recommends whether allegations are serious enough to warrant removal proceedings.
- Advises the concerned judge to resign or retire, if misconduct is established.
    - If the judge does not abide by the CJI's advice to resign or retire, the **CJI will inform the President and the Prime Minister** of the committee's finding that removal proceedings should be initiated.

Procedure and key features of the Judges (Inquiry) Act, 1968:

- **Motion Requirement:** An impeachment motion requires signatures from **100 Lok Sabha MPs** or **50 Rajya Sabha MPs**.
- **Inquiry Committee Formation:**
    - A **three-member committee** is constituted, including:
    - One Supreme Court Judge or Chief Justice.
    - One High Court Chief Justice.
    - One distinguished jurist.
- **Committee Powers:** The committee functions with powers **similar to a civil court**, including:
    - Summoning witnesses.
    - Demanding document production.
    - Recording evidence under oath.
- **Report Submission:** The committee **submits its findings to both Houses of Parliament**, along with clear observations on each charge.
- **Final Action:** If the motion is passed by both Houses, an official **address for removal** is presented to the **President of India** in the same session.

21. JUDICIAL TRANSFERS IN INDIA

Context:

The transfer of Justice Yashwant Varma from the Delhi High Court to the Allahabad High Court has sparked protests and reignited debates on judicial transfers.

About Judicial Transfers in India:

- What are Judicial Transfers?
    - Transfers involve the **relocation of a High Court judge** from one High Court to another, either in the interest of public administration or judicial functioning.
- Constitutional Provision:
    - **Article 222(1)** of the Constitution empowers the **President** to transfer a judge from one High Court to another **in consultation with the Chief Justice of India (CJI).**
- Key Supreme Court Judgments:
    - **First Judges Case (1981) — S.P. Gupta v. Union of India**
        - Held that the **executive had primacy**, and CJI's opinion was not binding.
    - **Second Judges Case (1993)**
        - Overturned earlier ruling, giving **primacy to judiciary** via the **collegium system**.
        - Stressed that transfers should be in **public interest** and **with wider consultation**.
    - **Third Judges Case (1998)**
        - Expanded collegium to **CJI + 4 senior-most judges**.
        - Required opinion of judges familiar with the concerned High Court.
- Authorities Involved in Judicial Transfers:
    - **Judiciary:** Chief Justice of India initiates the transfer.
        - **Consults:**
            1. Chief Justices of both transferring and receiving High Courts.
            2. One or more Supreme Court judges familiar with the judge's service record.
            3. **Collegium (for Chief Justices' transfer):** CJI + 4 senior-most SC judges.
    - **Executive:**
        - **Law Minister** reviews and forwards Collegium's recommendation to the **Prime Minister**.
        - **President of India** gives final approval.
        - **Department of Justice** issues official transfer notification.

Procedure of Judicial Transfer:

- **Initiation:** CJI assesses and proposes transfer based on judicial and administrative grounds.
- **Consultation:** Mandatory consultation with relevant High Court and Supreme Court judges.
- **Recommendation:** Finalised by the Collegium and forwarded to the Law Ministry.
- **Approval:** PM advises the President, who approves the transfer.

- **Notification:** Department of Justice publishes in the Gazette of India.

22. ASSET DECLARATION NORMS FOR JUDGES

Context:

Discovery of unaccounted cash at Delhi High Court judge Yashwant Varma's residence has renewed debate on mandatory disclosure of judges' assets.

About Asset Declaration Norms for Judges:

- Restatement of Values of Judicial Life (1997)
  - Judges must declare all movable and immovable assets (in their name, spouse's or dependents') **to the Chief Justice**.
  - It does **not mandate public disclosure**.
- Supreme Court Resolution (2009)
  - Judges' asset disclosures were made **voluntarily available** on the Supreme Court's website.
  - No statutory compulsion; updates have ceased since 2018.
- RTI Act Interpretation (2019)
  - Supreme Court ruled that judges' asset details do **not constitute personal information**, bringing them within the RTI ambit.
- Judicial Standards and Accountability Bill, 2010
  - Proposed **mandatory public declaration** of assets by judges.
  - Bill lapsed with the dissolution of the 15th Lok Sabha; never reintroduced.
- Parliamentary Committee Recommendation (2023)
  - Urged the introduction of legislation to ensure **mandatory disclosures by SC and HC judges**.
  - Awaiting legislative action.

About Asset Declaration by Public Officials:

- RTI Act, 2005
  - Promotes transparency; citizens can access details of public servants' assets via RTI applications.
- All India Services (Conduct) Rules, 1968
  - **Rule 16(1):** Mandatory annual declaration of assets and liabilities to the cadre-controlling authority.
- Political Candidates & MPs/MLAs
  - Based on SC ruling (2002), **mandatory disclosure at the time of nomination**.
  - Submitted to Speaker (Lok Sabha) or Chairperson (Rajya Sabha); publicly accessible.
- Union Ministers & Bureaucrats
  - Declare assets to PMO or respective state departments.
  - Information is often published online (e.g., PMO website, IAS officers list).

23. BILLS OF LADING BILL, 2025:

Context:

The **Lok Sabha passed the** Bills of Lading Bill, 2025, replacing the **169-year-old colonial-era Indian Bills of Lading Act, 1856**, to modernize India's shipping laws.

The new legislation aims to **align India's maritime trade with global standards**, simplifying legal processes and enhancing efficiency in the shipping sector.

About Bills of Lading Bill, 2025

A **Bills of Lading** is a **legal document** used in international shipping, acting as proof that goods have been loaded onto a vessel and specifying the terms of transport.

The **Bills of Lading Bill, 2025**, **replaces the Indian Bills of Lading Act, 1856**, ensuring a **modern, transparent, and efficient framework** for shipping transactions.

Key Features of the Bills of Lading Bill, 2025

- **Legal Modernization**: Replaces **colonial-era provisions** with a more structured and simplified framework.
- **Enhanced Business Efficiency**: Streamlines shipping documentation, reducing **litigation risks and legal disputes**. Establishes clear guidelines for carriers, shippers, and consignees.
- **Alignment with Global Standards**: Adapts international best practices to **boost India's role in global maritime trade**.
- **Government Empowerment**: Allows the **Central Government** to issue directions for effective implementation. Introduces a **standard repeal and**

saving clause to maintain legal continuity.

- **User-Friendly Provisions**: Simplifies language and structure without altering the **substantive principles** of the original law.
- **Boost to Maritime Trade**: Strengthens India's position as a **maritime hub**, supporting **ease of doing business**.

Implementing Body- Ministry of Ports, Shipping & Waterways, Government of India.

24. SECRET SITTING IN HOUSE

Context:

Discussions have resurfaced on the provision of holding a secret sitting in Lok Sabha as outlined in the parliamentary rules.

Despite existing rules, **India has never officially held a secret sitting**, with the closest instance being during the 1962 India-China conflict.

About Secret Sitting of Lok Sabha:

What it is:: A secret sitting is a closed-door parliamentary session where discussions are held confidentially, without public or media access.

Constitutional Provision: The Constitution of India does not directly mention secret sittings, but it empowers Parliament to frame its own rules under Article 118.

Chapter 25 of the Rules of Procedure and Conduct of Business in Lok Sabha, specifically **Rule 248** mention about Secret Sitting.

History:

- Though permitted by law, India has never conducted a secret sitting.
- In 1962, during the Chinese aggression, the proposal for secret sitting was suggested but declined by PM Jawaharlal Nehru.

Who can declare a secret sitting:

- The **Leader of the House** can request it.
- The **Speaker of the Lok Sabha** has the authority to approve and schedule the secret sitting.
- **Secret sitting is allowed in Rajya Sabha** as well.
    - It is provided under **Rule 266 of the Rules of Procedure and Conduct of Business in the Council of States (Rajya Sabha)**, where the Chairman can permit a secret sitting on a request made by the Leader of the House.

Features of Secret Sitting:

- No visitors or outsiders are allowed in the chamber, lobby, or galleries.
- Proceedings are recorded and published only with the Speaker's approval.
- Any unauthorized disclosure is considered a **gross breach of privilege**.

Limits:

Participants cannot keep notes or publish any part of the discussion.

- Revealing secret sitting proceedings is considered a **gross breach of privilege** of the House, leading to disciplinary action.
- Only with the **Speaker's consent** and a passed motion can such information be officially disclosed.

25. NEVA (NATIONAL E-VIDHAN APPLICATION)

Context:

Delhi has become the 28th legislature to join the National e-Vidhan Application (NeVA) platform by signing an MoU with the Ministry of Parliamentary Affairs and GNCTD, promoting paperless legislative governance.

About NeVA (National e-Vidhan Application):

What it is: A digital platform designed to modernize legislative operations by enabling paperless proceedings and real-time access to legislative documents.

Developed by: Created and implemented by the Ministry of Parliamentary Affairs (MoPA), Government of India.
Initiated under the guidance of the Government of India as part of the "One Nation, One Application" vision.

Aim:

- To digitize legislative processes across all state legislatures.
- To promote transparency, efficiency, and environmental sustainability.
- To empower lawmakers with smart tools for efficient legislative business.

Key Features of NeVA:

- **Device-Neutral Access:** Accessible across smartphones, tablets, laptops, and desktops for seamless use anytime, anywhere.
- **Paperless Legislature:** Promotes eco-friendly governance by significantly reducing paper usage, supporting Swachh Bharat and SDG goals.
- **Real-Time Digital Repository:** Provides instant access to legislative documents, including bills, agendas, notices, and reports with multilingual support.
- **Secure Cloud Infrastructure:** Hosted on Meghraj 2.0 ensuring robust security, data integrity, and confidentiality.
- **mNeVA Mobile App & Capacity Building:** User-friendly mobile app with continuous training, manuals, and video tutorials for easy adoption by legislators.
- **Number of States using NeVA**: 28 legislatures, including Delhi.

26. KERALA ESTABLISH SENIOR CITIZENS COMMISSION

Context:

Kerala has become the first state in India to establish a Senior Citizens Commission by passing the Kerala State Senior Citizens Commission Bill 2025.

About Senior Citizens Commission:

What it is: A **statutory body** established under the **Kerala State Senior Citizens Commission Act, 2025**.
It will safeguard the **rights and welfare** of elderly citizens and act as an advisory body for policymaking.

State establishing it: Kerala, is the first state in India to set up such a commission for senior citizens.

Aim of the Commission:

- To ensure the rehabilitation, protection, and empowerment of senior citizens.
- Promote active participation of senior citizens in building a progressive and inclusive Kerala.

Key Features and Functions:

- **Policy Advisory:** Formulates and recommends policies for the welfare of senior citizens.
- **Addressing Grievances:** Handles issues related to **neglect, abuse, exploitation, and loneliness** among the elderly.
- **Skill Utilization:** Promotes the use of senior citizens' skills and knowledge for **societal benefit**.
- **Legal Aid and Protection:** Facilitates access to legal support for senior citizens facing abuse or property disputes.
- **Awareness Campaigns:** Conducts educational initiatives to raise awareness about **elderly rights and responsibilities of families**.
- **Periodic Reports:** Submits regular reports and suggestions to the state government for policy improvement.

27. THE DRAMATIC PERFORMANCES ACT, 1876

Context:

Prime Minister during the NXT Conclave highlighted the Dramatic Performances Act, 1876, which allowed the British government to ban public performances on vague grounds. Though declared **unconstitutional in 1956** by the Allahabad High Court, the law was formally repealed in 2017 as part of the government's effort to remove obsolete laws.

About the Dramatic Performances Act, 1876:

What is the Dramatic Performances Act, 1876?

- Enacted by the **British colonial government** to **curb nationalist expression** through theatre and stage performances.
- Gave authorities the power to **ban plays, pantomimes, and public performances** that were deemed **seditious, obscene, defamatory, or scandalous**.

Reason Behind the Act:

- Introduced after the **1875-76 visit of the Prince of Wales, Albert Edward**, to suppress growing **nationalist**

sentiments in India.
- Aimed at **controlling public opinion** and restricting freedom of expression through the arts.

Who Were Covered Under the Act?
- **Theatre groups, playwrights, actors, and performers** involved in **public performances**.
- Any venue hosting plays, pantomimes, or **any form of** dramatic art.

Important Provisions of the Act:
- **Banning Power:** Any public performance **could be prohibited** if deemed "scandalous, defamatory, seditious, or obscene."
- **Search & Seizure:** Authorities could **raid venues** and seize materials **related to banned performances**.
- **Punishment:** Imposed **up to 3 months in jail** or fines for violating the Act.
- **Magistrate's Authority:** Allowed a Magistrate to **cancel permits or licenses** of performing groups.

Why Did the Law Continue After Independence?
- Article 372 **of the Constitution** allowed pre-existing colonial laws to remain in force **until repealed or challenged**.
- **Allahabad High Court in 1956 (State v. Baboo Lal & Ors.)** struck down the Act for violating **Article 19(1)(a) – Freedom of Speech & Expression**.

Formally repealed by **The Repealing and Amending (Second) Act, 2017** under the government's **ease of doing business** reforms.

28. THE CUSTOMS ACT OF 1962

Context:
Kannada actor Ranya Rao was caught smuggling 14.8 kg of gold at Bengaluru's Kempegowda International Airport. The Directorate of Revenue Intelligence (DRI) uncovered this major gold smuggling operation, invoking provisions under the **Customs Act of 1962.**

About the Customs Act Of 1962:
The Customs Act, 1962 regulates the **import and export of goods** in India. It safeguards the economy, controls smuggling, and promotes legal international trade.

Implementing Agency: Administered by the Central Board of Indirect Taxes and Customs **(CBIC)** under the **Ministry of Finance**.

Key Provisions of the Act:
- **Customs Duty:** Imposes duties on imported and exported goods based on the **Customs Tariff Act, 1975**.
- **Prohibitions and Restrictions:** Empowers the government to **ban or restrict certain imports/exports** for national security and public health.
- **Clearance Procedures:** Mandates proper documentation, duty payment, and adherence to customs protocols before clearance.
- **Warehousing Provisions:** Allows imported goods to be **stored without immediate duty payment** until released for consumption or export.

Exemptions Allowed for Passengers (International Arrivals):
General Duty-Free Allowance: ₹50,000 worth of goods for international passengers.

Gold Allowance:

Male passengers: 20 gm of gold (value up to ₹50,000).

Female passengers: 40 gm of gold (value up to ₹1,00,000).

NRIs: Can bring up to **10,000 gm** once in six months (duty applicable beyond exemption).

Other Allowances:

One laptop per adult passenger.

Alcohol: 2 litres.

Tobacco: 100 cigarettes or equivalent.

Cash Carrying Limit:
Passengers can carry up to **₹25,000** in Indian currency without declaration.

Must declare foreign currency if exceeding **$5,000 or $10,000 equivalent in total foreign exchange**.

Fines and Punishment for Smuggling:
Imprisonment: Jail term between **3 to 7 years**, based on severity.

Fines: Penalties may extend up to **three times the value** of smuggled goods.

29. INFORMATION TECHNOLOGY (IT) ACT, 2000

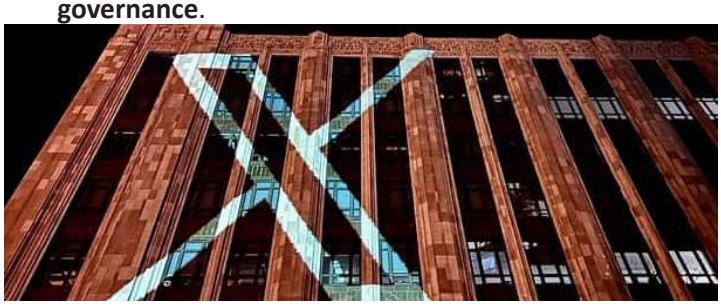
Context:
X Corp. (formerly Twitter Inc.) has challenged the Indian government's content blocking orders in the Karnataka High Court.

The company opposes the Centre's Sahyog portal, calling it a "censorship portal" that bypasses proper legal safeguards under the IT Act 2000.

About Information Technology (IT) Act, 2000:

What it is:

- The **IT Act 2000** is India's primary law governing **cyber activities, digital transactions, and electronic governance**.



- It provides a legal framework for **cybersecurity, digital signatures, data protection, and penalties for cyber offenses**.

Aim of the act:

- Facilitate **secure electronic communication and commerce**.
- Ensure **penalties for cybercrimes** and protection of user data.
- Foster innovation and trust in the **Indian IT and digital ecosystem**.

Key Features:

- Legal recognition of **electronic records and digital signatures**.
- Defines **liabilities and protections for intermediaries**.
- Empowers the **Central Government and** CERT-In for cybersecurity regulation.
- Amended in **2008 and 2015** to address evolving cyber challenges.

Key Provisions in News:

Section 69A of IT Act, 2000:

- Empowers the government to **block public access to online information** in interest of **sovereignty, security, public order, or prevention of incitement**.
- Requires **written orders and procedural safeguards**, upheld in the **Shreya Singhal vs Union of India (2015)** verdict.

Section 79 of IT Act, 2000:

- Provides **conditional immunity to intermediaries** for third-party content.
- Under **Section 79(3)(b)**, intermediaries must remove unlawful content when notified by the government or lose immunity.
- Does not authorize direct blocking orders; only **notifies intermediaries of liability**.

About Sahyog Portal:

What it is: An online platform developed to automate the issuance of notices **to intermediaries** for content removal under the IT Act.

Ministry Involved: Developed and managed by the **Ministry of Home Affairs (MHA)**.

Aim:

- To enable **swift and coordinated action** against unlawful digital content.
- Create a **clean and secure cyberspace** for Indian citizens.

Functions:

- Brings together **authorized government agencies and intermediaries** on one digital platform.
- Facilitates the **issuance, tracking, and monitoring of content removal notices**.
- Enhances **compliance, monitoring, and quick responses** to cyber law violations.

30. SECTION 44(3) OF THE DIGITAL PERSONAL DATA PROTECTION (DPDP) ACT

Context:

Activists and Opposition leaders have raised alarm over Section 44(3) of the Digital Personal Data Protection (DPDP) Act, 2023, citing threats to transparency under the Right to Information (RTI) Act, 2005.

About Section 44(3) of the Digital Personal Data Protection (DPDP) Act:

What is Section 44(3)? This clause **amends Section 8(1)(j)** of the RTI Act to restrict disclosure of personal information, removing earlier safeguards like public interest tests and legislative access exceptions.

- **Features of the Clause:**
  - Replaces the original wording with a **broader exemption:**
    - "(j) information which relates to personal information."
- **Removes clauses that:**
  - **Balanced privacy with public interest**,
  - Allowed disclosure if information was **relevant to public activity**,
  - Mandated **non-denial of info to citizens if not denied to Parliament**.
- **Why It's Controversial?**
  - It **expands the scope of denial** under RTI.

About Section 8(1)(j) **of the Right to Information (RTI) Act, 2005:**

- **What is Section 8?**
  - Lists exemptions where **public authorities can refuse disclosure** of certain information.

- **Key Exemptions under Section 8(1):**
  - National security and sovereignty (Clause a)

- Judicial restrictions or contempt of court (Clause b)
- Parliamentary privilege (Clause c)
- Commercial confidence or IP (Clause d)
- Fiduciary relationships (Clause e)
- Foreign government communications (Clause f)
- Threat to life or safety of informants (Clause g)
- Ongoing investigations (Clause h)
- Cabinet deliberations (Clause i)
- Personal information with public interest override (Clause j)

- **Impact of DPDP's Section 44(3) on RTI Act's Section 8(1)(j):**
  - **Dilutes** transparency by eliminating the public interest balancing clause.
  - Hampers access to key data on **public officials' assets, salaries, and misconduct cases**.
  - **Overrides judicial precedents** that interpreted Section 8(1)(j) in favour of public disclosure.
  - May lead to **blanket denials of legitimate information requests**, weakening democratic accountability.

31. UNIFIED PENSION SCHEME

Context:

The Pension Fund Regulatory and Development Authority (PFRDA) has issued guidelines for the implementation of the Unified Pension Scheme (UPS), which will come into effect from April 1, 2025, offering an alternative to the existing National Pension Scheme (NPS) for central government employees.

About Unified Pension Scheme (UPS):

- **What it is:** A contributory pension scheme for central government employees providing guaranteed monthly payouts and flexible investment options.
- **Announced in:** January 2025 via official government notification.
- **Implemented from:** April 1, 2025.
- **Implementing Agency:** Pension Fund Regulatory and Development Authority (PFRDA).

Key Features of UPS:

Eligibility:

- Central government employees in service as of April 1, 2025, already under NPS.
- New central government recruits joining on or after April 1, 2025 (option within 30 days).
- Retired or voluntarily retired employees under NPS as of March 31, 2025.
- Legally wedded spouse of eligible deceased retirees.

Choice and Irrevocability:

- Option once exercised is **final and irreversible**.
- Decision must be made within **three months** from April 1, 2025.
- **Contribution Requirement:**
  - **Employee contribution:** 10% of basic pay + dearness allowance.
  - **Government contribution:** 10% match + additional 8.5% to ensure guaranteed payout.
- Guaranteed Assured Payout:
  - Minimum assured payout of **₹10,000/month** after 10 years of qualifying service.
  - Full payout calculated as **50% of 12-month average basic pay** before retirement (subject to 25 years of service).
- Other features:
  - **PRAN Number Continuation from NPS:** The Permanent Retirement Account Number (PRAN) issued under the NPS continues to be used without any changes. Subscribers do not need a new PRAN for this scheme.
  - **Choice of Pension Funds:** Subscribers can select their preferred pension fund managers from the list of PFRDA-registered pension funds.
  - **Investment Change Flexibility:**
    - Subscribers are allowed to change their investment choice (pension fund or asset allocation) **once per financial year**.
    - Additionally, they can adjust their portfolio allocation (switching between asset classes) **up to two times in a financial year**.
  - **Partial Withdrawal Facility:** Subscribers can withdraw **up to 60% of the accumulated pension corpus** upon exit or retirement.

32. GOLD MONETISATION SCHEME (GMS)

Context:

The Finance Ministry has discontinued the Gold Monetisation Scheme (GMS) for medium- and long-term deposits from March 26, 2025.

RBI has clarified that **existing deposits will continue** until maturity; however, no fresh mobilisations or renewals will be allowed.

About Gold Monetisation Scheme (GMS):

What is GMS? A scheme to **mobilise idle gold held by**

individuals and institutions, launched to integrate gold into the formal financial system.

Launch Year: November 2015, as a revamped version of the Gold Deposit Scheme (1999).

Implemented by: Jointly by **Ministry of Finance**, **RBI**, and **scheduled commercial banks**.

Objective: To **reduce gold imports** and **curb** Current Account Deficit **(CAD)** by monetising household and institutional gold.

Categories under the Scheme:

Short-Term Bank Deposit (STBD):

- **Tenure:** 1 to 3 years
- **Interest:** Decided and paid by banks

Medium-Term Government Deposit (MTGD):

- **Tenure:** 5 to 7 years
- **Interest:** Fixed by GoI in consultation with RBI (2.25%)

Long-Term Government Deposit (LTGD):

- **Tenure:** 12 to 15 years
- **Interest:** Fixed by GoI (2.5%)

Features of Gold Monetisation Scheme (GMS):

- **Minimum Deposit:** 10 grams of gold (bars, coins, jewellery excluding stones/metals). Only gold items without embedded gems or other metals are accepted to ensure purity.
- **No Upper Limit for Deposit:** Individuals and institutions can deposit any quantity of gold without restrictions.
- **Interest Earned in Gold, Not Rupees:** Returns are credited in grams of gold, protecting investors from currency fluctuations.
- **Purity Verification through CPTCs (Collection & Purity Testing Centres):** Authorized centres test and certify gold quality before deposit to maintain transparency.
- **Tax Exemption on Interest Under Income Tax Act:** Interest earned is tax-free, making it a lucrative savings option for gold holders.

Government's Recent Decision on GMS (Effective March 26, 2025)

- **Medium- & Long-Term Deposits Discontinued:** Only short-term deposits (1-3 years) will continue, based on bank policies.
- **Short-Term Bank Deposits to Continue at Banks' Discretion:** Banks can choose whether to offer these deposits, subject to RBI guidelines.
- **No Fresh Deposits or Renewals Accepted:** Existing accounts remain active, but no new deposits or rollovers permitted.
- **Existing Deposits to Mature as per RBI Guidelines:** Previously made deposits will continue until maturity without premature withdrawal penalties.

33. SANSAD BHASHINI INITIATIVE

Context:

The Lok Sabha Secretariat and the Ministry of Electronics and Information Technology (MeitY) signed an MoU to launch the Sansad Bhashini initiative.

About Sansad Bhashini Initiative:

What it is: Sansad Bhashini is an AI-based digital initiative designed to enable real-time translation, transcription, and data access of parliamentary records in multiple Indian languages.

Ministry: Developed under the partnership of the Lok Sabha Secretariat and the Ministry of Electronics and Information Technology (MeitY).

Aim:

- To enhance multilingual support in parliamentary proceedings.
- To make parliamentary debates, documents, and archives more accessible for MPs, researchers, and the public.
- To promote linguistic diversity in governance and digital accessibility.

Key Features:

- **AI-powered real-time translation:** Translates legacy debates, agenda files, and committee reports into various regional languages instantly.
- **Speech-to-text conversion system:** Automatically converts spoken parliamentary debates into written text with noise reduction and customized vocabulary.
- **Automatic summarization:** Creates concise summaries of lengthy parliamentary discussions for quick understanding and better decision-making.
- **AI-powered chatbot:** Provides quick assistance to MPs and officials for retrieving procedural rules and

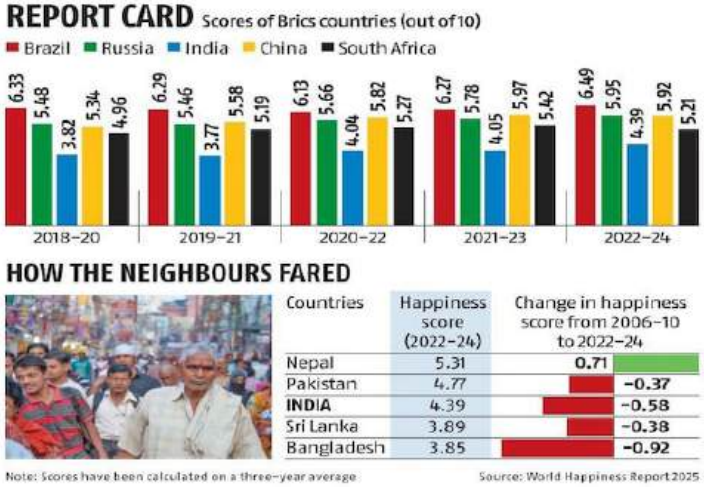
parliamentary documents.
- **Integration with Bhashini:** Uses MeitY's Bhashini platform for advanced translation capabilities and AI-based language processing.
- **Supports linguistic diversity:** Ensures content accessibility across India's diverse languages for improved public engagement and inclusivity.

34. THE WORLD HAPPINESS REPORT 2025

Context:
The World Happiness Report 2025 was released recently, ranking countries based on happiness levels. India ranked **118th out of 147 countries,** while Finland topped the list for the eighth consecutive year.

About World Happiness Report 2025:
What it is:
- An **annual global report** that ranks countries based on **life satisfaction and happiness levels** of their citizens.
- It reflects how people evaluate their quality of life, using statistical data and public perception.

Report released by:
- Published by the **Wellbeing Research Centre, University of Oxford**.



Released in collaboration with Gallup, UN Sustainable Development Solutions Network, and an independent editorial board.

Criteria Used for Ranking: The report uses six key indicators:
- **GDP per capita** – economic strength of a country.
- **Healthy life expectancy** – average life span in good health.
- **Social support** – availability of help from family or friends.
- **Freedom** – perceived freedom to make life choices.
- **Generosity** – willingness of people to help others.
- **Perception of corruption** – trust in public institutions.

Aim of the Report:
- To measure **global well-being and contentment**.
- To promote **policy focus on mental health, social trust, and quality of life** beyond just economic growth.

Key Summary of Report:
Trends in Global Happiness
- **Western and Nordic countries** continue to dominate top ranks.
- New entries into the top 10 include **Costa Rica (6th)** and **Mexico (10th)**.
- The **United States** and **United Kingdom** dropped to 24th and 23rd positions respectively due to rising **loneliness and discontent**.

Global Ranking – Top 3 Nations: Finland (Topper - 1st), Denmark (2nd) and Iceland (3rd).

Bottom 3 Nations: Afghanistan (147th), Sierra Leone, and Lebanon.

India's Ranking and Statistics:
- **India ranked 118th out of 147 countries**.
- Score improved from **4.054 (2021-23)** to **4.389 (2022-24)**. Ranked below Pakistan (109) and Nepal (92).
- **Strength:** High social support due to family structures and community bonds.
- **Weakness:** Lowest score in perceived freedom, showing limited individual choice satisfaction.

35. PEPSU MUZHARA MOVEMENT

Context:
The PEPSU Muzhara Movement, observed on March 19, marks a significant agrarian struggle in Punjab, where landless tenant farmers fought for ownership rights of the land they cultivated.

About PEPSU Muzhara Movement:
What was the Muzhara Movement?
A tenant farmers' uprising where **landless muzharas** demanded ownership of the land they cultivated.
It challenged the exploitative landlord system (biswedari) prevalent in **pre- and post-independence Punjab**.

Year and Region:
Started in the 1930s with small protests in the **Patiala princely state**.

Reached its peak between the **1940s–1950s**, spreading to **784 villages** across Patiala, Barnala, Mansa, Sangrur, Bathinda, Mohali, Fatehgarh Sahib, Faridkot, and Jind (Haryana).

Causes of the Movement:

- **Feudal Exploitation:** Muzharas were forced to surrender **one-third of their produce** to landlords, leaving them impoverished.
- **Colonial Revenue Chain:** Landlords paid a share to princely rulers who, in turn, paid revenue to the British, continuing exploitation.
- **Loss of Land Ownership:** Many small landholders were reduced to **tenant status**, losing control over their ancestral land.
- **Post-Independence Oppression:** After 1947, feudal landlords continued demanding produce, triggering intensified resistance.

Key Leaders:

- **Jagir Singh Joga:** Organised and united tenant farmers, leading mass mobilisations.
- **Buta Singh:** Strong voice for **land redistribution** and tenant rights.
- **Teja Singh Sutantar:** Brought **revolutionary ideology** and connected the movement with wider peasant struggles.
- **Sewa Singh Thikriwala:** Inspired the movement through his **anti-feudal activism**.

Forms of Movement:

- **Peaceful Protests:** Initially, the movement involved peaceful demands for land rights.
- **Armed Resistance:** As landlords and the administration turned violent, muzharas armed themselves for self-defense.
- **Mass Mobilisation:** Large gatherings, conferences, and collective actions were organised to resist exploitation.

Outcome:

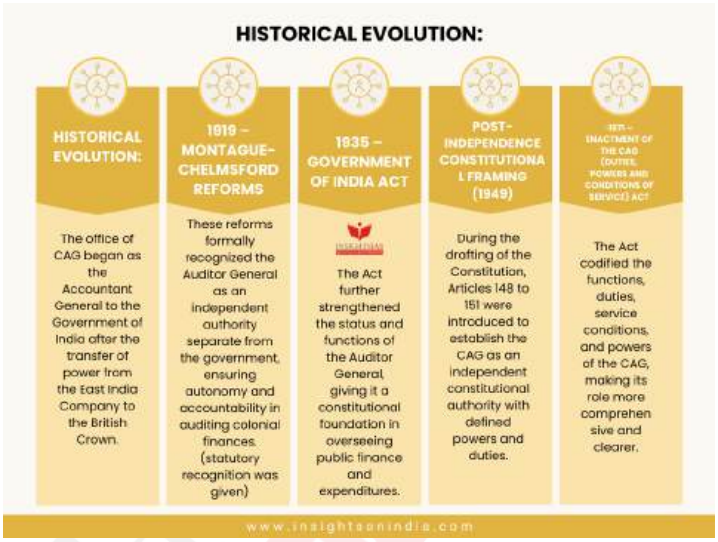
- **Land Reforms:** By 1952, land reforms were implemented, granting ownership rights to tenant farmers.
- **Symbol of Resistance:** The movement became a symbol of peasant resilience against feudal and state oppression.
- **Annual Commemoration:** March 19 is observed annually to honor the martyrs of the movement.

36. CAG (COMPTROLLER AND AUDITOR GENERAL OF INDIA)

Context:

The Supreme Court has issued notice to the Centre on a Public Interest Litigation (PIL) questioning the executive-dominated process of appointing the Comptroller and Auditor General (CAG) of India. The petition demands a **non-partisan selection committee** to safeguard the independence of the CAG, a key constitutional authority.

About CAG (Comptroller and Auditor General of India):



What is the CAG?

The **CAG** is India's **apex constitutional audit authority**, known as the **watchdog of the public purse**. It oversees the **financial accountability** of both **Union and State governments** and reports to Parliament.

Constitutional Article: Articles 148 to 151 (Part V) of the Indian Constitution define the **appointment, powers, duties, and audit reporting process** of the CAG.

Appointment Process:

- The **President of India appoints the CAG** by **warrant under his hand and seal** (Article 148).
- Current practice is executive-controlled; **calls for reform suggest an independent panel including the Prime Minister, Leader of Opposition, and Chief Justice of India**.

Term of Office:

Six years or until the age of 65, whichever is earlier.

The CAG is **ineligible for any future office under the Government of India or any State** after demitting office.

Service Conditions:

Salary is equal to that of a Supreme Court judge, determined by **Parliament**.

Administrative expenses are **charged on the Consolidated Fund of India**, ensuring financial independence.

Service conditions for staff are prescribed by the President in consultation with the CAG.

Removal Process:

- Can be removed only by the **President**, following the **same grounds and process as a Supreme Court judge**.
- Removal requires a **special majority resolution in both Houses of Parliament** for proven **misconduct or incapacity**.

Powers and Functions:

Audit Authority:

- Audits **all expenditures from the Consolidated Fund of India and State funds**.
- Audits accounts of **government corporations, PSUs, and government-funded bodies**.

Reporting Role:

- Submits **audit reports to the President or Governors**, who lay them before **Parliament or State Legislatures**.
- Reports are scrutinized by the **Public Accounts Committee (PAC)**.

Fiscal Oversight:

- Certifies the **net proceeds of taxes and duties**.
- Reviews government transactions related to **debts, advances, and suspense accounts**.

Legal and Discretionary Audits:

- Conducts **compliance audits, performance audits, and financial audits**.
- Can conduct **propriety audits** to evaluate the **wisdom, faithfulness, and economy** in government spending.

Role in Accountability:

- Acts as an **agent of Parliament**, ensuring **public funds are used legally and efficiently**.
- Does not control fund issuance (unlike Britain's CAG), functioning solely as **Auditor-General**.

37. BHASKARACHARYA NATIONAL INSTITUTE FOR SPACE APPLICATIONS AND GEO-INFORMATICS (BISAG-N)

Context:

The Comptroller and Auditor General (CAG) signed an MoU with BISAG-N to integrate remote sensing and GIS technologies into the audit process.

About Bhaskaracharya National Institute for Space Applications and Geo-informatics (BISAG-N):

What is BISAG-N? A **national-level technical agency** providing **space and geo-spatial solutions** for governance, planning, and development.

Established in:

- Originally founded as Remote Sensing and Communication Centre (**RESECO**) in 1997.
- Renamed **BISAG** in **2003**, after **Bhaskaracharya**, the 12th-century Indian mathematician.

Headquarters: Located in **Gandhinagar, Gujarat**

Ministry: Operates under the **Ministry of Electronics and Information Technology (MeitY)**, Government of India.

Objectives of BISAG-N:

- **Leverage geo-spatial and satellite technologies** for inclusive socio-economic development and policy implementation.
- **Support governance frameworks** like Digital India, PM-GatiShakti, and disaster management through end-to-end GIS-based solutions.
- **Drive innovation in public services** by integrating AI, ML, and big data analytics tailored to government requirements.

Key Functions of BISAG-N:

- **Geo-Spatial Applications:** Offers satellite-based services including remote sensing, photogrammetry, terrain modelling, and disaster analytics.
- **Integrated GIS Solutions:** Provides data creation, migration, visualisation tools, and map-based decision-making systems.
- **Smart Governance Platforms:** Develops ERP, MIS, GNSS-linked digital tools across sectors like land, agriculture, education, and health.
- **Capacity Building & Outreach:** Conducts training for officials and supports startups through satellite communication and finishing schools.
- **R&D and Custom Tech Development:** Leads innovation in AI, IoT, blockchain, and builds customised software for central/state departments.

38. PM'S SCHEME FOR MENTORING YOUNG AUTHORS (PM-YUVA 3.0)

Context:

The Ministry of Education launched PM's Scheme for Mentoring Young Authors (PM-YUVA 3.0) to mentor young authors and promote a reading and writing culture.

About PM's Scheme for Mentoring Young Authors (PM-YUVA 3.0):

Established in: First launched in 2021; now in its third edition (2025).

Ministry involved: Ministry of Education, under the Department of Higher Education.

Aim:

- To **mentor young authors** and develop a **new generation of writers**.
- To promote **reading, writing, and book culture** in India.
- To **showcase Indian heritage, culture, and knowledge systems globally**.

Key Features:

Age Limit: Open to **authors below 30 years**.

Mentorship Program: Selected writers will get training from renowned authors.

Focus Areas:

- Indian Diaspora in Nation Building
- Indian Knowledge System
- Makers of Modern India (1950-2025)

Execution:

- Implemented by the National Book Trust **(NBT), India**.
- Books will be **published and translated into multiple Indian languages**.
- Authors will engage in **literary festivals and cultural exchanges**.

Alignment with NEP 2020: Supports **creative leadership development** among youth.

Coverage:

- Open to participants **across India**, covering **22 Indian languages + English**.
- Encourages **regional language literature** to promote linguistic diversity.

39. SAMAGRA SHIKSHA ABHIYAN (SSA)

Context:

A Parliamentary Standing Committee has urged the Education Ministry to release over ₹4,000 crore in **pending Samagra Shiksha Abhiyan (SSA) funds** to Tamil Nadu, Kerala, and West Bengal.

The panel said it is **unjustified to link SSA funding** with a state's decision to not sign the **PM SHRI MoU**.

About Samagra Shiksha Abhiyan (SSA):

- **What is SSA?** SSA is a **centrally sponsored umbrella scheme** aimed at **integrated school education** from pre-school to Class 12.
- **Launched in:** 2018, by merging **three schemes** – Sarva Shiksha Abhiyan, Rashtriya Madhyamik Shiksha Abhiyan, and Teacher Education.
- **Implemented by:** Ministry of Education, Government of India.

Budget Allocation: Fund sharing:

- **90:10** for North-Eastern & Himalayan States
- **60:40** for other States
- **100%** for UTs without Legislature

Objectives of SSA:

- Improve **school effectiveness** and **learning outcomes**
- Ensure **universal access**, **equity**, and **quality** in school education
- Fulfil the mandate of the Right to Education (RTE) Act, 2009
- Enhance **vocationalisation**, teacher education, and use of **technology**

Key Features of SSA:

- **Holistic approach** to education from pre-primary to Class 12.
- One **strategic district-level plan** for education development.
- Prioritisation of **aspirational districts**, LWE-affected areas, and Educationally Backward Blocks (EBBs).
- **Focus on the 2 Ts –** Teachers and Technology.
- Aligned with **SDG 4**: Quality, inclusive, and equitable education by 2030.

About PM SHRI Schools – Model School Initiative:

- What is PM SHRI?
  - A **flagship model school scheme** aligned with the **National Education Policy (NEP) 2020**.
- Launched in: 2022-23, by the Ministry of Education, Government of India.
- **Aim:** To develop **14,500 model schools** that serve as **exemplars of quality education**, reflecting NEP 2020 principles.
- Key Features of PM SHRI Scheme:
  - Schools to offer **inclusive, equitable and joyful learning environments**
  - Integration of **modern technology**, **multilingual teaching**, and **green infrastructure**
  - Focus on **critical thinking**, **experiential learning**, and foundational literacy
  - The Scheme is proposed to be implemented over a **period of 5 years** w.e.f. 2022-23 to 2026-27.

- Participation requires **MoU signing** between Centre and State

40. REVISION OF MSME DEFINITION

Context:

The Government of India has notified revised criteria for MSME classification, increasing investment and turnover limits.

Finance Minister had announced new classification criteria for MSMEs, with investment and turnover limits for the classifications proposed to be increased to **2.5 times and 2 times**, respectively.

About Revision of MSME Definition:

What it is: A policy update amending the thresholds for classifying Micro, Small, and Medium Enterprises based on investment and turnover.

Announced In: Announced during the Union Budget speech by Finance Minister.

Amended By: The Ministry of MSME under Section 7 of the Micro, Small, and Medium Enterprises Development (MSMED) Act, 2006.

New Revision Effective From: Effective from April 1, 2025.

Purpose of Revision:

- To align MSME classification with current business realities and growth trends.
- To facilitate scaling-up, better credit access, and market expansion.
- To promote resilience, employment, and self-reliance in the MSME sector.

Features of New MSME Definition:

Micro Enterprises:

Rs. in Crore	Investment		Turnover	
	Current	Revised	Current	Revised
Micro Enterprises	1	2.5	5	10
Small Enterprises	10	25	50	100
Medium Enterprises	50	125	250	500

Investment limit raised from ₹1 crore to ₹2.5 crore.

- Turnover limit increased from ₹5 crore to ₹10 crore.

Small Enterprises:

- Investment threshold increased from ₹10 crore to ₹25 crore.
- Turnover ceiling raised from ₹50 crore to ₹100 crore.

Medium Enterprises:

- Investment limit revised from ₹50 crore to ₹125 crore.
- Turnover limit doubled from ₹250 crore to ₹500 crore.

41. INDIAN RUPEE SYMBOL

Context:

Tamil Nadu government replaced the official Indian Rupee symbol with the Tamil letter "Ru" in the state Budget 2025-26, sparking a political row.

About Indian Rupee Symbol:

What It Is: The **Indian Rupee (₹) symbol** represents India's **economic strength** and **global identity** in financial transactions.

Adopted In: Officially adopted by the **Government of India on July 15, 2010**.

Designed By: D. Udaya Kumar, a designer from IIT Bombay, selected through an open competition.

Features of the Symbol:

- A **blend of Devanagari 'Ra' (₹) and Roman 'R'**, reflecting India's linguistic diversity.
- Two **parallel horizontal stripes** at the top symbolize the **Indian national flag** and the **'equal to' sign (=)** representing **economic stability**.
- **Distinct design** ensures easy recognition in global financial systems.

42. MISSION AMRIT SAROVAR

Context:
Indian Railways will dig ponds under the Mission Amrit Sarovar to tackle water scarcity and improve water conservation.

About Mission Amrit Sarovar:

- A **nationwide water conservation program** to construct and rejuvenate ponds across India.
- Aims to **ensure water sustainability** at the local level.

Launched in: April 24, 2022, as part of Azadi Ka Amrit Mahotsav celebrations.

Ministry involved: Led by the Ministry of Rural Development, with collaboration from eight other ministries.

Implemented by: Bhaskaracharya National Institute for Space Applications and Geo-informatics (BISAG-N), providing geospatial data for site identification.

Key Features:

- **Target:** Construct or rejuvenate **75 ponds per district**.
- **Community Participation (Jan Bhagidaari):** Involves **local communities** in water conservation.
- **Climate Resilience:** Aims to strengthen groundwater levels and restore ecological balance.

Railways' Role:

- Identify and **excavate new waterbodies** near railway sites.
- Utilize **excavated material** for railway embankment construction.
- Coordinate with **State governments** for implementation.

43. MODEL WOMEN-FRIENDLY GRAM PANCHAYATS

Context:
The **Ministry of Panchayati Raj** will launch the **Model Women-Friendly Gram Panchayat (MWFGP) initiative** at a **National Convention on March 5, 2025**, in New Delhi.

About MWFGP

The Model Women-Friendly Gram Panchayat is a gender-inclusive governance initiative designed to enhance women's participation, safety, and leadership at the grassroots level.

Launched By:: **Ministry of Panchayati Raj**, Government of India. Part of the **International Women's Day 2025 celebrations**.

Agency Involved:: Supported by **State Institutes of Rural Development & Panchayati Raj (SIRD&PRs)** and international organizations like **UNFPA**.

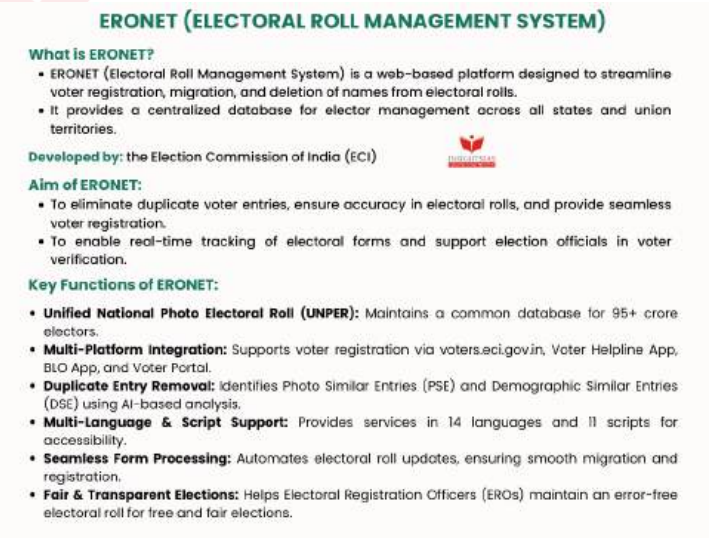
Key Features

- **One Model Women-Friendly Gram Panchayat in each district** across India.
- **Gender-sensitive governance** framework ensuring **safety, equity, and inclusivity**.
- **Dedicated Monitoring Dashboard** to track progress and implementation.
- **Capacity-building programs** for elected representatives and officials.
- **Showcasing best practices** in gender-sensitive governance.
- **Nationwide Mahila Gram Sabhas** on **March 8, 2025**, to mark **International Women's Day**.

44. EPIC NUMBER

Context:
West Bengal Chief Minister has alleged voter fraud due to duplicate EPIC numbers, accusing the Election Commission of electoral manipulation.

The Election Commission of India (ECI) clarified that identical EPIC numbers exist due to past decentralized systems but do not imply fake voters.



About EPIC Number:

What is an EPIC Number? A **unique alphanumeric code** assigned to each registered **elector** to prevent impersonation. It is distinct from the **EPIC card**, which is a **physical identity document** for voters.

Launched in: **Introduced in 1993** under the **Registration of Electors Rules, 1960** to enhance electoral transparency.

How is EPIC Different from EPIC Card?

- **EPIC Number:** A **unique identifier** linked to a voter's

registration.

- **EPIC Card:** A **physical voter ID card** containing personal details, a photograph, and constituency details.
- **EPIC does not confer voting rights**; only **electoral roll inclusion** does.

How is EPIC Number Allocated?

- Assigned **electronically** via **ERONET** when a new voter registers.
- Linked to **state and constituency data** to ensure **regional uniqueness**.

Key Features of EPIC Number:

- **Alphanumeric format:** Three-letter **alphabetical codes** followed by a **seven-digit number**.
- **Assigned through ERONET:** Automated allocation via **ECI's digital portal** since 2017.
- **Functional Unique Serial Number (FUSN):** Ensures **constituency-level uniqueness**.
- **Permanent Identification:** Remains the **same even after reissuing** of voter ID.

Can Two Voters Have the Same EPIC Number?

- **Yes, but only across different states** due to past **manual allocation** before the **ERONET system**.
- ECI has now initiated **EPIC rectification** under **ERONET 2.0** to ensure uniqueness.

Can an EPIC Number Be Changed?

- **Yes**, if duplication is detected, ECI will **reassign a unique EPIC number**.
- The voter's **eligibility, polling station, and constituency details remain unchanged**.

Significance of EPIC Number:

- **Prevents voter impersonation** by uniquely identifying electors.
- **Enhances electoral integrity** by maintaining a **centralized database**.
- **Enables easy verification** of voter details across states.
- **Supports digital election processes** under **Election Commission modernization efforts**.

45. FORM 17C

Context:

The Supreme Court is hearing a petition by ADR seeking the immediate publication of booth-wise voting data (Form 17C) on the Election Commission's website.

About Form 17C:

What it is: Form 17C is a mandatory election document that records booth-wise voter turnout and election results.

[1][FORM 17C
[*See* rules 49S and 56C(*2*)]

PART I.—ACCOUNT OF VOTES RECORDED

Election to House of the People/Legislative Assembly of the State/Union territory..... from .....Constituency.

Number and Name of Polling Station : .....
Identification Number of voting machine used at the Polling Station :
control unit .....
balloting unit .....
Printer (if used) .....

1. Total number of electors assigned to the Polling Station
2. Total number of voters as entered in the Register for Voters (Form 17A)
3. Number of voters deciding not to record votes under rule 49-O
4. Number of voters not allowed to vote under rule 49M
5. Test votes recorded under rule 49MA (*d*) required to be deducted—

(a) total number of test votes to be deducted : Total No. ..... Sl. No.(s) of elector(s) in Form 17A .....

(b) candidates(s) for whom test vote(s) cast :

Sl. No.	Name of candidate	No. of votes
.....	.....	.....
.....	.....	.....

1. Ins. by Notifin. No. S.O. 230(E), dated the 24th March, 1992.
2.Subs. by Notifin. No. S.O. 2470(E), dated the 14th August, 2013.

Its parts:

- **Part 1:** Account of Votes Recorded — includes booth-wise data on the number of electors, votes cast, Electronic Voting Machine **(**EVM) identification, tendered ballots, and discrepancies.
- **Part 2:** Result of Counting — provides candidate-wise vote counts obtained by pressing the result button on the EVM.

Law governed under: Governed by the **Conduct of Election Rules, 1961,** framed under the Representation of the People Act, 1951.

Procedures laid down:

- **Part 1** is filled by the **Presiding Officer** after polling, signed by polling agents, and sealed in a 'Strong Room.'
- **Part 2** is filled by the **Returning Officer** on counting day, verified, signed by counting agents, and officially declared.

Functions and powers of Form 17C:

- Ensures transparency and accountability of votes recorded and counted.
- Enables cross-verification of voter turnout and vote counts.
- Helps address discrepancies and strengthens trust in the electoral process.
- Legally binding for polling and counting officials, with signatures mandatory for validation.

46. D VOTERS

Context: The Assam Assembly witnessed discussions on 'D' (Doubtful) voters, with the Opposition demanding closure of

the detention center and the tabling of the National Register of Citizens (NRC) report.

About D Voters:

Who are 'D' Voters?

- 'D' (Doubtful) voters are individuals whose **Indian citizenship is under question**, and they are barred from **voting or contesting elections**.
- **Election Commission of India (ECI)** introduced this category in **1997** in Assam to identify those who failed to prove their citizenship.

Classification as 'D' Voters:

- Any person whose **citizenship status is in doubt** during electoral roll verification is marked as a 'D' voter.
- Cases are referred to **Foreigners Tribunals (FTs)**, which decide whether the person is an **Indian citizen or an illegal immigrant**.
- Families may have **some members recognized as citizens while others are marked as 'D' voters**, causing **legal and social distress**.

Rules Governing 'D' Voters:

- The Citizenship Act, 1955, and the **Citizenship Rules, 2003**, do not define 'D' voters explicitly.
- The **2003 Citizenship Rules** mandate that details of individuals **whose citizenship is doubtful** be entered in the National Population Register **(NPR)** with a remark for **further verification**.
- They are **not allowed to vote** or contest elections until they get clearance from the **Foreigners Tribunal (FT)**.

Key Features of 'D' Voter Status:

- **Temporary Classification**: The 'D' voter status cannot be prolonged indefinitely, and a final decision must be taken within a definite period.
- **Legal Recourse:** Individuals can appeal to the Foreigners Tribunal and seek clearance for inclusion in NRC.
- **Detention & Deportation:** If declared a foreigner, the person may be deported or placed in a detention center.
- **Impact on Families:** Many cases involve split families, where some members are marked as 'D' voters while others hold Indian citizenship.
- **Plight of Detainees:** Many Indian citizens have been detained, with no clear mechanism for their release even after years.

47. PM-SYM (PRADHAN MANTRI SHRAM YOGI MAANDHAN (PM-SYM) SCHEME)

Context:

The government has introduced new features and expanded outreach efforts to improve the implementation of the Pradhan Mantri Shram Yogi Maandhan (PM-SYM) scheme. Recent updates include an **extended revival period**, flexible exit provisions, and enhanced integration with the **e-Shram portal**.

About PM-SYM::

Pradhan Mantri Shram Yogi Maandhan (PM-SYM) is a **voluntary and contributory pension scheme** aimed at providing **financial security** to workers in the **unorganised sector**. **It is a Social Security Scheme** with **matching government contribution**. Ensures a **fixed monthly pension** after retirement. **Launched in** the **Interim Budget of 2019**.

Ministry Involved::

- Administered by the Ministry of Labour and Employment.
- Managed in collaboration with **Life Insurance Corporation (LIC) of India** and **Common Service Centres (CSC SPV)**.

Key Features of the Scheme::

- **Eligibility**: Workers in the unorganised sector earning **up to ₹15,000 per month**.

Pension Amount: **₹3,000 per month** after the age of **60 years**.

- **Government Contribution**: Matches worker's **1:1** contribution.
- **Flexible Contribution**: Ranges from **₹55/month (at age 18) to ₹200/month (at age 40)**.
- **Family Pension**: In case of **subscriber's death**, spouse gets **50% pension**.
- **Exit Options**:
  - If exited **before 10 years**, refund with savings interest.
  - If exited **after 10 years but before 60**, refund with accrued interest.
  - If **both subscriber and spouse pass away**, the corpus is credited back to the fund.
- **Enrolment Process**: Aadhaar-based registration through **Common Service Centres (CSCs)** or **Maandhan portal**.
- **Account Revival**: Now extended to **three years** for workers facing financial difficulties.

Specific Key Points::

- **Not Applicable for**:
  - Income taxpayers.
  - Those covered under **EPF, ESIC, or NPS**.
  - Individuals already receiving government pension benefits.
- **Awareness Initiatives**: Integration with **e-Shram**, SMS campaigns, and review meetings with **States/UTs**.

48. IMPLEMENTATION OF PRADHAN MANTRI FASAL BIMA YOJANA

Context:

The government has **extended the** Pradhan Mantri Fasal Bima Yojana (PMFBY) **and** Restructured Weather-Based Crop Insurance Scheme (RWBCIS) **till 2025-26** with an **outlay of ₹69,515.71 crore**. A **new grievance redressal mechanism**, including the Krishi Rakshak Portal **and Helpline (KRPH)**, has been introduced to enhance transparency and timely claim settlements.

About Pradhan Mantri Fasal Bima Yojana (PMFBY):

PMFBY is **India's flagship crop insurance scheme**, launched in **Kharif 2016**, to **provide financial security to farmers against crop loss** due to natural calamities.

It **aims** to stabilize farm income, ensure credit flow, and promote sustainable agriculture.

Nodal Ministry: Ministry of Agriculture & Farmers' Welfare, Government of India.

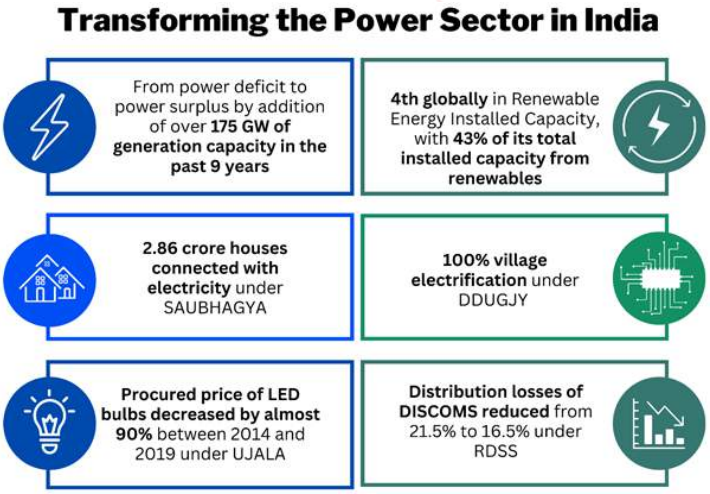
Key Features of PMFBY

- **Affordable Premium Rates**: Farmers pay **2% for Kharif crops, 1.5% for Rabi crops, and 5% for commercial/ horticulture crops**.
  The remaining premium is **subsidized by the Central and State Governments**.
- **Voluntary Participation**: Since **2020**, PMFBY is **optional for farmers** and States/UTs.
- **Technology Integration**: **Remote sensing, drones, and AI-based yield estimation** enhance transparency.
  Digitized claim settlement via Direct Benefit Transfer (DBT).
- **Implementation at State Level**: States select **insurance companies through a transparent bidding process**.
  Joint assessment teams determine crop loss estimates.
- **Grievance Redressal Mechanism**
- **District (DGRC) and State (SGRC) Grievance Committees** handle disputes.
- **Krishi Rakshak Portal (KRPH) & toll-free number (14447)** for real-time complaint resolution.

49. 5TH EDITION OF LINEMAN DIWAS CELEBRATED

Context: The Central Electricity Authority (CEA), in collaboration with **Tata Power-DDL**, celebrated the **5th edition of** Lineman Diwas on **March 4, 2025**, to recognize the contributions of linemen and ground maintenance staff in India's power sector.

Lineman Diwas was **first organized by Central Electricity Authority (CEA) in collaboration with Tata Power-DDL in March, 2021,** and subsequent editions were held in 2022, 2023 and 2024.



Theme: 'Seva, Suraksha, Swabhiman'

About Central Electricity Authority (CEA):

Central Electricity Authority (CEA) is a **statutory body** responsible for **power sector planning, development, and regulation** in India. It advises the **government on electricity policy and technical standards**.

It was **established** under the **Electricity (Supply) Act, 1948** and was later reconstituted under the **Electricity Act, 2003**.

Nodal Ministry-Operates under the **Ministry of Power, Government of India**.

Headquarters- New Delhi, India.

Structure & Composition

- **Chairperson**: Heads the authority and oversees **policy implementation and technical regulations**.
- **Members**: Comprises **technical and regulatory experts** from different domains of the **power sector**.

Divisions:

- **Power Planning & Monitoring Division**: Oversees power sector development.
- **Grid Operations & Transmission Division**: Manages **grid stability** and interconnectivity.
- **Distribution & Regulatory Affairs**: Ensures **efficient electricity distribution and policy compliance**.
- **Safety & Training Division**: Focuses on **workforce training, safety protocols, and best practices**.

50. GRANT IN AID TO NCDC

Context:

The **Ministry of Cooperation** has provided a ₹1,000 crore grant to the National Cooperative Development Corporation (NCDC) to strengthen **Cooperative Sugar Mills (CSMs).** The grant aims to **leverage ₹10,000 crore in financial assistance** for ethanol plants, cogeneration units, and working capital support.

About Grant-in-Aid to NCDC for Strengthening of Cooperative Sugar Mills (CSMs):

What is the Scheme?

- A **financial assistance initiative** to support **Cooperative Sugar Mills (CSMs)** in improving productivity and sustainability.
- Funds provided to **NCDC to enable borrowing from the market**, ensuring a **higher capital flow for sugar mills.**

Nodal Ministry: Ministry of Cooperation, Government of India.

Launched By: Implemented during **FY 2022-23** and continued in **FY 2024-25**.

Key Features of the Scheme

- **Financial Assistance for Sugar Mills**: **₹1,000 crore grant to NCDC** to mobilize **₹10,000 crore** for CSMs.
- Funds to be used for **ethanol production units, cogeneration plants, and working capital needs**.
- **Boosting Ethanol Production**: Supports the **National Bio-Energy Policy** by promoting **ethanol blending in fuel**.
- Helps **reduce crude oil imports and enhance energy security**.
- **Support for Co-generation Plants**: Sugar mills encouraged to establish **bagasse-based power generation** for energy self-sufficiency.
- Enables **integration with the renewable energy sector**.
- **Market-Based Fund Mobilization**: **NCDC leverages grant to raise capital from financial markets**, ensuring **sufficient liquidity** for sugar mills.

About National Cooperative Development Corporation (NCDC):

National Cooperative Development Corporation (NCDC) is a statutory organization dedicated to promoting, financing, and supporting cooperative institutions in India.

a. **Established in:** Founded in **1963** under the **National Cooperative Development Corporation Act, 1962**.
b. **Nodal Ministry:** Functions under the **Ministry of Cooperation, Government of India**.
c. **Headquarters: New Delhi, India**.

Functions of NCDC:

- **Financial Assistance:** Provides funds for cooperative development in agriculture, rural industries, and allied sectors.
- **Capacity Building:** Organizes training programs to enhance cooperative management skills.
- **Policy Implementation:** Supports government schemes for rural economic empowerment through cooperatives.
- **Project Development:** Assists in infrastructure creation, storage facilities, and marketing support for cooperatives.
- **Loan & Subsidy Disbursement:** Provides concessional loans and financial grants to cooperative societies.

51. PARVATMALA PARIYOJANA

Context:

The Cabinet Committee on Economic Affairs (CCEA) approved two major ropeway projects in Uttarakhand under the Parvatmala Pariyojana, connecting Govindghat-Hemkund Sahib (12.4 km) and Sonprayag-Kedarnath (12.9 km).

About Hemkund Sahib Ji:

Location: Situated in the **Chamoli district of Uttarakhand**, at an altitude of **4,632 meters** in the **Garhwal Himalayas**.

Connectivity: Currently accessible via a **21-km trek** from **Govindghat**, soon to be connected via **ropeway**.

Features:

One of **Sikhism's holiest shrines**, dedicated to **Guru Gobind Singh Ji**.

- Also, a gateway to the **Valley of Flowers**, a **UNESCO World Heritage Site**.

About Parvatmala Pariyojana:

A **National Ropeways Development Programme** aimed at **boosting ropeway connectivity in hilly areas**.

Launched In: Announced in the **Union Budget 2022-23** by the **Ministry of Road Transport and Highways (MoRTH)**.

Ministry: Implemented by **MoRTH** under the **National Highways Logistics Management Limited (NHLML)**.

Aim:

- To **enhance connectivity** in difficult terrains and **reduce travel time** in hilly areas.
- To **promote eco-friendly and cost-effective transport solutions**.
- To **boost tourism and local economy** by facilitating better access to remote locations.

Key Feature:

- **200+ Ropeway Projects Planned:** Over the next five years with a budget of ₹1.25 lakh crore.
- **Public-Private Partnership (PPP) Model:** Encourages **private sector participation** for economic viability.
- **Monocable & Tricable Gondola Technology:** Ensures high capacity, better efficiency, and safety.
- **Hybrid Annuity Mode (HAM) Support:** 60% construction funding by the government, making projects more feasible.
- **Make in India Initiative:** Focus on indigenous manufacturing to boost local industries.
- **Multi-Utility Benefits:** Ropeways to be used for tourism, urban transport, and logistics in remote areas.

52. UNITED STATES COMMISSION ON INTERNATIONAL RELIGIOUS FREEDOM (USCIRF)

Context:

The United States Commission on International Religious Freedom (USCIRF) in its 2025 report recommended designating India as a "Country of Particular Concern" (CPC), citing alleged religious freedom violations.
India strongly rejected the report, calling it "biased and politically motivated".

About USCIRF Recommendations on India:

- **Designation Suggested:** USCIRF has urged the US government to label India as a **Country of Particular Concern (CPC)** for "systematic and egregious" violations of religious freedom.
- **Targeted Sanctions:** The report recommended sanctions on India's external intelligence agency, **RAW**, and individuals like **Vikash Yadav** under the **International Religious Freedom Act (IRFA)**.
- **Other Proposals:**
  - Review arms sales, including **Predator drone deals**.
  - Highlight religious freedom in US-India diplomatic engagements.
  - Reintroduce the **Transnational Repression Reporting Act, 2024** to address global repression.
- Though USCIRF's recommendations are **non-binding**, they can influence **US foreign policy, bilateral relations, defence deals**, and global human rights discourse.

About USCIRF (United States Commission on International Religious Freedom):

- **Established by:** US Congress under the **International Religious Freedom Act (IRFA), 1998**.
- **Type:** Independent, bipartisan federal government agency.

Governance:

a. **9 Commissioners** appointed by the **President** and **Congressional leaders**.
b. Supported by a **non-partisan staff**.

- **Not Under:** US State Department (but works in coordination).
- **Legal Framework:** Guided by **Article 18 of the Universal Declaration of Human Rights.**
- **Core Functions of USCIRF:**
- **Monitor:** Global trends and violations of **freedom of religion or belief (FoRB)**.
- **Advise:** President, Secretary of State, and Congress on policy responses.
- **Recommend:** Designations like **Country of Particular Concern (CPC)** and **sanctions** under IRFA.
- **Engage:** With international partners, NGOs, religious groups, and human rights defenders.
- **Advocate:** For religious prisoners of conscience and raise awareness globally.
- **Publish:** Annual reports, thematic briefs, and maintain **FoRB Victims List**.

53. SAMARTH INCUBATION PROGRAM

Context:

The Centre for Development of Telematics (C-DOT), an autonomous R&D body under the Department of Telecommunications (DoT), Government of India, launched the 'Samarth' Incubation Program.

About Samarth Incubation Program:

- A dedicated incubation program supporting startups and innovators in telecom and ICT fields.
- Bridges the gap from ideation to commercialization, fostering high-impact technology solutions.

Ministry: Launched by C-DOT under the Department of Telecommunications (DoT), Government of India.

Implementing Agency: Software Technology Parks of India (STPI) serves as the official implementation partner.

Aim of the Program:

- Promotes next-gen technologies like 5G/6G, AI, IoT, cybersecurity, and quantum tech.
- Encourages scalable, sustainable business models and strengthens India's startup ecosystem.

Key Features:

- **Cohort Size:** 18 startups per program, totaling 36 startups across two six-month cohorts.
- **Hybrid Model:** Delivered in both physical and virtual modes for flexibility.
- **Support Offered:** Grants up to ₹5 lakh, access to C-DOT labs, mentorship, and networking opportunities.
- **Eligibility:** Startups must be DPIIT-recognized to apply.

Significance:

- Strengthens India's innovation ecosystem in telecom and ICT sectors.
- Creates job-generating businesses and fosters collaborative research and public-private partnerships.

54. NAMAMI GANGE PROGRAMME

Context:

The Namami Gange Programme, launched in 2014, has significantly improved sewage treatment capacity, river biodiversity, and pollution control measures in the Ganga River basin.

The programme has quadrupled the sewage treatment capacity in Varanasi, improved water quality in multiple states.

About Namami Gange Programme:

- A **comprehensive river conservation mission** aimed at **cleaning and rejuvenating River Ganga**.
- Approved as a **Flagship Programme** by the **Government of India** in **2014**.

Launched In: June 2014, with a budget outlay of ₹20,000 crore, later expanded to ₹42,500 crore.

Ministry: Ministry of Jal Shakti, under the National Mission for Clean Ganga (NMCG).

Aim of Namami Gange:

- **Pollution abatement and ecological restoration** of the Ganga River.
- **Sustainable waste management** through modern sewage treatment plants **(STPs)**.
- **Biodiversity conservation** and revival of aquatic ecosystems.
- **Public engagement and awareness** to promote community participation.

Key Features:

- **Sewage Treatment Infrastructure:** Over 200 sewage treatment projects have been launched to prevent wastewater from polluting the Ganga.
- **Riverfront Development:** Modernization of ghats and crematoriums along the river to enhance sanitation and tourism.
- **Biodiversity Conservation:** Efforts to restore aquatic life, leading to a rise in Gangetic Dolphin population and improved fish species diversity.
- **Afforestation & Eco-Restoration:** Over 1.34 lakh hectares of trees planted along the Ganga to prevent soil erosion and maintain water flow.
- **Ganga Gram Initiative:** Development of 1,674 villages along the river with better sanitation, waste management, and clean drinking water.
- **International Recognition & Collaboration:** Recognized as a Top 10 World Restoration Flagship Initiative (UN Decade on Ecosystem Restoration, 2022).

55. GUM ARABIC

Context:

Sudan's ongoing conflict has **halted the global trade of gum arabic**, a critical ingredient in **food, beverages, and cosmetics**.

With **70% of the world's supply** coming from Sudan, major companies like **Coca-Cola and PepsiCo** face potential shortages in the coming months.

About Gum Arabic:

Gum Arabic is a natural resin derived from the Acacia trees found in the Sahel region of Africa. It is used as a stabilizer, emulsifier, and thickening agent in various industries.

Usage of Gum Arabic

- **Food & Beverages**: Prevents ingredient separation in **soft drinks, candies, and baked goods**.
- **Cosmetics**: Used in **lotions, creams, and makeup** for consistency.
- **Pharmaceuticals**: Acts as a **binding agent in medicines and capsules**.
- **Printing & Textiles**: Used in **inks and dyes** for better adhesion.

Where is Gum Arabic Mainly Found?

- **Sudan**: Supplies **70% of global demand**.
- **Other Countries**: Chad, Nigeria, Senegal, and Mali also produce gum arabic, but in smaller quantities.

Significance of Gum Arabic

- **No Viable Substitute**: Essential for **carbonated drinks**, ensuring proper ingredient blending.
- **Economic Importance**: A major **export commodity** for Sudan.
- **Global Supply Chain Dependency**: Disruptions in Sudan directly **impact multinational corporations** like PepsiCo and Coca-Cola.

56. GLOBAL ENGAGEMENT SCHEME

Context:

The Global Engagement Scheme was recently discussed in the Lok Sabha, where the Union Minister for Culture and Tourism, Shri Gajendra Singh Shekhawat, provided details about its implementation, including the participation of artists from Maharashtra in international cultural festivals.

About Global Engagement Scheme::

Global Engagement Scheme, initiated by the **Ministry of Culture**, aims to promote India's diverse cultural heritage on the global stage and foster international cultural collaborations.

Nodal Ministry- Ministry of Culture, Government of India

Key Features of the Scheme

- **Promoting Cultural Heritage:** Showcases India's rich cultural diversity, including folk, classical, and contemporary art forms.
- **Strengthening Bilateral Cultural Ties**: Encourages collaboration with foreign nations to enhance India's cultural outreach.
- **Festival of India (FOI)**: Empanelled Indian artists perform abroad in cultural festivals organized by Indian Missions.
- Covers folk music, dance, puppetry, theatre, classical music, experimental dance, etc.
- Government funds travel and performances of selected artists.
- **Grant-in-Aid for Indo-Foreign Friendship Societies**: Financial support to cultural societies fostering Indo-foreign cultural exchange.

57. RAISINA DIALOGUE

Context:

The 10th edition of the Raisina Dialogue will be held from March 17-19, 2025, focusing on global security, diplomacy, and emerging geopolitical trends.

About Raisina Dialogue:

- **India's flagship international conference** on **geopolitics and geo-economics**, organized annually.
- Aims to **bring together global leaders, policymakers, academics, and strategic experts**.
- **Started in:** 2016, as an initiative of the Ministry of External Affairs (MEA) and Observer Research Foundation (ORF).

RAISINA
DIALOGUE

- **Ministry Involved:** Ministry of External Affairs (MEA).

Aim:

- **Foster global discussions** on diplomacy, security, and economic policies.
- **Enhance India's role** as a key player in international

affairs.
- **Strengthen cooperation** between nations on pressing global issues.

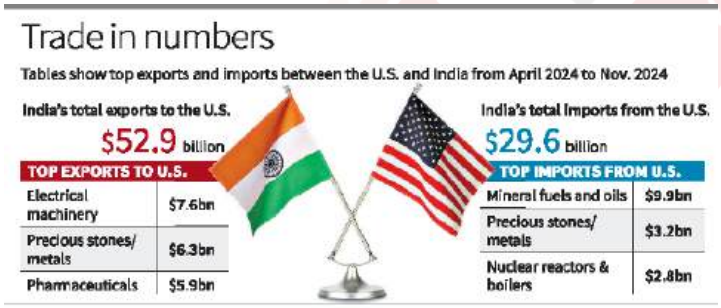
Key Features:
- **High-level participation** from global leaders, diplomats, and experts.
- **Panel discussions, keynote addresses, and networking sessions**.
- **Focus on emerging challenges** in security, technology, and governance.

About Raisina Dialogue 2025:
- **Organizers:** Ministry of External Affairs (MEA) and Observer Research Foundation (ORF).
- **Theme: "Kalachakra" (Wheel of Time)** – exploring geopolitical transformations and global uncertainties.
- **Chief Guest: New Zealand Prime Minister Christopher Luxon**, delivering the **keynote address**.

58. RECIPROCAL TARIFFS

Context: U.S. President Donald Trump announced reciprocal tariffs on nations imposing higher levies on American goods, targeting **India, China, the EU, Canada, and Mexico**. The move aims to **match import tariffs with** export tariffs, reshaping global trade dynamics and potentially triggering retaliatory actions**.**

What is a Reciprocal Tariff?
A reciprocal tariff is a trade policy where a country imposes **import duties equal to the tariffs charged on its exports** by other nations.



It is designed to **counter trade imbalances and discourage unfair tariff policies** by foreign governments.

How Does It Work?
- If a country imposes **higher tariffs on U.S. goods**, the U.S. will **match the rate** on imports from that nation.
- The policy applies to **goods, services, and non-tariff barriers** restricting U.S. market access.
- It aims to **reduce trade deficits** and **encourage countries to lower their tariffs** to maintain access to the U.S. market.

Does It Violate WTO Rules?
- **Yes, it may contradict** WTO principles, which advocate **non-discriminatory trade policies** under the **Most-Favored-Nation (MFN) rule**.
- However, the U.S. can justify it under **Article XXI (national security exception) or Article XX (general exceptions)** of the WTO agreement.

Consequences of Reciprocal Tariffs:
- **Escalation of Trade Wars:** Countries like China, Canada, and Mexico may impose retaliatory tariffs, leading to supply chain disruptions and higher global trade tensions.
- **Increase in Consumer Prices**: Tariffs raise import costs, which businesses pass on to consumers, causing inflation and reduced purchasing power.
- **Economic Volatility**: Unpredictable trade policies create market instability, lowering investor confidence and slowing economic growth.
- **Strained Diplomatic & WTO Disputes**: Countries may challenge U.S. tariffs at the WTO, worsening bilateral relations and risking trade retaliation.
- **Boost to U.S. Manufacturing:** Higher tariffs on imports may push companies to manufacture domestically, creating jobs and reducing trade deficits.

59. EU-INDIA TRADE AND TECHNOLOGY COUNCIL

Context:
India and the EU held the second ministerial meeting of the Trade and Technology Council (TTC), focusing on strategic technologies, clean energy, and trade resilience.

About EU-India Trade and Technology Council (TTC)**:**
What is the TTC? A **bilateral strategic platform** to enhance cooperation on trade, technology, and security between India and the European Union (EU).
Second TTC for the EU (after the US) and India's first-ever TTC with any country.

History & Origin:
- **Announced in April 2022** by Prime Minister of India and European Commission President.

- **Formally launched in February 2023**, followed by its **first ministerial meeting in May 2023** alongside Free Trade Agreement (FTA) negotiations.

Aim of the EU-India TTC:

- **Enhance digital and trade cooperation** through joint policy frameworks.
- **Reduce dependence on China and Russia** in critical sectors like **semiconductors and military technology**.
- **Boost research and innovation** in **AI, 6G, and quantum computing**.
- **Develop resilient supply chains** for **semiconductors, batteries, and rare earth materials**.

Key Features of the EU-India TTC:

Three Working Groups:

- **Digital & Strategic Technologies** – Focuses on **6G, AI, and quantum technology**.
- **Green & Clean Energy Technologies** – Covers **battery supply chains and renewable energy**.
- **Trade, Investment & Supply Chain Resilience** – Strengthens critical industries **like semiconductors and data governance.**

Strategic Shift in Global Trade & Technology Alliances:

- Complements India's participation in Quad's Emerging Technology Group and **Supply Chain Resilience Initiative (SCRI) with Japan & Australia**.
- Aligns with **EU's partnerships with Asia-Pacific nations** under its **Digital Compass 2030 strategy**.

Geopolitical & Economic Impact:

- TTC aims to diversify global trade routes, reduce China's technological dominance, and strengthen EU-India economic integration.
- Reinforces India's Indo-Pacific strategy and EU's efforts to counterbalance dependence on Chinese tech giants.

60. SIPRI REPORT (2020-24)

Context:

India has become the **second-largest arms importer** globally between **2020-24**, following Ukraine, as per the **Stockholm International Peace Research Institute (SIPRI)** report.
The report highlights a **decline in India's arms imports from Russia** and a rise in French arms exports to India.

About SIPRI Report (2020-24): Key Highlights of the SIPRI Report (2020-24)::

Global Trends in Arms Imports & Exports:

- **Ukraine** emerged as the **largest arms importer** due to ongoing war with Russia, with a **100-fold rise** in imports.
- **India** ranked **second** in arms imports, despite a **9.3% decline** compared to 2015-19.
- **China** exited the **top 10 arms importers list** for the first time since **1990-94**, reflecting its growing domestic defense industry.
- **Pakistan's arms imports** surged by **61%**, with **China supplying 81%** of its total imports.
- **European arms imports increased by 155%** due to geopolitical tensions and military rearmament.

India's Defense Imports

- **Russia remained the top supplier** but its share dropped to **36% (from 55% in 2015-19 & 72% in 2010-14)**.
- **France emerged as a major supplier**, with **28% of its total arms exports** going to India.
- India has **contracted major military deals** with France, including **36 Rafale jets & six Scorpene-class submarines**.
- **Deals for 26 Rafale-M jets & three more submarines** are expected to be finalized soon.

Global Arms Transfer & Export Trends

- **USA expanded its global arms market share to 43%**, reinforcing its dominance.
- **Russia's arms exports fell by 64%**, now comprising only **7.8% of global exports**, behind **France (9.6%)**.
- **Italy climbed to 6th place in arms exports**, with a **4.8% share** in global arms trade.
- **35 countries have supplied weapons to Ukraine** since 2022, with more deliveries in progress.

Stockholm International Peace Research Institute (SIPRI):

What is SIPRI:: **SIPRI** is an **independent international institute** focused on research in **conflict, armaments, arms control, and disarmament**.
Establishment:: Founded in **1966** in **Stockholm, Sweden**.
Functions & Significance:

- **Analyzes trends in global arms trade** and their impact on international security.
- **Monitors military spending** of nations and their strategic implications.
- **Provides data-driven insights** for policymakers on global defence dynamics.

61. T-72 TANKS

Context:

India signed a $248 million contract with Russia's Rosoboron export to procure 1,000 HP engines for its fleet of T-72 tanks, replacing the existing 780 HP engines to enhance combat capabilities.

The deal includes **Transfer of Technology (ToT) to Armoured Vehicles** Nigam Limited (AVNL) in Avadi, Chennai.

About T-72 Tanks:

- A **main battle tank (MBT)** originally developed by **the Soviet Union** and introduced in the **1970s**.
- One of the most **widely used tanks worldwide**, with over **25,000 units produced**.
- India operates **2,400+ T-72 tanks**, making it the

backbone of the Indian Army's armored forces.

Developed by:

- Designed by **Uralvagonzavod,** Soviet Union.
- India locally manufactures and upgrades T-72 tanks at the **Heavy Vehicles Factory, Avadi**.

Features of T-72 Tank:

- 
Firepower: Equipped with a 125mm smoothbore gun, 7.62mm coaxial machine gun, and 12.7mm anti-aircraft gun.
- **Mobility:** Now upgraded with 1,000 HP engines, improving battlefield speed and manoeuvrability.
- **Armor Protection:** Features composite and reactive armour to withstand enemy fire.
- **Night Combat Capability:** Enhanced thermal imaging systems allow for effective night operations.
- **Operational Range:** Can travel 460 km on-road and 300 km off-road with auxiliary fuel tanks.

Significance of T-72 Tanks in India's Defense:

- **Backbone of the Indian Army:** The largest tank fleet, forming the core of India's armored divisions.
- **Upgradation for Modern Warfare:** Enhanced mobility, protection, and firepower to match contemporary battle needs.
- **High-Altitude Deployment:** Used in Ladakh and desert warfare scenarios, proving versatile in diverse terrains.
- **Cost-Effective Modernization:** The engine upgrade enhances performance while keeping operational costs lower than acquiring new MBTs.
- **Strengthens India-Russia Defense Ties:** Reflects continued strategic military collaboration between New Delhi and Moscow.

62. UN80 INITIATIVE

Context:

UN Secretary-General Antonio Guterres launched the UN80 Initiative to enhance efficiency and cost-effectiveness within the United Nations as it faces financial and operational challenges.

What is the UN80 Initiative?

- A **reform strategy** to **boost efficiency and reduce costs** within the **United Nations**.

- Launched on the **80th anniversary of the UN** by **Secretary-General Antonio Guterres**.

Aim:

- Improve **financial sustainability** amid **shrinking global contributions**.
- Enhance **structural reforms** for **better mandate implementation**.
- Strengthen **strategic planning and cost-effectiveness**.

Key Targets:

- **Identify operational efficiencies** to streamline UN activities.
- **Review existing mandates** for better alignment with global priorities.
- **Restructure programs** to optimize financial and human resources.
- **Enhance collaboration** between different UN bodies for **cohesive action**.
- **Ensure greater transparency** in budget allocation and expenditure.

Features:

- Establishes an **internal task force** led by **Under-Secretary-General Guy Ryder**.
- Introduces a **rigorous review mechanism** to assess **UN programs and operations**.
- Aims to **make the UN more responsive** to emerging global challenges.
- **Encourages timely financial contributions** from member states to resolve liquidity crises.

63. INDO-PACIFIC OCEANS INITIATIVE (IPOI)

Context:

During his recent visit to India, New Zealand Prime Minister Luxon expressed interest in joining the Indo-Pacific Oceans Initiative (IPOI).

About the Indo-Pacific Oceans Initiative (IPOI):

What is IPOI?

The IPOI is a **non-treaty-based voluntary framework** designed to promote **cooperation for a free, open, and rules-based Indo-Pacific region**.

It emphasizes **collaboration among like-minded nations**

through **practical and inclusive maritime partnerships**.
Established in: 2019
Established at: East Asia Summit (EAS), Bangkok, Thailand

Nations Involved:

Open to **all like-minded Indo-Pacific countries**.
Current lead partners on various pillars include **Australia, Japan, Singapore, Indonesia, France, UK, and India**.

Aim of IPOI:

- To **strengthen maritime cooperation**.
- Promote **security, growth, and sustainable development** in the Indo-Pacific region.
- Foster **regional stability, economic growth, and environmental preservation** in alignment with India's **SAGAR (Security and Growth for All in the Region)** vision.

Functions of IPOI:

- **Encourages cooperation** on maritime resource management and security.
- **Strengthens disaster response and risk reduction** through shared strategies.
- Promotes **academic and technological exchange** for sustainable ocean development.
- Builds **robust maritime trade connectivity and transport links**.
- Supports **maritime environmental conservation** and ecological protection.
- Facilitates **capacity building and resource sharing** between partner nations.
- Serves as a platform for **enhancing India's leadership role** in the Indo-Pacific region.

64. EXTRADITION TREATY

Context:

The US Supreme Court rejected Tahawwur Rana's plea against extradition to India, clearing the way for his trial in the **26/11 Mumbai terror attack case**.

India has been pursuing Rana's extradition since 2011, but delays in the US legal system prolonged the process.

About Extradition Treaty:

- **An extradition treaty is a formal agreement between two countries** to transfer individuals accused or convicted of serious crimes.
- It ensures that **fugitives cannot evade justice by crossing international borders**.

Countries with Which India Has an Extradition Treaty

- **India has extradition treaties with 48 countries**, including: **United States, United Kingdom, Canada, Australia, UAE, France, Germany, Russia, and South Korea**.
- **India also has extradition arrangements with 12 additional countries**, allowing case-specific extradition.

Challenges in Extradition:

Legal hurdles in foreign courts delaying the process.
Political and diplomatic considerations influencing decisions.
Human rights concerns, such as the risk of torture or unfair trials.

The Extradition Act, 1962: The Extradition Act, 1962, **governs extradition procedures** in India. It defines how fugitives can be **extradited from India and how India can request extradition** from other countries.

Key Provisions of the Act

- **Applicability:** Covers both **treaty-based and non-treaty extradition cases**.
- **Dual Criminality Principle:** The offense **must be a crime in both India and the requesting country**.
- **Extradition Offenses:** Covers **terrorism, organized crime, drug trafficking, and financial fraud**.

Bar on Political Offenses: Individuals cannot be extradited for political offenses.

- **Rule of Specialty:** The fugitive **can only be tried for the crime they were extradited for**.
- **Human Rights Considerations:** No extradition if there is **a risk of torture or an unfair trial**.

Nodal Authority for Extradition

Ministry of External Affairs (MEA): Processes **extradition**

requests from foreign governments.

Central Bureau of Investigation (CBI): Handles **extradition-related investigations**.

National Investigation Agency (NIA): Pursues cases related to **terrorism and national security**.

Implementation of the Act

- **India initiates extradition through diplomatic channels** after verifying legal requirements.
- The **request is forwarded to the foreign country's** legal system for approval.
- If approved, **law enforcement agencies coordinate the fugitive's transfer** to India.

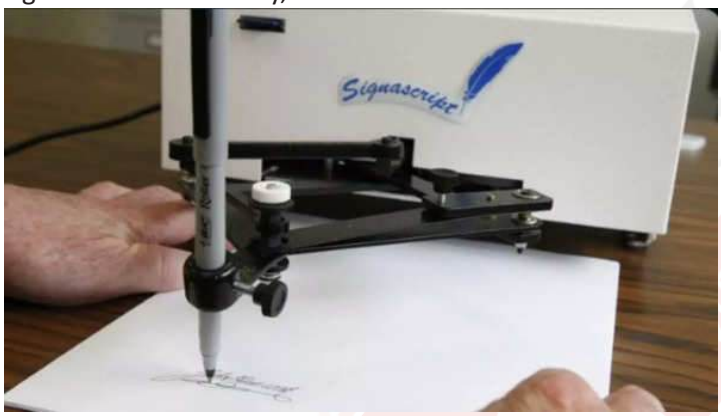
65. AUTOPEN

Context:

Former US President Donald Trump has declared that all pardons signed by President Joe Biden are invalid, alleging they were executed using an autopen.

About Autopen:

An autopen is a mechanical device that replicates a person's signature automatically, without manual effort.



History:

Early Origins: The first signature duplication machine, known as the polygraph, was invented by **John Isaac Hawkins in 1803**, using a pantograph mechanism to replicate handwriting.

Robot Pen (1930s): Developed in the 1930s, the Robot Pen became the first commercial autopen, mass-producing signature templates stored on record-like devices.

Commercial Success: The first commercially successful autopen was created by **Robert M. De Shazo Jr. in 1942.**

How Does an Autopen Work?

- **Signature Recording:** The device stores a template of the user's signature on a mechanical or digital record.
- **Signature Reproduction:** When activated, it guides a pen to replicate the exact signature onto documents.
- **Security Features:** Early devices included removable signature segments to prevent unauthorized use.

66. AFRICA HEALTH AGENDA INTERNATIONAL CONFERENCE (AHAIC) 2025

Context:

The Africa Health Agenda International Conference (AHAIC) 2025 called for urgent health financing reforms amid the **suspension of USAID funding** to African nations.

Held in Kigali, Rwanda (March 3-5, 2025), the conference emphasized domestic resource mobilization and regional cooperation to achieve health security and equity.

About AHAIC:

- **AHAIC is a premier pan-African health conference** that brings together policymakers, healthcare experts, and international organizations to discuss strategic solutions for Africa's health challenges.
- **Organized by Amref Health Africa** in collaboration with **Rwanda's Ministry of Health, WHO Africa, and Africa CDC**.
- **First launched in 2017** to address **Africa's unique health challenges** and promote **universal health coverage (UHC)**.

Key Objectives of AHAIC 2025

- **Health Financing Reforms:** Strengthen **domestic resource mobilization** and **reduce dependence on donor funding**. Promote public-private partnerships (PPP) for sustainable healthcare financing.
- **Universal Health Coverage (UHC):** Reinforce primary healthcare (PHC) as the foundation of UHC. Align policies with **the Alma-Ata Declaration on PHC.**
- **Tackling Emerging Diseases & Health Inequalities:** Address fiscal constraints and growing disease burdens. Develop **climate-resilient healthcare systems** to counter climate-linked health threats.
- **Digital Health & AI Integration:** Utilize technology and AI-driven innovations to improve healthcare accessibility and efficiency.
- **Community Health Workforce Empowerment:** Advocate for fair remuneration and better working conditions for Community Health Workers (CHWs).
- **Mitigating the Impact of USAID Funding Cuts:** Identify alternative funding sources to sustain critical health programs in Africa.

67. AFRICA-INDIA KEY MARITIME ENGAGEMENT (AIKEYME)

Context: The Indian Navy will participate in the maiden multilateral maritime exercise titled 'Africa-India Key Maritime Engagement' (AIKEYME), co-hosted with Tanzania in April 2025, to enhance maritime security and cooperation with African nations.

About Africa-India Key Maritime Engagement (AIKEYME):

What it is: A large-scale multilateral maritime exercise

aimed at enhancing naval cooperation and interoperability between India and African nations.

Host Nations: India and Tanzania (co-hosts).

Established in: The first edition will take place in **April 2025** in **Dar-es-Salaam,** Tanzania.

Nations Participating: Comoros**,** Djibouti Eritrea, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa, India and Tanzania (co-hosts)

Aims of AIKEYME:

- To strengthen maritime security in the Indian Ocean Region (IOR).
- To improve coordination in tackling piracy, illegal trafficking, and unregulated fishing.
- To enhance information sharing and surveillance between navies.

Key Features of AIKEYME:

- Harbour Phase Activities:
  - Tabletop exercises on piracy response and information sharing.
  - Training sessions in seamanship and Visit, Board, Search, and Seizure (VBSS) operations.
- Sea Phase Operations:
  - Search and Rescue (SAR) drills, small arms firing, helicopter operations, and VBSS exercises.
- Alignment with SAGAR and MAHASAGAR:
  - Supports India's SAGAR vision and MAHASAGAR initiative announced by PM Modi in March 2025.
- Deployment of INS Sunayna (IOS Sagar Initiative):
  - Month-long joint surveillance and port calls in Tanzania, Mozambique, Mauritius, Seychelles, and Maldives.

68. MILITARY EXERCISE IN NEWS

Context:

India recently participated in multiple military exercises, reinforcing defense cooperation and regional security.

About Military Exercise in News:

Exercise Bongosagar 2025

- **Nations Involved**: India and Bangladesh
- **Host:** Bay of Bengal
- **Aim:** Strengthening **maritime security**, tactical planning, and operational coordination.

Exercise Khanjar-XII 2025

- **Nations Involved:** India and Kyrgyzstan
- **Host:** Tokmok, Kyrgyzstan
- **Aim:** Enhancing **special forces interoperability**, focusing on **urban warfare and counter-terrorism** under the UN mandate.

Exercise Dharma Guardian 2025

- **Nations Involved:** India and Japan
- **Host:** East Fuji Training Area, Japan
- **Aim:** Improving **joint counter-terror operations, disaster relief drills, and military synergy** in the Indo-Pacific.

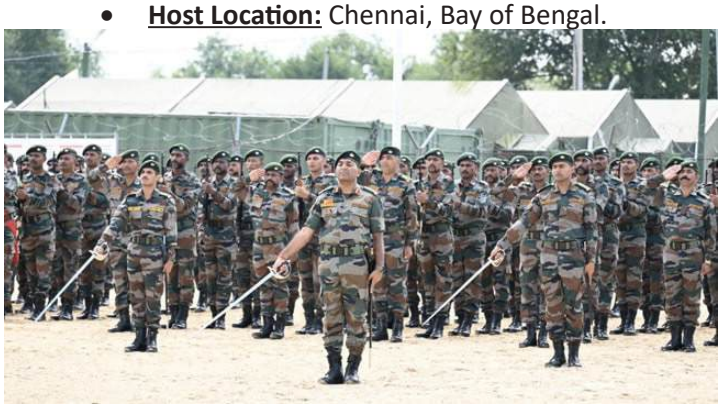
69. MILITARY EXERCISE IN NEWS

Context:

India and Russia launched the 6-day naval exercise INDRA off the Chennai coast. Simultaneously, the Indian Air Force (IAF) is set to participate in Exercise INIOCHOS-25, a multinational air drill in Greece.

About Military Exercise in News:

- **Exercise INDRA (India–Russia Naval Exercise)**
  - **Participating Nations:** India and Russia
  - **Host Location:** Chennai, Bay of Bengal.



- Aim:
  - Strengthen **maritime cooperation** and **interoperability.**
  - Conduct **tactical naval operations**, **live weapon drills**, **air defence**, **underway replenishment**, and **helicopter cross-deck landings.**
  - Enhance **strategic bilateral ties** and **operational synergy.**
- Exercise INIOCHOS-25 (Multinational Air Exercise)
  - **Participating Nations:** 15 countries (including

India)

- **Host Location:** Andravida Air Base, Elis region, Greece
- **Aim:**
  - Improve **interoperability** and **joint planning in air warfare.**
  - Train in **complex air combat scenarios.**
  - Strengthen **strategic defence relations** and **coalition air power coordination.**

70. EXERCISE SEA DRAGON 2025

Context:

India successfully concluded participation in Sea Dragon 2025, a two-week multinational anti-submarine warfare (ASW) exercise.

About Exercise Sea Dragon 2025:

What it is:: **Sea Dragon 2025 (SD25)** is an annual **multinational** anti-submarine warfare (ASW) exercise.

It aims to improve **interoperability, coordination, and tactical proficiency** among Indo-Pacific allies.

- **Host Nation:** United States Navy's 7th Fleet hosted the exercise.
- **Location of Event:** Conducted at Andersen Air Force Base, Guam, Western Pacific.

Aim of the Exercise:

- Strengthen **maritime security** and defense collaboration.
- Enhance **submarine detection, tracking, and neutralization capabilities**.
- Promote the concept of a **free, open, and secure Indo-Pacific**.

Key Features:

- **Live ASWEX exercise** to track real US Navy submarines.
- **Mobile training drills** using MK-30 'SLED' target systems.
- **Competitive evaluation phase** with graded ASW effectiveness.
- Deployment of **advanced Maritime Patrol and Reconnaissance Aircraft (MPRA)** from each participating nation.

Nations Involved:

- **India** (since 2021) with P-8I Neptune aircraft.
- **Australia** – RAAF P-8A Poseidon.
- **Japan** – JMSDF Kawasaki P-1 aircraft.
- **South Korea** – ROKN P-3 Orion.
- **United States** – P-8A Poseidon (Patrol Squadrons VP-16 & VP-47).

71. KHANJAR-XII

Context:

The Indian Army contingent has departed for the **12th edition of the India-Kyrgyzstan Joint Special Forces Exercise KHANJAR-XII**, scheduled from **March 10–23, 2025, in Kyrgyzstan**.

About KHANJAR-XII:

KHANJAR-XII is a bilateral military exercise between India and Kyrgyzstan, focusing on **counter-terrorism and special forces training**.

Started in 2011, the exercise has since become an **annual event**, alternating between India and Kyrgyzstan.

Indian contingent is represented by troops from the **Parachute Regiment (Special Forces)** and the Kyrgyzstan contingent is represented by **Kyrgyz Scorpion Brigade.**

Objective of KHANJAR-XII::

- **Strengthen military cooperation** between India and Kyrgyzstan.
- **Enhance interoperability in counter-terrorism operations** and special forces tactics.
- **Develop advanced combat skills** for **mountain warfare, sniping, and close-quarter combat**.
- **Exchange best practices** in **urban intervention, hostage rescue, and complex building operations**.
- **Improve coordination in multinational security efforts** against **terrorism and extremism**.

72. INS IMPHAL

Context:

INS **Imphal** has arrived at **Port Louis, Mauritius**, to participate in the **57th Mauritius National Day celebrations on March 12, 2025**.

The visit underscores **India's commitment to maritime security and regional cooperation**, aligning with the **'Neighbourhood First' policy and SAGAR vision**.

About INS Imphal:

- **INS Imphal** is a Visakhapatnam-class **(Project 15B) guided-missile destroyer** of the **Indian Navy**.
- It is the **third indigenous stealth destroyer**, commissioned in **December 2023**.
- **Built by**: **Mazagon Dock Shipbuilders Limited (MDL), Mumbai**.

Key Features of INS Imphal**:**

- State-of-the-Art Weaponry

Equipped with BrahMos supersonic cruise missiles.

- **Barak-8 surface-to-air missiles** for aerial defense.
- **76mm Super Rapid Gun Mount (SRGM) and AK-630 CIWS** for close-range combat.
- **Advanced Sensor & Radar Systems**: Features **Multi-Function Surveillance and Threat Alert Radar (MF-STAR)**.
- Includes **electronic warfare suites and towed array sonar** for underwater surveillance.
- **Stealth Capabilities**: Designed with **low radar cross-section** for stealth operations.
- Reduces detectability in enemy radar systems.
- **Enhanced Mobility & Endurance:** Powered by **four gas turbines**, capable of reaching **over 30 knots**.
- Operational range: **4,000 nautical miles**.
- **Helicopter & UAV Operations**: Can carry **two multi-role helicopters**, including **MH-60R Seahawks**.
- Supports **unmanned aerial vehicle (UAV) operations** for reconnaissance.

73. BAANKNET PORTAL

Context:

The government launched the revamped BAANKNET portal and e-BKray platform to enhance transparency, efficiency, and value realization in PSU bank e-auctions of non-performing assets.

About BAANKNET Portal**:**

- **What it is:** An advanced, integrated e-auction portal for Public Sector Banks and financial institutions to auction properties for recovery of NPA loans.

- **Ministry:** Launched under the Ministry of Finance, Department of Financial Services.
- **Aim:**
  - To ensure transparent, efficient, and secure e-auctions.
  - To enhance stakeholder trust and maximize value realization from asset sales.

Key Features:

- **Cutting-edge Platform:** Advanced property listing and e-auction system for easy, secure NPA recovery.
- **Automated KYC & Secure Payments:** Built-in KYC tools with reliable payment gateways for safe transactions.
- **All-India Property Listings:** Comprehensive database for smooth property search and sale across the country.
- **Smart Auctions:** Intelligent bidding with real-time updates to ensure fair pricing.
- **Transparency:** Bank-verified property titles to build confidence in buyers.
- **Widespread Adoption:** Used by all 12 PSBs and Insolvency and Bankruptcy Board of India (IBBI).

About e-BKray Platform:

What it is: A digital auction platform for disposing of assets under recovery proceedings by PSU banks.

Aim:

- To standardize and simplify e-auction processes across public sector banks.
- To ensure competitive bidding and higher asset value realization.

Developed by: Launched by the Department of Financial Services on 28th February 2019.

Functions:

- Centralized e-auction of bank properties under recovery proceedings.
- Reduces administrative burden by standardizing property auction procedures.
- Real-time auction tracking and transparent bidding processes.
- Helps banks recover NPA assets efficiently and quickly.

74. EQUALISATION LEVY

Context:

The government has proposed abolishing the **6%** **Equalisation Levy** on online advertisements from April 1, 2025, through amendments in the Finance Bill 2025, benefiting platforms like Google, Meta, and X.

About Equalisation Levy:

What it is: A tax imposed on non-resident digital service providers for services related to online advertisements and e-commerce transactions targeting Indian users.

Adopted in:

- Introduced in the **Finance Act, 2016** for online advertisements.
- Extended in the **Finance Act, 2020** to e-commerce supplies and services.

Aim:

To ensure a fair tax system for foreign digital platforms generating revenue from Indian customers without having a physical presence in India.

Categories under Equalisation Levy:

- **Online Advertisement Services (from June 1, 2016):** 6% levy on payments made to non-resident service providers for digital advertising services.
- **E-Commerce Transactions (from April 1, 2020, till August 1, 2024):** 2% levy on the value of e-commerce goods or services supplied or facilitated by non-resident e-commerce operators.

It is levied on:

- Payments to non-residents for online advertisements or digital ad space.
- E-commerce supply of goods or services targeting:
  - Indian residents.
  - Individuals using Indian IP addresses.

Exemptions Provided:

- If the non-resident has a **permanent establishment (PE) in India** and the service is linked to that PE.
- Transactions below specified thresholds:
  - ₹1 lakh for online advertisement services.
  - ₹2 crore for e-commerce transactions.
- Personal use transactions, not related to business or profession.

Key Features of Equalisation Levy:

- **Deduction Responsibility:** The service recipient (Indian resident or non-resident with PE) deducts the levy and deposits it with the Central Government.
- **Payment Schedule:** Monthly or quarterly, with specific due dates depending on the type of service.
- **Penalty for Non-Compliance:** Equal to the amount of levy not deducted or paid; interest of **1% per month** on late payments.
- **Appeal Mechanism:** Appeal to Commissioner of Income-tax (CIT) (Appeals) and Income Tax Appellate Tribunal (ITAT) available within prescribed timelines through Form No. 3 and Form No. 4.
- **Revenue Exclusion:** Income subjected to equalisation levy is exempt from income tax under **Section 10(50)** of the Income Tax Act.

75. DIGITAL TRANSFORMATION AWARD 2025

Context:

The Reserve Bank of India (RBI) has won the Digital Transformation Award 2025, presented by Central Banking, London.

About Digital Transformation Award 2025:

What it is?

The **Digital Transformation Award** recognizes **central banks and financial institutions** for **excellence in digital innovation** and **technology-driven governance**.

- **Presented by:** Awarded by **Central Banking, London**, a globally recognized institution focusing on monetary policies, governance, and financial transformation.

- **Eligibility:** Open to central banks, financial regulators, and monetary institutions that have successfully implemented digital reforms.
- **Winner of 2025 Award:** Reserve Bank of India (RBI) won for its digital initiatives – **'Saarathi'** and **'Pravaah'.**

About RBI's Digital Initiatives Leading to the Award:

Saarathi Initiative:

- **What it is?** An **internal workflow** digitization system for RBI employees.
- **Aim of the Scheme:** Enhance record management, automate processes, enable secure digital submissions, and improve data tracking & collaboration.
- **Impact:** Eliminated **manual paperwork**, streamlined task tracking, and integrated various RBI departments into a unified system.

Pravaah Initiative:

- **What it is?** A **digital regulatory application platform** for external users submitting documents to RBI.
- **Aim of the Scheme:** Digitize over 70 regulatory applications, enhance transparency, and improve cybersecurity in financial documentation.
- **Impact:** Created **a direct link with Saarathi**, reduced paperwork, and increased efficiency in RBI's external processing systems.

76. ANTI-DUMPING DUTIES

Context:

India has imposed anti-dumping duties on five Chinese products to safeguard domestic industries from low-priced imports.

These duties will be applicable for up to **five years** based on recommendations from the Directorate General of Trade Remedies (DGTR).

About Anti-Dumping Duties:

What it is:: Anti-dumping duty is a protectionist tariff imposed on imports priced below their normal value in the exporting country.

It aims to protect domestic industries from injury caused by unfairly priced imports.

Authority to impose in India

- The Directorate General of Trade Remedies (DGTR) under the Ministry of Commerce and Industry recommends anti-dumping duties.
- The **Ministry of Finance notifies and levies** these duties based on DGTR's investigation and recommendation.

When it is imposed:

- Imposed after evidence of material injury to domestic industry from cheap imports sold at below market price.
- Duties are typically levied for a period of up to five years and periodically reviewed.

Does it violate WTO rules?

- No, it is permitted under **Article 6** of the General Agreement on Tariffs and Trade (GATT), 1994.
- The WTO Anti-Dumping Agreement allows members to impose duties to ensure fair trade practices.

Recent Chinese goods with anti-dumping duty imposed:

- **Soft Ferrite Cores** (used in EVs, chargers, telecom equipment)
- **Vacuum Insulated Flasks**
- **Aluminium Foil**
- **Trichloro Isocyanuric Acid** (used in water treatment)
- **Poly Vinyl Chloride (PVC) Paste Resin**.

77. STRATEGIC BITCOIN RESERVE

Context:

U.S. President Donald Trump has signed an executive order establishing a Strategic Bitcoin Reserve to position the U.S. as a leader in digital asset storage.

The reserve will be capitalized with Bitcoin seized by the U.S. Treasury from criminal and civil forfeiture proceedings, creating a government-backed stockpile of cryptocurrencies.

About Strategic Bitcoin Reserve:

What is the Strategic Bitcoin Reserve?

- A **U.S. government-backed reserve** that will hold **Bitcoin and select other cryptocurrencies** as **strategic financial assets**.
- Aims to **enhance U.S. leadership in digital currency markets** and ensure **long-term value retention of crypto assets**.

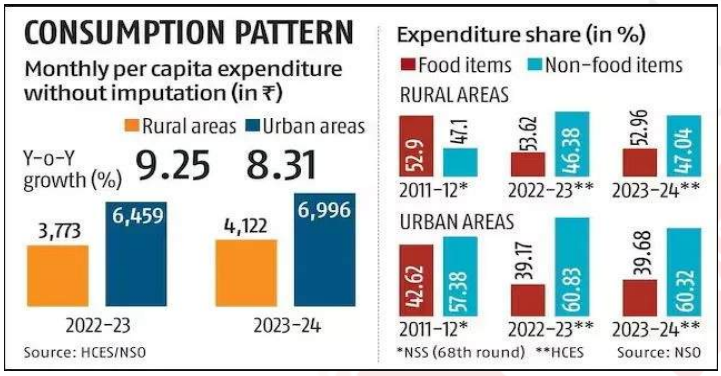
Established by:

- **President Donald Trump via an executive order** in **March 2025**.
- Managed by the U.S. Department of Treasury and Department of Commerce.

How it works?

- **Bitcoin Seizure Utilization:** The reserve will be funded by Bitcoin and other digital assets seized from criminal and civil forfeiture cases.
- **No Immediate Sales Policy:** The government will hold Bitcoin as a long-term asset, preventing premature sell-offs that could destabilize markets.
- **Digital Asset Stockpile:** Apart from Bitcoin, other cryptocurrencies like Ethereum, XRP, Solana, and Cardano will also be part of the reserve.
- **Budget-Neutral Strategy:** Treasury and Commerce Departments are tasked with acquiring more Bitcoin without imposing costs on taxpayers.
- **Centralized Crypto Strategy:** The reserve aims to act as a digital equivalent of Fort Knox, positioning Bitcoin as a strategic national asset.

78. HOUSEHOLD CONSUMPTION EXPENDITURE SURVEY (HCES) 2023-24



Context:

The Household Consumption Expenditure Survey (HCES) 2023-24 findings were released by the **National Statistics Office (NSO)**, highlighting **trends in household spending on food and non-food items**.

The data is expected to play a crucial role in **policy formulation, inflation tracking, and poverty estimation**.

About Household Consumption Expenditure Survey (HCES) 2023-24:

Data Collection & Methodology

- Conducted between **August 2023 – July 2024** by **NSO under MoSPI**.
- Digital data collection via **Computer Assisted Personal Interview (CAPI)** for **accuracy and real-time validation**.
- Survey covered **405 items** across food and non-food categories.
- **Rural sampling based on land possession**, while **urban sampling considered car ownership** as a classification criterion.

Broad Consumption Categories:

- **Food items**: Cereals, pulses, dairy, vegetables, fruits, eggs, meat, edible oil, beverages.
- **Non-food items**: Fuel, medical expenses, education, rent, clothing, consumer services, entertainment.

New Items Added in 2023-24 Survey

- **Food & Beverages**: Almonds, pistachios, breakfast cereals, nachos, mayonnaise, cup noodles.
- **Personal Care**: Handwash, facewash, body oil, deodorants, aftershave balm.
- **Clothing & Apparel**: Joggers, jumpsuits, sleepwear, lehengas, shrugs.
- **Consumer Electronics**: Bluetooth speakers, headphones, air purifiers, geysers, food processors.
- **Sports & Medical Equipment**: Treadmills, fitness cycles, wheelchairs, weighing machines.

Policy Implications

- Provides insights into **poverty levels, income disparities, and standard of living**.
- Helps in revising **inflation estimates and GDP calculations**.
- Serves as a basis for **policy interventions in welfare schemes** such as **food security, healthcare, and education**.

About National Statistics Office (NSO)

- **NSO** is India's **premier statistical body** under the Ministry of Statistics & Programme Implementation (MoSPI).
- It is responsible for **conducting surveys, data collection, and statistical analysis** for economic and social indicators.

Established In:: **Formed in 2019**, after merging the Central Statistics Office (CSO) and National Sample Survey Office (NSSO).

Chaired By:: The **Secretary, MoSPI**, heads the NSO.

Organizational Structure

- **Survey Division**: Conducts **household and enterprise surveys**.
- **Economic Division**: Estimates **national income, inflation, and industrial production**.
- **Field Operations Division**: Collects **data from households and businesses**.

Functions & Powers

- Conducts **large-scale surveys**, including **National Sample Surveys (NSS), Periodic Labour Force Survey (PLFS), and Household Consumption Expenditure Survey (HCES)**.
- Publishes **GDP data, Consumer Price Index (CPI), and Index of Industrial Production (IIP)**.
- Provides **statistical inputs for government policies and**

economic planning.
- Ensures **data accuracy, transparency, and compliance with global statistical standards**.

79. NAVRATNA STATUS

Context:
The Central Government has granted Navratna status to IRCTC and IRFC, making them the 25th and 26th Navratna CPSEs in India.

About Navratna Status:

What is Navratna Status? **Navratna** is a prestigious classification for **Central Public Sector Enterprises (CPSEs)** demonstrating **exceptional financial and operational performance**.

It grants **greater investment autonomy** and decision-making flexibility.

Who Grants Navratna Status?

The **Department of Public Enterprises (DPE)** under the **Ministry of Finance** awards Navratna status to eligible CPSEs.

Maharatna and Navratna category

Context: Oil India is now the 13th Maharatna CPSE in India. Additionally, the government raised ONGC Videsh Ltd (OVL) to a Navratna CPSE, making it the 14th Navratna among CPSEs.

Criteria for Maharatna Status	Criteria for Navratna Status	Criteria for Miniratna Status
1. Shall have Navratna status	1. Miniratna Category - I or Schedule 'A' CPSEs	Miniratna Category-I status: • Made profit in the last 3 years continuously • Pre-tax profit is Rs.30 crores or more in at least 1 of the 3 years • Having Positive net worth status
2. Listed on the Indian stock exchange with prescribed public shareholding	2. 'Excellent' or 'Very Good' rating in 3 of last 5 years	
3. Average annual turnover > Rs. 25,000 crore (last 3 years)	3. Composite score of 60 or above in the following 6 performance indicators including Net Profit to Net Worth, Cost of Services, Earning per share, etc.	
4. Average annual net worth > Rs. 15,000 crores (last 3 years)		Miniratna Category-II status: • Made profit for the last 3 years continuously • Having positive net worth status. • Not defaulted in the repayment of loans/interest payment on any loans due to the Government. • Not dependent upon budgetary support or Government guarantees.
5. Average annual net profit after tax > Rs. 5,000 crores (last 3 years)		
6. Significant global presence/international operations		

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Eligibility Criteria for Navratna Status:

- To qualify as a Navratna CPSE, a company must:
- **Be a Miniratna-I CPSE** with a **positive net worth**.
- Secure an **"Excellent" or "Very Good"** MoU rating in **three of the last five years**.
- Score **60+ points** on key financial indicators, including **net profit, net worth, and manpower cost**.
- Have at least **four independent directors** on its board.

Benefits of Navratna Status to Firms:

- **Investment Autonomy:** Can invest up to **₹1,000 crore or 15% of net worth** without government approval.
- **Expansion and Diversification:** Freedom to form **joint ventures, subsidiaries, and alliances** globally.
- **Increased Market Credibility:** Attracts **investors and strategic partnerships**, enhancing business growth.

About Indian Railway Catering and Tourism Corporation (IRCTC):

What is IRCTC? IRCTC is a **public sector enterprise** providing **ticketing, catering, and tourism services** for Indian Railways.

Establishment and Ministry: Established in: **1999**

Ministry: Operates under the **Ministry of Railways**, Government of India.

Key Functions:

- **E-Ticketing:** Manages **online train reservations** through its portal and mobile apps.
- **Catering Services:** Operates **onboard catering** and manages railway food plazas.
- **Tourism Services:** Offers **rail-based tourism packages**, including luxury trains like **Maharajas' Express**.
- **Rail Neer:** Produces and supplies **packaged drinking water** for railway passengers.

About Indian Railway Finance Corporation (IRFC):

What is IRFC? IRFC is a **public sector undertaking (PSU)** responsible for **raising financial resources** for the **expansion and modernization** of **Indian Railways**. It secures funding from **capital markets, banks, and other financial institutions**.

Establishment and Ministry: Established in: **12 December 1986**

Ministry: Operates under the **Ministry of Railways**, Government of India.

Key Functions:

- **Funding Indian Railways**: Provides **low-cost capital** for railway expansion.
- **Market Borrowings:** Raises funds through **bonds, external borrowings, and public offerings**.
- **Rolling Stock Leasing:** Finances the procurement of **locomotives, coaches, and wagons**.
- **Infrastructure Development:** Supports the **modernization and electrification** of railway networks.

80. COAL PRODUCTION IN INDIA

Context:
India has achieved a historic milestone by surpassing 1 billion tonnes of coal production in FY 2024–25, a feat hailed by Prime Minister as a proud moment reflecting energy security and self-reliance.

About Coal Production in India:

Historical Background: Commercial coal mining in India began in **1774 at Raniganj Coalfields** along the Damodar River.

Nationalisation of Coal:

- Coking coal mines **nationalised in 1972** under the Coking Coal Mines Act.

- Non-coking coal mines **nationalised in 1973** under the Coal Mines (Nationalisation) Act.

Categories of Coal in India:

Gondwana Coal:

a. **Age:** Formed around 250–300 million years ago (Permian period).
b. **Location:** Found in peninsular India.
c. **Major States:** Jharkhand, Odisha, Chhattisgarh, West Bengal, Madhya Pradesh, and Maharashtra.
d. **Characteristics:**
   - High carbon content and high calorific value.
   - Contains moisture and volatile matter.
   - Mostly bituminous and sub-bituminous in nature.
e. **Uses:** Primarily used for power generation, steel production, and industrial purposes.

Tertiary Coal:

- **Age:** Formed around 15–60 million years ago (Tertiary period).
- **Location:** Found in northeastern states and parts of Jammu & Kashmir.
- **Major States:** Assam, Meghalaya, Arunachal Pradesh, Nagaland, Jammu & Kashmir, and Rajasthan.
- **Characteristics:**
  - Higher moisture content and lower carbon concentration.
  - Mostly lignite or peat with lower calorific value.
- **Uses:** Used for power generation and domestic heating.

Types of Coal in India:

- **Anthracite:** Highest carbon content (80-95%), found in Jammu & Kashmir.
- **Bituminous:** 60-80% carbon content, found in Jharkhand, Odisha, West Bengal, Chhattisgarh, and Madhya Pradesh.
- **Sub-bituminous:** Dull black coal, higher energy than lignite.
- **Lignite:** Low carbon content (40-55%), found in Tamil Nadu, Rajasthan, and Assam.

Major Coal Producers in India:

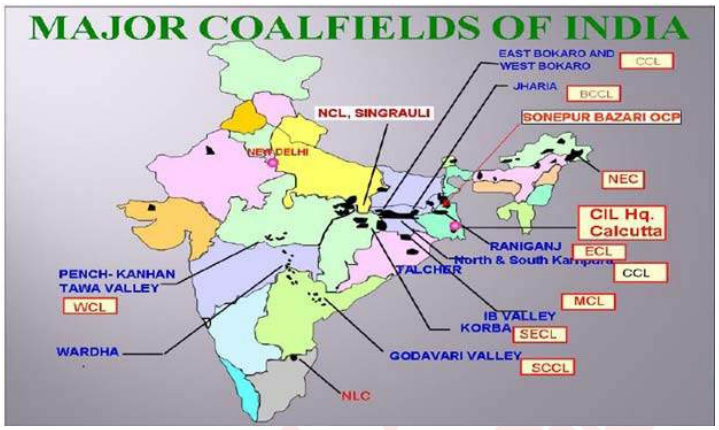
Coal India Limited (CIL): Largest contributor with 773.81 MT production in FY 2023-24.

Singareni Collieries Company Limited (SCCL): Key supplier for southern India, produced 70.02 MT in FY 2023-24.

Captive and private players: Increasing contributions post-coal sector reforms.

Top Coal Producers in the World (Rank-wise):

- **China** – Largest producer globally, contributing around 50% of world production.
- **India** – Second-largest coal producer with over 1 billion tonnes produced in 2024-25.



United States – Major exporter and consumer, ranking third globally.

Coal Producing States in India (Rank-wise):

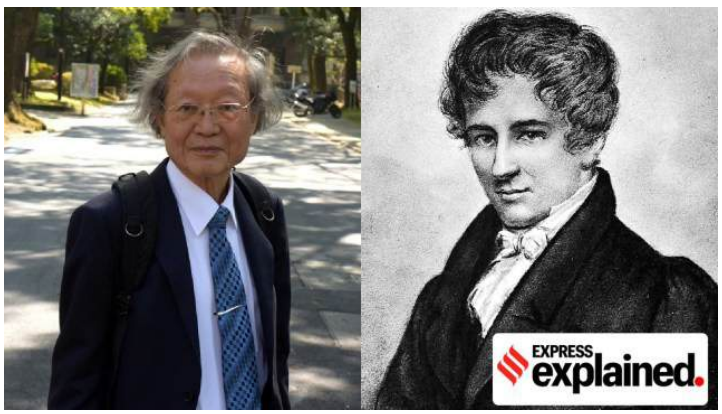
- **Jharkhand** – Largest reserves and major coking coal source.
- **Odisha** – Large contributor with major thermal coal mines.
- **Chhattisgarh** – Key producer with some of the world's largest coal mines.
- **West Bengal** – Historic coalfields such as Raniganj.

Coalfield	Location	Type
Jharia Coalfield	Dhanbad, Jharkhand	Bituminous (coking)
Raniganj Coalfield	West Bengal	Bituminous (thermal)
Korba Coalfield	Chhattisgarh	Thermal coal
Singrauli Coalfield	Madhya Pradesh & Uttar Pradesh	Non-coking thermal coal
Talcher Coalfield	Odisha	Thermal coal
Wardha Valley Coalfield	Maharashtra	Thermal coal
Neyveli Lignite Mines	Tamil Nadu	Lignite

Important Coal Mines in India:

Also in news: Chhattisgarh-based Coal India subsidiary South Eastern Coalfields Limited's (SECL) **Gevra and Kusmunda coal mines** have secured the 2nd and 4th spot in the list of the World's 10 largest coal mines released by WorldAtlas.com in 2024.

81. ABEL PRIZE 2025



Context: Japanese mathematician Masaki Kashiwara has been awarded the Abel Prize 2025. He was recognized for

foundational work in algebraic analysis and representation theory, especially for the theory of D-modules and crystal bases.

About Abel Prize:

- What it is?
  - It is a global award recognizing **outstanding achievements in mathematics**, considered the equivalent of a Nobel Prize in this field.
- **Established in:** In **2002** by the **Norwegian Parliament** to mark the 200th birth anniversary of **Niels Henrik Abel**.
- **Administered by:** The **Norwegian Academy of Science and Letters**, based on the recommendations from IMU and EMS.
- **Criteria:** Awarded for **pioneering contributions** in **pure and applied mathematics**.
- **Prize Money: 7.5 million Norwegian kroner** (~$720,000), along with a custom-designed glass plaque.

About Abel Prize 2025:

- **Recipient:** Masaki Kashiwara (Japan), aged 78.
- **Recognized For:**
  - Development of **D-modules**, a powerful tool connecting differential equations with algebraic geometry.
  - Discovery of **crystal bases**, enabling simpler graph-based solutions in complex calculations.
- Significance:
  - His work bridged isolated fields like **algebra, geometry, and mathematical physics**.
  - Opened **new avenues of research** and helped solve long-standing mathematical problems.

82. ONE DAY AS A SCIENTIST INITIATIVE

Context:

In response to PM Mann Ki Baat appeal, Ayush institutions opened their research labs to students under the 'One Day as a Scientist' initiative.

About One Day as a Scientist Initiative:

What is it?

- A government initiative allowing students to **experience real-world scientific research** for a day in **Ayush laboratories**.
- Provides hands-on exposure to **advanced lab equipment and modern research methodologies**.

Ministry: Ministry of Ayush

Implemented by: Leading **Ayush research institutes**, universities, and specialized labs.

Aim & Objectives:

- Encourage youth participation in scientific research and Ayush healthcare advancements.
- Bridge traditional and modern medicine through scientific validation and innovation.
- Develop scientific temperament among students by providing lab exposure and expert interactions.

Key Features:

- **Hands-on Lab Experience:** Students visit **Ayush research institutions** and explore **cutting-edge scientific tools**.
- **Mentorship by Scientists:** Experts provide **insights into research methodologies and technology**.
- **Integration of Modern & Traditional Sciences:** Focus on **Ayush therapies**, advanced diagnostic tools, and scientific validation.
- **Nationwide Participation:** Conducted across **multiple institutions**, including **National Institute of Ayurveda, CCRH, and CRIYN**.
- **Inspiring Future Careers:** Encourages students to **pursue careers in scientific research and innovation**.

83. AI KOSHA

Context:

The **Ministry of Electronics & IT (MeitY)** launched AI Kosha, a **secured AI datasets platform**, along with the **IndiaAI Compute Portal** and other initiatives to **accelerate AI innovation and research** in India.

The initiative, announced on the **IndiaAI Mission's anniversary**, aims to **democratize AI access, enhance AI competency in governance, and support AI startups and research**.

About AI Kosha: AI Kosha is a **secure AI innovation platform** designed to provide **seamless access to datasets, models, and AI development tools**. It serves as a **centralized repository** to **enable AI research and innovation** in India.

Developed By- Ministry of Electronics & Information Technology (MeitY) under the IndiaAI Mission.

Key Features

- **AI Dataset Repository**: Hosts **over 300 datasets and 80+ AI models** for research and development.
- **AI Sandbox Environment**: Provides **an integrated**

development environment (IDE) with **tools and tutorials** for AI model training.
- **Content Discoverability**: Uses **AI-readiness scoring** to help researchers **identify relevant datasets**.
- **Security & Access Control**: Features **data encryption** (at rest & in motion), **API-based secure access,** and **real-time malicious traffic filtering**.
- **Permission-Based Access**: Allows **tiered access** for different user groups like researchers, startups, and government bodies.

Benefits of AIKosha:
- **Accelerates** AI Research: Provides **high-quality datasets and pre-trained models**, reducing time for AI development.
- **Enhances AI Innovation**: Enables **startups, researchers, and enterprises** to develop **AI solutions with real-world data**.
- **Strengthens AI Security**: Promotes **ethically sourced, consent-based datasets**, ensuring **responsible AI practices**.
- **Boosts Public Sector AI Adoption**: Supports **government AI applications** in **governance, healthcare, and education**.

Limitations
- **Limited Dataset Variety**: Initial datasets are sourced from **government and research institutions**, reducing availability of **real-world commercial data**.
- **Access Restrictions**: Strict security protocols may limit **ease of data retrieval** for private-sector innovators.
- **Early Stage Development**: AIKosha is still evolving, and wider industry participation is required for expansion.

84. INDIA'S FIRST INDIGENOUSLY DEVELOPED MRI SCANNER

Context:
AIIMS New Delhi is set to install India's first indigenously developed MRI scanner for clinical evaluation. The initiative aims to reduce dependency on imported medical devices and promote 'Make in India' innovation.

About India's first indigenously developed MRI scanner:
What it is: The first fully indigenously developed **1.5 Tesla MRI scanner** designed for advanced medical imaging and clinical trials.

Developed by: SAMEER (Society for Applied Microwave Electronics Engineering and Research), an autonomous R&D body under **Ministry of Electronics and IT (MeitY)**.

To be installed in: Planned installation at AIIMS **New Delhi** by **October 2025** for clinical evaluation and feedback.

Project under: Developed under the national mission **SCANERA** (Swadeshi Chumbakiya Anu-naad Chitran – Ek Rashtriya Abhiyaan), started in **December 2014**.

Key Features:
- Indigenous technology aimed at **reducing treatment costs**.
- 1.5 Tesla MRI system designed to match **global clinical standards**.
- Backed by **government's** PLI scheme for medical devices.
- Complements development of other critical devices like **CT scanners, LINACs, and heart valves** under PLI.

About MRI Scanner Working:
- Scientific principle behind working:
  - MRI uses **strong magnetic fields** and **radiofrequency pulses** to align and excite protons in body tissues.
  - As protons realign with the magnetic field, they release energy, which sensors capture to create **3D anatomical images**.
- Used for:
  - Imaging of **soft tissues**, brain, spinal cord, muscles, ligaments, and tendons.
  - Detecting **tumors, aneurysms, neurological disorders**, and musculoskeletal injuries.
  - **Functional MRI (fMRI)** tracks brain activity during cognitive tasks.
- Risks associated:
  - **Magnetic interference:** Dangerous for patients with implants like pacemakers or cochlear devices.
  - **Noise discomfort:** Loud clicking sounds may cause discomfort; ear protection is recommended.
  - **Claustrophobia:** Patients may face anxiety inside closed MRI tunnels; open MRI systems address this issue.
  - **Contrast agents:** Risk of nephrogenic systemic fibrosis in dialysis patients from gadolinium-based agents.

85. DNA POLYMORPHISM

Context:
DNA polymorphisms and their role in DNA fingerprinting were highlighted for identifying individuals, exonerating the wrongly accused, and solving cold cases.
Recent advancements show extraction of intact DNA from

65,000-year-old remains, proving DNA's stability and forensic significance.

About DNA Polymorphism:

What it is: DNA polymorphism refers to the variations in DNA sequences among individuals that help in distinguishing one person from another.

Key Features:

- Arises due to **mutations or variations** in the DNA sequence.

- Found in both **coding and non-coding** regions of DNA.
- Occurs in forms like single nucleotide polymorphisms (SNPs) and short tandem repeats (STRs).

How they differentiate between people:

- Polymorphisms cause **unique DNA patterns** that differ in length or sequence.
- They help trace **lineage and ancestry** by identifying parental origin of chromosomes.
- Variation in **repeat numbers** at specific loci creates a distinct genetic profile.

About Short Tandem Repeats (STRs):

What they are: STRs are short sequences of DNA bases (2–6 base pairs) repeated multiple times in a row.

Key Characteristics:

- Found at specific locations in the genome.
- Highly polymorphic due to variation in **repeat numbers** among individuals.
- Serve as the **basis for DNA fingerprinting**.

About DNA Fingerprinting:

What it is: A technique to create a unique DNA profile for an individual using STR patterns, helpful for identification and parentage analysis.

Organs that can be used: Blood, Saliva, Semen, Skin cells, and Teeth and Bones.

Key Features:

- Utilizes **PCR and capillary electrophoresis** for amplification and separation of STRs.
- DNA fingerprints are **unique for each person**, except identical twins.
- Used for **forensic investigations, disaster victim identification, and organ donor matching**.
- Can analyze samples even from degraded or aged biological materials.

Limitations:

- Requires careful handling to avoid **contamination**.
- **Partial profiles** may arise from degraded samples.
- Cannot distinguish **identical twins**.
- Privacy concerns regarding **genetic data misuse**.

86. INDIA'S FIRST ZOO TO PRESERVE DNA SAMPLES

Context:

Padmaja Naidu Himalayan Zoological Park in Darjeeling has become India's first zoo to preserve DNA samples of Himalayan wildlife.

The initiative aims to create a genetic bank or "frozen zoo" to aid future conservation efforts.

About Padmaja Naidu Himalayan Zoological Park:

Located in: Situated in **Darjeeling, West Bengal**, at an altitude of **2,150 metres (7,050 feet)**.

Established in: Founded on **14th August 1958**, as a joint venture of the Government of India and the Government of West Bengal.

History:

Initially named **Himalayan Zoological Park**.

Renamed in **1975** in memory of **Smt. Padmaja Naidu**, former Governor of West Bengal.

Transferred to the **Department of Forests, Government of West Bengal** in **1993**.

Operates under the **Ministry of Environment and Forests**, Government of India.

Features:

- **Largest high-altitude zoo in India** spread over **67.8 acres**.
- Known for **ex-situ conservation and captive breeding** of species like **red pandas, snow leopards, Tibetan wolves**.
- Focus on educating and spreading conservation awareness among locals and visitors.
- Houses dedicated research facilities for animal health, behavior, and biodiversity conservation.

About India's First Zoo to Preserve DNA Samples:

Project Name: Popularly known as India's **first frozen zoo** or DNA cryogenic conservation project.

Aim:

- Preserve genetic material of endangered Himalayan species for **future research and conservation**.
- Facilitate **assisted reproduction techniques** and safeguard biodiversity from extinction threats.

Implemented by:

- **Padmaja Naidu Himalayan Zoological Park** in collaboration with **Centre for Cellular and Molecular Biology (CCMB), Hyderabad**.
- Collection of tissue samples from captive and deceased animals like **red pandas, snow leopards, Himalayan black bears**.
- Storage of samples in liquid nitrogen at **-196°C** in dedicated bio-banking facilities.
- Project started in **2023**, with **60 DNA samples collected** so far.

87. NATIONAL GENE BANK

Context:

The Union Government has announced the establishment of a Second National Gene Bank to conserve 10 lakh crop germplasm, under the theme "Investing in Innovations" in Budget 2025–26.

The initiative aims to safeguard **India's agricultural biodiversity** and ensure long-term food and nutritional security.

About National Gene Bank (NGB):

What is a Gene Bank?

A **repository of plant genetic material** (seeds, tissue, pollen) designed to conserve biodiversity and protect crop varieties from extinction.

Organisation Involved: Managed by **ICAR – National Bureau of Plant Genetic Resources (NBPGR)**, under the Ministry of Agriculture & Farmers' Welfare.

Aim: To conserve **genetic resources of cultivated and wild crops**, enabling sustainable agriculture, food security, and resilience against climate change.

Technology & Facilities:

- Uses **cryogenic storage**, **long-term seed preservation chambers**, **DNA fingerprinting**, and **digital databases** for germplasm management.
- Facilitates **distribution to breeders, scientists, and global researchers**.

Key Features:

- Strengthens **national and international biodiversity initiatives** (e.g., SAARC, BRICS).
- Supports **public-private partnerships** in crop improvement and seed conservation.
- Acts as a **fail-safe genetic vault** to secure heritage and climate-resilient varieties.

About India's First National Gene Bank:

Location: New Delhi, at ICAR-NBPGR headquarters

Established in: 1996

Features:

- Stores **4.71 lakh accessions** from **2157 species**.
- Includes **cereals (1.7 lakh), legumes (69,200+), oilseeds (63,500+), millets (60,600+), vegetables (30,000)**.
- Operates with **12 regional stations** across India.
- **Second-largest gene bank globally**, contributing to international PGR conservation.

About India's Second National Gene Bank:

Location: Yet to be finalised

Announced in: Union Budget 2025–26

Key Features:

- Capacity to **conserve 10 lakh germplasm lines**, doubling India's gene banking capability.
- Equipped with **state-of-the-art infrastructure**, focused on **advanced genetic storage technologies**.
- Supports **future-ready agriculture**, **climate adaptation**, and **nutritional security goals**.
- Serves as a **safety duplicate gene vault**, ensuring redundancy against natural or man-made threats.

88. RUSHIKONDA BEACH REGAINED BLUE FLAG CERTIFICATION

Context:

Rushikonda Beach in Visakhapatnam has regained its prestigious Blue Flag certification after temporary withdrawal due to compliance issues.

About Removal of Blue Flag:

Organisation Responsible: The **Foundation for Environmental Education (FEE)**, Denmark, administers and monitors the Blue Flag certification globally.

Procedure for Removal of Blue Flag:

In each country, a **National Operator** designated by the Foundation for Environmental Education (FEE) is responsible for conducting **scheduled and surprise control visits** to Blue Flag beaches.

- The **Centre for Environment Education** is India's national Blue Flag Beach operator..

Control visits are conducted by National Operator to assess compliance with 33 environmental and safety criteria.

Observations and recommendations are **shared with local authorities.**

Temporary withdrawal is implemented if issues are unresolved within **10 days**.

After corrective actions, compliance is verified through audits before restoring the flag.

Conditions for Removal:

- **Minor non-compliance:** Single minor issue that does not affect health/safety; rectification required within 10 days.
- **Multiple non-compliances:** Two or three minor issues; temporary withdrawal until resolved.
- **Major non-compliance:** Any serious issue impacting visitor safety or environmental integrity leads to immediate and season-long withdrawal.
- Climatic or unforeseen emergencies can also lead to **temporary suspension** of the certification.

About Rushikonda Beach:

Located in: Situated in **Visakhapatnam, Andhra Pradesh**.

Features:

- Only Blue Flag-certified beach **in Andhra Pradesh**; first awarded in **2020**.
- The beach boasts beautiful **golden sands and clear waters**, making it a popular spot for relaxation and swimming.

89. SPADEX MISSION

Context:

ISRO successfully undocked the two SpaDeX satellite, marking a major milestone in space docking technology.

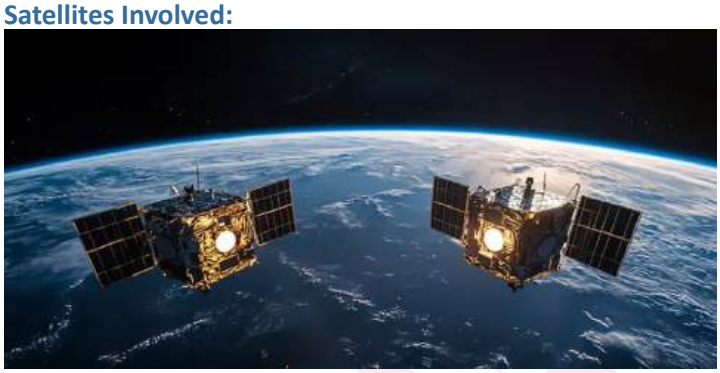
This achievement makes **India the fourth country after the U.S., Russia, and China** to demonstrate rendezvous, docking, and undocking capabilities in orbit.

About SpaDeX Mission:

A technology demonstration mission by ISRO designed to test and validate **spacecraft rendezvous, docking, and undocking operations** in orbit.

Crucial for future **space station assembly, lunar sample return missions, and deep-space exploration**.

Satellites Involved:



SDX-01 (Chaser) – The active satellite responsible for docking maneuvers.

- **SDX-02 (Target)** – The passive satellite that facilitates docking.

Launched In: December 30, 2024, aboard PSLV-C60 from Satish Dhawan Space Centre, Sriharikota.

Aim:

- To **develop and demonstrate docking, undocking, and power transfer technologies** in space.
- Establish a foundation for **future space station construction, human spaceflight, and interplanetary missions**.

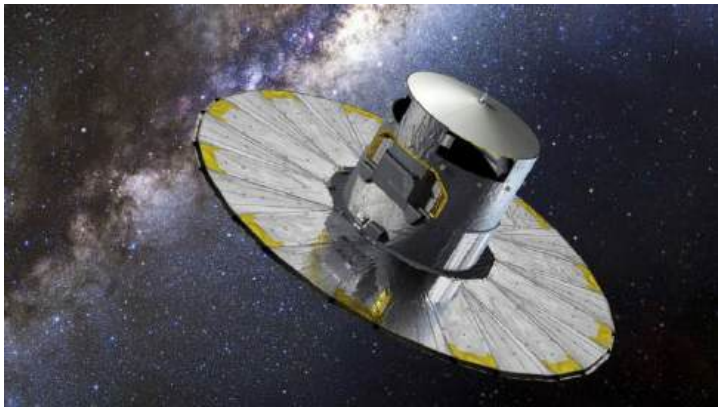
Key Features:

- **First Indian Space Docking Demonstration:** Achieved successful docking on January 16, 2025, and undocking on March 14, 2025.
- **Orbital Operations:** Performed in a 460 km circular orbit with 45-degree inclination.
- **Autonomous Docking:** Showcased the capability of two satellites to autonomously dock and undock.
- **Power Transfer Between Satellites:** Demonstrated the transfer of electric power between docked spacecraft, critical for future modular spacecraft and in-space servicing.
- **Monitored via Global Ground Stations:** Operations tracked from Bengaluru, Lucknow, and Mauritius.

Significance of the Mission:

- **Paves the way for India's Space Station:** Essential for assembling, maintaining, and operating an Indian Space Station.
- **Supports Human Spaceflight:** Enables future Gaganyaan missions and lunar human exploration.
- **Advances In-Space Robotics & Logistics:** Useful for autonomous docking, fuel transfer, and orbital repairs.
- **Enhances India's Deep-Space Exploration:** Assists in sample return missions from the Moon and Mars.

90. GAIA SPACE OBSERVATORY



Context:

The European Space Agency (ESA) officially retired its Gaia space observatory. Gaia significantly enhanced our understanding of the Milky Way by creating the most detailed 3D map of the galaxy.

About Gaia Space Observatory:

What is Gaia? Gaia (originally Global Astrometric Interferometer for Astrophysics) was a **space-based astrometry mission** designed to map the Milky Way with unmatched precision.

Organisation Involved: Developed and operated by the **European Space Agency (ESA)**.

Launched In: December 2013 and began full-scale operations from **July 24, 2014**.

Objective of Mission:

- To chart a **three-dimensional map of the Milky Way.**
- To track positions, distances, movements, and physical characteristics of **over 2 billion stars**.
- To predict the galaxy's future shape and study its formation history.

Significant Discoveries:

- **3D Galactic Map:** Gaia revealed the warped and wobbling structure of the Milky Way's disc and provided insights into its spiral arms and central bar.
- **New Class of Black Holes:** Detected "dark" black holes only by their gravitational pull — a first in astronomical observation.
- **Stellar Collisions:** Confirmed the Milky Way's dynamic evolution due to ancient galactic collisions, possibly influencing the formation of the Sun.
- **Asteroid Tracking:** Catalogued over **1.5 lakh asteroids**, helping identify potential threats to Earth.
- **Legacy Data:** Although only 2% of the Milky Way has been mapped, Gaia's data will support discoveries for decades as further releases continue.

91. CHANDRAYAAN-5 MISSION AND INDIA'S SECOND SPACEPORT

Context:

ISRO Chief V. Narayanan announced the Centre's approval for the Chandrayaan-5 mission, advancing India's lunar exploration goals.

HealsoconfirmedthatIndia'ssecondspaceportatKulasekarapattinam, Tamil Nadu, will see its **first SSLV launch in 2027.**

About Chandrayaan-5:

Chandrayaan-5 is India's upcoming lunar mission aimed at deploying a 350 kg rover on the Moon.

Nations Involved:

The mission is part of a **collaborative venture between India and Japan**, enhancing space research partnerships.

Aim:

- To **deploy a larger lander and rover** with the goal of collecting extensive lunar data.
- Strengthen technologies necessary for **potential human landing missions by 2040**.

Key Features:

- **350 kg advanced rover** for detailed lunar exploration.
- Features a **high-capacity lander** suitable for future crewed missions.
- Supports sample return missions and **technology demonstration for safe landings**.
- Follows the success trajectory of **Chandrayaan-3** and builds upon **Chandrayaan-4** sample collection goals.

About India's Second Spaceport:

Location: Kulasekarapattinam, Thoothukudi district, Tamil Nadu.

Aim:

- To **support launches of Small Satellite Launch Vehicles (SSLVs)** and strengthen India's presence in the global small satellite market.
- Reduce dependence on Sriharikota and facilitate **direct southward launches over the Indian Ocean**.

Key Features:

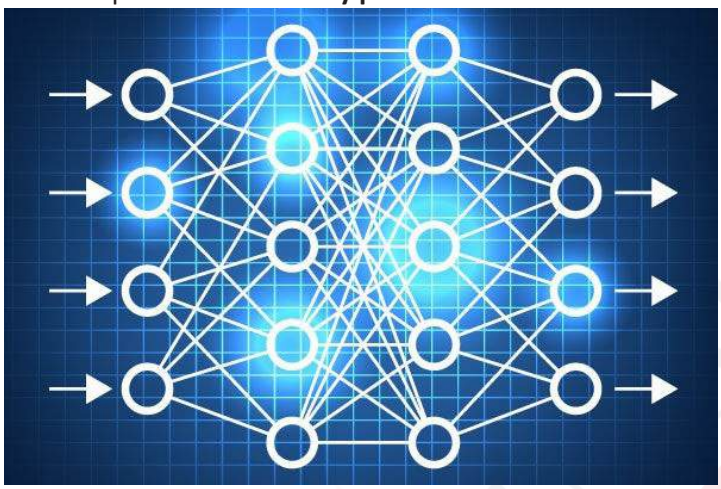
- Spread across **2,350 acres**.
- Equipped with **35 major facilities**, including: Dedicated launchpad, Rocket integration facilities, Ground range and checkout facilities and Mobile Launch Structure (MLS) integrated with advanced

checkout systems.
- Launch capacity of **24 satellites annually** using SSLVs.
- Strategic location minimizes fuel consumption and avoids overflight of landmasses.

92. NEURAL NETWORKS

Context:
Neural networks form the foundation of modern AI models, enabling machines to process complex data efficiently.

About Neural Networks:
Neural networks, also called artificial neural networks (ANNs), are a machine learning technique that mimics the human brain.
They consist of **interconnected nodes (neurons)** that process and interpret data to **identify patterns and make decisions**.



How Neural Networks Work?
Neural networks have three main layers:
- **Input Layer:** Receives raw data (e.g., images, text, or numbers).
- **Hidden Layers:** Process and refine information by adjusting **weights and biases**.
- **Output Layer:** Produces the final result based on the processed inputs.

The model **learns** by adjusting the strength of connections between neurons using algorithms like backpropagation.
Training a neural network requires **large datasets** to improve accuracy over time.

Significance of Neural Networks:
- **Automates Decision-Making:** Enables AI systems to function with minimal human intervention.
- **Handles Complex Data:** Processes unstructured data like **images, text, and speech** with high accuracy.
- **Improves Predictions:** Used in weather forecasting, stock market analysis, and medical diagnostics.
- **Enhances Language Processing:** Powers AI assistants like ChatGPT, Siri, and Google Assistant.
- **Drives Deep Learning:** Forms the backbone of computer vision, speech recognition, and autonomous systems.

93. FLARELESS CORONAL MASS EJECTION

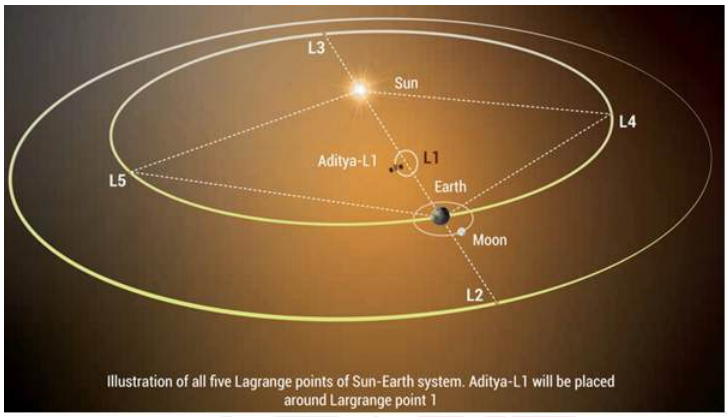


Illustration of all five Lagrange points of Sun-Earth system. Aditya-L1 will be placed around Largrange point 1

Context:
Scientists from the Indian Institute of Astrophysics (IIA) observed a flareless coronal mass ejection (CME) using the Visible Emission Line Coronagraph (VELC) onboard Aditya-L1.

About Aditya-L1 Mission:
Launched in: September 2, 2023.
Developed by: ISRO, with contributions from Indian academic institutions.
Mission Type: India's first solar observation mission positioned at **Lagrange Point 1 (L1)**.
Distance from Earth: 1.5 million km (1% of Earth-Sun distance).

Primary Aim:
- Study the **Sun's corona, chromosphere, and solar emissions**.
- Monitor **solar wind, magnetic storms, and space weather impacts** on Earth.

Key Features:
- **Constant Solar Observation:** Uninterrupted view of the Sun due to L1 positioning.
- **Indigenous Payloads: 7 payloads** designed for **spectroscopy, coronagraphy, and particle analysis**.
- **Minimized Fuel Usage: L1's gravitational balance reduces orbital maintenance efforts**.
- **Early Warning System:** Detects **solar radiation and storms before they reach Earth**.

About Flareless Coronal Mass Ejection:
- A **flareless CME** is a **massive ejection of plasma and magnetic field** from the Sun's corona that occurs **without an associated solar flare**.
- Unlike typical CMEs, it does not release **intense electromagnetic radiation** before the eruption.
- It challenges existing models of solar activity, requiring **new insights into magnetic instabilities**.

How Flareless CMEs Form?
- **Magnetic Reconnection:** Occurs when **magnetic**

field lines rearrange in the Sun's atmosphere, leading to energy release.

- **Gradual Magnetic Build-up:** Magnetic stress accumulates **over time**, eventually releasing plasma without a sudden energy burst.
- **Flux Rope Eruption:** A pre-existing twisted magnetic structure in the corona slowly becomes **unstable and erupts outward**.
- **No Preceding Flare:** Unlike typical CMEs, no strong **X-ray or UV burst** precedes the plasma ejection.
- **Sunspot Influence:** Often linked to regions with **weak or decaying magnetic fields**, where flare energy is insufficient.

Key Features of Flareless CMEs:

- **Low Energy Signature:** No significant **X-ray or radio emissions**, making early detection difficult.
- **Slower Ejection Speeds:** Travels at **lower velocities (~400–1,000 km/s)** than flare-associated CMEs.
- **Magnetically Driven:** Initiated by **gradual destabilization of coronal magnetic fields** rather than impulsive energy release.
- **Space Weather Impact:** Can still **trigger** geomagnetic storms on Earth, affecting **satellites and communication systems**.
- **Rare Phenomenon:** Less frequently observed compared to **flare-associated CMEs**, requiring **continuous solar monitoring**.

94. SUPERSOLID LIGHT

Context:

Italian scientists have demonstrated that light can exist as a supersolid, combining solid-like structure with frictionless flow.

About Supersolid light:

Supersolid light is a rare quantum state where light exhibits both the rigid structure of a solid and the frictionless flow of a superfluid.

Previously, Supersolidity had only been observed in **Bose-Einstein condensates (BECs) a state** of matter that forms when a collection of bosons is cooled to nearly absolute zero, causing them to share the same quantum state.

How is Supersolid Light Formed?

- **Platform Used:** Researchers used a **semiconductor gallium arsenide structure** embedded with microscopic ridges.
- **Creation of Polaritons:** By firing a **laser**, they generated **polaritons** — hybrid particles made from **light and matter**.
- **Observation of Satellite Condensates:** As the **photon count increased**, **satellite condensates** appeared, showing symmetric energy but opposite wavenumbers — a key indicator of supersolidity.

Key Characteristics of Supersolid Light:

- **Solid-like lattice arrangement** in spatial patterns.
- **Frictionless flow**, mimicking superfluid behaviour.
- Exhibits **quantum coherence** and **long-range order** at near absolute zero temperatures.
- Demonstrates **simultaneous symmetry breaking and superfluid properties**.

Significance of the Discovery:

- **Quantum Computing Advancement:** Supersolid light can enhance qubit stability and lead to more reliable quantum computing systems.
- **Optical Devices Innovation:** Potential to revolutionize photonic circuits and next-generation optical technologies.
- **Fundamental Quantum Research:** Opens avenues for exploring quantum phase transitions and new quantum states of matter.
- **Precision in Quantum Control:** Allows scientists to control and manipulate quantum states of light with unprecedented stability.

95. STARLINK

Context:

Airtel and Jio have collaborated with Starlink, a satellite internet network operated by SpaceX, founded by Elon Musk, to deliver satellite broadband services in India.

About Starlink:

- A satellite-based internet service operated by **SpaceX**, founded by **Elon Musk**.
- Designed to provide **high-speed, low-latency broadband** globally, especially in remote areas.

Developed by: SpaceX

Parameter	Starlink (LEO Satellite)	Traditional Broadband (Fiber/Cellular)
Latency	25-50 ms	1-10 ms (fiber) / 50-100 ms (cellular)
Speed	50-220 Mbps	100 Mbps - 1 Gbps (fiber)
Coverage	Global (even remote areas)	Limited to wired/cellular areas
Setup Time	Quick (self-install)	Time-consuming (fiber laying required)
Pricing	Costly hardware + monthly fee	More affordable in urban areas

Launched in **2019**, aims to deploy **42,000 satellites** in low-

Earth orbit **(LEO)**.

How Does Starlink Work?

- Uses a **constellation of LEO satellites** to provide internet access.
- A **Starlink dish** connects to the nearest satellite, which transmits data to and from **ground stations** connected to the internet.
- Unlike fiber or cellular networks, Starlink does not depend on **terrestrial infrastructure**.

Key Features:

- **Low Latency (25-50 ms):** Suitable for gaming, video calls, and HD streaming.
- **Speeds up to 220 Mbps:** Varies by region, with average speeds of **50-100 Mbps**.
- **Global Coverage:** Effective in areas with poor broadband infrastructure.
- **Portability:** Works for **homes, businesses, vehicles, ships, and aircraft**.
- **Easy Installation:** Self-installable **dish and router** for quick setup.

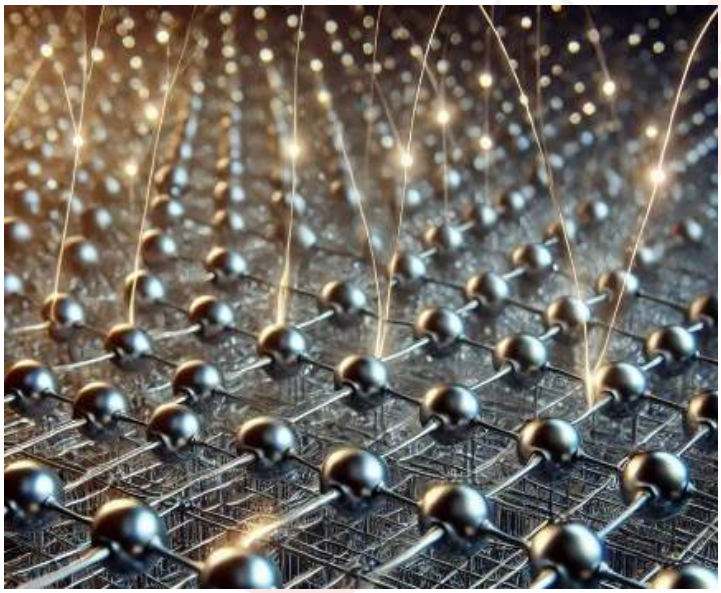
Is Starlink Superior to Regular Broadband?

Nations Rolling Out Starlink:

Active in 100+ countries: U.S., Canada, UK, Germany, Australia, Bhutan, Bangladesh, Myanmar, etc.

Pending approvals: India, Pakistan, Indonesia.

96. BOSE METAL



Context:

A research team from China and Japan has found strong evidence that niobium diselenide ($NbSe_2$) exhibits properties of a Bose metal, a long-theorized but unproven quantum state.

About Bose Metal:

What is a Bose Metal?

- A **Bose metal** is a **quantum metallic state** where **Cooper pairs** exist but fail to condense into a **superconducting phase**.
- Unlike traditional metals, its **conductivity remains between zero and infinity** at near absolute zero temperature.

Key Features of Bose Metals:

- **Formation of Cooper Pairs:** Electrons experience a net **attractive force**, forming Cooper pairs.
- **Absence of Superconducting Coherence**: Despite pairing, these particles do not form a long-range superconducting state.
- **Intermediate Conductivity:** Conductivity **neither reaches infinity (superconductor) nor zero (insulator)**.
- **Magnetic Field Sensitivity:** Strong magnetic fields influence the **formation and behaviour** of Bose metals.

Limitations of Bose Metals:

- **No Practical Applications Yet:** Theoretical concept with **no direct industrial use**.
- **Experimental Challenges:** Requires **precise control of temperature, thickness, and magnetic field**.
- **Ambiguous Definition:** Scientists debate whether Bose metals are **distinct quantum states or transitional phases**.

97. PUNCH MISSION

Context:

NASA is set to launch the PUNCH mission on March 6, 2025, to study the Sun's corona and heliosphere.

Launched by: NASA (National Aeronautics and Space Administration).

Key Objective:

- To study the **Sun's outer atmosphere (corona)** and how solar wind evolves as it moves through space.
- To improve **understanding of solar storms** and their impact on Earth's space environment.

Unique Features:

- First-of-its-kind mission focusing on the **Sun's corona and its interaction** with the heliosphere.
- Consists of four identical suitcase-sized satellites that will **provide continuous imaging of the inner corona.**
- Will enhance predictions of space weather events, helping protect satellites and communication networks.

98. HYPERLOOP TECHNOLOGY

Context:

India's Hyperloop technology will be developed at Integral Coach Factory (ICF), Chennai, as announced by Railway Minister.

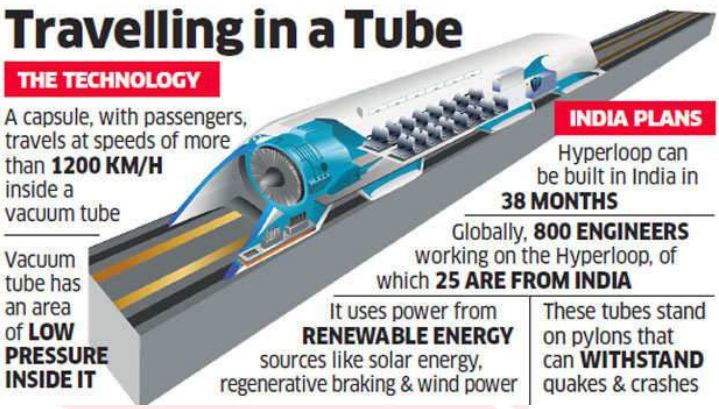
The Hyperloop test facility at IIT Madras is the longest in Asia, and testing has shown promising results.

About Hyperloop Technology:

Hyperloop is an **ultra-high-speed** transportation system using **magnetic levitation (maglev) and near-vacuum tubes** for travel at speeds up to **1,220 km/h**.

Working Mechanism:

- Uses **low-pressure tubes** with built-in vacuums to reduce air resistance.



Magnetic levitation allows pods to hover, reducing friction.

- Electromagnetic propulsion drives the pod forward.

Key Features:

- **Energy-efficient** and **low emissions** transportation.
- **Faster than air travel** on shorter routes.
- Reduces **road congestion and noise pollution**.

Origin:

- Concept **proposed by Elon Musk** in 2013 through the **Hyperloop Alpha white paper**.
- Developed as **open-source technology** for research worldwide.

About Hyperloop in India:

Established at: IIT Madras and ICF Chennai.

Ministry Involved: Ministry of Railways.

Aim:

- Develop an indigenous Hyperloop system.
- Make India a global leader in futuristic transport technology.

Companies Involved:

- **IIT Madras Avishkar Hyperloop Team** – Leading the project.
- **Integral Coach Factory (ICF), Chennai** – Developing electronics and technical components.

99. REGIONAL 3R AND CIRCULAR ECONOMY FORUM IN ASIA AND THE PACIFIC

Context:

The 12th Regional 3R and Circular Economy Forum in Asia and the Pacific concluded with the unanimous adoption of the Jaipur Declaration, promoting sustainable resource use and circular economy principles. India proposed the **'Cities Coalition for Circularity' (C-3)** to enhance global collaboration on waste management and urban sustainability.

About Regional 3R and Circular Economy Forum in Asia and the Pacific:

What is It?

A **regional platform** that brings together **policymakers, industry leaders, and researchers** to discuss sustainable waste management and circular economy practices.

Focuses on the **3R principles – Reduce, Reuse, Recycle** to promote resource efficiency and environmental sustainability.

Host City: Jaipur, Rajasthan, India.

Organized by: Ministry of Housing and Urban Affairs (India), UN Centre for Regional Development (UNCRD), and Institute for Global Environmental Strategies (IGES).

Supported by: United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), Japan's

Ministry of Environment, and other global organizations.

History:

- **Established in 2009**, the forum has become a **leading conference on sustainable** urban waste management in Asia-Pacific.
- **Last Forum (2023):** Hosted by Cambodia.
- **India's Previous Hosting:** Indore (2018, 8th Forum).

12th Regional 3R and Circular Economy Forum (2025):

Theme: "Realizing Circular Societies Towards Achieving SDGs and Carbon Neutrality in Asia-Pacific."

Key Outcomes of the Jaipur Declaration:

- **Commitment to Circular Economy:** Strengthening waste management systems and sustainable material consumption.
- **Launch of 'Cities Coalition for Circularity' (C-3):** A global alliance for knowledge-sharing and urban sustainability.
- **Integration with SDGs & Climate Goals:** Aligning circular economy strategies with carbon neutrality and climate resilience.
- **India's Candidacy for WCEF 2026:** India announced its bid to host the World Circular Economy Forum (WCEF) 2026.
- **CITIIS 2.0 Initiative:** Agreements worth ₹1,800 crore signed for integrated waste management and climate action projects across 18 cities in 14 states.

100. NO MONEY FOR TERROR (NMFT) CONFERENCE

Context:

The 4th 'No Money for Terror' (NMFT) Conference was held in Munich, 2025, where India emphasized the need for global cooperation against terror financing.

About No Money for Terror (NMFT) Conference:

What is NMFT?

A global ministerial-level initiative aimed at combating terrorist financing. Platform for intelligence sharing, legal cooperation, and **policy formulation** against terror funding.

Established in: 2018, first held in Paris.

Under control of: Financial Action Task Force (FATF) & UN Counter-Terrorism Bodies.

Aim:

- Disrupt financial networks of terrorist organizations.
- Strengthen global financial monitoring and regulatory frameworks.
- Facilitate international cooperation in countering terror financing.

Functions & Features:

- **Intelligence Sharing:** Enhances real-time data exchange on financial transactions linked to terrorism.
- **Legal Reforms & Regulations:** Encourages nations to update counter-terrorism laws and financial tracking systems.
- **Monitoring Digital Transactions:** Addresses cryptocurrency risks, online crowdfunding, and emerging terror financing methods.
- **Strengthening Banking & Financial Oversight:** Works with banks, fintech companies, and financial intelligence units to detect suspicious transactions.
- **Capacity Building:** Provides training, technical expertise, and resources to nations for effective counter-terrorism operations.

101. DEFENCE ACQUISITION COUNCIL (DAC)

Context:

The Defence Acquisition Council (DAC) has approved procurement worth ₹54,000 crore to boost India's defence capabilities.

The approval includes **T-90 tank engines, Varunastra torpedoes, and Airborne Early Warning and Control Systems** for the Army, Navy, and Air Force.

About Defence Acquisition Council (DAC):

What it is: The **Defence Acquisition Council (DAC)** is the apex body under the Ministry of Defence that oversees capital acquisitions for India's defence forces.

Established in: Formed in **2001**, based on the recommendations of the **Group of Ministers on National Security Reform** after the Kargil War.

Chaired by: Defence Minister of India currently Rajnath Singh.

Functions:

- Grant Acceptance of Necessity **(AoN)** for capital acquisitions.
- Categorize acquisitions into **Buy, Buy & Make, or Make** categories.
- Approve the **15-Year Long-Term Integrated Perspective Plan (LTPP)**.
- Monitor major procurement projects and ensure progress with regular feedback.

Major Approved Procurement Details:

Procurement Name	Features
1350 HP Engines for T-90 Tanks (Army)	- Upgraded from current **1000 HP** engines for enhanced power.
	- Improves **battlefield mobility**, especially in **high-altitude regions**.
	- Strengthens India's armored capabilities.
Varunastra Heavyweight Torpedoes (Navy)	- **Indigenous ship-launched anti-submarine torpedo**.
	- Speed: Over **40 knots**; Range: **40 km**.
	- Warhead: **250 kg high-explosive**.
	- Capable of targeting quiet submarines in deep and shallow waters.
	- Features advanced **active-passive acoustic homing and GPS/NavIC guidance**.
	- First inducted in **2016**.
Airborne Early Warning & Control System (AEW&C) for IAF	- **Force multiplier system** for tracking hostile aircraft, UAVs, and missiles.
	- Net-centric with **command-and-control functions**.
	- Provides **composite battlefield picture** using multi-sensor integration.
	- Guides **interceptor aircraft** efficiently to neutralize threats.

102. FIRST PERSON VIEW KAMIKAZE ANTI-TANK DRONE

Context:

The Indian Army has **successfully developed and tested** a First-Person View (FPV) kamikaze-role drone equipped with anti-tank munition.

About First Person View Kamikaze Anti-Tank Drone:

What is it? A low-cost, First-Person View (FPV) drone equipped with impact-based anti-tank munition developed for kamikaze-style tactical warfare.

- **Developed by:** Indian Army's **Fleur-De-Lis Brigade**, in collaboration with **DRDO's Terminal Ballistics Research Laboratory (TBRL), Chandigarh**.
- **Aim:** To enhance India's capability in **modern drone warfare** through indigenous, cost-effective, and precision-strike systems.

Features and Functions:

- **First-Person View Control:** Operated using FPV goggles that stream live visuals, providing real-time battlefield awareness and control.
- **Kamikaze Strike Role:** Acts as a single-use drone carrying impact-explosive payloads designed to destroy armoured targets like tanks.
- **In-House Fabrication:** Assembled at the **Rising Star Drone Battle School**, with over 100 units fabricated by March 2025 for training and trials.
- **Dual-Safety Mechanism:** Prevents accidental detonation; payload can only be activated via pilot's radio controller under controlled conditions.
- **Real-Time Feedback Relay:** Live status updates of payload visible through FPV interface for safe and accurate deployment.
- **Technical Optimization:** Focus on **weight balance, flight stability**, and **manoeuvrability** for effective tactical deployment.
- **Low-Cost Innovation:** Estimated cost of ₹1.4 lakh per drone, with 5 inducted and 95 more being procured.

Applications:

- **Anti-Tank Missions:** Effective against armoured targets in tactical zones
- **Urban Warfare:** Can fly through narrow spaces with precision control
- **High-Risk Terrain Operations:** Remote strike capability reduces soldier casualties.
- **Surveillance and Target Elimination:** Offers both eye-in-the-sky and direct kill capability.

103. TAVASYA

Context:

The second frigate of Project 1135.6, 'Tavasya,' built by Goa Shipyard Limited, was launched on March 22, 2025. The launch highlights India's commitment to Aatmanirbharta and advances in indigenous defence production.

About Tavasya:

- **What it is:** A Krivak-class stealth frigate designed for multi-dimensional naval combat.
- **Project under:** Built under Project 1135.6 Additional Follow-on Ships.
- **Built by:** Goa Shipyard Limited (GSL), with technology transfer from Russia.
- **Aim:** To strengthen India's maritime security and promote self-reliance in shipbuilding.
- **Key Features:**
  - **Length:** 124.8 meters; Width: 15.2 meters; Displacement: 3600 tons.
  - **Speed:** Up to 28 knots.
  - Advanced sensors, sonar, and BrahMos missile system.
  - Indigenous torpedo launchers and auxiliary control systems.
  - Capable of surface, sub-surface, and air combat operations.
  - Named after Bhima's mace, symbolizing strength and resilience.

About Project 1135.6:

- **What it is:** A bilateral India-Russia naval project for stealth frigate construction with technology transfer.
- **Aim:** To enhance the Indian Navy's combat fleet with advanced stealth warships.
- **Ships Built Under Project 1135.6:**
  - Two frigates built in Russia: INS Tushil (commissioned Dec 2024), Tamal (commissioning June 2025).
  - Two frigates being built in India: Triput (launched July 2024), Tavasya (launched March 2025).

104. PRATIBIMB MODULE

Context:

The 'Pratibimb' module of the Indian Cyber Crime Coordination Centre (I4C) has helped in the arrest of 6,046 cybercriminals and assisted in 36,296 cyber investigations.

About Pratibimb Module:

What is the Pratibimb Module?

- A **crime-mapping tool** that tracks **cybercriminals and crime infrastructure** across India.
- Developed under the **Indian Cyber Crime Coordination Centre (I4C)** by the **Union Home Ministry**.

How Does It Work?

- Uses **geospatial mapping** to pinpoint **cybercrime hotspots**.
- Helps **jurisdictional officers** with **real-time intelligence** on cybercriminals.
- Provides **techno-legal assistance** to **Law Enforcement Agencies (LEAs)**.
- Facilitates **data sharing** and analytics via **'Samanvaya'**, a coordination platform for LEAs.

Significance of the Pratibimb Module:

- **Enhanced Cyber Policing:** Strengthens **law enforcement capabilities** in tackling cybercrime.
- **Faster Crime Resolution:** Assists in **swift arrests and cyber investigations**.
- **Interstate Crime Tracking:** Identifies **linkages between cybercriminals** across **States/UTs**.
- **Tech-Driven Governance:** Enables data-driven policymaking to curb cyber threats.
- **Boosts National Security:** Helps **prevent digital frauds, financial scams, and data breaches**.

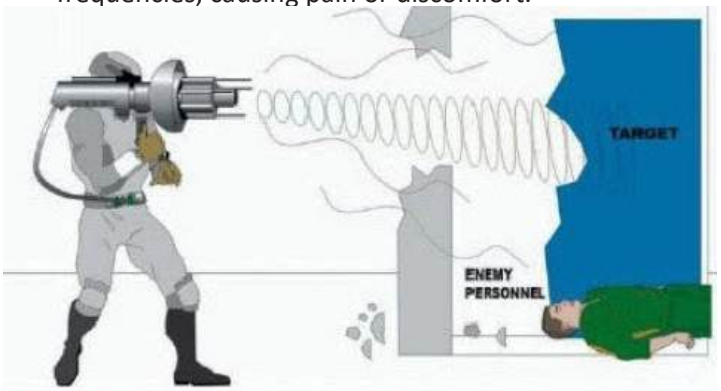
105. SONIC WEAPONS

Context:

Serbia's government has been accused of using illegal sonic weapons against protesters in Belgrade.

About Sonic Weapons:

- Devices that emit extremely loud sounds over long distances to disperse crowds or disorient individuals.
- They can deliver either audible or inaudible frequencies, causing pain or discomfort.



How Do Sonic Weapons Work?

- **Use of Transducers:** Hundreds of electronic transducers convert energy to produce focused sound beams.
- **Controlled Output:** Authorities can adjust frequency, volume, and direction to target specific areas.
- **Directional Sound Beam:** A narrow beam ensures targeted impact without spreading in all directions.

Different Types of Sonic Weapons:

Long-Range Acoustic Device (LRAD):

- Emits sound up to 160 dB with an 8,900-meter range.
- Used for crowd control and voice communication in military and police operations.

Mosquito Device:

- Produces high-frequency sounds audible only to youth below 30 years.
- Deployed to deter gatherings of teenagers in public spaces.

Infrasonic Weapon:

- Emits very low-frequency, inaudible sound waves.
- Causes disorientation and discomfort; still experimental and not fully weaponized.

Applications of Sonic Weapons

- **Crowd Control:** Used by law enforcement to disperse large protests.
- **Military Use:** Deployed for security alerts and communication over long distances.
- **Property Protection:** Mosquito devices prevent loitering around sensitive locations.

Harmfulness on Health:

- **Hearing Damage:** Prolonged exposure above 120 dB can cause permanent hearing loss.
- **Tinnitus:** Continuous loud sound causes ringing in the ears that can last for hours or days.
- **Physical Symptoms:** Includes headaches, nausea, sweating, vertigo, and disorientation.
- **Severe Injury:** In extreme cases, may lead to vomiting and bleeding from the ears.
- **Indiscriminate Effect:** Can harm not just protesters but also bystanders and enforcement personnel.

106. AUDIBLE ENCLAVES

Context:

Researchers at Penn State have developed audible enclaves for personal sound delivery without headphones.

About Audible Enclaves:

What are Audible Enclaves?

- Localized pockets of sound heard only at precise intersection points of ultrasonic beams.
- Enable private audio delivery to individuals in public spaces without disturbing others.

Principle Behind Audible Enclaves:

- **Nonlinear Acoustic Effect:** Two ultrasonic waves intersect and interact non-linearly to generate audible sound only at the intersection point.
- **Use of Metasurfaces:** 3D-printed acoustic lenses bend ultrasonic beams along curved paths to meet at a controlled point.

How Audible Enclaves Work:

- **Ultrasonic Transducers:** Two devices emit ultrasonic beams at slightly different frequencies.
- **Self-Bending Beams:** Beams follow crescent-shaped paths due to metasurfaces' directional control.
- **Intersection Point:** Audible sound is produced only where beams intersect, isolating the audio zone.
- **Obstacle Navigation:** The beams can bend around human heads or objects, reaching the precise point without disturbance.

Key Features:

- **Privacy Listening:** Audio is only heard by the person within the sound beam intersection, ensuring confidentiality.
- **Virtual Headset Effect:** Users can listen without headphones, with no sound leakage to others.
- **Indoor and Outdoor Usability:** Tested in reverberant spaces, classrooms, vehicles, and open environments.
- **Directional Sound Control:** Can direct sound beams to targeted locations even behind barriers.

Limitations:

- **Short Range:** Currently functional only up to 1 meter from the sound source.
- **Low Sound Intensity:** Output is limited to around 60 decibels, equivalent to a normal conversation.
- **Power Limitations:** Increasing range or volume requires higher ultrasonic beam intensity.
- **Environmental Dependence:** Effectiveness may reduce in noisy or unpredictable outdoor conditions.

107. SWAYAAN INITIATIVE

Context:

The Ministry of Electronics and Information Technology (MeitY) and Drone Federation of India launched the National Innovation Challenge for Drone Research (NIDAR) under the SwaYaan initiative.

About NIDAR:

What it is: National Innovation Challenge for Drone Application and Research (NIDAR).

Part of: Launched under the **SwaYaan - Capacity Building for Human Resource Development in Unmanned Aircraft Systems (UAS)** initiative.

Ministry: Ministry of Electronics and Information Technology **(MeitY)** in collaboration with **Drone Federation of India (DFI)**.

Aim: Encourage research, innovation, and real-world drone applications in **disaster management** and **precision agriculture**. Engage over **100 student teams** for developing autonomous drone solutions.
Foster **startup incubation**, cloud credits, software support, and internships.

About SwaYaan Initiative:

- **What it is:**A comprehensive capacity-building program for drone and allied technologies in India.
- **Launched in:** Approved by **MeitY** in **July 2022**.
- **Ministry:** Ministry of Electronics and Information Technology (MeitY).
- **Aim:** Train **42,560 participants** to create a skilled drone technology workforce.

Features:

- Implemented via a **hub-and-spoke model** with participation from 30 top institutions including IISc, IITs, IIITs, NITs, CDAC, and NIELIT.
- Focus areas include **Drone Electronics**, **GNC Algorithms Simulation**, **Aeromechanics**, **Drone Applications**, and **Allied UAS Technologies**.
- Initiation of minor degree programs, bootcamps, and workshops.
- Active industry participation through challenges and innovation platforms.

108. SILVAGUARD

Context:
Dryad Networks has unveiled Silvaguard, an AI-powered autonomous drone system capable of detecting and suppressing wildfires, offering a vital solution amid rising wildfire threats.

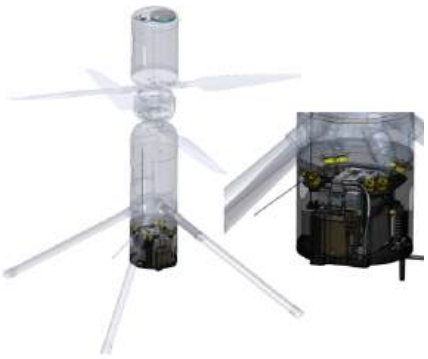
About Silvaguard:

Silvaguard is a **prototype drone-based wildfire detection and suppression system** developed to autonomously locate and extinguish early-stage wildfires.

Developed by: Dryad Networks, a Berlin-based climate-tech company specializing in forest monitoring and environmental sensor networks.

Aim:
To deliver a **rapid, autonomous wildfire response system** that reduces fire damage and prevents large-scale CO_2 emissions from forest fires.

Key Features of Silvaguard:



Integration with Silvanet:
Works with Dryad's Silvanet IoT sensor network deployed across forests to detect fires even before visible flames emerge.

Autonomous Launch: Upon fire detection, drones are launched automatically from solar-powered hangars.

Real-Time Imaging: Equipped with thermal cameras, obstacle avoidance systems, and infrared sensors to provide live visuals and precise fire location.

Fire Suppression Capability: Future versions to use sonic wave technology to extinguish fires using sound frequencies.

109. MYCELIUM BRICKS

Context:
Mycelium bricks are emerging as a sustainable alternative to conventional clay bricks, which contribute to 300 million tonnes of CO_2 emissions annually.

About Mycelium Bricks:

- **Bioengineered construction material** made from **fungal mycelia**, sawdust, and husk.
- Mycelium forms a **fibrous network** that solidifies into **lightweight, durable bricks**.

Developed by:

- Research in sustainable construction has driven their development.
- Innovators like **Roha Biotech (IIT Madras Incubated)** and global research institutions are refining production techniques.

Key Features:

- **Lightweight & Strong:** High strength-to-weight ratio but weaker than concrete.
- **Thermal Insulation:** Effective heat insulator, reducing energy consumption.
- **Fire-Resistant:** Naturally resistant to flames but requires treatment for long-term durability.
- **Biodegradable:** Decomposes naturally, reducing waste.
- **Eco-Friendly Production:** Low carbon footprint as it does not require high-temperature kilns.

Significance of Mycelium Bricks:

- **Reduces Carbon Footprint:** Offers an alternative to high-emission clay bricks.
- **Sustainable Construction:** Aligns with green building initiatives and high-performance architecture.
- **Potential for Mass Adoption:** Suitable for interior panels, liquid filters, sports equipment, and circuit boards.

110. ASTRA MISSILE

Context:

The Astra Beyond Visual Range Air-to-Air Missile (BVRAAM) was successfully test-fired from the Tejas Light Combat Aircraft (LCA) AF MK1 prototype off the Odisha coast.

About Astra Missile:

- **An advanced Beyond Visual Range Air-to-Air Missile (BVRAAM)** designed for **fighter aircraft**.
- Enables aircraft to **engage targets beyond 100 km without direct visual contact**.

Developed by:

- **Defence Research and Development Organisation (DRDO)**, India.
- **Manufactured by Bharat Dynamics Limited (BDL)** under a ₹2,971 crore contract.

Key Features:

- **Altitude:** Can engage targets at **20 km altitude**.
- **Range:** Over 100 km, with high-speed precision targeting.
- **Guidance System:** Equipped with **inertial navigation, mid-course updates, and active radar homing** for precise hits.
- **Speed:** Capable of **Mach 4.5 (4.5 times the speed of sound)**.
- **Integration:** Already deployed on Su-30MKI, now being integrated with **LCA Tejas & MiG-29**.
- **Combat Advantage:** Provides **large stand-off range**, reducing pilot risk from enemy air defense.

Significance:

- **Strengthens India's Air Defense:** Enhances IAF's air superiority and aerial combat effectiveness.
- **Reduces Foreign Dependency:** Eliminates the need for imported air-to-air missiles.
- **Boosts Indigenization:** Developed under Make in India, supporting India's self-reliance in defense technology.
- **Enhances Fighter Jet Capabilities:** Enables Indian fighter jets to strike enemy aircraft at long distances.

111. NAG MISSILE SYSTEM (NAMIS)

Context:

The Ministry of Defence has signed a ₹2,500 crore deal to procure the Nag Missile System (NAMIS) and 5,000 light vehicles, marking a significant step toward enhancing India's indigenous defence capabilities.

About Nag Missile System (NAMIS):

What is NAMIS? NAMIS (Tracked version) is a **third-generation, fire-and-forget anti-tank guided missile (ATGM)** system designed for the Indian Army.

Developed By:

Defence Research and Development Organisation (DRDO)

Procurement carried out through **Armoured Vehicle Nigam Limited**.

Features of Nag Missile (Mark 2):

- **Fire-and-Forget Capability:** Allows target engagement without post-launch guidance.
- **High Precision Targeting:** Capable of defeating tanks with **Explosive Reactive Armour (ERA)**.
- **Platform Integration:** Mounted on **NAMICA** (Nag Missile Carrier) for greater mobility.
- **Indigenous Design:** Fully developed under the **'Buy (Indian-IDDM)'** category to promote self-reliance.

Procurement Highlights:

- **Category:** Indigenously Designed, Developed, and Manufactured (IDDM).
- **Aligned With:** Aatmanirbhar Bharat mission to promote domestic defence production.
- **Employment Generation:** Expected to boost MSMEs and generate both direct and indirect employment through component manufacturing.

Also in news:

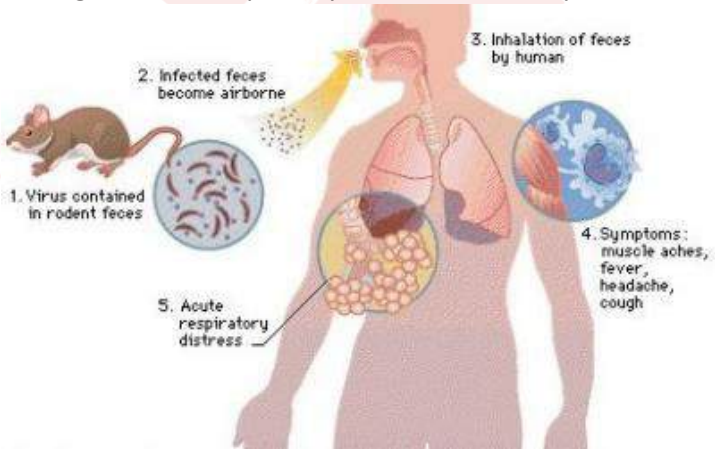
- The Indian Army conducted Exercise 'Prachand Prahaar', a tri-service integrated multi-domain warfare drill that showcased India's enhanced combat readiness in high-altitude conditions.
- **About Exercise Prachand Prahaar:**
- **Host:** High-altitude terrain of **Arunachal Pradesh**, under the **Eastern Command**.
- **Military Involved:** Tri-services – Army, Navy, and Air Force.
- **Aim:**
  - To **validate integrated surveillance**, command and control, and precision strike capabilities.
  - To simulate **modern battlefield conditions** using advanced platforms like UAVs, swarm drones, loitering munitions, fighter aircraft, and space-based assets.
  - To reinforce **jointness, interoperability**, and **technological superiority** across all domains of warfare.

112. HANTAVIRUS

Context:

The death of Betsy Hackman, wife of actor Gene Hackman, due to hantavirus infection has raised awareness about this rare but deadly virus.

Hantavirus causes Hantavirus Pulmonary Syndrome **(HPS) and Hemorrhagic Fever with Renal Syndrome (HFRS)**, leading to severe respiratory distress and kidney failure.



About Hantavirus:

Caused By: Hantaviruses belong to the Bunyaviridae family and are transmitted by **infected rodents** such as **deer mice, rice rats, and cotton rats**.

How Does it Occur?

Humans contract the virus through **contact with infected rodent urine, droppings, or saliva**.

Aerosolization occurs when **contaminated materials are disturbed**, making **inhalation the primary mode of transmission**.

No **human-to-human transmission** has been confirmed except in **Andes virus cases in South America.**

Symptoms:

- **Incubation Period:** Symptoms appear **1-8 weeks** after exposure.
- **Initial Flu-like Symptoms:** Fever, muscle aches, fatigue, nausea, and dizziness.
- **Severe Respiratory Phase**: Shortness of breath, coughing, chest tightness, and rapid fluid buildup in the lungs.
- **Complications:** Can escalate to acute respiratory distress syndrome (ARDS), internal bleeding, and kidney failure.

Treatment & Prevention:

- **No Specific Cure:** Supportive medical care is the only option.
- **Oxygen Therapy & Ventilation:** Used for patients with **severe respiratory distress**.
- **Early Detection is Critical**: Prompt medical intervention improves survival chances.
- **Rodent Control Measures:** Sealing homes, avoiding direct rodent contact, and proper sanitation **reduce risk**.
- **High-Risk Groups:** Farmers, campers, construction workers, and individuals in rodent-prone areas should **exercise caution**.

113. PLASTIC ICE VII

Feature	Description
Structure	Cubic crystalline lattice, similar to Ice VII
Molecular Motion	Picosecond rotational movement, unlike rigid ice
Formation Conditions	High temperature (450-600K) & high pressure (0.1-6 GPa)
Scientific Method Used	QENS (Quasi-Elastic Neutron Scattering)
Phase Transition	Transition from Ice VII to Plastic Ice VII, possibly leading to a superionic phase at even higher pressures.

Context:

Scientists have experimentally confirmed the existence of Plastic Ice VII, an exotic phase of water with hybrid solid-liquid properties.

About Plastic Ice VII:

A **unique phase of water** where **molecules remain in a rigid crystalline structure while retaining rotational motion**. Originally predicted in **2008**, but **experimentally confirmed in 2025**.

How does it form?

Extreme Conditions: Forms under 450-600K (177-327°C) temperature and 0.1-6 GPa pressure (60,000 times atmospheric pressure).

Lab Confirmation: Verified through Quasi-Elastic Neutron Scattering (QENS) at ILL, France.

Key Characteristics:

Applications & Significance:

- **Planetary Science:** Explains water's behavior inside icy moons (Ganymede, Callisto, Titan) and exoplanets.
- **Extreme Environment Research:** Helps in understanding high-pressure physics and material science.
- **Space Exploration:** Improves knowledge of ice phases in extreme planetary conditions, aiding in future astrobiology studies.
- **Hydrogen Storage & Energy Research:** May have potential technological applications in material sciences.

114. TRIBHUVANDAS PATEL

Context:

The Lok Sabha has passed a Bill to establish Tribhuvan Sahkari University in Anand, Gujarat, named after Tribhuvandas Patel, founder of the Kaira Milk Union (Amul).

About Tribhuvandas Patel:

Early Life & Background:

- **Born:** 22 October 1903 in **Anand**, Kheda district, Gujarat.
- **Family:** Son of **Kishibhai Patel**, a farmer; studied at **DN High School**, Anand.
- **Education:** Graduate from **Gujarat Vidyapith**, Ahmedabad.
- Participated in movements like **Civil Disobedience**, **Salt Satyagraha**, and **anti-untouchability drives**; jailed in **Nasik (1930)** and **Visapur**.

Contribution to the Cooperative Movement:

- Founded **Kaira Milk Union (Amul)** on 14 December 1946 to end **dairy exploitation** by private traders like Polson Dairy.
- Promoted **inclusive village-level dairy cooperatives** based on:
  - *One man, one vote* principle
  - Equal participation across **castes and communities**

- Appointed **Dr. Verghese Kurien** and supported him in building the foundation of **India's White Revolution**.
- Later helped establish:
  - National Dairy Development Board (NDDB)
  - Institute of Rural Management Anand (IRMA)
  - Gujarat Cooperative Milk Marketing Federation (GCMMF)

Role in Freedom Struggle:

- Close follower of **Mahatma Gandhi's principles**.
- Dedicated life to **rural upliftment**, **community health**, and **self-reliance.**
- Founded **Tribhuvandas Foundation** from public donations to serve rural health needs.

Recognitions & Awards:

- Ramon Magsaysay Award (1963) for Community Leadership.
- Padma Bhushan (1964) for Social Service.

115. CALI FUND

Context:

COP16 to the **Convention on Biological Diversity** **(CBD)** secured a landmark agreement on biodiversity funding, committing **$200 billion annually by 2030** to conservation efforts. A major outcome was the **launch of the Cali Fund,** ensuring fair benefit-sharing from genetic resources used in industries like pharmaceuticals and biotechnology.

About Cali Fund:

What is the Cali Fund?

- A **global financial mechanism** designed to ensure **equitable benefit-sharing from digital genetic resources**.
- Ensures that industries **using biodiversity-based genetic data contribute financially to conservation efforts**.

Origin & Launch:

- Proposed during **CBD COP16 discussions in Cali, Colombia (2024)**.
- Officially launched at **CBD COP16 in Rome (2025)** as part of the biodiversity finance agreement.

Aim of the Cali Fund:

- **Compensate Indigenous communities** and developing nations for their role in preserving biodiversity.
- **Secure long-term biodiversity financing** from industries benefiting from genetic resources.
- Support conservation initiatives and global biodiversity targets **under the** Kunming-Montreal Global Biodiversity Framework **(KMGBF).**

Implemented by: United Nations Convention on Biological Diversity (CBD) in collaboration with the Global Environment Facility **(**GEF**)** and international stakeholders.

Key Features of the Cali Fund:

- **Fair Benefit-Sharing Model:** Industries using **genetic data for commercial products** (pharmaceuticals, biotechnology, agriculture) must share profits for conservation.
- **Support for Indigenous Communities: 50% of the Cali Fund's resources will go to Indigenous groups**, recognizing their vital role in protecting biodiversity.
- **Long-Term Sustainable Financing:** The fund will **generate revenue through access-and-benefit-sharing (ABS) mechanisms**, ensuring continuous financial support for biodiversity conservation.
- **Global Tracking & Accountability:** Governments must **report biodiversity financing progress** using updated **KMGBF indicators**.
- **Preparation for COP17 (Armenia, 2026):** The **first global biodiversity finance review** will assess **fund utilization and impact** at COP17.

116. WORLD WIDE FUND FOR NATURE (WWF)

Context:

The Uttarakhand Forest Department has partnered with WWF to install trap cameras in forest interiors to provide real-time wildlife alerts on forest roads.

Forest department is installing **trap cameras** in interior forest roads to alert drivers about **wild animal movement** in real time.

About WWF **(World Wide Fund for Nature):**

What is WWF?

- **An international NGO** working for environmental conservation and reducing human impact on nature.

Established: 1961

Founders: Sir Peter Scott, Max Nicholson, and others

Origin: Initiated to support IUCN and global conservation efforts via fundraising and activism.

Headquarters: Gland, Switzerland

Objective of WWF: To **halt environmental degradation** and promote a **sustainable future** where humans live in harmony with nature.

Major Functions:

- Supports over **3,000 conservation projects** across 100+ countries.
- Publishes **Living Planet Report** and maintains the Living Planet Index.
- Conducts campaigns like Earth Hour and **Debt-for-Nature Swap**.
- Works in six major domains: **wildlife, forests, oceans, freshwater, food**, and **climate**.
- Uses **AI tools and sensor-based technologies** for wildlife monitoring.
- Funded primarily by **individuals (65%)**, **governments (17%)**, and **corporate donors (8%)**.

117. KASAMPATTY SACRED GROVE

Context:

Kasampatty Sacred Grove in Dindigul district has been officially notified as Tamil Nadu's second Biodiversity Heritage Site (BHS) under the Biological Diversity Act, 2002.

About Biodiversity Heritage Sites (BHS):

Definition: **Biodiversity Heritage Sites** are ecologically fragile areas possessing **rich biodiversity**, **endemism**, and **cultural importance**, often conserved by local communities.

Declared Under: Section 37 of the **Biological Diversity Act, 2002.**

Criteria for Declaration:

Areas with:

- Rich **wild and domesticated species diversity**
- High **endemism or rare species**
- **Cultural or sacred** significance (e.g., sacred groves)
- Ecological corridors or **habitats for threatened species**

Procedure for Declaration:

- Suggestions invited by **State Biodiversity Boards (SBBs)** through **Panchayats or Biodiversity Management Committees (BMCs)**
- Ecological and cultural studies conducted in consultation with local communities
- **Government Gazette notification** issued by the State after public consultation
- Management plan implemented by local bodies and monitored by **State Biodiversity Boards (**SBBs).

About Kasampatty Sacred Grove (Veera Kovil Grove):

Location:

- Kasampatty village, near **Alagarmalai Reserve Forest**, **Dindigul district**, Tamil Nadu
- Total area: **4.97 hectares**

First BHS in Tamil Nadu: Arittapatti village in Madurai district, declared in 2022

Key Features of Kasampatty Grove:

Cultural Significance: Locals worship deity **Veeranan** at the **Veera Kovil Temple**

Ecological Importance:

- Acts as an **ecological bridge**, supporting pollination and soil fertility in nearby mango plantations
- Enhances **local climate stability** and **wildlife connectivity**

Community-Led Conservation:

- Protected following a resolution by **Reddiyapatty Panchayat Council**
- Supported by the **Tamil Nadu Biodiversity Board** and **District Collector.**

118. LIGHT FISHING

Context:

Despite being banned in India's Exclusive Economic Zone (EEZ) since 2017, light fishing continues unchecked, damaging marine biodiversity. Centre has banned light fishing in all coastal states in 2017.

About Light Fishing:

A fishing method using **high-intensity artificial lights** (often powered by generators) to attract fish to the water surface during night operations.

Predominantly used by **mechanised trawlers**, especially for catching squid, sardines, and juvenile fish.

LED light fishing usually takes place between **December and February**, a season which sees meagre catches.

How It Works:

- **LED or halogen lights** are suspended over the water or placed underwater.
- The bright light disturbs the fish's natural orientation and attracts entire shoals.
- Fish, including juveniles, are **easily netted**, increasing bycatch and unsustainable harvest.

Impacts on the Marine Ecosystem:

Juvenile Fish Depletion: Removes immature fish before reproduction, reducing **future fish populations**.

Biodiversity Loss: Attracts **non-target species**, disturbing the marine food web.

Spawning Disruption: Artificial lights interfere with **natural spawning cycles**.

International Trade Risks: Overfishing can impact **seafood exports**, especially to the EU and Japan.

119. MISHTI SCHEME

Context:

Gujarat has become the national leader in mangrove afforestation, covering 19,020 hectares in two years under the MISHTI scheme.

About MISTI Scheme:

What it is? The MISHTI (Mangrove Initiative for Shoreline Habitats & Tangible Incomes) scheme, launched in 2023, aims to expand India's mangrove cover and enhance coastal resilience.

Focuses on **ecological restoration and livelihood generation for coastal communities**.

Launched In: Union Budget 2023-24, with implementation from **2023 to 2028**.

Funding Sources:

- **CAMPA Fund** (Compensatory Afforestation Fund Management and Planning Authority).
- **MGNREGS** (Mahatma Gandhi National Rural Employment Guarantee Scheme).
- **Other government and private funding sources**.

Under Ministry: Ministry of Environment, Forest & Climate

Change (MoEF&CC).

Aims:

- **Restore degraded mangrove ecosystems** and increase **India's mangrove cover**.
- **Strengthen coastal resilience against climate change and sea erosion**.
- **Promote ecotourism and sustainable livelihoods** for coastal communities.
- **Support global mangrove conservation under the** Mangrove Alliance for Climate (MAC), initiated at **COP27**.

Major Features:

Targeted Afforestation & Expansion: Covers **540 sq km of mangrove expansion** across **9 coastal states and 4 Union Territories**.

Community & Livelihood Focus:

- Promotes **sustainable income sources for coastal populations**.
- Enhances **fishing and ecotourism opportunities**.

Climate Change Mitigation:

- Strengthens **shoreline protection** against storms and rising sea levels.
- Supports **India's commitments under the Paris Agreement & UN SDGs**.

Global Mangrove Distribution:

Rank	Region	Mangrove Cover (Mha)	Percentage of Global Mangroves
1	South & Southeast Asia	5.33	36.20%
2	North & Central America	2.55	17.30%
3	Western & Central Africa	2.3	15.60%
4	South America	2.12	14.40%

India's Mangrove Distribution (India State of Forest Report 2023)

Rank	State/UT	Mangrove Cover (sq km)	% of Total Mangrove Cover in India
1	West Bengal	2,114	42.30%
2	Gujarat	1,177	23.60%
3	Andaman & Nicobar Islands	616	12.30%
4	Andhra Pradesh	404	8.10%
5	Maharashtra	324	6.50%

Mangrove Status: Total Mangrove cover of the country is **4,991.68 km2,** which accounts for **15 %** of the country's total geographical area.

120. OFFSHORE MINING

Context:

The Kerala Assembly passed a resolution opposing the Centre's offshore mining policy, citing environmental, economic, and security concerns.

About Offshore Areas Mineral (Development and Regulation) Act, 2002:

The Offshore Areas Mineral (Development and Regulation) Act, 2002 regulates mineral exploration and mining activities in India's offshore areas.

Key Features

- **Legal Framework**: Establishes guidelines for granting mineral concessions in offshore regions.
- **Authority**: Empowers the **Union Ministry of Mines** to regulate and oversee mining operations.
- **Private Participation**: The **2023 amendment** allows private players to explore and extract deep-sea minerals through an auction system.
- **Revenue Sharing**: Introduces royalty and revenue-sharing mechanisms between the Centre and States.

Cause of Contention:

- **Environmental Concerns**: Deep-sea mining threatens **marine biodiversity, fisheries, and coastal ecosystems**.
- **Economic Impact**: Adversely affects the **livelihood of fisherfolk** dependent on marine resources.
- **National Security Risks**: Strategic minerals such as rare earth elements could be accessed by private players, raising security concerns.
- **Federalism Issue**: States have **limited say** in offshore resource management, despite bearing direct consequences.

121. CAMPA FUNDS

Context:

The Supreme Court has directed the Uttarakhand Chief Secretary to respond to allegations of financial irregularities in the **Compensatory Afforestation Fund Management and Planning Authority (CAMPA)** funds, highlighted in a **CAG report.**

The report claims **misuse of funds** by the **Forest Department**, including unauthorized purchases of **iPhones, laptops, fridges, and office renovations**, instead of afforestation activities.

About CAMPA Funds:

Compensatory Afforestation Fund Management and Planning Authority (CAMPA) is a mechanism for **afforestation and forest conservation** to compensate for the **diversion of forest land** for non-forest purposes.

Established by the **Supreme Court in 2009**, it operates at both **national and state levels**.

Objectives of CAMPA:

- **Compensate forest loss** by promoting afforestation and natural regeneration.
- **Ensure effective fund utilization** for forest and wildlife conservation.
- **Provide financial support** for forest protection, research, and training.
- **Strengthen institutions** responsible for forest management.

Provisions Under CAMPA

- **Funds Collection**: Money is collected from **project proponents** seeking forest clearance under the **Forest (Conservation) Act, 1980.**
- **Utilization of Funds**: Used for **compensatory afforestation, additional afforestation, penal compensatory afforestation, and wildlife conservation**.
- **State CAMPA**: Receives funds from the **Adhoc CAMPA** and administers their utilization for forest development.
- **Monitoring & Accountability**: An independent system is set up for concurrent monitoring and evaluation.

Role of CAMPA

- **National CAMPA Advisory Council**: Provides **guidelines and oversight** for State CAMPA bodies.
- **State CAMPA**: Implements afforestation, conservation, and **forest protection programs** at the state level.
- **Funds Distribution**: Allocates funds for infrastructure development, wildlife protection, and training of forest officials.

Significance of CAMPA

- **Promotes Sustainable Development**: Balances economic growth with environmental conservation.
- **Enhances Forest Cover**: Aims to **regenerate lost forests** due to industrial and infrastructural projects.
- **Strengthens Wildlife Protection**: Supports habitat conservation and biodiversity restoration.
- **Improves Livelihoods**: Generates employment in afforestation and forest management activities.

Limitations & Challenges

- **Misuse of Funds**: Reports of financial mismanagement and fund diversion for non-forestry activities.
- **Slow Implementation**: Delays in **fund disbursement** and **project execution** reduce effectiveness.
- **Lack of Transparency**: Insufficient monitoring mechanisms allow for misallocation of resources.
- **State-Level Discrepancies**: Uneven **implementation and fund utilization** across different states.

122. STOCKHOLM WATER PRIZE 2025

Context:

Günter Blöschl, a renowned hydrologist, has been awarded the 2025 Stockholm Water Prize for his pioneering research on flood risks and climate change impacts globally.

About Stockholm Water Prize 2025:

What it is: An internationally acclaimed water award recognizing outstanding achievements in water science, management, and protection.

Awarded by: Presented by the **Stockholm Water Foundation** in collaboration with the Royal Swedish Academy of Sciences.

Origin: Established in **1991** as part of the Stockholm Water Festival, celebrating Sweden's commitment to clean water.

Who are awarded:

- Individuals or organizations with exceptional contributions to water conservation, management, and sustainability.
- Laureates come from diverse fields including science, engineering, policy, and environmental advocacy.
- **Features:**
  - Presented annually by King Carl XVI Gustaf of Sweden during the World Water Week in August.
  - Nominations can be made by anyone (except self-nominations or close relatives).
  - The Prize Committee shortlists candidates, and final approval is done by the Board of the Stockholm Water Foundation.
- **First Winner:**
  - Professor **David W. Schindler** (Canada, 1991), recognized for contributions to understanding pollution and climate impacts on lakes.
- **2025 Winner and Contribution:**
  - **Günter Blöschl**, Professor at Vienna University of Technology.
  - Recognized for revolutionizing flood risk assessment and developing observation-based climate-flood connections.

123. GENE-EDITED BANANAS

Context:

A UK-based biotech company, **Tropic**, has developed a gene-edited banana that remains fresh and yellow for **12 hours after peeling**, reducing food waste.

This breakthrough in genetic modification could help curb **post-harvest losses and carbon emissions**, contributing to sustainability.

Recent Advancements in Gene-Editing Technology:

CRISPR-Cas9 Breakthroughs: CRISPR-Cas9 remains the most widely used gene-editing tool, enabling precise DNA modifications. Scientists have improved **base-editing techniques**, allowing for single-nucleotide changes without breaking DNA strands.

Prime Editing: A more refined version of CRISPR, **Prime Editing**, can directly write new genetic sequences without cutting DNA entirely.

This technique enhances **safety and accuracy** in genetic modifications.

Gene-Edited Crops for Agriculture: Non-browning bananas (Tropic) and **Arctic apples** (Okanagan Specialty Fruits) extend shelf life and reduce waste. **Drought-resistant wheat, pest-resistant rice, and vitamin-enhanced tomatoes** are advancing agricultural productivity.

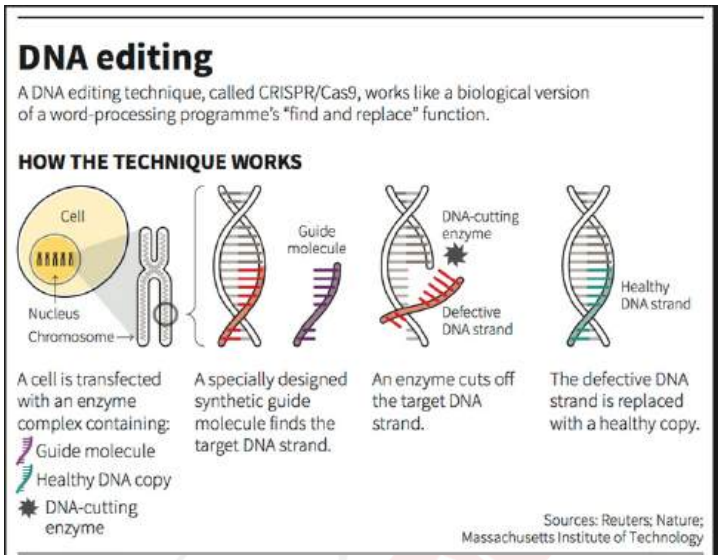
Therapeutic Applications: Gene editing is revolutionizing **cancer treatment** (CAR-T cell therapy). Ongoing trials aim to **cure genetic disorders** like **sickle cell anemia and cystic fibrosis**.

About Gene Editing:

- Gene editing involves **modifying an organism's DNA** to enhance traits, eliminate defects, or develop resistance to diseases.
- Unlike traditional breeding, it allows **precise and controlled alterations** at the molecular level.

Methods Used:

- **CRISPR-Cas9** – Most common technique, cuts DNA at specific sites for modification.
- **Zinc Finger Nucleases (ZFNs)** – Custom DNA-binding proteins used to alter genes.



TALENs (Transcription Activator-Like Effector Nucleases) – Precise cutting and editing of genetic sequences.

Regulatory Provisions in India:

- **Genetic Engineering Appraisal Committee (GEAC)** under **MoEFCC** oversees gene-editing approvals.
- **The Food Safety and Standards Authority of India (FSSAI)** regulates genetically modified foods.
- India **approved GM Mustard** for commercial cultivation but has stricter regulations for gene-edited crops.

Current Status in India

- **India has not approved CRISPR-based crops for commercial use yet**, but research is underway.
- Gene-edited **rice, wheat, and bananas** are in developmental stages.
- The **Indian Council of Agricultural Research (ICAR)** is exploring gene-editing to improve **climate resilience and pest resistance** in crops.

124. COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Context:

The 20th meeting of the Commission on Genetic Resources for Food and Agriculture (CGRFA-20) has commenced in Rome, where global leaders will discuss strategies for conserving plant and forest genetic resources and release two major global reports.

About Commission on Genetic Resources for Food and Agriculture (CGRFA):

What it is: A permanent intergovernmental body that focuses on conserving and sustainably using biodiversity essential for food security and agriculture.

Established in: 1983, initially as the Commission on Plant Genetic Resources; expanded in 1995 to cover all genetic resources relevant to food and agriculture.

Headquarters: Rome, Italy.

Parent Organization: Food and Agriculture Organization (FAO) of the United Nations.

Aim of the Commission:

- To promote the sustainable use of biodiversity for food, agriculture, and human well-being.
- To foster global cooperation in conserving genetic resources and enhancing food security.
- To guide the fair and equitable sharing of benefits derived from the use of genetic resource

Key Functions:

- **Global Policy Development:** Formulates international policies and strategies for biodiversity conservation in food and agriculture.
- **Monitoring and Coordination:** Oversees the implementation of conservation policies and coordinates efforts between member nations.
- **Negotiation of Key Treaties:** Guided negotiations for the *International Treaty on Plant Genetic Resources for Food and Agriculture*.
- **Biodiversity Data Management:** Supports the creation of global databases and information systems for better resource management.
- **Biennial Meetings:** Conducts regular sessions every two years, with special sessions when needed.

125. ANTHURIUM FLOWERS

Context:

The first-ever export consignment of Anthurium flowers from Mizoram to Singapore was flagged off in February.

About Anthurium Flower:

Scientific Name: *Anthurium* (family: Araceae).

Grown In:

- **Native region**: Americas, from northern Mexico to northern Argentina and parts of the Caribbean.
- **In India**: Widely cultivated in **Mizoram** and other North Eastern states.

Features of the Plant:

- Herbaceous plants that can grow as epiphytes or terrestrially.
- Inflorescence consists of a spadix and colorful spathe (red, pink, orange, and other colors).
- Produces juicy berries containing seeds.
- Toxic in nature due to calcium oxalate crystals; sap can irritate skin and eyes.

Significance:

- Significant contribution to India's floriculture exports (USD 86.62 million in FY 2023–24).
- **'Anthurium Festival'** is an annual cultural and tourism event celebrated in Mizoram. It showcases the beauty and commercial potential of Anthurium flowers grown in the region.
- Floriculture is commercially cultivated in several states with **Tamil Nadu (21%), Karnataka (16%),** Madhya Pradesh (14%) and West Bengal (12%).
- The major **importing countries from India** were U.S.A, Netherland, United Arab Emirates, U.K and Canada.

126. RASHTRIYA GOKUL MISSION

Context:

The Union Cabinet has approved a **revised outlay of ₹3,400 crore** for the Rashtriya Gokul Mission (RGM). Additional **₹1,000 crore** has been allocated for the **period 2021–22 to 2025–26**, with new initiatives for cattle development.

About Rashtriya Gokul Mission (RGM):

It is a flagship scheme for development and conservation of indigenous bovine breeds in India.

The mission aims to enhance milk production **and**

productivity in a sustainable manner.

Launched In: The scheme was launched in **December 2014**.

Ministry: Implemented by the **Ministry of Fisheries, Animal Husbandry, and Dairying**.

Aim of Rashtriya Gokul Mission:

Boost bovine productivity and increase sustainable milk production using modern technology.

Promote the use of high genetic merit bulls for breeding improvement.

Expand Artificial Insemination (AI) services at farmers' doorsteps.

Preserve and promote indigenous cattle and buffalo breeds through scientific methods.

Funding Pattern: The scheme is implemented on a **100% grant-in-aid basis**, except for certain components:

- **₹5,000 subsidy per IVF pregnancy**.
- **50% subsidy for sex-sorted semen cost**.
- **50% subsidy up to ₹2 crore** for establishing breed multiplication farms.

127. SOIL FERTILITY MAPPING

Context:

The **Soil & Land Use Survey of India (SLUSI)** has generated **digital soil fertility maps** for **351 villages across 34 districts in Maharashtra** using geospatial techniques.
This initiative, under the **Soil Health & Fertility Scheme**, aims to **enhance soil productivity and optimize fertilizer use**.

About Soil Fertility Mapping:

It is a **scientific method** of assessing and visualizing soil nutrient composition across different regions.

Uses **geospatial techniques, remote sensing, and AI-based tools** to generate precise **soil health data**.

Benefits of Soil Fertility Mapping

- **Precision Agriculture**: Helps farmers identify **nutrient deficiencies and surpluses**.
  Enables **targeted fertilizer application** for better crop yield.
- Cost-Efficient Farming: Reduces overuse and underuse of fertilizers, optimizing costs.
  Enhances soil productivity and economic returns for farmers.
- Improved Soil Health Management: Encourages integrated nutrient management (INM).
  Promotes organic manures and bio-fertilizers for sustainable farming.
- **Environmental Sustainability**: Minimizes **soil degradation** and **nutrient depletion**.
  Reduces **chemical runoff and groundwater contamination**.
- Empowering Farmers: Soil Health Cards (SHC) provide customized recommendations.
  Farmers can download SHC data using mobile-based services.

Key Features of The Soil Fertility Mapping Project:

- **Digital Mapping & Data Collection:** Soil samples are collected and analysed for **pH, organic carbon, nitrogen, phosphorus, potassium, sulfur, and micronutrients (zinc, copper, iron, manganese, boron)**.
- Each soil sample is **geo-coded using GPS** and assigned a **unique QR Code** for tracking.
- **Use of Geospatial & AI-Based Tools: Remote sensing and GIS mapping** are integrated for **high-accuracy data analysis**.
- AI-powered **predictive modeling** assists in **nutrient management strategies**.
- **Overcoming Challenges:** Village-level **mini soil testing labs** are deployed in **remote and hilly areas**.
- Digital platforms enable **farmers to access soil fertility reports via mobile numbers**.
- **Nationwide Implementation:** The **Soil Health & Fertility Scheme** is available across **all States & Union Territories**.
- SLUSI works under the **Department of Agriculture & Farmers' Welfare** to promote **scientific soil management**.

128. AAHAR 2025

Context:

The **Agricultural and Processed Food Products Export Development Authority (APEDA)** showcased **India's agricultural and processed food excellence at AAHAR 2025**, with **95 exhibitors from 17 states and UTs**. The event emphasized **India's strength in agri-exports, plant-based foods, and food processing innovation**.

About APEDA:

APEDA (Agricultural and Processed Food Products Export Development Authority) is a **statutory body** established under the **APEDA Act, 1985**.

It functions under the **Ministry of Commerce & Industry**, Government of India.

Headquarters: **New Delhi, India**.

Structure of APEDA

- **Chairman**: Appointed by the **Government of India**.
- **Advisory Board**: Comprises **exporters, farmers, industry experts, and government representatives**.

- **Regional Offices**: Located in **Mumbai, Kolkata, Bangalore, Hyderabad, Guwahati** to support exporters.

Functions of APEDA

- **Export Promotion & Development**: Facilitates **agricultural and processed food exports**.
- Supports **market research, branding, and export certification**.
- **Quality Standards & Certification**: Regulates **quality control and packaging** of export products.
- Implements **Good Agricultural Practices (GAP) and Organic Farming Standards**.
- **Financial Assistance to Exporters**: Provides subsidies and incentives for **exporters and food processors**.
- Supports **cold chain infrastructure development**.
- **Market Expansion & Global Trade**: Organizes **international trade fairs and buyer-seller meets**.
- Strengthens **bilateral trade relations for agricultural exports**.

129. NATIONAL BOARD FOR WILDLIFE (NBWL)

Context:

Prime Minister chaired the 7th National Board for Wildlife (NBWL) meeting at Gir National Park, focusing on conservation strategies, protected area expansion, and human-wildlife conflict mitigation.

About National Board for Wildlife (NBWL):

What is the NBWL?

- The **NBWL** is the **highest advisory body** on wildlife conservation in India.
- Established under **Section 5A of the Wildlife (Protection) Act, 1972.**
- **Reconstituted in 2022**, replacing the **Indian Board for Wildlife (1952)**.

Chaired By:

- **Prime Minister of India** (Ex-officio Chairperson).
- **Vice-Chairperson**: Minister of Environment, Forest, and Climate Change (MoEFCC).

Structure of Organisation:

- **47-member committee** including top government officials, conservationists, ecologists, and environmentalists.
- **Includes defence and expenditure secretaries, army chief, and other high-ranking officials**.
- **Member-Secretary:** Additional Director General of Forests (Wildlife) & Director, Wildlife Preservation.

Key Outcomes of the NBWL Meeting:

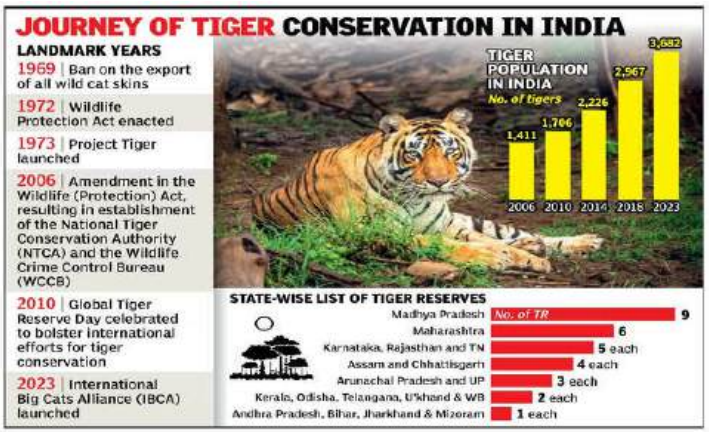
- **National Referral Centre for Wildlife:** Established in Junagadh to enhance wildlife healthcare, disease monitoring, and research.
- **Asiatic Lion Population Estimation 2025**: 16th census announced to track lion numbers, with focus on Barda Wildlife Sanctuary expansion.
- **Centre for Human-Animal Conflict Mitigation:** Set up at SACON, Coimbatore, to develop rapid response strategies and tracking systems.
- **New Conservation Initiatives:** Project Gharial, Great Indian Bustard Conservation Plan, and Tiger Conservation outside reserves launched.
- **AI & Technology in Wildlife Protection**: BISAG-N & WII collaboration for AI-based wildlife tracking, geospatial mapping, and forest fire monitoring.

Standing Committee of NBWL: A smaller body under NBWL for project clearances related to protected areas.

Functions and Powers of NBWL:

- **Wildlife Conservation Policy:** Advises the Central Government on wildlife protection strategies.
- **Approval for Projects in Protected Areas:** Mandates clearance for any development projects within PAs, Tiger Reserves, and wildlife habitats.
- **Boundary Alterations in Protected Areas:** No changes to PA boundaries without NBWL recommendation.
- **Tourism Regulation:** Approves construction of tourist lodges and eco-tourism activities in PAs.
- **Mitigation of Human-Wildlife Conflict:** Develops strategies to reduce habitat destruction and human-animal interactions.
- **Wildlife Health & Research:** Supports scientific research, conservation programs, and AI-based wildlife monitoring.

130. MADHAV NATIONAL PARK



Context:

Madhav National Park in Madhya Pradesh has been declared India's **58th Tiger Reserve** and the **9th in the state**.

About Madhav National Park: Location: Shivpuri district,

Chambal region, Madhya Pradesh. **Established:** 1958. **Area Covered: 354 sq km**.

Flora and Fauna: Dry deciduous forest with **teak, sal, and dhok** trees; home to **tigers, leopards, wolves, chinkara, nilgai, and crocodiles**.

Historical Significance: Named after **Maharaja Madhav Rao Scindia**; earlier used as a **royal hunting ground**.

Reintroduction of Tigers: Started in **2023**, with three tigers (including two females) introduced.

Major Attraction: Sakhya Sagar Lake, George Castle, and eco-tourism activities.

What is a Tiger Reserve?

- A **Tiger Reserve** is a protected area meant for the conservation of **Bengal tigers** and their ecosystem.
- It falls under **Project Tiger (1973)**, a centrally sponsored scheme by the **National Tiger Conservation Authority (NTCA)**.
- These reserves ensure **tiger population growth, habitat conservation, and human-wildlife conflict mitigation**.

Procedure to Designate a Tiger Reserve in India

- **Proposal & Identification:-**The **State Government** proposes a region based on the **viability of the tiger population, habitat conditions, and biodiversity value**.
- **Approval by the National Tiger Conservation Authority (NTCA):-**NTCA **evaluates the proposal**, considering factors such as **tiger presence, ecological balance, and community impact**.
- **Central Government Notification:-** After NTCA's approval, the **Union Ministry of Environment, Forest, and Climate Change (MoEFCC)** declares the area as a **Tiger Reserve under Section 38V of the Wildlife Protection Act, 1972**.

Core & Buffer Zone Demarcation:

The reserve is divided into:

- **Core Zone:** Strictly protected for wildlife, with **zero human disturbance**.
- **Buffer Zone:** Allows **regulated human activities** to support conservation while considering local livelihoods.

Conservation Measures & Monitoring:- Regular **population surveys, habitat management, and anti-poaching measures** are implemented.

- NTCA oversees monitoring through **the M-STrIPES (Monitoring System for Tigers – Intensive Protection and Ecological Status) program**.

131. SATKOSIA TIGER RESERVE

Context:

Satkosia Tiger Reserve (STR) in Odisha faces human-wildlife conflict as 674 families have been relocated from forest areas under the tiger conservation initiative. **Despite resettlement efforts**, STR remains **one of the four notified tiger reserves in India without a single tiger**.

About Satkosia Tiger Reserve:

Location: Spans Angul, Cuttack, Boudh, and Nayagarh districts in Odisha.

Established: 2007, by merging Satkosia Gorge Sanctuary (1976) and Baisipali Wildlife Sanctuary (1981).

Total Area: 1,136.70 sq. km.

Geographical Significance: A **transitional zone** between **Eastern Ghats and Deccan Plateau**, promoting rich biodiversity. **Fauna:** Previously home to **12 tigers (2007)**, but the **2022 census found none**; shelters **elephants, leopards, mugger crocodiles, wild dogs, and 200+ bird species**.

Flora: Houses **400+ plant species**, including **Sal, Mahua, Bamboo, and medicinal plants**.

Ramsar Site: Recognized as a **wetland of international importance**.

Tiger Reintroduction: Initiated in **2018** with two tigers from Madhya Pradesh; **failed due to poaching and mismanagement**.

Human Settlements: 234 villages in the surrounding impact zone, creating conflicts over land and resources.

National Tiger Conservation Authority (NTCA)::

The **National Tiger Conservation Authority (NTCA)** is a **statutory body** under the **Ministry of Environment, Forest and Climate Change (MoEFCC)**, responsible for **tiger conservation and habitat management in India**.

Established In: 2006, under **Section 38L of the Wildlife Protection Act, 1972** (Amendment 2006).

Chaired By:

- **Union Minister of Environment, Forest & Climate Change**.
- **Vice-Chairperson:** Minister of State (MoEFCC).
- **Members:** Includes **experts in wildlife, ecology, and environmental law**.

Structure of NTCA:

- **Chairperson:** Minister of Environment, Forest & Climate Change.
- **Vice-Chairperson:** Minister of State (MoEFCC).
- **Members: -Secretary (MoEFCC), Director General of Forests & Special Secretary, Chief Wildlife Wardens from Tiger Reserve States, Experts from Wildlife, Tribal Affairs, and Environmental Law, NGO Representatives in Wildlife Conservation**

Functions & Powers of NTCA:

- **Implementation of Project Tiger:** -Oversees **funding and management** of **all 58 tiger reserves**.
- **Approval of Tiger Conservation Plans (TCPs):** Ensures **scientific management** of tiger habitats.
- **Habitat Protection & Corridor Development:**-Focuses on **minimizing human-wildlife conflict** and **expanding buffer zones**.
- **Monitoring & Evaluation:** -Conducts **tiger population assessments every four years** using **M-STrIPES technology**.
- **Human-Wildlife Conflict Mitigation: -Relocation of villages** from core zones under **voluntary resettlement programs**.
- **Legal Authority:** -Empowers states to **declare, demarcate, and manage tiger reserves**.
- **Public Awareness & Capacity Building:** -Promotes **eco-tourism, community involvement, and anti-poaching initiatives**.

132. SMOOTH-COATED OTTER

Context:

Smooth-coated otters **will return to the Delhi Zoo after a 20-year absence**, as part of an **animal exchange program with the Surat Zoo**.

About the Smooth-Coated Otter:

- **Scientific Name:** *Lutrogale perspicillata*
- **Habitat:** Found in **wetlands, rivers, lakes, mangroves, and estuaries** across **South and Southeast Asia**.

- **Distribution:** Native to **India, Bangladesh, Nepal, Sri Lanka, Myanmar, Thailand, Malaysia, and Indonesia**.
- **Physical Characteristics:**
  - **Larger than other otter species**, with **shorter fur and a flattened tail**.
  - Has **webbed feet** for efficient swimming.
  - Primarily **carnivorous**, feeding on **fish, crustaceans, and amphibians**.

IUCN Status & Conservation::

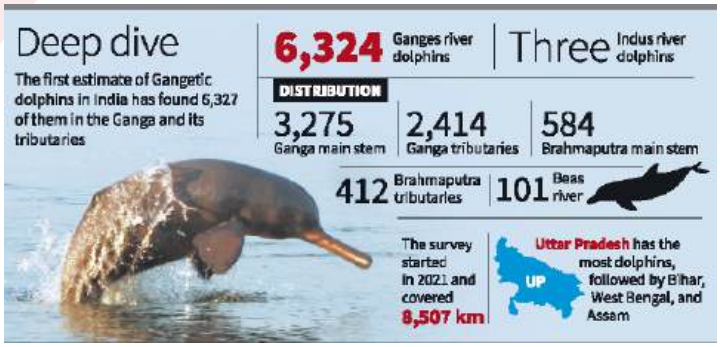
- **IUCN Red List: Vulnerable (VU)** due to **habitat destruction, poaching, and water pollution**.
- **CITES Listing: Appendix II**, restricting international trade.
- **Threats:**
  - **Habitat loss** due to **wetland degradation**.
  - **Illegal hunting for fur and pet trade**.
  - **Decline in fish population** impacting food availability.
- Conservation Measures:
  - **Protected under Schedule II of the Wildlife Protection Act, 1972 (India)**.
  - Conservation projects focusing on **wetland restoration and anti-poaching efforts**.

133. DOLPHIN SURVEY

Context:

A comprehensive survey under Project Dolphin (2020) estimated 6,327 Gangetic dolphins across eight Indian states.

The survey provides the **first systematic population estimate** of river dolphins in India, aiding conservation efforts.



About Dolphin Survey:

Survey Conducted By: Ministry of Environment, Forest & Climate Change **(MoEFCC)** under Project Dolphin (2020).

Conducted with support from **Wildlife Institute of India (WII)** and various state forest departments.

Survey Coverage:

- Covered 28 rivers **across eight states,** spanning 8,507 km.
- **Major river basins:** Ganga, Brahmaputra, and Indus.

Key Findings: Total Dolphins: 6,327 (6,324 Gangetic dolphins + 3 Indus dolphins).

About Gangetic Dolphin:

What is the Gangetic Dolphin?

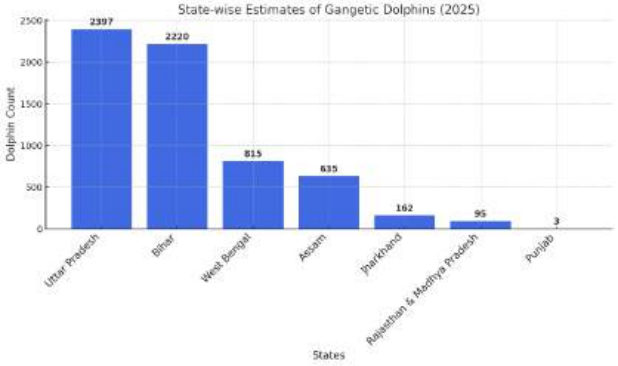
- A **freshwater river dolphin**, one of the **few river dolphins** in the world.
- Known as **"Susu"** due to the sound it makes while surfacing.

Rivers found in:

- **Ganga-Brahmaputra-Meghna** and **Karnaphuli-Sangu River systems** of **India, Nepal, and Bangladesh**.
- **Extinct in many parts** of its original range.

Key Features:

- **Blind dolphin:** Has **no lens in its eyes**, relies on echolocation for movement and hunting.



- **Feeds on fish** and prefers **counter-current systems** of main river channels.
- **Surfaces every 30-120 seconds** to breathe, as it cannot survive underwater.

IUCN Status & National Recognition:

- **IUCN Red List**: Endangered
- **Wildlife Protection Act, 1972**: Schedule I species (highest protection).
- **National Aquatic Animal of India** – Declared in **2009**.

134. GREAT WHITE SHARKS

Context:

A **20-year study in South Africa** reveals that the decline of Great White Sharks disrupted marine ecosystems, causing cascading food web imbalances.

About Great White Sharks:

- **Scientific Name:** *Carcharodon carcharias*

- **IUCN Status:** Vulnerable.
- **Habitat & Distribution:**
  - Found in **temperate coastal waters** (e.g., USA, South Africa, Australia, Japan).
  - **Migratory** - some travel to tropical waters but return to temperate zones for feeding.
- **Key Features:**
- **Adaptations**: Regional endothermy (warm-blooded), serrated teeth, torpedo-shaped body.
  - **Food Habits:**
    - Hunts seals, dolphins, fish; uses **ambush tactics** ("bite-and-wait").
  - **Reproduction:**
    - It is a **Viviparous animal** (give birth to live young instead of laying eggs) with 12-month gestation.
    - **Late maturity:** Females at 15–16 ft (age 12–18 years), males at 11–13 ft (age 10).
- **Ecological Role:**
  - **Top Predator:** Regulates prey populations (e.g., seals, mid-sized sharks).
  - **Indicator Species:** Health reflects marine ecosystem stability.
- **Study Findings:**
  - Decline in South Africa's False Bay led to **surge in seals/sevengill sharks**, causing fish/small shark populations to crash.

135. WOOLLY MICE

Context:

Scientists at **Colossal Biosciences** have genetically engineered **"woolly mice"** by editing specific genes to **mimic traits of the woolly mammoth**, such as thick, wavy fur and cold adaptation.

This experiment aims to **validate genetic modifications** for potential use in **reviving the extinct woolly mammoth**, but experts remain skeptical about its significance.

About Woolly Mice:

Genetically modified mice engineered to express mammoth-like traits, including **longer, wavier hair and cold adaptation features**.

- Created as a **model organism** to study genetic modifications that could be applied to **de-extinct species like the woolly mammoth**.

Who Created Woolly Mice and How?

Developed by: **Colossal Biosciences**, a US-based genetic

engineering company.

Genetic Modifications: Scientists **edited seven key genes** linked to **hair length, texture, colour, and metabolism**, found in **woolly mammoths and their closest relatives, Asian elephants**.

Methodology:

- Compared mammoth genomes with **Asian elephants** to identify **cold-adaptation genetic variants**.
- Introduced these **gene edits** into laboratory mice using **CRISPR gene-editing technology**.

Key genetic edits:

- **FGF5 gene**: Regulated **hair growth**, producing **three times longer fur**.
- **MC1R gene**: Altered **coat colour** to **golden**, similar to mammoths.
- **FABP2 gene**: Modified **lipid metabolism**, potentially increasing **cold tolerance**.

Significance of Woolly Mice Experiment

- **Proof of Concept for De-Extinction**: Demonstrates that **specific genetic traits** from extinct animals can be **replicated in living organisms**.
- **Advances Genetic Engineering**: Provides insights into **complex gene interactions** and their role in **physical adaptations**.
- **Potential for Biodiversity Conservation**: Suggests that **gene editing** could be used to **prevent extinctions** and enhance species' adaptation to **climate change**.
- **Model for Studying Cold Adaptation**: Helps scientists understand how **genes influence thermoregulation**, which could benefit **wildlife conservation** in extreme climates.

136. MARBURG VIRUS DISEASE

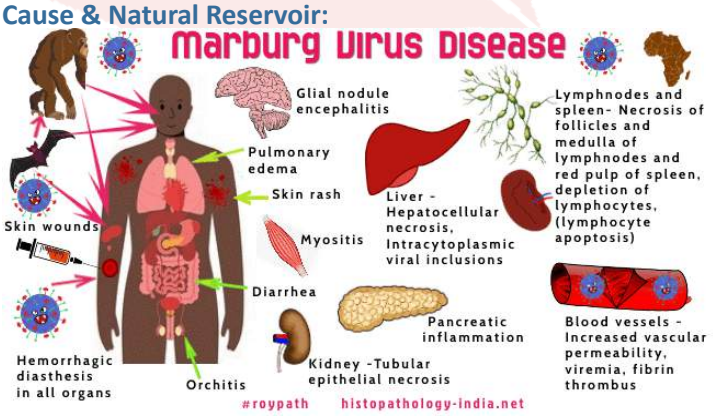
Context:

Tanzania declared the end of its second Marburg Virus Disease (MVD) outbreak after 42 days with no new cases.

About Marburg Virus Disease (MVD):

Origin of MVD: First identified in **1967 in Marburg, Germany**, when laboratory workers were exposed to infected **green monkeys from Uganda**.

Cause & Natural Reservoir:



Causative Agent: **Marburg virus (MARV)**, a highly infectious **RNA virus** belonging to the **Filoviridae family**, similar to **Ebola**.

Primary Reservoir: The **African fruit bat (Rousettus aegyptiacus)** acts as a natural host, harboring the virus without showing symptoms.

Modes of Transmission:

Zoonotic Transmission: Humans contract the virus through direct or prolonged exposure to bat-inhabited caves or contact with infected animals.

Human-to-Human Spread:

- Direct contact with **blood, saliva, vomit, urine, or other bodily fluids** of infected individuals.
- Indirect transmission through **contaminated surfaces, clothing, or medical equipment**.

Symptoms:

- **Early stage:** Fever, chills, severe headache, muscle pain, rash, nausea, and diarrhea.
- **Advanced stage:** Liver failure, shock, internal bleeding, and multi-organ failure.

Treatment:

- No **specific cure or vaccine**.
- Supportive care includes **fluid replacement, oxygen therapy, and blood transfusions** to improve survival chances.

About Tanzania:

- **Location:** East Africa, south of the Equator.
- **Capital:** Dodoma (largest city: Dar es Salaam).
- **Neighbouring Countries:** Uganda, Kenya (north), Mozambique, Malawi, Zambia (south), Rwanda, Burundi, and DR Congo (west).

Geographic Features:

- **Mountains:** Home to **Mount Kilimanjaro (5,895m)**, Africa's highest peak.
- **Rivers:** Drains into major rivers **Nile, Congo, Zambezi**, and Indian Ocean rivers **Rufiji, Ruvuma, Pangani**.
- **Lakes:** Shares **Lake Victoria, Lake Tanganyika, and Lake Nyasa**.
- **Rift Valleys:** Hosts parts of the **Great Rift Valley**, forming deep depressions with lakes.

137. BIOSAARTHI MENTORSHIP INITIATIVE

Context:
Union Minister unveiled the BioSaarthi Mentorship Initiative at the 13th Foundation Day of BIRAC, highlighting India's rapid rise in the global bioeconomy.

About BioSaarthi Mentorship Initiative:
What is BioSaarthi? A **structured global mentorship program** aimed at nurturing India's emerging **biotech startups** through expert guidance and capacity building.

- **Ministry Involved:** Ministry of Science and Technology, Government of India.
- **Implementing Agency:** Biotechnology Industry Research Assistance Council (BIRAC) under the Department of Biotechnology (DBT).
- **Objective:** To **strengthen India's** biotechnology ecosystem by supporting startups, fostering innovation, and promoting global competitiveness through mentorship.

Key Features

- **Six-Month Cohort Model:** Structured sessions for selected startups with dedicated mentor-mentee engagements.
- **Global Mentor Pool:** Involvement of overseas experts, especially from the Indian diaspora, volunteering to support India's innovation ecosystem.
- **Startup-Centric Approach:** Personalized mentoring to address entrepreneurial challenges in biotech, including R&D, scaling, regulation, and funding.
- **Innovation Ecosystem Linkage:** Promotes collaboration between industry, academia, and government institutions.
- **Nationwide Outreach:** Complements initiatives like BioE3 (Biotech for Economy, Employment, Environment) for inclusive sectoral growth.

138. DARE2ERAD TB INITIATIVE

Context:
The Department of Biotechnology has completed sequencing 10,000 TB genome samples under the Dare2eraD TB initiative.

About Dare2eraD TB Initiative:
What it is:: Data-Driven Research to Eradicate TB (Dare2eraD TB) is a flagship program using genome sequencing to tackle drug-resistant tuberculosis in India.

Launched in: Launched on **World TB Day, March 24, 2022**.
Ministries/Organizations involved: Led by the **Department of Biotechnology (DBT)** under **Ministry of Science & Technology**, in collaboration with **ICMR** and **CSIR**, along with the Indian Tuberculosis Genomic Surveillance Consortium (InTGS).

Aims of the Initiative:

- Conduct whole genome sequencing (WGS) of **32,200 TB strains** from active TB cases.
- Establish a **biorepository** of clinical Mycobacterium tuberculosis strains.
- Map genetic diversity and correlate with **treatment outcomes**.
- Study **household transmission dynamics** and community-level spread.
- Provide **data-driven public health recommendations**.

Key Features:

- Multi-laboratory network collaboration with **RePORT India Consortium** and **National TB Elimination Program**.
- Sequencing and analysis **at top institutes:** ICGEB (Delhi), CCMB (Hyderabad), NIBMG (Kalyani), NIRT (Chennai), and analysis at NII (Delhi).
- Data storage at the **Indian Biological Data Centre (RCB, Faridabad)**.
- Genome data integrated with epidemiological findings for actionable interventions.

Achievements So Far:

- **10,000** genome samples sequenced by March 2025 (1/3rd target).
- **7% samples found resistant to single-drug therapy**.

139. REVISED LIVESTOCK HEALTH AND DISEASE CONTROL PROGRAMME (LHDCP)

Context:
The Union Cabinet approved the revision of the Livestock

Health and Disease Control Programme (LHDCP) with an outlay of ₹3,880 crore for 2024-26 to enhance livestock disease control.

A new component, **Pashu Aushadhi,** has been introduced to provide affordable generic veterinary medicines through PM-Kisan Samriddhi Kendra and cooperatives.

About Revised Livestock Health and Disease Control Programme (LHDCP):

What is LHDCP?

- A **centrally sponsored scheme** aimed at improving **livestock health** through **vaccination, disease control, and veterinary infrastructure enhancement**.
- It ensures higher productivity, economic growth for farmers, and disease prevention in livestock.

Developed By: Department of Animal Husbandry & Dairying.

Aim:

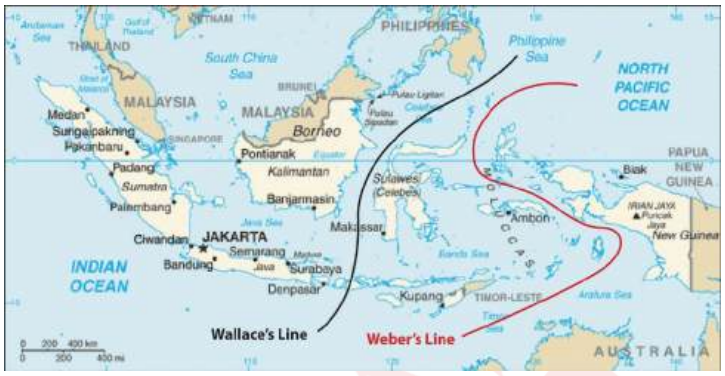
- To **prevent, control, and eradicate major livestock diseases** through **vaccination, surveillance, and veterinary services**.
- To improve **veterinary healthcare accessibility** via **Mobile Veterinary Units (MVUs)**.

Diseases Covered: Foot and Mouth Disease (FMD), Brucellosis, Peste des Petits Ruminants (PPR), Classical Swine Fever (CSF), Lumpy Skin Disease (LSD), Anthrax, Rabies, and other livestock diseases.

Key Features:

- **National Animal Disease Control Programme (NADCP):** Focuses on **FMD and Brucellosis** eradication through mass vaccination.
- **Critical Animal Disease Control Programme (CADCP):** Targets **PPR and CSF** through 100% vaccination coverage.
- **Mobile Veterinary Units (MVUs):** Doorstep veterinary care through **customized vehicles with diagnostic and treatment facilities**.
- **Pashu Aushadhi Initiative:** ₹75 crore allocated for providing **affordable generic veterinary medicines**.
- **Strengthening Veterinary Infrastructure:** Upgrading **veterinary hospitals, dispensaries, and diagnostic labs**.
- **Surveillance & Disease Reporting:** Strengthening **real-time disease monitoring** via the Information Network for Animal Productivity and Health (INAPH).
- **Public Awareness & Capacity Building:** Training farmers and veterinarians on disease prevention and biosecurity measures.
- **Central-State Fund Sharing:** 60:40 for states, 90:10 for Northeast & Himalayan states, 100% for UTs.

The Wallace Line



Context:

The Wallace Line, first identified by Alfred Russel Wallace, explains species distribution between Asia and Australia, with new studies refining our understanding of its evolutionary significance.

About the Wallace Line:

What is the Wallace Line?

A **biogeographical boundary** that **separates the eco-zones of Asia and Australia**. Identified by **Alfred Russel Wallace in 1863**, it runs between **Bali and Lombok**, and continues north through the Makassar Strait between Borneo and Sulawesi.

Formation of the Wallace Line:

- **Result of continental drift:** Australia **split from Antarctica and drifted northward**, colliding with **Asia around 35 million years ago**.
- This movement **formed deep-water channels** that still **act as barriers**, preventing species migration.
- During the **Pleistocene Epoch**, land bridges emerged due to **lower sea levels**, yet the **deep waters between Asia and Australia maintained the boundary**.

Uniqueness of the Wallace Line:

- **Sharp distinction in species:** To the **west**, Asiatic species like **tigers and elephants** dominate, while to the **east**, Australian fauna such as **kangaroos and marsupials** thrive.
- **Narrow geographical divide:** Despite being just **20 km apart**, islands on either side have **distinct biodiversity**.
- **Birds and mammals** are heavily influenced, with **few species crossing the line**, while **marine species remain unaffected** due to the **high connectivity of ocean ecosystems.**

Significance of the Wallace Line:

- **Supports the theory of evolution** by showing how geographical barriers drive species diversification.
- **Essential for conservation**: Understanding species migration helps predict biodiversity responses to habitat loss and climate change.
- **Highlights the impact of continental drift** on global ecosystems and the role of natural barriers in shaping evolution.

140. NATIONAL GREEN HYDROGEN MISSION

Context:

The Government of India has **sanctioned five pilot projects** for using **hydrogen in buses and trucks** under the National Green Hydrogen Mission.

These projects will deploy **37 hydrogen-powered vehicles** across **10 major routes**, supported by **₹208 crore in funding**.

About National Green Hydrogen Mission:

What is the Green Hydrogen Mission?

A **flagship initiative** aimed at making India a **global hub** for **green hydrogen production, usage, and export**.

Focuses on **decarbonization, clean energy adoption, and reducing fossil fuel dependency**.

Launched In: 4th January 2023

Ministry: Ministry of New and Renewable Energy (MNRE)

Budget Outlay: **₹19,744 crore** (2023-2030)

Aim of the Mission:

- **Develop India as a global green hydrogen hub**.
- **Reduce carbon emissions** and **fossil fuel imports**.
- Promote **clean energy transition** and self-reliance (Aatmanirbhar Bharat).
- **Enable India's leadership in green hydrogen technology and markets**.

Key Features of the Mission:

- **Demand Creation:** Government to mandate **minimum green hydrogen consumption** for key industries.
- **SIGHT Programme:** Financial incentives for **electrolyser manufacturing** and **hydrogen production**.
- **Green Hydrogen Hubs:** Development of **two large-scale hubs** for production and usage.
- **Policy Support:** Waiver of **interstate transmission charges** for renewable energy use in hydrogen production.
- **Infrastructure Development:** Support for **pipelines, tankers, and storage facilities**.
- **Research & Development (SHIP):** Public-private collaboration for hydrogen technology advancements.
- **Skill Development:** Industry-focused **training programs** in collaboration with MNRE.
- **International Cooperation:** Partnerships for **hydrogen technology transfer and exports**.

141. WHITE HYDROGEN

Context:

France has discovered the world's largest white hydrogen deposit in the Moselle region, estimated at 46 million tons, valued at $92 trillion.

Found beneath the soil of **Folschviller in the Moselle region**.

About White Hydrogen: What it is: White hydrogen is naturally occurring pure hydrogen found underground, formed due to geological reactions. It emerges when minerals react with water deep beneath the Earth's crust.

Key Features:

- **Zero-emission:** It occurs naturally without requiring industrial production, avoiding CO_2 emissions.
- **Low cost:** White hydrogen production costs around $1 per kilogram, making it highly affordable.
- **Renewable source:** White hydrogen constantly regenerates within the Earth, unlike exhaustible fossil fuels.
- **Combustion output:** When used as fuel, white hydrogen produces only water vapor after combustion.

Significance:

- **Clean energy alternative:** Can reduce reliance on fossil fuels for heavy industries like aviation, shipping, and steel.
- **Energy security:** Potential game-changer for energy independence in hydrogen-importing countries.
- **Cost-effectiveness:** Could significantly lower global hydrogen prices compared to synthetic alternatives.
- **Sustainability:** Supports climate action with its low carbon footprint and renewable nature.

Limitations:

- **Exploration difficulty:** Hard to locate deposits due to specific geological conditions.
- **Environmental risks:** Potential hydrogen leakage could disrupt greenhouse gas reduction efforts.

- **Storage and transport challenges:** Requires extremely low liquefaction temperatures (-253°C) and robust pipelines.
- **Regulatory barriers:** Absence of clear guidelines for extraction and safe handling.

142. HYDROGEN-POWERED TRUCK TRIALS

Context:
Union Minister Pralhad Joshi flagged off **India's first fleet of hydrogen-powered heavy-duty truck trials in New Delhi.** The trials align with the National Green Hydrogen Mission (NGHM), reinforcing India's commitment to **clean mobility and energy security**.

About Hydrogen-Powered Trucks::
Hydrogen-powered heavy-duty trucks use fuel cell technology, converting hydrogen into electricity to power vehicles. These trucks offer a zero-emission alternative to diesel-powered transportation.

Launched By::
- **Ministry of New and Renewable Energy (MNRE)**.
- Supported by **Indian Oil Corporation Limited (IOCL)**.

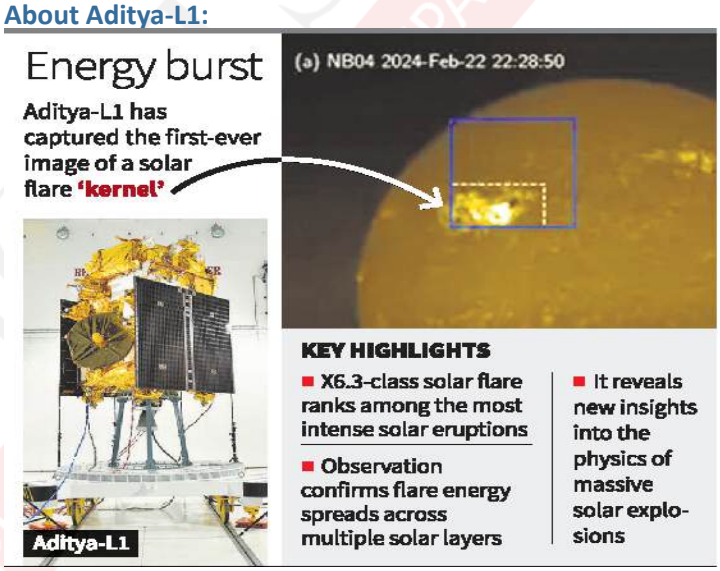
Key Features
- **Zero Emissions**: **No carbon emissions**, reducing air pollution and dependency on fossil fuels.
- **Long Range & Fast Refueling**: Hydrogen-powered trucks offer a **longer driving range** and **quicker refueling times** compared to battery-electric vehicles.
- **Operational Routes**: Initially deployed on the **Faridabad–Delhi NCR** and **Ahmedabad–Surat–Vadodara** routes.
- **Hydrogen Refuelling Stations**: IOCL is setting up **hydrogen refuelling infrastructure** in **Faridabad, Vadodara, Pune, and Balasore**.
- **Energy Security**: Reduces India's **oil import dependency**, supporting **clean energy transition**.

Part of::
- National Green Hydrogen Mission **(NGHM)**.
- India's **Hydrogen Mobility Initiative** to promote sustainable transport.
- Government's **Net-Zero Emission Goals for 2070**.

143. SOLAR FLARE CAPTURED BY ADITYA L1 MISSION:

Context:
ISRO's Aditya-L1 mission captured the first-ever image of a solar flare **'kernel'**, marking a significant breakthrough in solar physics research.
- The **Solar Ultraviolet Imaging Telescope (SUIT)** onboard Aditya-L1 recorded the brightening in the Near Ultraviolet (NUV) band, offering new insights into solar flare energy dynamics.

About Aditya-L1:



What is Aditya-L1?
- **India's first space-based solar mission**, launched to study the **Sun's outer layers and solar activity**.
- Positioned at **Lagrange Point L1**, about **1.5 million km from Earth**, enabling **continuous solar observation** without eclipses.

Launched In: **September 2, 2023**, aboard **PSLV C-57** rocket. Successfully placed in **halo orbit around L1 on January 6, 2024**.

Aim of the Mission:
- Study **solar dynamics, including flares, coronal mass ejections (CMEs), and magnetic field variations**.
- Observe **solar radiation and its impact on Earth's climate and space weather**.

What are Solar Flares?
- **Sudden bursts of intense energy from the Sun's atmosphere**, caused by **magnetic field interactions**.
- Release **X-rays, ultraviolet light, and charged particles**, which can **disrupt satellite communications and power grids on Earth**.

How Aditya-L1 Studies Solar Flares?

- **SUIT (Solar Ultraviolet Imaging Telescope):** Captures UV images of the lower solar atmosphere.
  - **SoLEXS (Solar Low Energy X-ray Spectrometer) & HEL1OS (High Energy L1 Orbiting X-ray Spectrometer):** Monitor **solar X-ray emissions** to detect flares.
  - **Continuous observation from L1** provides a **real-time picture of solar activity**.

About Solar Ultraviolet Imaging Telescope (SUIT):

What is SUIT?

- **A specialized telescope on Aditya-L1**, developed by **Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune**.
- Captures **high-resolution images in 11 different NUV wavebands**, covering the **photosphere and chromosphere**.

Recent Observations:

- SUIT detected an **X6.3-class solar flare**, one of the **most intense solar eruptions recorded**.
- Observed brightening in the **Near Ultra-Violet (NUV) band (200-400 nm)**, a wavelength never studied in such detail before.
- Provided **clear evidence of energy transmission from the solar surface to the corona**.

Significance of the Discovery:

- **Validates long-standing theories** about solar energy transfer.
- Helps **predict solar storms and space weather** to **protect satellites and power grids**.
- Advances **global solar physics research**, enhancing our understanding of **the Sun's impact on Earth's climate**.

144. BLUE GHOST

Context:

Firefly Aerospace's Blue Ghost successfully landed upright on the Moon, becoming the second private spacecraft to achieve this feat.

About Blue Ghost:

Blue Ghost is a **privately developed lunar lander** designed for **scientific exploration and technology demonstration** on the Moon. The Mission is part of **NASA's Commercial Lunar Payload Services (CLPS)** program, which partners with private companies to advance lunar exploration.

Developed By: Firefly Aerospace, a Texas-based private space company.

Mission Aim:

- **Scientific Research:** Conduct lunar soil analysis and test radiation-tolerant technology.
- **Navigation Experiments:** Evaluate global satellite navigation feasibility on the Moon.

- **Artemis Program Support:** Help develop cost-effective solutions for future human missions.

Key Features:

- **Landing Location:** Mons Latreille, a volcanic formation in the **Mare Crisium** region.
- **Size:** Comparable to a **hippopotamus** (compact but robust design).
- **Instruments:** Equipped with **10 scientific payloads**, including lunar dust analysis tools.
- **Operational Timeline:** Designed to function for **one full lunar day** (14 Earth days).
- **Eclipse & Sunset Imaging:** Will capture **a total lunar eclipse on March 14** and a **lunar sunset on March 16**.

1st Private Moon Mission:

- Intuitive Machines' Odysseus became the first private spacecraft to land on the Moon (February 2024), but it landed **sideways**.
- **Blue Ghost** is the **first commercial lander** to achieve a **stable and upright** lunar landing, improving mission success rates.

145. MISSION 300

Context: The World Bank and the African Development Bank (AfDB), along with key partners, have launched Mission 300, an ambitious initiative to electrify 300 million people in Sub-

Saharan Africa by 2030.

About Mission 300:

What is Mission 300? Mission 300 is a large-scale electrification initiative aimed at **providing electricity to 300 million people in Sub-Saharan Africa by 2030** through grid expansion, mini-grids, and off-grid solar solutions.

Launched In: 2025

Launched By: World Bank, African Development Bank (AfDB), in collaboration with Rockefeller Foundation, Global Energy Alliance for People and Planet (GEAPP), Sustainable Energy for All (SE4ALL), and Energy Sector Management Assistance Program (ESMAP).

Aim: To provide **affordable, reliable, and sustainable electricity** to 300 million people in Africa, accelerating the transition to **clean energy solutions**.

Key Features of Mission 300:

- **Multi-Sector Collaboration:** Partners with governments, private investors, and multilateral banks to drive large-scale electrification.
- **Hybrid Electrification Model:** Expands national grids while deploying mini-grids and off-grid solar for rural and remote areas.
- **Digital & Real-Time Monitoring:** Implements digital tracking and mobile-based data collection for progress verification and accountability.
- **Financial & Policy Frameworks:** Leverages public-private financing and strengthens regional power transmission networks.
- **Social Impact & Inclusion:** Promotes women-led energy enterprises and generates employment through energy sector expansion.

NOTE: Focus more on initiative name, aim, and launched by.

MAPPING:

1. SUDAN:

Context:

Indian Coast Guard Ship Sachet departed for Sudan, carrying over two tons of life-saving medicines, including anti-cancer drugs, as part of India's humanitarian aid efforts.

About Sudan:

- **Located in:** Northeastern Africa, Sudan is the **third-largest country in Africa.** It lies **adjacent to the Sahara in the north** and stretches southward to the forests of West Africa and the Congo River basin.
- **Capital:** Khartoum, situated at the confluence of the **White Nile and Blue Nile** rivers.
- **Neighbouring Countries:** Egypt, Eritrea, Ethiopia, South Sudan, Central African Republic, Chad, Libya and the Red Sea.

Geological Features:

River Systems: Nile River system dominates Sudan's geography, with its two major tributaries:

- **White Nile:** Flows from **Lake Victoria**, through South Sudan into Sudan.
- **Blue Nile:** Originates from the **Ethiopian Highlands**, merging with the White Nile at **Khartoum**.

Seasonal Rivers (wadis) drain into the Nile but often dry up in arid regions.

Mountain Ranges & Plateaus:

- Marrah Mountains (Darfur Plateau): The highest elevation (~3,000 meters), home to volcanic highlands.
- Red Sea Hills: Located in northeastern Sudan, forming an uplifted escarpment along the Red Sea.
- Nuba Mountains: Situated in south-central Sudan, rising abruptly from the plains.

2. ZAMBIA

Context:

The Government of India has secured a 9,000 sq. km block in Zambia for copper and cobalt exploration, marking a strategic move in securing critical minerals.

The project will be led by the Geological Survey of

India **(GSI),** supporting India's clean energy and EV battery industries.

About Zambia:
Location: Landlocked country in Southern Africa.
Capital: Lusaka.

Neighbouring Countries:
Borders Angola, Democratic Republic of the Congo (DRC), Tanzania, Malawi, Mozambique, Zimbabwe, Botswana, and Namibia.

Geographic Features:
- **Major Rivers** – Zambezi River, Kafue River, Luangwa River
- **Mountains** – Nyika Plateau, Mafinga Hills
- **Minerals** – Rich in copper, cobalt, nickel, and uranium

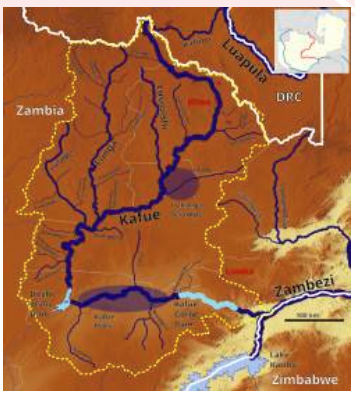
Copper Mine in News:
- **Northwestern Province**: India's **newly acquired copper exploration block** is located here.
- Zambia is the **7th largest copper** producer globally.
- **Chile** is the world's largest producer of copper.

About Increasing Demand for Copper:
Why is Copper Demand Rising?
- **Growth of EV batteries** and **clean energy technologies** requires large amounts of copper.
- **Infrastructure development, defense, and advanced electronics** fuel global demand.
- **Projected supply shortage by 2035** is driving countries to secure copper reserves.

India's Copper Status & Existing Mines:
- **India's copper production** has declined by 8% since 2018-19.
- **Hindustan Copper Ltd (HCL)** is the only **government-owned producer**.

Key Copper Mines in India:
- **Malanjkhand (Madhya Pradesh)**: Largest open-pit copper mine.
- **Khetri (Rajasthan)**: Key underground copper mine.
- **Singhbhum Belt (Jharkhand)**: One of the oldest copper-producing regions.

3. ZAMBIA



Context:
A tailings dam collapse at a Chinese-owned copper mine in northern Zambia has led to an acid spill contaminating the Kafue River.

About Zambia:
- **Location:** South-Central Africa, landlocked.
- **Capital:** Lusaka.
- **Neighbouring Countries:** Angola, Democratic Republic of Congo, Tanzania, Malawi, Mozambique, Zimbabwe, Botswana, Namibia.

Geographic Features:
- **Rivers**: Zambezi, Kafue, Luangwa, Luapula**.**
- **Mountains**: Nyika Plateau, Mafinga Hills (highest at 2,300m).

Lakes: Lake Tanganyika: One of the world's deepest and oldest freshwater lakes, shared with neighbouring countries.

About Kafue River:
Origin: The Kafue River originates near the **Zambia-DRC border**, flowing southward through central Zambia.

Tributaries: Major tributaries include **Lukanga Swamp**, which regulates water flow, and **Lunga River**, which enhances the river's volume.

Mouth: The river joins the **Zambezi River near Chirundu**, forming an important confluence.

Major Cities Along Its Course: The river passes through key cities like Kitwe, Lusaka, Kafue Town, Mazabuka, and Chirundu.

4. NAMIBIA

Context:
Namibia has sworn in Netumbo Nandi-Ndaitwah as its **first female president**, becoming **Africa's second directly elected female** head of state. The first African nation to have a woman as the head of state through direct election was **Liberia**.

About Namibia:

Location: Situated on the southwestern coast of Africa.

Capital: Windhoek.

Neighbouring Nations: Borders Angola (north), Zambia (northeast), Botswana (east), South Africa (south), and the Atlantic Ocean (west).

Geographic Features:

Rivers: Permanent rivers include Kunene, Okavango, Zambezi, Mashi, and Orange River.

Mountains: Brandberg Mountain is the highest peak (2,573 meters).

Topographic Zones: Coastal Namib desert, Central Plateau, and the Kalahari region in the east.

Major Crops: Millets, maize, sorghum, and vegetables are cultivated in the northern fertile regions.

5. YEMEN

Context:

U.S. President Donald Trump ordered airstrikes on Houthi rebel-held areas in Yemen, resulting in 31 deaths, including civilians.

About Yemen:

Location: Southwestern corner of the Arabian Peninsula, strategically positioned at the entrance of the Red Sea.

Capital: Sanaa.

Neighbouring Countries:

- **Saudi Arabia (North)** and **Oman (East)**.
- **Borders the Red Sea, Gulf of Aden, and Arabian Sea**.

Geographic Features:

- **Mountains:** Hadhramaut Mountains, Haraz Mountains, and Sarawat Range.
- **Rivers:** Wadis (seasonal rivers), including Wadi Hadhramaut and Wadi Zabid.
- **Valleys:** Tihama Coastal Plain along the Red Sea coast.

About Houthi Rebels:

- A **Zaidi Shia rebel group** from **northern Yemen**, officially known as **Ansar Allah**.
- **Founded in the 1990s** as a **political and religious movement** opposing Saudi-backed Sunni influence.

6. DJIBOUTI

Context:

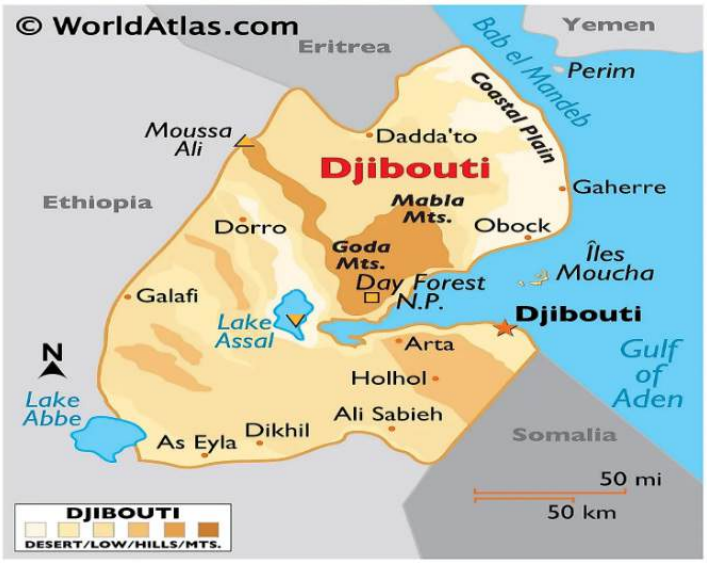
Over 180 migrants are missing after four boats sank between Djibouti and Yemen, highlighting the dangers of illegal migration routes in the Horn of Africa.

About Djibouti:

Located in: The Horn of Africa, at the junction of the **Red Sea and Gulf of Aden**.

Capital: Djibouti City, a major deepwater port and railhead to Addis Ababa (Ethiopia).

Neighbouring Countries: Eritrea, Ethiopia, Somalia and Gulf of Aden.



Geographical Features:

Mountains:

- **Mount Moussa (2,028m)**: Highest peak.
- **Day Forest**: One of Djibouti's **coolest regions**.

Lakes & Drainage:

- **Lake Assal (155m below sea level)**: Lowest point in Africa, highly saline.
- **Lake Abbe**: Located on the border with Ethiopia.
- **No permanent rivers**, only **seasonal streams and underground water sources**.

Geological Activity:

- Situated at the junction of the Red Sea, Gulf of Aden, and East African Rift.
- **High seismic activity**, with frequent tremors and volcanic eruptions, including **Ardoukoba volcano (1978)**.

7. TÜRKIYE

Context:

Over 1,100 people have been detained in Türkiye following mass protests sparked by the arrest of opposition candidate and Istanbul Mayor, causing widespread unrest across 55 provinces.

About Türkiye (Turkey):

Location: Türkiye is situated at the crossroads of **Asia and Europe**, acting as a bridge between both continents.

Capital: The capital city of Türkiye is **Ankara**, while **Istanbul** is the largest city and key seaport.

Neighbouring Nations: Greece, Bulgaria, Georgia, Armenia, Azerbaijan (Nakhchivan exclave), Iran, Iraq, and Syria.

Geographical Features:

Mountains:

- **Pontic Mountains:** Stretch along the Black Sea coast, reaching heights above 12,900 feet in the Kaçkar range.
- **Taurus Mountains:** Run parallel to the Mediterranean coast with peaks exceeding 11,000 feet.

- **Mount Ararat:** Highest peak at 5,165 meters, near the borders of Armenia and Iran.

Rivers:

Euphrates and Tigris Rivers: Major rivers flowing south into Syria and Iraq, forming part of the Tigris-Euphrates system.

Sakarya, Kızıl, and Yeşil Rivers: Important rivers flowing into the Black Sea and Aegean Sea.

Plateaus:

Anatolian Plateau: Central massif area, characterized by flat and gently sloping lands with volcanic peaks like Erciyes (3,916 meters).

8. BALOCHISTAN

Context:

India strongly rejected Pakistan's allegations linking it to the Jaffar Express train hijacking in Balochistan, calling them baseless.

About Balochistan:

Situated in: Western Pakistan, forming its largest and most sparsely populated province.

Borders: Iran (west), Afghanistan (northwest), Khyber Pakhtunkhwa and Punjab (northeast and east), Sindh (southeast), and the Arabian Sea (south).

Historical Background

- **Ancient Inhabitants:** Passed through the **Stone and Bronze Ages** and was part of **Alexander the Great's empire**.
- **Baloch Migration:** The Baloch people arrived in the **14th century CE**, integrating with existing populations.
- **Colonial & Post-Colonial Era:** Became part of British India and later **Pakistan in 1947**. Balochistan was formally declared a **separate province in 1970**.

Geographical Features:

Mountains:

- **Sulaiman Range:** Forms the eastern boundary, extending into Afghanistan.
- **Toba Kakar Range:** Located in the northwest, forming a natural border.
- **Makran, Kharan, Chagai Ranges:** Predominantly in western Balochistan, extending towards Iran.

Rivers & Water Bodies:

- **Hingol River:** Largest River in Balochistan, draining into the Arabian Sea.
- **Dasht River:** Major River in southwestern Balochistan.

Deserts & Plains:

- **Chagai & Kharan Deserts:** Arid, barren regions in northwestern Balochistan.
- **Makran Coastal Belt:** Extends along the Arabian Sea, known for **Gwadar Port** and strategic importance.
- **Bolan Pass:** A historically significant route connecting **Balochistan to Afghanistan**.

9. ARMENIA-AZERBAIJAN PEACE TREATY

Context:

Armenia and Azerbaijan have agreed to a peace treaty after nearly four decades of conflict over Nagorno-Karabakh, marking a historic resolution in the region.

About Nagorno-Karabakh:

Location: A landlocked mountainous region in the Caucasus between the Black Sea and the Caspian Sea.

Political Status:

- Internationally recognized as part of Azerbaijan but populated mostly by ethnic Armenians.
- It had an unrecognized separatist government closely linked to Armenia.

Historical Conflict:

- Declared **independence from Azerbaijan in the late 1980s**, leading to the **First Nagorno-Karabakh War (1988-1994)**.
- In **September 2023**, **Azerbaijan regained full control** after a **24-hour military operation**, forcing **120,000 ethnic Armenians** to flee.

About Armenia:

- **Location:** A landlocked country in the South Caucasus.
- **Border nations:** Turkey, Georgia, Azerbaijan, and Iran
- **Capital:** Yerevan.

Geographic Features:

- **Mountains**: **A highly mountainous country**, dominated by the **Lesser Caucasus Mountains.**
- **Highest Peak: Mount Aragats (4,090 meters)**.
- **Rivers:** The **Aras River**, forming the southern border with **Turkey and Iran**.
- **Lakes: Lake Sevan**, one of the **largest freshwater lakes in the region**.

About Azerbaijan:

- **Location:** Located in **eastern Transcaucasia**.
- **Bordered by:** Russia, Georgia, Armenia, Iran, and Caspian Sea.
- **Capital:** Baku, a major oil-rich city on the Caspian Sea coast.

Geographic Features:

- **Mountains:** The **Greater Caucasus Mountains** dominate the **north**, with **Mount Bazardüzü (4,466 meters)** as the highest peak.
- **Rivers:** Major rivers include the **Kura and Aras**, supporting **agriculture and hydroelectric power**.
- **Caspian Sea Coastline:** Azerbaijan has a **large coastline along the Caspian Sea**, playing a **crucial role in trade and energy exports**.

10. SURINAME

Context:

India has sent machinery worth $1 million to Suriname to support the growth of its passion fruit industry as part of the India–Suriname development partnership.

About Suriname:

Location: Suriname is located on the northern coast of South America. **Capital:** Paramaribo.

Neighbouring Nations: Borders the Atlantic Ocean (north), French Guiana (east), Brazil (south), and Guyana (west).

Geographical Features:

Mountains: Juliana Top (highest peak, 1,230 metres) located in the Wilhelmina Mountains.

Rivers: Major rivers include the Courantyne, Coppename, Suriname, and Maroni rivers flowing north into the Atlantic.

Plateaus and Plains:

New Coastal Plain with swampland and polders for agriculture.Zanderij Formation of rolling hills with savanna and tropical rainforests.

The southern region consists of highlands and the Sipaliwini Savanna near the Brazilian border.

11. KABUL

Context:

A key suspect in the **Abbey Gate bombing** during the U.S. withdrawal from **Afghanistan in August 2021** has been **captured and is en route to the United States** for prosecution.

About Kabul::

Location & Geography:

- **Country:** Afghanistan
- **Region:** Located in **eastern Afghanistan**, nestled in the Kabul River valley.
- **Elevation:** 1,790 meters (5,873 feet) above sea level.

Neighbouring Provinces: Borders **Parwan, Logar, Kapisa,** and **Nangarhar** provinces.

Geographic Features:

- **Major River: Kabul River**, a tributary of the Indus River.
- **Mountain Ranges:**
  - **Hindu Kush Mountains** (north and west of Kabul).
  - **Paghman Range** (southwest of the city).
- **Climate:** Continental climate with **cold winters and hot summers**.

Strategic and Economic Importance **of** Kabul**::**

- **Political and Administrative Centre:** Houses the Afghan government, international embassies, and diplomatic missions.
- **Economic Hub:** Major commercial and trade centre with industries in **textiles, food processing, and handicrafts**.
- **Transport & Trade:**
  - Central node in Afghanistan's **highway network** linking major cities.
  - Kabul International Airport serves as a key **aviation hub**.
- **Security & Geopolitical Challenges:**
  - Frequent **conflicts, insurgencies, and terrorist activities** impact stability.
  - **Strategic interest for global powers**, including India, China, Russia, and the U.S.

12. JAPAN

Context:

Japan is facing its biggest forest fire in three decades, with over 2,000 firefighters deployed to control the flames in Iwate Prefecture.

About Places in News:

Ofunato, Iwate Prefecture:

- **Location:** Situated in **northern Japan**, within **Iwate Prefecture** on the **Honshu Island**.
- **Habitat:** A coastal city with **dense forests, mountainous terrain, and a humid climate**.
- **Significance:** Known for **fisheries, tourism, and rich biodiversity**, now battling an unprecedented wildfire.

About Japan:

- **Located in:** East Asia, surrounded by the Pacific Ocean.
- **Capital:** Tokyo, one of the world's largest metropolitan areas.

Neighbouring Countries:

- **China:** Separated by the East China Sea to the southwest.
- **South Korea:** Lies across the Korea Strait and the Sea of Japan (East Sea).
- **North Korea:** Shares maritime boundaries via the Sea of Japan (East Sea).
- **Russia:** Separated by the La Perouse (Sōya) Strait, Sea of Okhotsk, and Kuril Islands dispute.
- **Taiwan:** Lies to the south across the Philippine Sea.

Japan is surrounded by multiple seas, including the **Sea of Japan, East China Sea, Pacific Ocean, and Sea of Okhotsk**, which define its maritime boundaries.

Geological Features:

- **Mountains & Volcanoes**
- **Over 80% of Japan** is covered in **mountains**.

- **Mount Fuji** (3,776 meters): The **highest peak** and a **dormant volcano**.
- Lies on the **Pacific Ring of Fire**, making it **prone to earthquakes and volcanic activity**.
- **Islands**
- **Main Islands**: Honshu, Hokkaido, Kyushu, Shikoku.
- **Other Notable Islands**: Ryukyu (including Okinawa), Izu, Bonin (Ogasawara), and Volcano Islands.
- **Rivers & Climate**
- **Major Rivers**: Shinano River (longest), Tone River, Kiso River.
- **Climate:** Varies from **humid subtropical in the south** to **cold continental in the north**.

13. SAGAR ISLAND

Context:
Authorities have taken multiple measures to **address coastal erosion and saline ingress** on Sagar Island**, West Bengal**, following directives from the National Green Tribunal (NGT).

About Sagar Island**:**
Geographical Location:

- Sagar Island (Sagardwip) is located in the **Bay of Bengal** at the confluence of the **Hooghly River and the Ganges Delta**.
- It is the **largest island** in the **Sundarbans region** and falls under **South 24 Parganas district, West Bengal**.

Environmental and Economic Significance:

Home to Gangasagar Mela, one of India's **largest religious pilgrimages**, attracting millions of devotees annually.

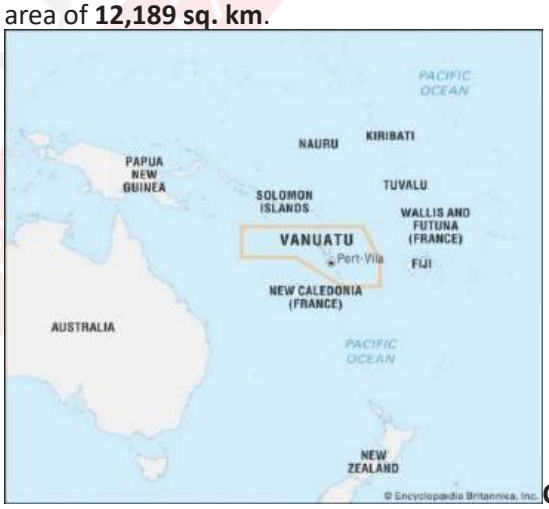
- **Vital fishing and agricultural hub**, sustaining the **coastal economy**.
- **Highly vulnerable to climate change**, facing **severe coastal erosion, salinity intrusion, and extreme weather events**.

14. VANUATU

Context:
Vanuatu **Prime Minister Jotham Napat revoked Lalit Modi's citizenship**, stating that acquiring Vanuatu's passport should not be a means to avoid extradition.

This move brings global attention to Vanuatu's Citizenship by Investment (CBI) program, which has been criticized for being exploited by individuals facing legal issues.

About Vanuatu**: Geographical Location::**

- Vanuatu is an **island nation** in the **South Pacific Ocean**, situated approximately 1,750 km east of Australia.
- It consists of **83 volcanic islands**, covering a total land area of **12,189 sq. km**.
- 

Capital: Port Vila
- **Neighbouring Countries: Australia, Fiji, New Caledonia,** and **Solomon Islands**.

Geographical Features

- **Major Islands:** Efate, Espiritu Santo, Malekula, Tanna, Pentecost.
- **Volcanic Activity:** Home to **active volcanoes like Mount Yasur (Tanna) and Ambae Volcano**.
- **Climate: Tropical climate** with frequent **cyclones and earthquakes** due to its location in the Pacific Ring of Fire.
- **Marine Ecosystem:** Rich in coral reefs, deep-sea fisheries, and marine biodiversity.

Political & Economic Structure

- **Government: Parliamentary Democracy** under a **Constitutional Republic**.
- **Official Languages:** Bislama, English, French.

- **Currency**: Vanuatu Vatu (VUV).

Key Economic Sectors:

- **Tourism:** Major contributor to GDP, with cruise ships and eco-tourism playing vital roles.
- **Agriculture:** Exports **coconuts, kava, cocoa, coffee, and beef**.
- **Fisheries & Forestry:** Support **local livelihoods** and trade.
- **Offshore Financial Services:** Vanuatu is known for **tax haven policies**, attracting foreign investments.

Vanuatu's Citizenship by Investment Program **(CBI):**

- Allows **foreign nationals to acquire citizenship** through **investment or financial contributions**.
- Often **used by individuals seeking visa-free travel or tax advantages**.
- **Lalit Modi Controversy:**
- Former IPL chairman **Lalit Modi's Vanuatu citizenship was revoked** by **Prime Minister Jotham Napat** on March 10, 2025.
- **Authorities cited concerns over using citizenship to evade extradition**.

15. NORTH SEA

Context:

A **rare collision** between an **oil tanker and a cargo ship** in the North Sea resulted in a **massive fire and injured 32 people**. A **large-scale rescue operation** was launched by the **UK Coastguard**, with firefighting vessels and emergency services responding to the incident.

About North Sea: North Sea is a marginal sea of the Atlantic Ocean, located between **Great Britain, Scandinavia, Germany, the Netherlands, Belgium, and France.**

Key Facts About the North Sea:

- **Area**: Approximately **570,000 square kilometers**.
- **Average Depth**: **95 meters**, with a **maximum depth of 700 meters** in the Norwegian Trench.
- **Connected Water Bodies**: Linked to the **Norwegian Sea, English Channel, and the Baltic Sea**.
- **Bordering Countries: United Kingdom**, **Norway**, **Denmark**, **Germany**, **Netherlands**, **Belgium**, **France**
- **Major Rivers Flowing into the North Sea: Rhine River** (Germany, Netherlands), **Elbe River** (Germany), **Thames River** (United Kingdom), **Seine River** (France), **Ems River** (Germany), **Meuse River** (Belgium, Netherlands)

Geographical and Economic Significance:

Maritime Trade & Shipping Hub: One of the **busiest maritime routes globally**, handling a **significant portion of European trade**.

Major ports: **Rotterdam (Netherlands), Hamburg (Germany), Antwerp (Belgium), and London (UK)**.

- **Rich in Natural Resources: Vast reserves of oil and natural gas**, making it a critical energy hub. Major offshore oil fields: **Brent, Ekofisk, and Forties**.

  Leading energy suppliers: **Norway and the UK**.
- **Renewable Energy Hub:** Home to some of the **largest offshore wind farms in the world**, crucial for **Europe's green energy transition**.
- **Fishing Industry:** One of the world's most **productive fishing zones**, supporting industries in **Norway, Denmark, and the UK**.
- **Strategic Military Importance:** Historically significant in **both World Wars** and remains a key region for **NATO naval exercises**.

16. SENKAKU ISLANDS

Context:
Japan has raised strong concerns over the longest recorded intrusion by Chinese Coast Guard ships near the disputed Senkaku Islands.

About Senkaku Islands Dispute:
Location:
- The Senkaku Islands are located in the **East China Sea**, northeast of Taiwan.
- The group comprises **eight uninhabited islands** with a total area of approximately **7 sq km**.

Presently controlled by: The islands are currently administered and controlled by **Japan since 1972**.

Disputed Nations: The dispute exists between **Japan, China (Diaoyu Islands)**, and **Taiwan (Diaoyutai Islands)**.

History of Dispute:
- After World War II, Japan renounced several territories, including Taiwan, through the **1951 Treaty of San Francisco**.
- Under this treaty, **Nansei Shoto islands** came under **US trusteeship** and were returned to Japan in **1971**.
- China began asserting its claim only after the discovery of potential **oil and gas reserves** in the 1970s.

Significance of Senkaku Islands:
- **Strategic Location:** Close to key shipping lanes between East Asia and the rest of the world.
- **Resource Potential:** Rich in **fisheries and potential oil and gas reserves**.
- **Geopolitical Hotspot:** Represents growing **China-Japan-US strategic tensions** in the Asia-Pacific region.

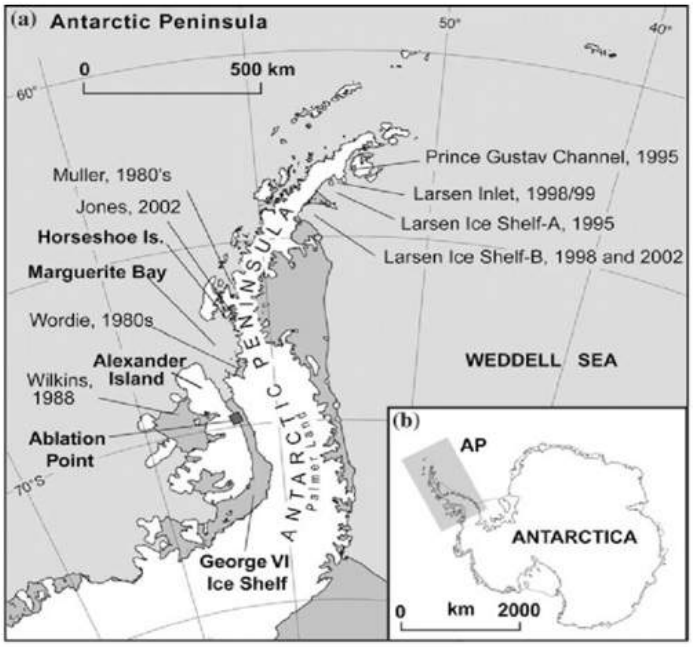
17. GEORGE VI ICE SHELF

Context:
Scientists discovered thriving ecosystems with potential new species beneath the Antarctic ice shelf after the A-84 iceberg broke away from the George VI Ice Shelf.

The findings, part of **UNESCO's** Challenger 150 initiative, offer new insights into life under ice-covered seafloors.

About George VI Ice Shelf:
Located in: Situated in Antarctica, occupying **George VI Sound**, which separates **Alexander Island** from **Palmer Land**.

Nation controlling it: Governed under the **Antarctic Treaty System**, with research presence and exploration led by **United Kingdom** and **United States**.



Neighbouring Sea: Lies adjacent to the **Bellingshausen Sea** in the Southern Ocean.

Geographical Features:
- Stretches from **Ronne Entrance** in the southwest to **Niznik Island** in the north, covering around 30 nautical miles.
- Ice thickness exceeds **150 metres**, with underlying waters reaching depths of **1,300 metres**.
- Characterized by extensive floating ice shelves, subglacial ecosystems, and complex underwater geography.

Recent Discoveries Beneath George VI Ice Shelf:
- **New Species Found:** Discovery of giant sea spiders, octopi, corals, and a giant phantom jellyfish at depths of up to 1,300 meters.
- **Unexplored Ecosystems:** Accessed after the break-away of the A-84 iceberg, revealing life in previously inaccessible regions.
- **Nutrient Transport Mystery:** Possible unknown nutrient transport mechanisms sustaining life under 150-meter-thick ice.

Significance of Discoveries:
- **Scientific Breakthrough:** Challenges existing assumptions about life in extreme, nutrient-deprived environments.
- **Climate Insights:** Offers clues on how ecosystems may respond to melting ice shelves and climate change.
- **Marine Conservation:** Underlines the need to protect fragile Antarctic marine ecosystems.

18. GREENLAND

Context:
Greenland, an autonomous territory under Denmark,

recently held parliamentary elections that could shape its future course—either toward full independence or continued ties with Copenhagen.

About Greenland:

- **Location:** World's largest island, situated between the Arctic and Atlantic Oceans.
- **Capital:** Nuuk.
- **Political Status:** An autonomous territory within the Kingdom of Denmark.
- **Population:** Approximately 57,000 people.

Geographic Features:

- **Ice Sheet:** Covers around 80% of Greenland.
- **Mountains:** Watkins Range, including Gunnbjørn Fjeld (tallest mountain in the Arctic).
- **Major Water Bodies:** Scoresby Sound (world's largest fjord), Ilulissat Icefjord (UNESCO World Heritage Site).

Economy:

- **Primary Sectors:** Fishing (accounts for 90% of exports), tourism, and small-scale mining.
- **Potential Growth Areas:** Rare earth minerals, uranium, and other strategic metals.

Why is Greenland in the Spotlight?

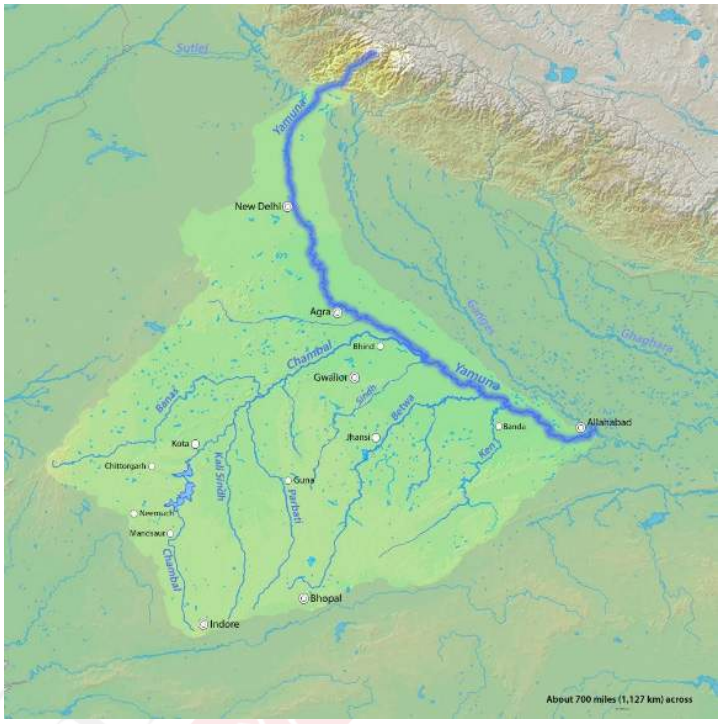
Push for Independence: All major political parties support the idea of breaking away from Danish rule.

Greenland currently receives an **annual subsidy of $565 million from Denmark**, about 20% of its GDP.

Geopolitical Interests:

- **Trump's Renewed Interest:** First proposed purchasing Greenland in 2019, leading to diplomatic tensions. Recently, Trump revived his ambition, claiming Greenland should join the US for "prosperity and security."
- **Resource Race in the Arctic:** Greenland is rich in **rare earth elements, uranium, and critical minerals** needed for global industries.

19. YAMUNA RIVER



Context:

Delhi has introduced solar-hybrid river cruises on the Yamuna River, covering a 22 km stretch between **Sonia Vihar and Jagatpur**, to boost eco-friendly tourism and connectivity. The initiative reduces carbon emissions, promotes green energy solutions, and enhances sustainable urban mobility in the capital.

About Yamuna River:

Origin: The Yamuna originates from the Yamunotri Glacier in the Himalayas at an altitude of **4,421 meters**.

Historically, it was a **tributary of the River Ghaggar (likely the Saraswati River of the Vedas)** but later shifted **eastward due to tectonic activity**.

Course & States: The **Yamuna River basin** extends across **Uttarakhand, Himachal Pradesh, Haryana, Delhi, Uttar Pradesh, and Rajasthan**. **Total Length**: **1,376 km** (Longest River in India that does not directly drain into the sea).

Major Tributaries:

- **Himalayan Region:** Rishi Ganga, Hanuman Ganga, Tons, and Giri.
- **Plains:** Hindon, Chambal, Sind, Betwa, and Ken.
- **Tons River** contributes approximately **60% of the Yamuna's total water flow**.

Confluence: The **Yamuna merges with the Ganga** at **Prayagraj (Allahabad)**, forming the **sacred Sangam**.

Key Cities Along the Yamuna:

- Noida, Mathura, Agra, Firozabad, Etawah, Kalpi, Hamirpur, and Prayagraj (Allahabad).
- In **Delhi**, the Yamuna enters at **Palla Village** and exits at **Jaitpur**, covering **52 km** within the National Capital Territory.

20. WULAR LAKE

Context:
Wular Lake, India's largest freshwater lake in Jammu & Kashmir, is facing shrinkage and siltation, raising serious flood risks for the Kashmir Valley.

About Wular Lake:
Located in: Situated in Bandipore district of Jammu & Kashmir, approximately 50 km northwest of Srinagar.

River fed: Fed by the **Jhelum River**, playing a vital role in the hydrology of the Kashmir Valley.

Lake formation: Formed due to tectonic activity and believed to be a remnant of the ancient **Satisar Lake.**

Unique features of the lake:

- **Largest freshwater lake in India** and the second largest in Asia, spanning 200 sq. km.
- Lies at an altitude of 1,580 m at the **foothills of Haramuk Mountain.** Hosts **Zaina Lank,** an artificial island built by King Zainul-Abi-Din.
- Acts as a natural flood absorption basin for the Kashmir Valley.
- Home to rich biodiversity, including Himalayan monal, short-toed eagle, black-eared kite, and many migratory birds.
- Contributes to 60% of total fish production in the region.

Recognition: Declared a Wetland of International Importance under the Ramsar Convention in 1990.

21. ANA SAGAR LAKE

Context:
The Supreme Court has directed the Rajasthan government to demolish the illegal Seven Wonders Park near Anasagar Lake, Ajmer within six months, citing environmental concerns and violations of wetland laws.

About Ana Sagar Lake:
Location: Ana Sagar Lake is located in Ajmer district, Rajasthan, India. It is an artificial lake (man-made lake)

Built By: Constructed between 1135-1150 AD by King Arnoraja (also known as Ana), grandfather of Prithviraj Chauhan.

Historical Significance:

- Mughal emperor Jahangir built the famous Daulat Bagh garden adjacent to the lake.
- Shah Jahan added five marble pavilions (Baradaris) along the lake, making it a popular tourist and heritage site.

Importance:

- The lake spans approximately 13 km² and serves as a major water body for the region.
- It contributes to groundwater recharge, supports biodiversity, and attracts tourism to Ajmer.

Ramsar Site Status:
Ana Sagar Lake is not yet designated as a Ramsar site under the Wetlands of International Importance.

22. BETWA RIVER

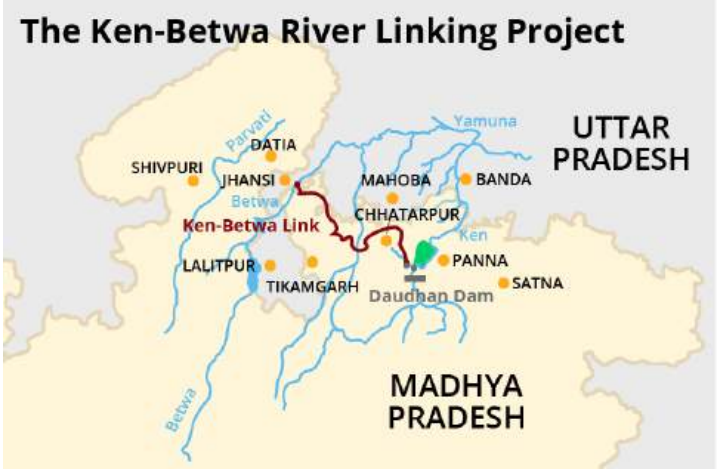
Context:
The Betwa River in Madhya Pradesh is drying up due to illegal sand mining, deforestation, and over-extraction through borings.

About Betwa River:
Origin: The Betwa River originates from **Jhiri village in Raisen district**, Madhya Pradesh. It rises at an elevation of 470 metres in the **Vindhya Range**.

States Flow Through:

- Flows through **Madhya Pradesh** and **Uttar Pradesh**, covering districts like Bhopal, Vidisha, Orchha, and Hamirpur.
- The river travels **590 kilometres** before meeting the Yamuna.

Tributaries of Betwa:



Major tributaries: Halali and Dhasan rivers.

Halali River is the longest tributary, measuring **180.32 kilometres** in length. The basin includes **14 tributaries**, with **11 entirely in Madhya Pradesh** and **3 partially shared with Uttar Pradesh**.

Betwa is a Tributary of: The **Betwa River** is a right-bank tributary of the Yamuna River, meeting it near **Hamirpur in Uttar Pradesh**.

Causes of River Betwa's Slow Death:

- **Illegal Sand Mining:** Rampant sand extraction from the riverbed has disrupted natural water flow and damaged the river's ecological balance.
- **Deforestation in Catchment Areas:** Unchecked cutting of forests around the river's origin has reduced natural water recharge and soil retention.
- **Excessive Groundwater Borings:** Over-extraction of water through illegal borewells has depleted the river's natural sources and blocked surface flow.
- **Encroachment and Concrete Construction:** Cement walls and construction near the river's origin have choked the natural channels, affecting the river's ability to replenish itself.

23. SILAHALLA POWER PROJECT

Context:

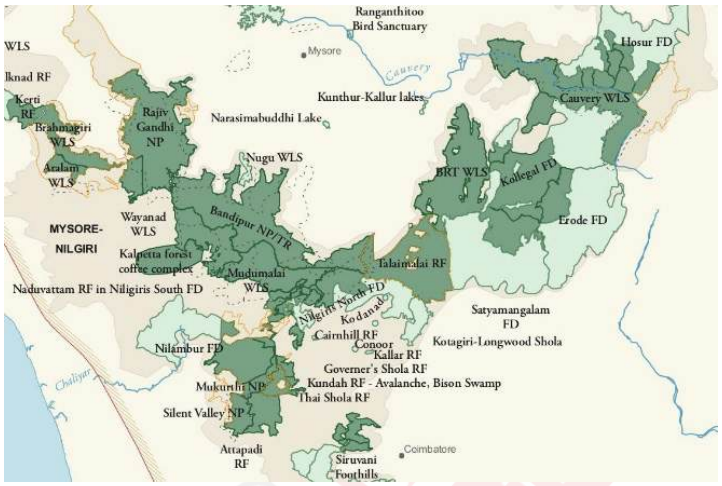
The Tamil Nadu Pollution Control Board (TNPCB) recently cancelled the public hearing for the Silahalla Power Project in the Nilgiris due to public opposition and environmental concerns.

About Silahalla Power Project:

What it is: A pumped storage hydroelectric project by Tamil Nadu Generation and Distribution Corporation Limited (TANGEDCO) to generate electricity by transferring water between two reservoirs.

Location: Kundah Taluk, Nilgiris district, Tamil Nadu.

Aim: To address peak power demand by generating 1,000 MW electricity.



Rivers Associated: Silahalla stream, a tributary of the **Kundah River**, which feeds the **Bhavani River (**which is Cauvery River tributary**)**

Project Features:

- Construction of two dams (upper and lower reservoirs).
- Tunnels of 2.8 km (head race) and 1.56 km (tail race).
- Underground powerhouse and surface storage points.

About Nilgiri Biosphere Reserve:

Location: Situated in the **Nilgiri Hills** of the Western Ghats.

State involved: Spans across **Tamil Nadu, Kerala, and Karnataka**.

Major Protected Areas within the Reserve: Mudumalai Wildlife Sanctuary (TN), Wayanad Wildlife Sanctuary (Kerala), Bandipur National Park (Karnataka), Nagarhole National Park (Karnataka), Mukurthi National Park (TN), and Silent Valley National Park (Kerala).

Flora:

- **132 endemic species**, including rare plants like Adenoon, Calacanthus, and Frerea.
- Diverse ecosystems: tropical evergreen, montane sholas, grasslands, moist deciduous forests, and thorn forests.

Fauna:

- Largest known population of endangered **Nilgiri Tahr** and **Lion-tailed macaque**.
- Significant populations of **elephants, tigers, gaurs, sambars, and chitals**.

UNESCO Recognition: First UNESCO-designated **Biosphere Reserve in India (1986)** under the Man and Biosphere Programme.

Tribal Communities: Indigenous groups include **Todas, Kotas, Irulas, Kurumbas, Paniyas**, and **Adiyans**, who depend on the forest ecosystems for their livelihoods.

24. SHENDURNEY WILDLIFE SANCTUARY

Context:

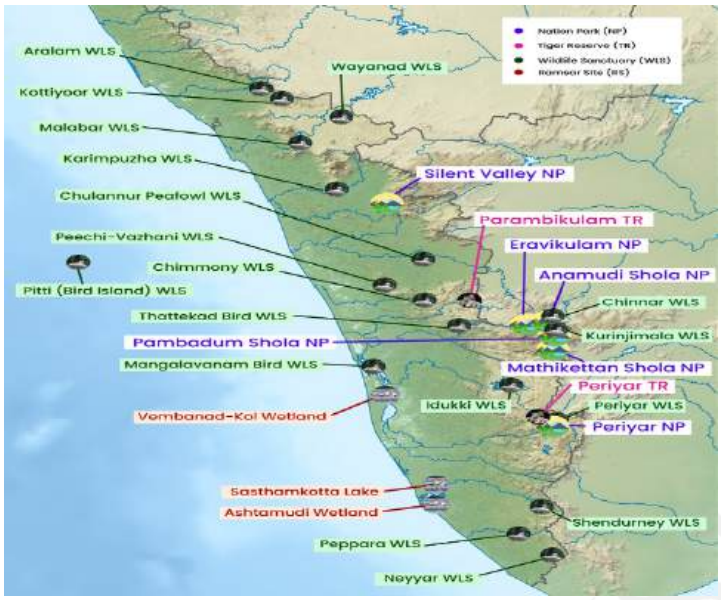
Researchers from University of Kerala have discovered two new species of jumping spiders from Shendurney Wildlife Sanctuary, Kerala, marking the first record of the

Epidelaxia genus in India.
The species, **Epidelaxia falciformis sp. nov. and Epidelaxia palustris sp. nov.**, extend the known range of the genus beyond Sri Lanka, enhancing the biodiversity records of the Western Ghats.

About Newly Identified Jumping Spider Species:

What are they? These belong to the **Epidelaxia genus**, a group of **jumping spiders** previously believed to be endemic to Sri Lanka. Discovered in **Kulathupuzha, Kollam**.

Names & Classification:



Epidelaxia falciformis sp. nov.

- Epidelaxia palustris sp. nov.

Unique Features:

- **E. falciformis**: Males have brown carapace with a yellow stripe, and females exhibit a yellow triangular-shaped marking on the prosoma.
- **E. palustris**: Males have pale brown bands on the sides, and females have white orbital setae (hairs) around their eyes.
- **Adaptation**: Highly specialized for survival in **dense foliage of Western Ghats**.

About Shendurney Wildlife Sanctuary:

Location:

- Located in **Kollam district, Kerala**, under **Agasthyamalai Biosphere Reserve**.
- Declared a **wildlife sanctuary on August 25, 1984**, covering **172.4 sq. km**.
- Encompasses **Thenmala Dam reservoir** (~18.69 sq. km).

Major Flora & Fauna:

Flora: Tropical evergreen & semi-evergreen forests, home to 1,257 flowering plant species, with 309 endemic to the Western Ghats.

Fauna: **Mammals** – Lion-tailed macaque (endangered), Indian bison, Malabar giant squirrel. **Birds** – **267 species**, including the **Great Eared Nightjar**, first recorded in Kerala here.

Rivers & Unique Aspects:

Rivers: Mansar & Manhar flow through the sanctuary.

Unique Aspects:

- First **eco-tourism project in India** (Thenmala Eco-Tourism).
- No **sandalwood trees**, a rare characteristic among Kerala's forests.

25. JHELUM RIVER

Context:

The Jammu & Kashmir government has admitted in the Assembly that untreated wastewater from towns like Anantnag, Bijbehara, and Mattan is being discharged into local streams leading to the Jhelum River.

About Jhelum River:

- **Origin:** Verinag spring, at the foot of the Pir Panjal Range in **Anantnag district**, Jammu & Kashmir.
- **Length:** Approximate length: **725 km (450 miles)**.
- **States/ UT flowed through:** Jammu & Kashmir
- **Tributaries:** Kishanganga River, Kunhar River, Other tributaries include the Sandran River, Bringi River, Arapath River.
- **Jhelum is a tributary of:** Chenab River, which further merges into the **Indus River system** in Pakistan.
- **Key Geographical Features:**
- Flows through Wular Lake at Srinagar, acting as a natural regulator.
- Forms **deep gorges** while crossing the Pir Panjal mountains.
- Enters **plains at Mangla**, where **Mangla Dam** supports irrigation and hydroelectricity.
- **Major canals:** Upper Jhelum Canal (Mangla to Chenab at Khanki) and Lower Jhelum Canal (from Rasul for irrigation).

26. PAMBAN RAIL BRIDGE

Context:

Prime Minister of India to **inaugurate India's first vertical-lift railway bridge** on April 6, replacing the 111-year-old Pamban

Bridge.

The new ₹531-crore bridge enhances **maritime safety** and **rail connectivity** to Rameswaram, Tamil Nadu.

About Old Pamban Bridge:

What was it? A historic railway bridge linking Rameswaram Island to Mandapam (mainland Tamil Nadu).

Key Details:

- **Built in:** 1914 (completed in 2.5 years).
- **Built by:** British India under Madras Railway.
- **Connecting Towns:** Connects Mandapam (mainland) with Rameswaram (Pamban Island), Tamil Nadu.

Unique Features:

- **India's first and only sea bridge** until Bandra-Worli Sea Link **(2010)**.
- **Bascule (Scherzer lift) mechanism:** Manual lever-operated **double-leaf section** for ship passage.
- A **double-leaf bascule bridge** is a type of **movable bridge** that uses a counterweight mechanism to lift each side (called a *leaf*) to allow ships or boats to pass through underneath.
- **Length:** 2.065 km, with **143 piers** and **12.5 m height** above sea level.
- **Lifespan**: Operated for **108 years** before corrosion led to its closure (2022).

About New Pamban Bridge:

- **Built By:** Rail Vikas Nigam Limited (RVNL) at ₹531 crore.
- **Key Features:**
  - **Vertical-lift span (72 m):** First in India, automated for smoother ship movement.
  - **Stronger construction:** Corrosion-resistant materials for longer durability.
  - **Modern Technology:** Fully automatic lift mechanism (vs. manual in old bridge).
  - **Energy Efficient:** Solar-ready design for future sustainability.

Key Difference between Old and New Pamban Bridge:

Feature	Old Pamban Bridge	New Pamban Bridge
Inauguration Year	1914	2025
Type	Double-leaf bascule	Vertical lift span
Span Control	Manual operation	Automated lift system
Length	2.065 km	2.2 km
Ship Clearance	Limited, slow	Wider and quicker clearance
Lifespan	Over 100 years	Next-generation, corrosion-resistant

27. KASUNGU NATIONAL PARK

Context:

Kasungu National Park is in news as communities along the Malawi-Zambia border have initiated legal action against the International Fund for Animal Welfare (IFAW) due to increased human-elephant conflicts after relocating 263 elephants into the park.

About Kasungu National Park:

Location: Central Region of Malawi, west of Kasungu town, approximately 175 km north of Lilongwe, bordering Zambia.

Established: 1970, second-largest park in Malawi, covering 2,316 sq km.

Controlled by: Malawi's Department of National Parks and Wildlife (DNPW).

Rivers within Park: Dwangwa, Lingadzi, Lifupa (important for hippo sightings at Lifupa Lodge).

Local Tribes: Predominantly inhabited by Chewa people.

Key Features

Flora:

Primarily Miombo woodland.

Grassy wetlands or dambos along river channels.

Fauna:

Major Wildlife: Elephants, Sable antelope, Roan antelope, Kudus, Impalas, Hartebeest, Zebras, African Buffaloes.

Conservation: Designated Lion Conservation Unit since 2005.

Current Issue:

- **Elephant Relocation:** 263 elephants moved from **Liwonde National Park** to Kasungu in 2022 by Malawi's DNPW, African Parks, and IFAW.
- Elephants frequently enter nearby villages, causing at least 12 deaths and crop damage affecting over 11,000 villagers, leading to significant financial losses.

About International Fund for Animal Welfare (IFAW):

What is IFAW?

- A leading global non-governmental organization (NGO) dedicated to animal welfare and conservation.
- **Established:** In 1969 by **Brian Davies**.
- **Headquarters:** Based in the USA, with operations spanning over 40 countries.

Objective:

- Protect and rescue individual animals and wildlife populations globally.
- Conserve natural habitats to maintain ecological balance.

Key Functions:

- **Wildlife Rescue:** Saving animals from emergencies, natural disasters, or exploitation.
- **Habitat Preservation:** Ensuring safe ecosystems through habitat restoration projects.
- **Advocacy:** Promoting strong legal frameworks and public policies to protect animals.
- **Public Awareness:** Educating communities on coexistence and animal welfare.

28. OPERATION BRAHMA

Context:

A **7.7 magnitude earthquake** hit **Mandalay, Myanmar**, killing over 140 people and causing structural damage across Myanmar and neighbouring countries.

India has launched **Operation Brahma**, sending humanitarian aid and relief supplies to the affected region.

About Myanmar: Location: Southeast Asia, between latitudes **10°N to 28.5°N**

Capital: Nay Pyi Taw (declared in 2006, replacing Yangon)

Neighbouring Countries:

India, China, Bangladesh, Thailand, Laos.

Bordered by **Andaman Sea and Bay of Bengal** to the south.

Geological Features:

Mountain Ranges:

Northern Mountains (Mount Hkakabo, 5,881 m – highest peak).

Western Ranges (Patkai, Naga, Chin, Rakhine Hills).

Shan Plateau (Eastern uplands with steep ranges and deep valleys).

Major Rivers:

Irrawaddy River (Main navigable river).

Chindwin, Sittang, and Salween Rivers drain different physiographic zones.

Why Myanmar Experiences Frequent Earthquakes?

- Tectonic Plates Involved:
- Lies on the **collision zone** between the **Indian Plate** and the **Eurasian Plate.**
- Earthquakes occur due to **strike-slip faulting** caused by **horizontal movement** of plates.
- Sagaing Fault:
- A major active fault running **north to south** through central Myanmar.

- Acts as a boundary between the **Indian Plate** **(moving north)** and the **Eurasian Plate.**

About Operation Brahma:

- Launched by the **Indian Air Force** using **C-130J aircraft.**
- First batch: **15 tonnes** of relief material and includes **search and rescue personnel** and **medical teams.**

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