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MAPPING

GENERAL STUDIES – 1

Topics: Salient features of Indian Society, Diversity of India.

1. SCROLL, CLICK, REPEAT: THE SOCIAL MEDIA TRAP FOR TEENS

Context:

Rising social media use among teenagers' sparks debates on benefits and risks, with moves like Australia's ban for under-16s underscoring the need to balance digital engagement and mental health.

Rise of Social Media Usage by Teenagers:

- **Widespread Access:** Reports show over 43% of Indian children aged 8-18 have active social media accounts, with many accessing it via parental smartphones.
- **Growing Dependency:** Late-night scrolling and excessive screen time are common, often impacting mental and physical health.
- **Global Patterns:** Similar trends exist globally, with countries like Norway and France initiating regulations to curb overuse.
- **Demographic Reach:** Teenagers use platforms for self-expression, learning, and forming social connections.

Benefits of Social Media for Teenagers:

- **Social Interaction:** Enables connectivity with peers, family, and online communities.
- **Educational Opportunities:** Provides access to learning resources, forums, and academic discussions.
- **Creativity:** Encourages creative expression through videos, images, and profile customization.
- **Identity and Support:** Offers a space for marginalized groups (LGBTQ+, disabled youth) to find support.
- **Mental Well-being:** Facilitates emotional support through online groups, fostering a sense of belonging.

Issues with Social Media and Children:

1. **Cyberbullying**: Frequent cases of harassment and threats create psychological stress.
2. **Exposure to Inappropriate Content**: Children often encounter violent, aggressive, or sexual material.
3. **Addiction**: Compulsive usage disrupts sleep patterns and leads to anxiety and depression.
4. **Privacy Risks**: Personal data can be misused or sold to third parties.
5. **Pressure and Comparison**: Unrealistic standards harm self-esteem, particularly among teenage girls.

Government Initiatives to Handle Social Media Usage:

1. **Y20 Initiative:** Engages youth in policy-making on digital safety and mental health.
2. **Digital Detox Campaigns:** Encourages balanced screen time and offline activities.
3. **IT Act and Data Protection Act:** Proposes safeguards for children's privacy and exposure online.
4. **National Cybersecurity Initiatives:** Focus on creating child-safe online spaces with stringent content moderation.

Way Ahead:

1. **Parental Engagement:** Open conversations and negotiated guidelines for social media use.
2. **Education:** Integrate digital literacy and citizenship into school curricula.
3. **Regulated Access:** Introduce age-appropriate features and time-windowed digital usage.
4. **Collaborations with Tech Companies:** Ensure safe modes and curated content for children.
5. **Global Cooperation:** Learn from international models like Finland's digital citizenship program and France's mobile ban in schools.

Conclusion:

A balanced approach is essential to regulate social media for teenagers, ensuring their mental well-being and digital literacy without depriving them of the benefits of technology. Collaborative efforts among parents, governments, and tech platforms can foster a healthier relationship with the digital world.

PYQ:

1. 'Right to Privacy' is protected under which Article of the Constitution of India? (UPSC-2021)
   a) Article 15

b) Article 19
c) Article 21
d) Article 29

Answer: c)

GENERAL STUDIES – 2

Topics: Indian Constitution- historical underpinnings, evolution, features, amendments, significant provisions and basic structure; Comparison of the Indian constitutional scheme with that of other countries.

1. UCC: UNITING INDIA THROUGH LEGAL EQUALITY

Context:

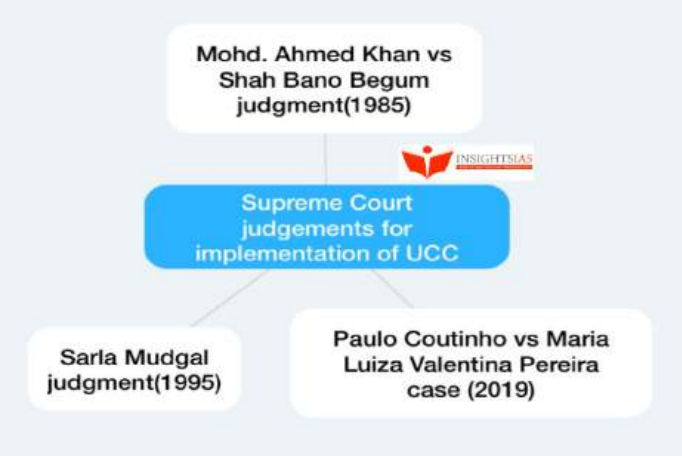
The union Home minister recently reaffirmed government commitment to implementing a Uniform Civil Code (UCC) nationwide, citing its successful implementation in Uttarakhand.

What is UCC?

The Uniform Civil Code aims to replace personal laws based on customs and religious scriptures with a unified legal framework applicable to all citizens, regardless of religion. It seeks to address areas such as marriage, divorce, inheritance, and adoption under a common legal structure, promoting equality and secularism.

Key Features of UCC:

1. **Uniformity in Laws:** Establishes a common set of laws governing civil matters across all religions.
2. **Gender Equality:** Removes discriminatory practices in personal laws, especially concerning women's rights.
3. **Secular Legal System:** Delinks civil law from religion, ensuring laws are religion-neutral.
4. **National Integration:** Promotes social harmony by creating a common legal identity.
5. **Simplification of Legal Processes:** Streamlines legal complexities arising from diverse personal laws.



Legal Framework and Articles Governing UCC:

- **Article 44:** Directive Principle of State Policy that mandates the State to endeavour to secure a Uniform Civil Code for all citizens.
- **Article 14:** Guarantees equality before the law and equal protection of the laws.
- **Article 25:** Protects religious freedom, raising questions about balancing religious practices with legal uniformity.
- **Entry 5 of the Concurrent List** in the Seventh Schedule, which specifically addresses various aspects including marriage, divorce, adoption, and succession, among others, allowing for legislation concerning personal laws.

Need for UCC in India:

1. **Gender Equality:** Eliminates discriminatory practices in personal laws.
2. ***E.g.*** Reforms in **Hindu Succession Act** provided daughters equal inheritance rights but excluded Muslim women from similar benefits.
3. **Curbing Misuse of Personal Laws:** Ensures fairness across religions by addressing legal loopholes.
4. ***E.g.*** Instances of misuse of **triple talaq** before its criminalization.
5. **Promotes National Unity:** Unifies diverse communities under one legal framework.
6. ***E.g.*** Persistent communal tensions highlight the need for legal uniformity.
7. **Simplifies Legal Processes:** Reduces conflicts arising from varying personal laws.
8. ***E.g.*** Disputes over inheritance rights between communities in states like Kerala and Tamil Nadu.
9. **Protects Marginalized Communities:** Provides equitable legal protection for minorities.
10. ***E.g.*** Tribal communities often face inequities under existing customary practices.

Best practices:

- **Goa's UCC Practice:** Rooted in the Portuguese Civil Code of 1867, mandates compulsory registration of marriages and provides equal property rights for sons and daughters, promoting gender equality and legal uniformity among all residents.
- Uttarakhand's UCC: Uttarakhand became the first Indian state to enact a Uniform Civil Code (UCC), establishing uniform laws on marriage, divorce, inheritance, and live-in relationships for all residents, irrespective of religion, while exempting Scheduled Tribes.

Leaders' Views on UCC:

1. **B.R. Ambedkar:** Emphasized the State's power to legislate for social reforms, including personal laws.
2. **K.M. Munshi:** Linked UCC with national unity and highlighted its role in modernizing societal practices.
3. **Supreme Court:** 2019 **Jose Paulo Coutinho v. Maria Luiza Valentina** Pereira case, the Court lauded Goa's implementation of a uniform civil code and urged for its nationwide adoption.
4. **The 21st Law Commission,** led by Justice Balbir Singh Chauhan in 2018, stated that a uniform civil code wasn't necessary or desirable at that stage, emphasizing the coexistence of secularism with the country's plurality.

Challenges to UCC:

1. **Religious Opposition:** Concerns over UCC infringing on religious practices.
2. ***E.g.*** Strong resistance from sections of the Muslim community over personal law reforms.
3. **Diverse Customs:** India's pluralistic society makes implementing a uniform code complex.
4. ***E.g.*** Regional differences in property rights among Hindu communities in Tamil Nadu and Karnataka.
5. **Political Sensitivities:** Accusations of UCC being used for vote-bank politics.
6. ***E.g.*** Allegations of political motives behind UCC discussions during elections.
7. **Legal Ambiguity:** Lack of clarity on how UCC would be harmonized with existing laws.
8. ***E.g.*** Debates on how to integrate tribal and customary laws.
9. **Public Awareness:** Limited understanding of UCC's implications among the masses.
10. ***E.g.*** Protests in Manipur against UCC reveal misconceptions about its purpose.

Way Ahead:

1. **Inclusive Dialogue:** Engage stakeholders across religions and communities to build consensus.
2. **Phased Implementation:** Begin with common areas like marriage, inheritance, and adoption.
3. **Public Awareness Campaigns:** Educate citizens on UCC's benefits to counter misinformation.
4. **Balancing Religious Freedom:** Ensure the UCC does not undermine constitutional rights under **Article 25**.
5. **Strengthening Legal Frameworks:** Build robust mechanisms to address potential conflicts and ambiguities.

Conclusion:

As Dr. B.R. Ambedkar stated, **"We are having liberty to reform our social system, which is full of inequities and inequalities."** The Uniform Civil Code is a step toward a more equitable and secular India. Its implementation requires sensitivity, dialogue, and commitment to upholding constitutional values while respecting the nation's diversity.

PYQ:

1. Discuss the possible factors that inhibit India from enacting for its citizen a uniform civil code as provided for in the Directive Principles of State Policy. (UPSC-2015)

Topics: Parliament and State Legislatures – structure, functioning, conduct of business, powers & privileges and issues arising out of these.

2. INDIA'S PARLIAMENTARY DEMOCRACY - FROM RUCKUS TO RESOLUTION

Context:

India's parliamentary democracy, hailed globally for its vibrancy, faces a serious challenge due to repeated disruptions in legislative proceedings. Such behaviour not only wastes valuable time and resources but also undermines public trust in democratic institutions.

Data on Parliamentary Disruptions in 2024: (*Source:* *PRS Legislative Research*).

- **Winter Session Stalemate:**
  - Over **32% of scheduled time** was lost in disruptions over demands for discussions on controversial bills and governance issues.
- **Budget Session Deadlock:**
  - Lok Sabha and Rajya Sabha functioned for only **45% and 31% of their respective scheduled times**.
- **Frequent Walkouts and Protests:**
  - Opposition parties staged walkouts 17 times, disrupting key debates, including discussions on unemployment and inflation.
- **Decreasing Legislative Productivity:**
  - Productivity fell below **50% in four consecutive sessions**, the lowest in a decade.

Reasons Behind Repeated Disruptions:

1. **Lack of Consensus**: Deep polarization between ruling and opposition parties.
2. **Contentious Legislation**: Absence of pre-legislative consultations leads to resistance.
3. **Unaddressed Opposition Demands**: Inadequate government response to issues raised by the opposition.
4. **Procedural Violations**: Use of unparliamentary behavior like sloganeering and rushing to the well of the house.
5. **Political Polarization:** Deepening ideological divides between the ruling party and the opposition have led to confrontational politics, resulting in frequent disruptions.
6. **External Events Influencing Proceedings:** External controversies and scandals have spilled over into parliamentary sessions, causing further disruptions.

Laws Addressing House Disruptions in India

1. **Rules of Procedure and Conduct of Business**: Grant presiding officers' authority to maintain decorum.
2. **Article 105 (Privileges)**: Protects MPs' freedom of speech but not unruly behaviour.
3. **Code of Conduct for Members**: Emphasizes ethical and disciplined behaviour.
4. **Rule 374(A) of Lok Sabha**: Allows for automatic suspension of members engaging in grave misconduct.

Consequences of Parliamentary Disruptions:

1. **Loss of Public Trust**: Erodes confidence in democratic institutions and governance.
2. **Wastage of Resources**: Millions of rupees spent on non-productive parliamentary sessions.
3. **Missed Opportunities**: Delayed or incomplete legislation on pressing socio-economic challenges.
4. **International Reputation**: Diminishes India's image as a stable democracy.

Way Ahead:

1. **Consensus-Building:** Promote dialogue between ruling and opposition parties to resolve disputes.
2. **Strict Enforcement**: Presiding officers must implement suspension rules for repeated disruptions.
3. **Ethical Training**: Encourage youth in politics to prioritize decorum and accountability.
4. **Pre-Legislative Consultations**: Address opposition concerns before introducing contentious bills.
5. **Public Awareness**: Foster citizen understanding of the consequences of disruptions to increase accountability.

Conclusion:

To uphold India's democratic ethos, all stakeholders must work collectively to ensure that Parliament becomes a hub of constructive debate and policymaking. Building consensus and fostering respect for parliamentary rules are vital to restoring the sanctity of legislative institutions.

PYQ:

1. To what extent, in your view, the Parliament is able to ensure accountability of the executive in India? (UPSC-2021)

Topics: Structure, organization and functioning of the Executive and the Judiciary; Ministries and Departments of the Government; pressure groups and formal/informal associations and their role in the Polity.

3. THE BENCH ON TRIAL: EXPLORING JUDICIAL ACCOUNTABILITY

Context: Recent instances of judicial misconduct in India have reignited the debate on the mechanisms to hold judges accountable, emphasizing the need for transparency and responsibility in judicial actions.

- A speech delivered **by Justice Shekhar Kumar Yadav**, that made apparent his biases against the Muslim community, has once again spotlighted the difficulty in India's review mechanism to hold judges of the higher judiciary accountable.

What is Judicial Accountability?

Judicial accountability refers to the principle that judges must take responsibility for their decisions and actions. It ensures transparency in decision-making and mandates judges to act within the framework of the law, upholding the trust vested in them by society.

Provisions for Judicial Accountability:

- **Constitutional Provisions:**
  - **Article 124(4) and 124(5):** Allows impeachment of Supreme Court judges for proven misbehavior or incapacity.
  - **Article 217:** Impeachment of High Court judges based on similar grounds.
  - **Article 235:** Empowers High Courts to control and supervise subordinate courts.
  - **Restatement of Judicial Values (1997):** Acts as a code of conduct for higher judiciary members.
- **Legal Provisions:**
  - **Judges (Inquiry) Act, 1968:** Establishes a mechanism to investigate misconduct through a three-member panel.
  - Contempt of Courts Act, 1971**:** Ensures that judiciary functions independently without undue influence.
  - **Judicial Standards and Accountability Bill (pending):** Aims to enhance transparency in judicial conduct and strengthen oversight mechanisms.

Need for Judicial Accountability:

- **Ensuring Public Trust:** Upholding the credibility of the judiciary and maintaining citizens' confidence in the legal system.
- **Preventing Misconduct:** Ensures that judges adhere to ethical standards and constitutional principles.
- **Enhancing Transparency:** Judicial decisions should be open to scrutiny to promote fairness.
- **Balancing Independence and Responsibility:** Prevents misuse of judicial independence for personal or political interests.
- **Promoting Rule of Law:** Ensures decisions are unbiased, equitable, and in line with constitutional mandates.

Examples of Judicial Accountability:

1. **Justice Soumitra Sen's Impeachment (2011):** Found guilty of financial misconduct as a court-appointed receiver, showcasing accountability through parliamentary processes.
2. **Justice P.D. Dinakaran's Resignation (2011):** Resigned amid allegations of land grabbing and corruption, highlighting the role of public scrutiny in judicial conduct.
3. RTI **and Judiciary (2020):** Supreme Court upheld the applicability of RTI to itself, ensuring transparency and accountability in judicial appointments and decisions.

Challenges to Judicial Accountability:

- **Impeachment Complexity:** The current impeachment process is cumbersome, requiring a two-thirds majority in Parliament.
- **Limited Oversight Mechanisms:** Lack of robust external mechanisms to monitor judicial behaviour.
- **Independence Concerns:** Excessive accountability measures may threaten judicial independence.
- **Resignations Before Proceedings:** Judges resigning to avoid inquiries hinder the accountability process.
- **Lack of Transparency:** Closed-door deliberations reduce public trust in judicial proceedings.

Way Ahead:

- **Legislative Reforms:** Expedite the passage of the Judicial Standards and Accountability Bill for structured oversight.
- **Strengthening Internal Mechanisms:** Develop independent judicial review bodies to monitor conduct.
- **Codifying Ethical Guidelines:** Expand and enforce the Restatement of Judicial Values.
- **Public Scrutiny:** Enhance transparency through regular publication of judgments and judicial activities.
- **Training and Awareness:** Conduct regular ethical training for judges to ensure adherence to constitutional principles.

Conclusion:

Judicial accountability is pivotal for preserving the judiciary's independence and integrity. Transparent mechanisms and institutional reforms are vital to reinforce public trust and ensure that justice delivery aligns with democratic principles.

PYQ:

1. 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)
2. Critically examine the Supreme Court's judgment on 'National Judicial Appointments Commission Act, 2014' with reference to the appointment of judges of higher judiciary in India. (UPSC-2017)

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

4. SIMULTANEOUS ELECTION

Context:

The Union Cabinet approved "One Nation, One Election" to synchronize elections, sparking debates on its impact on federalism, democracy, and logistics.

What Is One Nation One Election (ONOE)?

- **Definition:** ONOE refers to holding elections for the Lok Sabha, all state assemblies, and local bodies simultaneously to streamline governance and reduce costs.
- **Historical Practice:** Simultaneous elections were conducted in India from 1951-1967 but were disrupted due to premature dissolutions of assemblies and the Lok Sabha.
- **Scope:** ONOE covers elections for the Lok Sabha and state assemblies, with municipal and panchayat elections synchronized within 100 days.

Constitutional Articles Involved in ONOE:

- **Article 83 & 172:** Relates to the duration of the Lok Sabha and state assemblies, requiring amendments for synchronization.
- **Article 324A:** Proposed for establishing logistical mechanisms for simultaneous elections.
- **Article 368:** Governs constitutional amendments requiring state ratification for changes impacting local bodies.

Need for ONOE:

1. **Reduced Costs:** ONOE aims to cut the high financial burden of frequent elections.
2. **Governance Efficiency:** Eliminates prolonged disruptions caused by the Model Code of Conduct (MCC).
3. **Resource Optimization:** Reduces diversion of security forces and personnel from essential duties.
4. **Voter Fatigue:** Prevents declining voter turnout caused by repeated elections.
5. **Development Continuity:** Minimizes policy paralysis and ensures uninterrupted governance.

Ramnath Kovind Committee Recommendations:

1. **Two-Phase Elections:**
   - Phase 1: Lok Sabha and state assemblies.
   - Phase 2: Local body elections within 100 days.
2. **New Article 82A:** Specifies terms and synchronization mechanisms for assemblies and Lok Sabha.
3. **Midterm Polls:** Ensures new elections for dissolved assemblies/Lok Sabha align with the national cycle.
4. **Single Electoral Roll:** A unified roll for all elections to streamline processes.
5. **Logistical Planning:** Advance procurement of EVMs, VVPATs, and deployment of personnel.

Challenges of ONOE:

1. **Overshadowing Regional Issues:** National issues may dominate, sidelining local priorities.
2. **Impact on Regional Parties:** Smaller parties may lose relevance, affecting political diversity.
3. **Federalism Concerns:** Centralized decision-making may undermine state autonomy.
4. **Logistical Hurdles:** Requires a significant scale-up in infrastructure, resources, and trained personnel.
5. **Midterm Dissolutions:** Aligning dissolved assemblies with the national cycle is complex.

Way Ahead:

1. **Legislative Deliberation**: Engage all stakeholders through detailed parliamentary discussions.
2. **Consensus Building**: Include states and regional parties to address federal concerns.
3. **Pilot Projects**: Implement ONOE in phases to assess feasibility and challenges.
4. **Resource Investment**: Strengthen electoral infrastructure and ensure preparedness.
5. **Public Awareness**: Educate citizens on the benefits and changes under ONOE.

Conclusion:

A balanced approach is essential for implementing ONOE, ensuring cost efficiency without compromising democratic values, federal principles, and regional representation. As Justice Dipak Misra noted, "Any reform must harmonize with constitutional integrity and public welfare."

PYQ:

Simultaneous election to the Lok Sabha and the State Assemblies will limit the amount of time and money spent in electioneering but it will reduce the government's accountability to the people". Discuss. (UPSC-2017)

5. CHEATING THE SYSTEM: HOW TO END EXAM MALPRACTICE?

Context:

A seven-member panel headed by former ISRO chairman **K Radhakrishnan** has made a set of 101 recommendations to the Ministry of Education for conducting national level entrance exams in a "transparent, smooth and fair" manner.

Reasons for malpractice in exams:

- **High Stakes:** Entrance exams like NEET and JEE determine admissions to premier institutes, leading to unethical practices.
- **Lack of Robust Systems:** Dependence on outsourced agencies and weak digital infrastructure create vulnerabilities.
- **Inadequate Monitoring:** Insufficient oversight at test centres allows manipulation.
- **Corruption and Collusion:** Involvement of insiders and private service providers in leaks and irregularities.
- **Technological Exploitation:** Use of advanced cheating devices and hacking of online systems.

Recent Exam Scams in 2024:

1. **NEET-UG Paper Leak:** Reports of question paper leaks led to widespread criticism of the National Testing Agency (NTA).
2. **UGC-NET Irregularities:** Allegations of mismanagement and suspicious allocation of testing centres.
3. **BPSC Exam Scam Allegation 2024** involved irregularities in the recruitment process, including alleged paper leaks and manipulation in the selection of candidates

Government initiatives to counter malpractice:

1. **Strengthening NTA:** Increased focus on enhancing its capacity and resources.
2. **Biometric Verification:** Implementation of Digi-Exam systems to verify candidates' authenticity.
3. **Digital Infrastructure:** Collaboration with Kendriya Vidyalayas and Navodaya Vidyalayas to establish computer-based testing centres.
4. **Use of AI and Big Data**: Predictive analytics to identify unusual patterns in exam results.
5. **Legal Frameworks**: Strict penalties under laws such as the Prevention of Malpractices in Exams Act in some states.

Public Examinations (Prevention of Unfair Means) Act, 2024:

- **Aim:** To curb malpractice, ensure transparency, and uphold the integrity of public examinations in India.
- **Exams Covered:** Includes national-level entrance exams like NEET, JEE, UGC-NET, and state-level recruitment or competitive examinations.
- **Penalties:** Strict provisions for offenders, including imprisonment of up to 10 years and fines up to ₹10 lakh for cheating, impersonation, or paper leaks.
- **Accountability:** Empowers authorities to hold organizers and service providers accountable for lapses and enforces measures like biometric verification and CCTV monitoring.

Challenges in countering malpractices:

1. **Resource Constraints:** Lack of funding and infrastructure to implement secure testing systems nationwide.
2. **Coordination Issues:** Difficulty in synchronizing efforts among central and state authorities.
3. **Dependence on Private Agencies:** Outsourcing leads to a lack of accountability.
4. **Technological Barriers:** Limited access to reliable digital solutions in rural areas.
5. **Resistance to Reform:** Bureaucratic inertia and reluctance to adopt new measures.

Key recommendations of the Radhakrishnan Committee:

1. **Limit NTA's Scope:** Focus primarily on entrance exams, reducing dependence on outsourced agencies.
2. **Strengthen Local Coordination:** Involve state and district officials in exam processes akin to election management.
3. **Multi-Stage Testing:** Introduce multi-session and adaptive testing models to enhance security and fairness.
4. **Digital Transformation:** Establish 400-500 nationwide computer-based testing centres within a year.
5. **Improved Security Measures:** Use sealed test centres, CCTV monitoring, and secure transport for question papers.
6. **Candidate Authentication:** Implement Digi-Exam systems to ensure biometric verification.
7. **Harmonized Criteria:** Standardize eligibility, admission criteria, and exam modes across institutions.

NOTE: This committee recommendation is NTA specific, which you can also use as a way ahead for curbing down malpractice in other exams too.

Conclusion:

To safeguard the integrity of national-level exams, robust digital infrastructure, transparent systems, and coordinated efforts are essential. The Radhakrishnan Committee's recommendations provide a pathway for reform, ensuring equitable opportunities for all students.

PYQ:

1. How have digital initiatives in India contributed to the functioning of the education system in the country? Elaborate on your answer. (UPSC-2020)

Topics: Issues relating to development and management of Social Sector/Services relating to Health, Education, Human Resources.

6. DISEASE – X

Context:

The recent outbreak in the Democratic Republic of Congo, claiming over 400 lives, has spotlighted Disease X, a hypothetical pathogen highlighted by the WHO in 2018.

What is Disease X?

- **Definition:** A placeholder for an unidentified, highly infectious pathogen capable of causing global pandemics.
- **Potential Causes:** It could stem from viruses, bacteria, fungi, or zoonotic sources.
- **Historical Context:** Conceptualized after the 2014–2016 Ebola outbreak, highlighting gaps in global health responses.
- **Uncertainty:** Disease X is unpredictable in its emergence, transmission, and impact.
- **Severity:** Predicted to be 20 times more lethal than SARS-CoV-2.

Features of Disease X:

- **Novel Threat:** Represents unknown pathogens with potential for rapid global spread.
- **Wide Origins:** Could be zoonotic, antimicrobial-resistant, or a result of bioterrorism.
- **Human Impact:** High mortality rates, overwhelming healthcare systems.
- **Environmental Links:** Driven by deforestation, urbanization, and climate change.

WHO Priority List of Pathogens:

- **Purpose:** Focus global efforts on diseases with high epidemic potential and insufficient medical countermeasures.
- **Pathogens Listed:** Includes Ebola, Marburg, Lassa fever, Nipah, Rift Valley fever, Zika, and Disease X.
- **Criteria:** High mortality, rapid spread, and lack of vaccines or treatments.

Patterns of Emerging Diseases:

1. **Zoonotic Origins:** About 70% of emerging diseases come from animals.
2. **Environmental Factors:** Deforestation, urban sprawl, and intensive agriculture increase risks.
3. **Globalization:** Interconnected travel and trade amplify local outbreaks into pandemics.
4. **Undiscovered Threats:** Over 1.7 million unknown viruses in wildlife could infect humans.

Initiatives to Counter Disease X:

Global Efforts:

1. **WHO Pandemic Treaty:** Aims for global cooperation in preparedness and equitable resource distribution.
2. **Pandemic Fund:** Strengthens health systems in low-income nations.
3. **mRNA Technology Hub:** Enhances vaccine production capacity in developing countries.
4. **BioHub System:** Facilitates global sharing of pathogens and viruses.
5. **WHO Hub for Pandemic Intelligence:** Develops research to bridge gaps in outbreak detection.

Indian Efforts:

1. **Integrated Disease Surveillance Programme (IDSP):** Tracks outbreaks and monitors trends.
2. **National Institute of Virology:** Conducts research on viral pathogens and zoonotic diseases.
3. **Biotech Initiatives:** Focus on indigenous vaccine development and diagnostic tools.
4. **Emergency Response Fund:** Allocates resources for immediate pandemic responses.

Challenges in Predicting Disease X:

1. **Unpredictable Emergence:** Complex interactions between humans, animals, and the environment.
2. **Vast Pathogen Pool:** Only a fraction of human-infecting pathogens are identified.
3. **Climate Change:** Alters disease transmission dynamics, expanding vector-borne illnesses.
4. **Technological Gaps:** Limited genomic data and inadequate global surveillance systems.
5. **Resource Inequity:** Disparities in healthcare infrastructure between nations.

Way Ahead:

1. **Strengthen Surveillance:** Expand real-time genomic sequencing and AI-driven outbreak prediction tools.
2. **Global Cooperation:** Promote equitable sharing of vaccines, diagnostics, and treatments.
3. **Public Health Investment:** Build robust healthcare infrastructure, particularly in vulnerable regions.
4. **Education and Awareness:** Train healthcare workers and inform communities about emerging threats.
5. **Research and Development:** Focus on universal vaccines and prototype pathogen platforms.

Conclusion:

Disease X represents an inevitable yet unpredictable health threat requiring global preparedness. Strengthened surveillance, equitable resource distribution, and international collaboration are critical to safeguarding humanity against the next pandemic.

PYQ:

1. Appropriate local community-level healthcare intervention is a prerequisite to achieve 'Health for All' in India. Explain. (UPSC-2018)

7. ASHA WORKERS

Context:

ASHAs (Accredited Social Health Activists) play a pivotal role in India's healthcare system, especially in rural and underserved areas. Despite their significant contributions to maternal health, immunization, and awareness, these workers face numerous challenges that hinder their impact.

ASHA Workers in India:

- **Origin:** Launched in 2005 under the National Rural Health Mission (NRHM) to strengthen grassroots healthcare in rural areas.
- **Who Are ASHAs:** Female volunteers from local communities trained to promote health awareness and access to healthcare services.
- **Aim:** To serve as a link between communities and the healthcare system, fostering healthcare awareness and access at the village level.
- **Functions:**

- Maternal and child healthcare.
- Immunization drives.
- Health education on sanitation, hygiene, and nutrition.
- Support under national health programs like tuberculosis and family planning.

Role of ASHAs in Developing India:

1. **Improving Maternal and Child Health:** Promoting institutional deliveries and antenatal care has reduced maternal and infant mortality rates.

E.g.: Institutional delivery rate increased from 47% (2007) to 79% (2022).

2. **Enhancing Immunization Rates:** Mobilizing communities to participate in vaccination programs has improved child immunization rates.
3. **Disease Surveillance:** Reporting outbreaks and promoting early diagnosis under programs like Revised National Tuberculosis Control.
4. **Advocacy and Behaviour Change:** Creating awareness of sanitation, nutrition, and lifestyle diseases has led to improved public health behaviour.
5. **Bridging Healthcare Gaps:** Acting as a liaison between rural communities and public health facilities.

Government Initiatives to Empower ASHAs:

1. **Remuneration and Incentives:**
2. Increased pay and performance-based incentives announced in the 2018 budget.
3. **Insurance Coverage:** Free health insurance under Ayushman Bharat and Pradhan Mantri Jeevan Jyoti Bima Yojana.
4. **Training Programs:** Skill enhancement through continuous training under National Health Mission (NHM).
5. **Recognition and Support:** Platforms like Village Health Mapping and digital tools for better outreach and feedback.
6. **Infrastructure Development:** Improved logistics and access to medical supplies for effective delivery of services.

Challenges Faced by ASHA Workers:

1. **Heavy Workload:** Multiple responsibilities with limited support strain their efficiency.
2. **Inadequate Compensation:** Delayed payments and lack of social security benefits affect motivation.
3. **Gender and Caste Discrimination:** ASHAs, often from marginalized communities, face systemic biases.
4. **Lack of Recognition:** Insufficient acknowledgment of their efforts leads to dissatisfaction.
5. **Inadequate Infrastructure:** Limited access to transport and medical supplies hampers service delivery.

Way Ahead:

1. **Formalize Employment Status:** Transition ASHAs from volunteer roles to formal employment with benefits.
2. **Strengthen Training and Resources:** Provide modern training and ensure a steady supply of essential medical tools.
3. **Enhance Financial Stability:** Introduce timely and higher compensation with performance bonuses.
4. **Recognition Programs:** Establish awards and public acknowledgment to boost morale.
5. **Digital Integration:** Expand access to technology for real-time data collection and communication.

Conclusion:

As Nelson Mandela once said, **"Health cannot be a question of income; it is a fundamental human right."** Empowering ASHAs is not just a policy priority but a moral imperative. Strengthening their roles with dignity, resources, and support will ensure that India's healthcare system becomes more inclusive, effective, and capable of serving even the most marginalized.

PYQ:

1. Appropriate local community-level healthcare intervention is a prerequisite to achieve 'Health for All' in India. Explain. (UPSC-2018)

8. THE QUEST FOR HEALTH EQUITY

Context:

Health equity remains a critical goal for achieving Universal Health Coverage **(UHC)** in India. Despite government initiatives systemic inequalities persist across gender, religion, and regions, widening the gap in access to quality healthcare services.

What is Health Equity?

Health equity ensures that **everyone has a fair opportunity** to achieve their highest health potential, addressing avoidable disparities caused by social, economic, and environmental factors.

Various Parameters of Health Equity

1. **Access to Healthcare:** Equitable distribution of hospitals, health workers, and medicines in rural and urban areas.
2. **Financial Protection:** Reducing out-of-pocket healthcare expenditures and ensuring insurance coverage.
3. **Gender Parity:** Equal healthcare access for women, men, and non-binary individuals.
4. **Social Determinants:** Addressing poverty, education, housing, and clean water to improve health outcomes.
5. **Quality of Care:** Ensuring timely, affordable, and standardized healthcare services for all.

Present Inequity in Health in India:

1. **Gender Inequality:**
   - **Anaemia among Women**: 59% in the lowest wealth quintile (NFHS-5, 2019-21).
   - Maternal mortality remains higher in rural areas due to lack of care.
2. **Religious Inequality:**
   - **Muslims** have higher infant mortality rates (43 per 1,000 live births) than the national average (Census 2011).
3. **Regional Disparity:**
   - Urban areas have 75% of healthcare professionals, but only **27% of India's population** resides there (WHO).
   - Rural CHCs face **83% shortages** of specialists, worsening access to care.
4. **Caste and Tribal Marginalization:**
   - **Child Mortality**: Higher among Scheduled Tribes and Scheduled Castes.
   - Immunization rates lower for marginalized groups compared to upper castes (NFHS-5).
5. **Economic Disparity:**
   - Out-of-pocket expenses: **39.4%** of total health expenditure (NHA, 2021-22).
   - Over **50 million people** are pushed into poverty annually due to healthcare costs.

Government initiatives:

1. **Ayushman Bharat – PMJAY:** Provides ₹5 lakh annual health cover for low-income families.
2. **National Health Mission (NHM):** Focuses on strengthening primary and urban healthcare systems.
3. **Pradhan Mantri Ayushman Bharat Digital Mission:** Promotes digital healthcare access and efficiency.
4. **Free Medicine Schemes:** Tamil Nadu's robust **drug procurement system** ensures free medicines.
5. **Focus on Primary Healthcare:** Kerala's model emphasizes strong primary health infrastructure.

Challenges for health equity:

1. **Inadequate Public Funding:** Government healthcare spending stands at only **1.84% of GDP**.
2. **Shortage of Healthcare Workers:** Severe deficit of doctors and specialists, particularly in rural areas.
3. **Over-Reliance on Private Sector:** High private healthcare costs exacerbate inequities.
4. **Socioeconomic Barriers:** Poverty, gender discrimination, and illiteracy hinder healthcare access.
5. **Regional Imbalance:** States with low healthcare infrastructure struggle with accessibility and quality of care.

Way ahead to achieve health equity:

1. **Increased Public Health Spending:** Raise budgetary allocation to **2.5% of GDP** for improved infrastructure and resources.
2. **Strengthen Primary Healthcare:** Focus on **PHCs and CHCs** with adequate staffing and facilities in rural areas.
3. **Expand Insurance Coverage:** Integrate **informal sector workers** into schemes like PMJAY.
4. **Leverage Technology:** Use digital health platforms for telemedicine and health awareness.
5. **Address Social Determinants:** Tackle poverty, education gaps, clean water access, and nutrition to improve overall health outcomes.

Conclusion:

Achieving health equity requires political commitment, increased investment, and inclusive policies that address systemic disparities. **As Nelson Mandela said, "Health cannot be a question of income; it is a fundamental human right."**

PYQ:

1. Consider the following statements: (UPSC-2023)
   Statement-I: India's public sector health care system largely focuses on curative care with limited preventive, promotive and rehabilitative care.
   Statement-II: Under India's decentralized approach to health care delivery, the States are primarily responsible for organizing health services.
   Which one of the following is correct in respect of the above statements?
   a) Both Statement-I and Statement-II are correct and Statement II is the correct explanation for Statement-I
   b) Both Statement-I and Statement-II are correct and Statement II is not the correct explanation for Statement-I
   c) Statement-I is correct but Statement II is incorrect
   d) Statement-I is incorrect but Statement-II is correct
   Answer: b)

9. EMPTY SHELVES, FULL WARDS: ANTIBIOTIC SHORTAGES IN A FRAGILE WORLD

Context:

The World Health Organization (WHO), in collaboration with the Global Antibiotic Research and Development Partnership (GARDP), has highlighted the urgent issue of global antibiotic shortages.

Antibiotic Shortage: Global Data and Examples

- **Global Burden:** In 2019, AMR directly caused 1.27 million deaths and was associated with 4.95 million more (Source: Lancet, 2022).
- **Regional Examples:**
  - **United Kingdom:** A 2023 shortage of paediatric amoxicillin, used for Strep A, led to treatment delays and fatalities.
  - **Low- and Middle-Income Countries (LMICs):** Frequent stockouts of first-line antibiotics exacerbate public health challenges.
- **Market Failures:** Over 42% of antibiotic shortages are reported compared to other drugs (WHO, 2024).

Reasons behind antibiotic shortage:

- **Market and Economic Failures:** Antibiotics are less profitable than other drugs, leading to reduced investment in production.
  - Supply chain disruptions and bottlenecks deter manufacturing.
- **Regulatory Hurdles:** Strict regulatory requirements increase production costs.
  - Delays in approvals further discourage manufacturers.
- **Sudden Demand Surges:** Outbreaks of bacterial infections result in erratic demand, straining supply chains.
- **Limited Manufacturers:** Dependence on a small number of global suppliers increases vulnerability to disruptions.
- **Stock Management Issues:** Poor procurement practices and lack of national stockpiling systems.

Impacts of antibiotic shortages:

1. **Increased AMR Risk:** Shortages force reliance on suboptimal or broad-spectrum antibiotics, accelerating resistance.
2. **Higher Mortality and Morbidity:** Delayed treatments contribute to preventable deaths.
   - Vulnerable populations, including children, face severe health risks.
3. **Economic Strain:** Prolonged illnesses due to ineffective treatments burden healthcare systems.
4. **Public Health Challenges:** Limited access undermines global health security, especially in Lower- middle income countries (LMICs).
5. **Quality Concerns:** The use of substandard or falsified antibiotics increases the likelihood of treatment failure.

WHO recommendations to counter antibiotic shortages:

1. **Enhancing Flexibility for Acute Shortages:** Temporary imports, extending expiry dates, and waiving certain testing requirements during crises.
2. **Strengthening Supply Chains:** Diversifying suppliers, incentivizing local production, and maintaining strategic stockpiles.
3. **Increasing Market Visibility:** Sharing data on demand and potential shortages to ensure better supply chain

coordination.

4. **Institutionalizing Collaboration:** Establishing emergency plans and fostering partnerships between countries and manufacturers.
5. **Reinforcing Regulatory Frameworks:** Streamlining approval processes, enforcing quality controls, and removing substandard products.

Conclusion:

Addressing antibiotic shortages is pivotal to combating AMR and safeguarding global health systems. WHO's roadmap provides actionable steps to mitigate these shortages and enhance resilience. Strengthening global collaboration and regulatory measures will be key to ensuring equitable and sustainable access to essential antibiotics.

PYQ:

1. Which of the following are the reasons for the occurrence of multi-drug resistance in microbial pathogens in India? (UPSC-2019)
    1. Genetic predisposition of some people
    2. Taking incorrect doses of antibiotics to cure diseases
    3. Using antibiotics in livestock farming
    4. Multiple chronic diseases in some people

    Select the correct answer using the code given below.

    a) 1 and 2
    b) 2 and 3 only
    c) 1, 3 and 4
    d) 2, 3 and 4

    Answer: b)

Topics: Important aspects of governance, transparency and accountability, e-governance applications, models, successes, limitations, and potential; citizens charters, transparency & accountability and institutional and other measures.

10. SAFER, SMARTER, FAIRER: E-TRACKING FOR UNDERTRIALS

Context:

Electronic tracking of undertrials is being explored as a solution to address overcrowding while ensuring compliance with court conditions and preserving individual liberty.

Undertrials in India:

- 75.8% of prison population (4,34,302 out of 5,73,220) are undertrials.
- 76.33% of incarcerated women are undertrials.
- 8.6% of undertrials have been in prison for over three years.
- Prisons operate at 131% occupancy, compared to 4,36,266 capacity.
- **Legal representation gap**: Many undertrials lack access to free legal aid due to inadequate ratio.

Indian Undertrial Laws Overview

- Section 479 of BNSS: First-time offenders eligible for release after serving one-third of maximum sentence.
- Section 436A of CrPC: Undertrials serving half the maximum sentence can be released on personal bond.
- Supreme Court PIL on Prison Conditions (2013) emphasizes timely identification and release of eligible undertrials.
- Speedy trial is a fundamental right under Article 21 of the Constitution.

What is Electronic Tracking of Undertrials?

Electronic tracking involves the use of monitoring systems, such as GPS-enabled devices, to supervise undertrials outside prison. It reduces incarceration while ensuring compliance with legal conditions.

Types of Electronic Tracking:

- **GPS-Enabled Ankle Monitors:** Real-time location tracking devices.
- **RFID (Radio Frequency Identification):** Monitors proximity to designated areas.
- **Mobile Applications:** Smartphone-based location and status reporting.

- **Biometric Systems:** Fingerprint, facial recognition, or voice authentication for identity verification.

Advantages:

- **Cost-Effective:** Significantly cheaper than incarceration.

E.g. Odisha spends ₹1 lakh per undertrial annually, while trackers cost ₹10,000-₹15,000.

- **Decongests Prisons:** Helps alleviate overcrowding in Indian jails operating at 131% capacity.
- **Enables Rehabilitation:** Allows undertrials to work, care for families, and avoid stigma.
- **Enhanced Judicial Confidence:** Courts can grant bail with greater assurance of compliance.

Limitations:

- **Privacy Concerns**: Raises questions about surveillance and data security.

E.g. Supreme Court struck down invasive bail conditions in 2023.

- **Social Stigma**: Visible devices like ankle monitors can lead to discrimination and isolation.
- **Technical Failures**: GPS and monitoring systems may not function effectively in remote areas.
- **Financial Burden**: Debate over whether costs should be borne by the government or the accused.

Global Practices:

1. **United States:** Widely used for pre-trial and parole cases but criticized for "e-carceration" and social inequities.
2. **European Union:** Countries like the UK and Sweden employ electronic tags for conditional pre-trial releases.

Conclusion:

Electronic tracking is a cost-effective and humane alternative to incarceration, offering relief to overcrowded prisons. However, its success depends on robust privacy safeguards, equitable implementation, and judicial oversight to balance rights and justice.

PYQ:

1. With reference to India, consider the following statements: (UPSC-2021)
    1. When a prisoner makes out a sufficient case, parole cannot be denied to such prisoner because it becomes a matter of his/her right.
    2. State Governments have their own Prisoners Release on Parole Rules.

    Which of the statements given above is/are correct?
    a) 1 only
    b) 2 only
    c) Both 1 and 2
    d) Neither I nor 2

    Answer: b)

11. CASTE AND COUNT: MAPPING INDIA'S SOCIAL FABRIC

Context:

The demand for a caste Census has become a heated political issue, fuelled by calls from opposition leaders and NGOs.

What is a Caste Census?

A caste census involves enumerating India's population based on caste categories. While Scheduled Castes (SCs) and Scheduled Tribes (STs) have been recorded in every census since 1951, data on Other Backward Classes (OBCs) and sub-castes has been absent, leaving critical gaps in policymaking and affirmative action initiatives.

Need for a Caste Census:

1. **Addressing Inequities:** Helps identify intra-caste disparities and ensures equitable allocation of resources.
2. **Empirical Evidence for Policies:** Provides a data-driven basis for affirmative action.
3. **Monitoring Effectiveness:** Enables assessment of existing reservation policies.
4. **Governance:** Guides resource allocation and better implementation of welfare schemes.

***Example*:** Bihar's 2023 caste census revealed that 84% of the population belongs to OBCs, EBCs, and SCs, necessitating targeted measures.

5. **Social Justice:** Fulfills constitutional mandates for equality and non-discrimination.

Historical Background

1. **Colonial Era:**
   - First caste census in 1871-72.
   - Last caste data collected in 1931 under British rule.
2. **Post-Independence**:
   - **Socio-Economic and Caste Census (SECC) of 2011:** Identified over 46.7 lakh caste/sub-caste groups but faced significant data inconsistencies.

Implications of a Caste Census:

- **Social**
  - Better identification of disadvantaged groups.
  - Reinforces caste-based identity, potentially deepening divisions.

Example: Bihar's findings challenged dominant caste narratives.

- **Political**
  - Reshapes political strategies by identifying neglected caste groups.

Example: Post-Bihar census, calls for proportional reservations surged.

  - Could weaken broader Hindu identity politics.
- **Economic**
  - Enables resource allocation based on need rather than assumption.
  - Facilitates targeted economic development programs for backward groups.
- **Governance**
  - Helps track implementation and impact of welfare schemes.
  - Aids in prioritizing infrastructure and healthcare interventions.
- **Legal**
  - Provides empirical justification for affirmative action in courts.
  - Addresses challenges in implementing SC, ST, and OBC reservations.

Challenges to Caste census:

1. **Complexity in Classification:** Similar-sounding castes or regional variations lead to misclassification.

Example: 'Sen' in Bengal (upper caste) vs 'Sain' (OBC barber caste).

2. **Upward/Downward Mobility Claims:** Self-reporting influenced by perceived benefits.

Example: Bihar caste census faced controversies over classification issues.

3. **Administrative Feasibility:** Inadequate training of enumerators and lack of infrastructure.
4. **Data Integrity:** Risks of data manipulation due to political and social pressures.
5. **Societal Divisions:** Potential hardening of caste identities.

Case Study: Bihar Caste Census (2023)

Impact:

- Triggered demands for proportional reservations.
- Strengthened the narrative for caste-based welfare.

Way Ahead

1. **Standardized Methodology:** Clear guidelines for classification to avoid errors.
2. **Training of Enumerators:** Specialized training to ensure accurate data collection.
3. **Data Confidentiality:** Strict measures to protect the privacy of respondents.
4. **Incorporating Technology:** Use AI and geospatial tools for accurate data mapping.
5. **Proactive Policy:** Utilize findings to create inclusive and targeted welfare programs.
6. **Stakeholder Engagement:** Involve academia, policymakers, and social leaders to ensure credibility.

Conclusion:

A caste census, while fraught with challenges, offers an unparalleled opportunity to address systemic inequities and foster inclusive growth. By leveraging accurate data for policymaking, India can move closer to its constitutional ideals of equality, justice, and dignity for all citizens.

PYQ:

1. Consider the following statements: (UPSC-2009)
    1. Between Census 1951 and Census 2001, the density of the population of India has increased more than three times.
    2. Between Census 1951 and Census 2001, the annual growth rate (exponential) of the population of India has doubled.

    Which of the statements given above is/are correct?
    a) 1 only
    b) 2 only
    c) Both 1 and 2
    d) Neither 1 nor 2

    Answer: d)

Topics: India and its neighbourhood- relations.

12. FROM RAMAYANA TO REALPOLITIK: INDIA-SRI LANKA RELATIONS

Context:

India and Sri Lanka share a long history of cultural, economic, and strategic ties. Recent developments have strengthened bilateral cooperation, particularly in trade, defence, and energy, amid concerns about geopolitical influences in the Indian Ocean region.

Historical Background and Agreements:

- **Cultural Ties:** Rooted in Buddhism, which spread from India to Sri Lanka during Emperor Ashoka's reign, fostering deep religious and historical connections.
- **Post-Independence Relations:** India supported Sri Lanka during its early nation-building years, including the **Indo-Sri Lanka Agreement of 1987**, which aimed to resolve the Tamil issue through autonomy.
- **Civil War Era:** Relations soured due to India's involvement through the Indian Peacekeeping Force (IPKF) and tensions over LTTE activities.
- **Post-Civil War:** India supported reconstruction efforts post-2009, aiding Tamil communities and addressing human rights concerns.
- **Trade Relations:** The India-Sri Lanka Free Trade Agreement **(ISFTA)** signed in 2000 boosted bilateral trade, with India emerging as Sri Lanka's largest trading partner.

Recent outcomes of the meeting:

1. **Economic Cooperation:** Agreements on energy connectivity, including a multi-product petroleum pipeline and electricity grid integration.
2. **Defence Commitments:** Assurance from Sri Lanka to prevent its territory from being used against India's security.
3. **Development Projects:** Initiatives like the Indian Housing Project and renewable energy efforts targeting Tamil areas.
4. **Regional Stability:** Reaffirmation of mutual goals through the Colombo Security Conclave to enhance maritime security.

Significance of India-Sri Lanka Relations:

1. **Strategic Location:** Sri Lanka's position in the Indian Ocean makes it crucial for securing Sea Lanes of Communication (SLOCs).
2. **Maritime Security:** Ports like Hambantota are vital for regional stability amid rising Chinese influence.
3. **Economic Collaboration:** Trade, investment, and energy partnerships are key to regional development.
4. **Cultural and People-to-People Ties:** Shared history fosters goodwill and cooperation in areas like education and heritage conservation.

Concerns in India-Sri Lanka Relations:

1. **Chinese Influence:** Projects like Hambantota Port and Colombo airport raise security concerns.

E.g. Chinese naval vessel docking incidents in Sri Lankan waters.

2. **Fishing Disputes:** Indian fishermen's arrests in the Palk Strait create tensions.
3. **Tamil Issue:** Lack of progress on the 13th Amendment for Tamil autonomy remains contentious.

4. **Geopolitical Rivalries:** Balancing relationships with China and India is challenging for Sri Lanka.
5. **Debt Crisis:** Sri Lanka's economic instability requires careful navigation to ensure sustainable aid and trade ties.

Way ahead:

1. **Strengthen Strategic Ties:** Enhance maritime security through joint exercises and infrastructure investments.

E.g. Colombo Security Conclave and the Trincomalee oil tank farm project.

2. **Address Tamil Issues:** Advocate for equitable political solutions for Tamil minorities.
3. **Expand Economic Engagement:** Conclude the **India-Sri Lanka Free Trade Agreement (FTA)** for broader trade coverage.
4. **Counter Chinese Influence:** Leverage soft power and strategic investments to balance geopolitical competition.

E.g. Development of Sampur Power Plant.

5. **People-Centric Initiatives:** Focus on community welfare through education, healthcare, and housing programs.

Conclusion:

India-Sri Lanka relations are rooted in shared cultural heritage and strategic imperatives. Strengthening ties through mutual respect, economic cooperation, and security collaboration will ensure regional stability and prosperity in South Asia.

PYQ:

1. 'India is an age-old friend of Sri Lanka.' Discuss India's role in the recent crisis in Sri Lanka in the light of the preceding statement. (UPSC-2022)
2. In respect of India-Sri Lanka relations, discuss how domestic factors influence foreign policy. (UPSC-2013)

13. INDIA'S REFUGEE POLICY ON ROHINGYA

Context:

A recent report by The Azadi Project and Refugees International highlights critical gaps in India's refugee policies concerning the Rohingya community.

Rohingya Issue:

- **Background:** The Rohingya are an ethnic Muslim minority in Myanmar, considered the world's largest stateless population due to Myanmar's refusal to grant them citizenship.
- **Persecution:** They have faced decades of violence, including genocidal campaigns by Myanmar's authorities, compelling them to flee to neighbouring countries.
- **Global Refuge:** Nearly 2.8 million Rohingyas are dispersed across countries like Bangladesh, Malaysia, India, and Indonesia.
- **In India:** As per UNHCR, approximately 22,500 Rohingyas reside in India, facing challenges like lack of legal status, arbitrary detention, and human rights violations.

India's Refugee Policy on Rohingyas:

- **Legal Framework:** India lacks a domestic refugee law and is not a signatory to the 1951 Refugee Convention or its 1967 Protocol.
- **Governance:** Rohingyas are treated under the **Foreigners Act, 1946** and the **Passport Act, 1967**, allowing the government to categorize them as illegal migrants.
- **Judicial Stance:**
  - The Supreme Court ruled in ***Mohammad Salimullah v. Union of India (2021)*** that Rohingyas cannot be deported without due process but deferred to national security concerns.
  - High Courts, in cases like ***Ktaer Abbas Habib Al Qutaifi v. Union of India***, have interpreted **non-refoulement** as part of Article 21 (Right to Life).
- **Exclusions:** The **Citizenship Amendment Act, 2019** explicitly excludes persecuted Muslim minorities, including Rohingyas, from its ambit.

International Conventions on Refugees:

- **1951 Refugee Convention and 1967 Protocol:** Enshrines the principle of **non-refoulement**, preventing the return of refugees to places where they face persecution or torture.
- **Other Treaties:**

- **International Covenant on Civil and Political Rights (ICCPR):** Protects individuals from torture or inhuman treatment upon return.
- **Convention on the Rights of the Child (CRC):** Advocates for the welfare of refugee children.

Challenges and Issues in India's Refugee Policy:

- **Legal Vacuum:** Absence of a unified refugee law leads to arbitrary and inconsistent treatment.
- **Detention and Living Conditions:** Detained Rohingyas face dehumanizing conditions, including in transit camps like Matia in Assam.
- **National Security Concerns:** Rohingyas are often perceived as potential security threats, influencing judicial and policy decisions.
- **Civil Society Constraints:** Revocation of FCRA licenses has hampered NGOs' efforts to provide legal and humanitarian aid.
- **Exclusionary Policies:** The exclusion of Muslim refugees from CAA undermines India's secular constitutional framework.

Way Ahead:

- **Legislative Framework:** Formulate a comprehensive **domestic refugee law** that aligns with international conventions.
- **Strengthen Judicial Oversight:** Reinforce the judiciary's role in upholding non-refoulement under Article 21.
- **Improve Living Conditions:** Ensure humane detention centres with adequate resources for food, healthcare, and education.
- **Community Involvement:** Empower local communities and NGOs to support refugee rehabilitation.
- **International Collaboration:** Work with global bodies like UNHCR to develop sustainable solutions for the Rohingya crisis.

Conclusion:

India, as a democracy committed to human dignity, must align its policies with global humanitarian norms, ensuring the safety and well-being of Rohingya refugees while balancing national security concerns. A fair and inclusive approach is imperative to uphold India's constitutional and international obligations.

PYQ:

1. "Refugees should not be turned back to the country where they would face persecution or human right violation." Examine the statement with reference to the ethical dimension being violated by the nation claiming to be democratic with open society. (UPSC-2021)

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

14. SOUTH ASIAN ECONOMIC UNION

Context:

The South Asian Economic Union (SAEU) remains an aspirational vision amidst the geopolitical and economic complexities of the region.

What is the South Asian Economic Union?

- **Definition:** The SAEU is a long-term vision of the South Asian Association for Regional Cooperation (SAARC) to integrate the economies of its eight member states: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka.
- **Objective:** To enhance regional trade, investment, connectivity, and economic cooperation through phased integration of markets.
- **Foundation:** Built on agreements like SAFTA (2006), aimed at reducing tariffs and promoting free trade among members.
- **Pillars of Integration:** Regional market integration, cross-border connectivity, energy cooperation, and private sector liberalization (ADB Report).

Data on Trade Among SAARC Members: [Source: ADB Report]

- **Intra-regional trade share:** Accounts for less than 5% of formal trade among SAARC nations.
- **India's dominance:** India contributes 73% of intra-regional exports but only 13% of imports, highlighting trade

imbalances.

- **Smaller members' reliance:** Bhutan, Afghanistan, and Nepal rely heavily on intra-regional exports, with shares of 82%, 67%, and 71%, respectively.
- **Trade barriers:** Complex non-tariff barriers (NTBs) and safeguard measures limit trade liberalization under SAFTA.

Role of BIMSTEC in Asian Economic Union:

1. **Regional Connectivity:** BIMSTEC bridges South and Southeast Asia, promoting trade and connectivity through infrastructure projects like the BIMSTEC Master Plan for Transport Connectivity.
2. **Economic Cooperation:** Facilitates free trade agreements and sectoral collaborations, including energy, tourism, and technology, contributing to regional economic integration.

Role of SAARC in Asian Economic Union:

1. **Trade Liberalization:** SAARC established the South Asian Free Trade Area (SAFTA) to reduce tariffs and promote intra-regional trade, a critical step towards economic integration.
2. **Policy Harmonization:** Encourages member states to align trade and economic policies, creating a foundation for a unified market within South Asia.

India's Initiatives to Enhance Economic Cooperation

- **Neighbourhood First Policy:** Focuses on strengthening economic ties with SAARC nations through bilateral and multilateral agreements.
- **India-Sri Lanka Cooperation:** Expansion of the India-Sri Lanka Free Trade Agreement and development of Trincomalee as an energy hub.
- **Energy Connectivity:** Projects like the Bangladesh-Bhutan-India-Nepal (BBIN) energy grid to enhance regional power trade.
- **Infrastructure Initiatives:** Kaladan Multimodal Transit Transport Project and road corridors to improve trade connectivity with Myanmar and Bangladesh.
- **Digital Connectivity:** India's push for digital infrastructure and e-governance projects in neighboring countries to boost trade facilitation.

Challenges to the South Asian Economic Union:

- **Political tensions:** Conflicts between India and Pakistan, and differing alignments like Nepal's engagement with China's Belt and Road Initiative.
- **Trade imbalances:** India's export dominance and limited imports from other SAARC nations create economic disparities.
- **Non-tariff barriers:** Restrictive policies and lack of harmonized trade regulations limit regional trade growth.
- **Infrastructure gaps:** Poor transport and logistics infrastructure hinders effective cross-border trade.
- **Economic disparity:** Divergent economic policies and levels of development among SAARC members complicate integration efforts.

Way Ahead:

- **Strengthen SAFTA:** Revise and simplify trade agreements to eliminate non-tariff barriers and encourage fair trade practices.
- **Boost connectivity:** Invest in regional transport corridors, energy grids, and digital infrastructure to facilitate smoother trade and investment flows.
- **Resolve political issues:** Encourage multilateral dialogues to address geopolitical tensions and foster trust among SAARC nations.
- **Leverage private sector:** Involve businesses to drive innovation and investments in regional integration projects.
- **Promote inclusivity:** Focus on equitable policies to address trade imbalances and ensure smaller nations benefit from integration efforts.

Conclusion:

The vision of a South Asian Economic Union holds transformative potential for the region. However, achieving this goal requires addressing deep-rooted political and economic challenges through sustained efforts and cooperation. A phased and inclusive approach could gradually turn this distant dream into a reality, fostering growth and stability across South Asia.

PYQ:

1. "Increasing cross-border terrorist attacks in India and growing interference in the internal affairs of several member-

states by Pakistan are not conducive for the future of SAARC (South Asian Association for Regional Cooperation)." Explain with suitable examples. (UPSC-2016)

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

15. A FRACTURED REGION: UNDERSTANDING THE MIDDLE EAST TURMOIL

Context:

The collapse of Bashar al-Assad's regime in Syria after an 11-day offensive by rebel groups has triggered a geopolitical reshuffle in the Middle East.

Middle East Tensions and Syria's Recent Fall:

- Syria's **Collapse**
  - Assad's rule, characterized by authoritarianism, ended after sustained pressure from rebel forces led by Abu Mohammed al-Jawlani, a former al-Qaeda operative.
  - External supporters like Iran and Russia shifted focus elsewhere, contributing to Assad's defeat.
- **Regional Dynamics**
  - Turkey-backed Hayat Tahrir al-Sham (HTS) emerged as a dominant force.
  - Questions arise about Syria's future governance and potential descent into Islamist authoritarianism.

Factors Behind Tensions in the Middle East

- **Authoritarian Regimes**: Fragile political systems often collapse under pressure from internal dissent or external interventions.
- **Proxy Conflicts:** Rivalries among global powers (e.g., Russia, the U.S.) and regional players (e.g., Iran, Turkey) exacerbate instability.
- **Sectarian Divides:** Sunni-Shia tensions underpin many conflicts, fueling violence and regional rivalries.
- **Geopolitical Ambitions:** Nations like Turkey, Iran, and Saudi Arabia aim to expand their influence, often at the expense of regional stability.

Impacts:

1. **In the Region:**
   - **Power Vacuum:** The absence of Assad may lead to infighting among rebel factions.
   - **Instability:** Potential rise of extremist groups threatens regional peace.
   - **Economic Fallout:** Ongoing conflicts disrupt trade and economic recovery.
   - **Refugee Crisis:** Renewed displacement of civilians exacerbates humanitarian challenges.
2. **On India:**
   - **Energy Security**: Instability in the Middle East could impact oil imports.
   - **Diaspora Risks**: Threats to Indian workers in Gulf nations.
   - **Geopolitical Balancing**: Navigating relations with regional powers like Iran and Saudi Arabia.
   - **Strategic Interests**: Maintaining influence in a volatile region.
3. **Globally:**
   - **Rise of Extremism:** Threat of radical Islamist movements spreading beyond the region.
   - **Geopolitical Rivalries:** Renewed tensions among global powers like the U.S., Russia, and China.
   - **Economic Impact:** Oil market volatility affects global economies.
   - **Humanitarian Concerns**: Escalating crises demand international intervention.

Way Ahead

1. **Inclusive Governance:** Rebel factions must build a pluralistic framework respecting minority right.
2. **International Cooperation:** Global powers should mediate to ensure stability and prevent extremism.
3. **Regional Stability:** Nations like Turkey and Saudi Arabia must prioritize peace over influence.
4. **Humanitarian Aid:** Focus on addressing displacement, hunger, and healthcare crises in affected areas.

Conclusion:

The fall of Assad signals a transformative phase in the Middle East, fraught with uncertainty and opportunity. Stability in Syria and the broader region hinges on inclusive governance, regional cooperation, and international mediation.

PYQ:

1. The area known as 'Golan Heights' sometimes appears in the news in the context of the events related to (UPSC-2015)
   a) Central Asia
   b) Middle East
   c) South-East Asia
   d) Central Africa

   Answer: b)

GENERAL STUDIES – 3

Topics: Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment.

1. UPI - UNLEASHING PROSPERITY AND INNOVATION

Context:

Launched in 2016 by NPCI, India's UPI has revolutionized digital payments, achieving record usage in October 2024 and showcasing India's digital financial leadership.

UPI Features:

- 24/7 operation for seamless fund transfers.
- Single interface for integration of multiple bank accounts.
- Secure authentication with single-click 2-factor authentication.
- Privacy protection through virtual payment addresses.
- QR code compatibility for instant payments.
- Flexibility for merchant payments, in-app transactions, donations, collections.
- No Merchant Discount Rate (MDR) incentive for adoption.
- Voice-enabled notifications for small vendors.

Impact of UPI in India:

- Empowers small businesses, street vendors, and rural populations with secure digital transactions.
- Increased adoption during COVID-19 for contactless transactions.
- Accelerates India's transition to a cashless economy.
- Provides user convenience with multiple payment methods.
- Widely used across all sectors, showcasing universal acceptability.

Success of UPI

- Rapid Growth: Recorded 16.58 billion transactions worth ₹23.49 lakh crores in October 2024 and 74 billion transactions worth ₹125.94 trillion in 2022.
- Wide Acceptance: Supports payments from ₹1 micro-transactions to large-scale retail payments.
- Tech Integration: Linkage with RuPay credit cards expands utility.
- Global Expansion: Operational in 7 countries, facilitates cross-border transactions, accounts for 49% of global real-time payment transactions.
- BRICS Advocacy: Proposed expansion to BRICS nations for remittances and financial inclusion.

Limitations of UPI:

- Cybersecurity risks: Phishing and identity theft, leading to over ₹129 crore digital fraud losses in 2022.
- Infrastructure challenges: Dependence on internet and smartphone leaves 45% of rural India without broadband.
- Transaction limits: UPI caps transactions at ₹2 lakh, limiting high-value transfers.
- Over-reliance on digital: Excludes 20% of India's adult population lacking digital literacy.

• Operational issues: Peak hours downtime and a 5% failure rate reported in 2023.

Way Ahead for India's UPI Strategy:

• Strengthen security with advanced fraud detection systems.
• Expand infrastructure in rural areas to increase smartphone and broadband penetration.
• Collaborate with nations like France, UAE, Singapore for UPI traction.
• Introduce offline UPI and QR-based rural solutions.
• Promote public awareness through nationwide campaigns to teach safe UPI usage.

Conclusion:

UPI has not only revolutionized the way India conducts financial transactions but has also positioned the country as a global leader in digital payments. By offering a seamless, secure, and accessible platform for both individuals and businesses, UPI has played a pivotal role in promoting financial inclusion and accelerating the nation's shift towards a cashless economy.

PYQ:

1. Implementation of Information and Communication Technology (ICT) based Projects/ Programmes usually suffers in terms of certain vital factors. Identify these factors, and suggest measures for their effective implementation. (UPSC-2019)

2. NITI AAYOG: TRADE WATCH QUARTERLY

Context:

The NITI Aayog's Trade Watch Quarterly (TWQ) report for Q1 FY25 highlights India's trade performance, opportunities from global trade realignments, and challenges such as trade fragmentation and carbon tariffs.

Key trends and insights from the report:

- **Regional Performance:**
  - North America (21%) and the European Union (18.6%) are pivotal markets.
  - Trade with FTA partners grew by 12% in exports and 10.3% in imports.
- **Sectoral Performance:**
  - **Growth sectors:** IT services, pharmaceuticals, electrical machinery, and mineral fuels.
  - **Declining sectors:** Labour-intensive goods like textiles, pearls, and leather.

Strategic Policy Interventions:

1. **Infrastructure Development:**
   - Expansion of the **Trade Connect e-Platform** for streamlined exporter support.
   - Enhanced logistics under the **National Logistics Policy.**
2. **Export Incentives:**
   - Continued support through schemes like RoDTEP (Remission of Duties and Taxes on Exported Products).
3. **Technological Integration:**
   - Emphasis on digital trade and innovation to unlock high-growth sectors.
4. **PLI Schemes:**
   - Scaling manufacturing in sectors like electronics, textiles, and automobiles.
5. **Strengthening FTAs:**
   - Strategic agreements with partners like the UK and EU to reduce trade barriers.

Emerging Risks:

1. **Geopolitical Shifts:**
   - Opportunities from U.S.-China trade tensions but risks of overdependence.
2. **EU Carbon Border Adjustment Mechanism (CBAM):**
   - Tariffs of 20–35% on Indian exports of carbon-intensive goods like steel and aluminium starting 2026.
3. **Manufacturing Challenges:**
   - High input costs and fragmented production systems reducing competitiveness.
4. **Labour-Intensive Sector Decline:**
   - Structural inefficiencies in textiles, pearls, and leather sectors affecting global market share.

Future Suggested Roadmap:

1. **Boost Digital Integration:**
   - Leverage digital platforms for trade facilitation and innovation.
2. **Diversify Export Portfolio:**
   - Focus on high-growth sectors like IT, pharmaceuticals, and renewable energy.
3. **Build Resilience Against CBAM:**
   - Invest in green technologies and align with global sustainability standards.
4. **Expand Trade Agreements:**
   - Pursue FTAs with emerging economies for diversified market access.
5. **Empower MSMEs:**
   - Simplify regulations and provide targeted credit support for small exporters.

Conclusion:

India's trade growth is key to achieving a Viksit Bharat by 2047. Addressing inefficiencies, adopting technology, and strengthening global ties can establish India as a competitive trade leader.

PYQ:

1. Consider the following statements: (UPSC-2023)
   Statement-I: In the post-pandemic recent past, many Central Banks worldwide had carried out interest rate hikes.
   Statement-II: Central Banks generally assume that they have the ability to counteract the rising consumer prices via monetary policy means.

Which one of the following is correct in respect of the above statements?

a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-1
b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-1
c) Statement-I is correct but Statement-II is incorrect
d) Statement-I is incorrect but Statement-II is correct

Answer: a)

3. VIKSIT BHARAT 2047

Context:

India aims for developed nation status by 2047 under the Viksit Bharat vision. However, challenges like slower growth, high taxes, and declining foreign investments risk hindering progress.

Targets of India for Viksit Bharat 2047:

- **Economic Growth:** Achieve a sustained GDP growth rate of 7-8% annually.
- **Social Equity:** Eradicate poverty, ensure universal healthcare, and provide quality education.
- **Global Competitiveness:** Position India among the top three global economies.
- **Environmental Sustainability:** Attain net-zero emissions by 2070 while enhancing renewable energy adoption.
- **Industrial Modernization:** Boost manufacturing to contribute 25% to GDP under Make in India.

India's Economic Performance 2024:

Sector/Indicator	Key Highlights
GDP Growth	GDP growth slowed to **5.4%** (July-September 2024), below the RBI's 7% projection.
Services Sector	Contributed **54.72% of GVA**, valued at ₹146.44 lakh crore in 2023-24, making it the largest economic driver.
Industry Sector	Accounted for **27.62% of GVA**; notable challenges include record-high steel imports from China affecting domestic producers.
Agriculture Sector	Contributed **17.66% of GVA**; displayed resilience with strong agricultural output.
Inflation	Retail inflation increased to **6.21% in October**, breaching RBI's tolerance band.
Monetary Policy	RBI retained interest rate at **6.5%**, cut cash reserve ratio by **50 basis points**, injecting ₹1.16 trillion into the economy.

Government Initiatives for Viksit Bharat

- **Make in India and Aatmanirbhar Bharat:** Promote domestic manufacturing and reduce import dependency.
- **PLI Schemes:** Financial incentives for key sectors like electronics, pharma, and textiles.
- **PM Gati Shakti Master Plan:** Integrates infrastructure projects across sectors for faster development.
- **Digital India:** Expands internet access, boosts fintech adoption, and supports e-governance.
- **National Education Policy (NEP 2020):** Reforms in education to create a skilled workforce.
- **Green India Mission:** Focus on renewable energy and sustainable urban development.

Challenges India Faces:

- **Economic Inequalities:** Regional and income disparities hinder inclusive growth.
- **Infrastructure Gaps:** Delayed implementation of key projects affects connectivity.
- **Policy Uncertainty:** Retrospective tax policies and weak enforcement of reforms deter investors.
- **Global Risks:** Economic slowdown and geopolitical tensions impact trade and investments.
- **Environmental Concerns:** Balancing industrial growth with ecological sustainability remains critical.

Way Ahead:

- **Policy Reforms:** Ensure consistency in fiscal and monetary policies to attract investments.
- **Skill Development:** Bridge the education-employment gap by focusing on industry-relevant skills.
- **Boost Exports:** Enhance global trade partnerships and competitiveness in manufacturing.
- **Rural Development:** Strengthen healthcare, education, and infrastructure in rural areas.
- **Green Transition:** Scale up renewable energy capacity and adopt sustainable practices across industries.

Conclusion:

India's vision for Viksit Bharat 2047 is ambitious but achievable with sustained efforts in policy, innovation, and social inclusion. By addressing challenges strategically, India can emerge as a global leader in economy and sustainability, ensuring equitable growth for all.

PYQ:

1. Increase in absolute and per capita real GNP do not connote a higher level of economic development, if: (UPSC-2018)
    a) Industrial output fails to keep pace with agricultural output.
    b) Agricultural output fails to keep pace with industrial output.
    c) Poverty and unemployment increase.
    d) Imports grow faster than exports.

    Answer: c)

1. In a given year in India, official poverty lines are higher in some States than in others because: (UPSC-2019)
    a) Poverty rates vary from State to State
    b) Price levels vary from State to State
    c) Gross State Product varies from State to State
    d) Quality of public distribution varies from State to State

    Answer: b)

4. OILFIELDS (REGULATION AND DEVELOPMENT) AMENDMENT BILL, 2024

Context:

The Oilfields (Regulation and Development) Amendment Bill, 2024 was passed by the Rajya Sabha to encourage domestic production of petroleum and mineral oils and promote private sector participation.

Key Features in Bill:

1. **Expanded Definition of Mineral Oils:**
    - Includes all hydrocarbons (natural gas, crude oil, shale gas, and coal-bed methane).
    - Excludes coal, lignite, and helium.
2. **Introduction of Petroleum Lease:**
    - Replaces "mining lease" with "petroleum lease" covering activities like exploration, production, and disposal

of mineral oils.
- Existing leases remain valid.

3. **Decriminalisation of Offences:**
   - Replaces imprisonment with fines: **₹25 lakh** for violations and **₹10 lakh** per day for continued violations.
4. **Rule-Making Powers:**
   - Central government can set rules on environmental obligations, emission reductions, and dispute resolution mechanisms.
5. **Adjudication Mechanism:**
   - Penalties adjudicated by Joint Secretary-level officers; appeals directed to the Appellate Tribunal under the Petroleum and Natural Gas Board Act, 2006.

Significance:

- **Boosts Domestic Production:** Encourages exploration and production of petroleum and natural gas.
  - Reduces import dependency on crude oil.
- **Private Sector Participation:** Attracts private investment with clear lease regulations and reduced penalties.
- **Environmental Responsibility:** Introduces rules for emission reductions and sustainable practices.
- **Regulatory Simplification:** Decriminalisation enhances ease of doing business.
- **Modernisation:** Aligns with global energy trends by addressing unconventional hydrocarbons like shale gas.

Challenges

- **State Rights:** Potential disputes over states' taxation rights due to changes in lease terminologies.
- **Environmental Concerns:** Handing over resources to private entities might lead to over-extraction or ecological harm.
- **Implementation Issues:** Effective enforcement of environmental and emission norms may pose challenges.
- **Regulatory Overlap:** Coordination between central and state authorities for royalty collection and lease approvals.

Conclusion:

The Oilfields Amendment Bill, 2024, modernises India's regulatory framework for petroleum exploration, boosting domestic production and private investment. However, addressing environmental and state taxation concerns is crucial to ensuring balanced growth and sustainability.

1. Consider the following statements: (UPSC-2019)
   1. Coal sector was nationalised by the Government of India under Indira Gandhi.
   2. Now, coal blocks are allocated on lottery basis.
   3. Till recently, India imported coal to meet the shortages of domestic supply, but now India is self-sufficient in coal production.

   Which of the statements given above is/are correct?
   a) 1 only
   b) 2 and 3 only
   c) 3 only
   d) 1, 2 and 3

   Answer: a)

5. BALANCING THE SCALES: RBI VS CENTRE DYNAMICS

Context:

The RBI-government relationship has often seen conflicts over autonomy and policy. As Shaktikanta Das' tenure as RBI Governor ends, disputes over monetary policy echo past tensions.

Laws Governing RBI-Centre Relations:

1. **RBI Act, 1934**:
   - Establishes the RBI's role and functions.
   - **Section 7**: Empowers the central government to issue directions to the RBI in matters of public interest.
2. **Banking Regulation Act, 1949**:
   - Governs banking sector regulation, providing the RBI authority over banking operations.
3. **Public Debt Act, 1944**:

- Empowers the RBI to manage public debt on behalf of the government.

4. **Monetary Policy Framework Agreement (2016)**:
   - Introduced inflation targeting, mandating coordination between the RBI and the government.

History of Rift Between RBI and Centre:

1. **Y.V. Reddy (2003-2008)**:
   - Clashes over forex reserves usage and financial market development priorities.
   - Opposition to loan waivers and Tobin tax proposals.
2. **D. Subbarao (2008-2013)**:
   - Resisted government pressure to lower interest rates during the global financial crisis.
   - Opposed the Financial Stability and Development Council, citing undermining of RBI's role.
3. **Raghuram Rajan (2013-2016)**:
   - Advocated RBI independence, resisting regulatory shifts to SEBI.
   - Advised against demonetisation, emphasizing preparation and costs.
4. **Urjit Patel (2016-2018)**:
   - Dispute over surplus reserve transfer.
   - Resigned citing government interference under **Section 7 of the RBI Act**.

Factors Leading to Tussles:

1. **Monetary Policy Autonomy**: RBI focuses on inflation control; governments prioritize growth stimulation.
2. **Surplus Reserve Transfers**: Governments often seek access to RBI reserves for fiscal spending.
3. **Interest Rate Policy**: Frequent government demands for rate cuts to boost investment and growth.
4. **Regulatory Overreach**: Conflicts over RBI's regulatory authority in banking and financial markets.
5. **Political and Economic Divergences**: Immediate political goals of governments clash with the RBI's long-term stability goals.

Consequences of RBI-Centre Conflicts:

1. **Erosion of Institutional Trust**: Weakens credibility of RBI as an autonomous institution.
2. **Policy Uncertainty**: Impacts investor confidence due to lack of clear economic policy direction.
3. **Economic Instability**: Misdirected monetary or fiscal policies can harm economic stability.
4. **Resignations and Leadership Gaps**: Leadership disruptions, as seen during Urjit Patel's tenure.

Way Ahead for Resolving Issues:

1. **Enhance Dialogue**: Regular consultations between the RBI and the government to align policy priorities.
2. **Strengthen Frameworks**: Revisit and reinforce the **Monetary Policy Framework Agreement** to clarify roles.
3. **Limit Political Interference**: Avoid invoking **Section 7** except in extraordinary circumstances.
4. **Transparent Decision-Making**: Encourage data-driven, transparent monetary policy decisions.
5. **Institutional Reforms**: Establish a formal mechanism for resolving disputes between the RBI and the government.

Conclusion:

The RBI-government tussles underscore the delicate balance between monetary autonomy and fiscal accountability. Strengthening mutual respect and institutional frameworks is critical to fostering stability and confidence in India's financial ecosystem.

PYQ:

1. If the RBI decides to adopt an expansionist monetary policy, which of the following would it not do? (2020)
   1. Cut and optimize the Statutory Liquidity Ratio
   2. Increase the Marginal Standing Facility Rate
   3. Cut the Bank Rate and Repo Rate

   Select the correct answer using the code given below:
   a) 1 and 2 only
   b) 2 only
   c) 1 and 3 only
   d) 1, 2 and 3

   Answer: b)

6. FISCAL DISCIPLINE IN INDIAN STATES

Context:

The Reserve Bank of India (RBI) released its report on state finances, highlighting the fiscal performance of Indian states.

RBI Data on State Fiscal Condition:

- **Gross Fiscal Deficit (GFD):** States contained GFD within 3% of GDP in 2022-23 and 2023-24; budgeted at 3.2% for 2024-25.
- **Revenue Deficit:** Limited to 0.2% of GDP in 2023-24.
- **Capital Expenditure:** Increased from 2.4% of GDP in 2021-22 to 3.1% budgeted for 2024-25.
- **Outstanding Liabilities:** Declined from 31% of GDP (March 2021) to 28.5% (March 2024), yet above the pre-pandemic level of 25.3%.

What is Fiscal Prudence?

- **Definition:** Fiscal prudence refers to the responsible management of public finances, focusing on controlling deficits, maintaining sustainable debt levels, and prioritizing productive expenditure.

Reasons Behind the Lack of Fiscal Prudence Among States:

- **Populist Schemes:** States like Punjab and Andhra Pradesh face financial strain due to free electricity, water subsidies, and farm loan waivers, impacting long-term fiscal sustainability.

E.g. Punjab's free electricity scheme for farmers increased the state's subsidy burden in 2023.

- **Rising Debt Levels:** Over-dependence on borrowing for capital and revenue expenditures.

E.g. West Bengal's debt-to-GDP ratio remained at 35.5% in 2023, well above the FRBM limit.

- **Off-Budget Borrowings:** Use of off-budget mechanisms such as guarantees and loans by state PSUs creates hidden liabilities.

E.g. Andhra Pradesh in 2023 faced scrutiny for ₹55,000 crore off-budget borrowing.

- **Delay in Fiscal Reforms:** Resistance to implementing reforms such as property tax increases or disinvestment.

E.g. Rajasthan deferred property tax hikes in 2024 due to political opposition.

- **Dependence on Central Grants:** States often rely on the Centre rather than building self-sustained revenue mechanisms.

E.g. Northeastern states relied heavily on central funds in 2023, limiting fiscal autonomy.

Initiatives to Achieve Fiscal Prudence:

- **RBI:**
  - **State-Specific Fiscal Responsibility Legislations (FRLs):** Legal framework for fiscal discipline.
  - **Monitoring Off-Budget Borrowings:** Enhanced reporting and transparency.
  - **Encouraging Counter-Cyclical Fiscal Policies:** Advocating expenditure and savings based on economic cycles.
- **Government:**
  - **14th and 15th Finance Commissions:** Recommendations for fiscal consolidation and debt sustainability.
  - **Debt Consolidation Roadmaps:** Specific targets for states.
  - **Increased Capital Allocation:** Promoting growth-enhancing spending.
  - **Subsidy Rationalization:** Programs to optimize welfare expenditures.

Challenges to Fiscal Prudence in Indian States:

1. **Rising Subsidies:** Increased reliance on populist measures.
2. **High Contingent Liabilities:** Off-budget borrowing and guarantees strain finances.
3. **Revenue Deficits:** Poor tax administration and dependency on Central grants.
4. **Debt Overhang:** Liabilities remain above pre-pandemic levels despite recent reductions.

Way ahead to achieve fiscal prudence:

1. **Adopt Risk-Based Frameworks:** Implement counter-cyclical policies for financial resilience.
2. **Debt Consolidation Roadmap:** Set clear, time-bound targets for reducing liabilities.
3. **Enhance Revenue Sources:** Improve state tax administration and rationalize subsidies.
4. **Transparency in Borrowings:** Ensure strict reporting of off-budget liabilities.
5. **Focus on Growth-Enhancing Expenditure:** Prioritize capital spending to boost economic growth.

Conclusion:

The 15th Finance Commission's recommendations and RBI's insights serve as crucial guidelines for achieving sustained fiscal prudence in Indian states. Adopting comprehensive fiscal reforms is essential to balance developmental needs and fiscal sustainability.

PYQ:

1. Distinguish between Capital Budget and Revenue Budget. Explain the components of both these Budgets. (UPSC-2021)
2. Do you agree with the view that steady GDP growth and low inflation have left the Indian economy in good shape? Give reasons in support of your arguments. (UPSC-2019)

7. RARE AND ESSENTIAL: THE GLOBAL HUNT FOR CRITICAL MINERALS

Context:

In 2023, the Ministry of Mines identified 30 critical minerals vital for India's economic growth and security. The report noted complete import dependency for 10 minerals, with China dominating the critical minerals sector.

Definition:

- Critical minerals are those minerals which are essential for economic development and national security, the lack of availability of these minerals or even concentration of existence, extraction or processing of these minerals in few geographical locations may lead to supply chain vulnerability and disruption.

Importance of Critical Minerals:

- **Economic Development:** Support industries like electronics, energy storage, and renewable energy.
- **National Security:** Essential for aerospace, defence, and telecommunication sectors.
- **Sustainability:** Vital for achieving global Net Zero emissions commitments through clean energy technologies.
- **Technological Edge:** Power critical sectors like semiconductors, EVs, and high-tech manufacturing.
- **Global Transition:** Underpin the shift to a low-carbon economy, fostering renewable energy adoption.

Factors leading to China's dominance in critical minerals:

1. **Resource Base and Reserves:** China has vast reserves of critical minerals like rare earth elements (REE), lithium, and graphite, ensuring a strong supply base.
2. **Processing Capabilities:** Controls **87% of rare earth processing**, **58% of lithium refining**, and **68% of silicon processing**, dominating global supply chains.
3. **Strategic Investments:** Heavy investments in domestic and overseas mining projects to secure mineral assets globally.
4. **Vertical Integration:** Developed end-to-end infrastructure from mining to refining, ensuring efficiency and cost-effectiveness in production.

Distribution of Critical Minerals

- **In India**
  - Lithium: Found in Jammu & Kashmir (5.9 million tonnes).
  - Rare Earth Elements (REE): Andhra Pradesh, Odisha, and Rajasthan.
  - Graphite: Arunachal Pradesh (largest deposit in India).
  - Cobalt: Found in Odisha and Jharkhand.
  - Tungsten: Deposits in Rajasthan and Karnataka.
- **In the World**
  - China: Dominates lithium, graphite, and REE processing (controls 87% of rare earth processing).
  - Australia: Major producer of lithium and REE.
  - DRC: Largest cobalt reserves (60% of global output).
  - USA: Significant REE mining but lacks refining capabilities.
  - South America: Lithium Triangle (Chile, Argentina, Bolivia).

Initiatives taken by India for critical minerals:

- KABIL: Joint venture securing overseas mineral assets for supply-chain diversification.

- **Strategic Partnerships:** Member of **Minerals Security Partnership** and **Critical Raw Materials Club**.
- **Exploration and Research:** Geological Survey of India (GSI) and CSIR promoting domestic exploration and recycling technologies.
- **Production-Linked Incentives:** Focus on recycling and extracting critical minerals.
- **National Strategies:** Proposed **Centre of Excellence for Critical Minerals (CECM)** to streamline policies and strategies.

Challenges to critical minerals:

- **Import Dependency:** Heavy reliance on China for refining and processing critical minerals.
- **Exploration Bottlenecks:** Lack of advanced mining technology for deep-seated minerals.
- **Policy Gaps:** Absence of clear regulatory frameworks and incentives for private sector participation.
- **Environmental Concerns:** High environmental impact of mining and refining processes.
- **Supply Chain Risks:** Geopolitical tensions and export restrictions by dominant players like China.

Recommendations of Veena Dermal Committee:

1. Establish a **Centre of Excellence for Critical Minerals** to address technological gaps and enhance domestic capabilities.
2. Periodically update the list of critical minerals for India's evolving needs.
3. Promote **recycling technologies** and circular economy practices to reduce virgin mineral dependency.
4. Develop policies to attract **private investment** in mineral exploration and processing.
5. Strengthen **international collaborations** for securing overseas assets and sharing advanced technologies.

Conclusion:

India's growing focus on critical minerals is pivotal for sustaining economic growth, technological advancements, and energy transition. A comprehensive strategy addressing exploration, processing, and supply chain risks is essential to reduce dependency and achieve self-reliance in this critical sector.

PYQ:

1. Consider the following minerals: (UPSC-2020)
    1. Bentonite
    2. Chromite
    3. Kyanite
    4. Sillimanite

In India, which of the above is/are officially designated as major minerals?

a) 1 and 2 only
b) 4 only
c) 1 and 3 only
d) 2, 3 and 4 only

Answer: d)

8. THE RICH PAY MORE? UNPACKING WEALTH TAX POLICIES

Context:

The proposal to reintroduce wealth tax in India has sparked debates, with arguments for reducing inequality through redistribution versus concerns over capital flight and administrative inefficiencies.

What is Wealth Tax?

Wealth tax is a **direct tax levied on the net wealth of individuals, HUFs, and companies** to ensure redistribution of resources. In India, it was governed by the **Wealth Tax Act, 1957**, abolished in 2016 due to high administrative costs and low revenue collection.

Features and Criteria of Wealth Tax:

- **Target Entities:** Applicable to individuals, HUFs, and companies; excludes firms, co-operatives, and mutual funds.
- **Net Wealth Definition:** Includes immovable assets (e.g., real estate), financial instruments, and luxury items after deducting liabilities.
- **Exemptions:** Assets held by charitable institutions, political parties, and specific businesses.
- **Rate:** Previously, wealth exceeding ₹30 lakh was taxed at 1%.

- **Valuation Date:** Calculated annually as of **March 31st**.

Global Models of Wealth Taxation:

- **Norway:**
  - 0.85%-1.1% tax on net wealth.
  - Strong public support due to investments in health and education.
  - Minimal capital flight due to robust infrastructure and social trust.
- **Switzerland:**
  - Decentralized system; cantons set individual tax rates.
  - Wealth tax contributes 3.6%-3.8% of total state revenue.

Advantages of Wealth Tax:

1. **Reduces Inequality:** Ensures redistribution of wealth, promoting social equity.
2. **Revenue for Development:** Provides funding for health, education, and social services.
3. **Encourages Productive Asset Allocation:** Discourages investments in unproductive assets like gold and real estate.
4. **Progressive Nature:** Targets ultra-wealthy, leaving the middle class unaffected.

Disadvantages of Wealth Tax:

1. **Capital Flight:** Wealthy individuals may relocate to avoid taxes, reducing domestic investment.
2. **High Administrative Costs:** Challenges in asset valuation and compliance increase collection expenses.
3. **Evasion and Loopholes:** Wealth can be easily transferred or hidden, limiting effectiveness.
4. **Impact on Savings and Investments:** May discourage long-term wealth accumulation.

Way Ahead:

1. **Targeted Approach:** Focus on ultra-high-net-worth individuals while protecting the middle class.
2. **Efficient Administration:** Leverage technology for accurate wealth tracking and compliance.
3. **Transparent Revenue Use:** Channel tax revenues into visible improvements in health, education, and infrastructure to build trust.
4. **Global Collaboration:** Partner with other nations for data sharing and preventing tax evasion.
5. **Periodic Review:** Continuously evaluate the impact and modify policies as needed.

Conclusion:

Reintroducing a wealth tax in India requires a delicate balance between equity and efficiency. Lessons from global examples underscore the importance of targeted policies, robust administration, and transparent utilization to foster sustainable development without disrupting economic stability.

PYQ:

1. The term 'Base Erosion and Profit Shifting' is sometimes seen in the news in the context of (UPSC-2016)
   a) mining operation by multinational companies in resource-rich but backward areas
   b) curbing of the tax evasion by multinational companies
   c) exploitation of genetic resources of a country by multinational companies
   d) lack of consideration of environmental costs in the planning and implementation of developmental projects

   Answer: b)

Topics: Major crops cropping patterns in various parts of the country, different types of irrigation and irrigation systems storage, transport and marketing of agricultural produce and issues and related constraints; e-technology in the aid of farmers.

9. SOIL: THE SILENT LIFELINE OF OUR PLANET

Context:

The 10th World Soil Day, themed "Caring for Soils – Measure, Monitor, and Manage," highlighted soil health's critical role in food production.

Present Status of Soil in India:

Aspect	Details
Topsoil Importance	95% of food production relies on topsoil, which takes 1,000 years to regenerate naturally.
Nitrogen Deficiency	Less than 5% of Indian soils have high nitrogen levels.
Phosphate Sufficiency	Only 40% of Indian soils have sufficient phosphate.
Potash Sufficiency	Only 32% of Indian soils have sufficient potash levels.
Organic Carbon Sufficiency	Just 20% of Indian soils are sufficient in organic carbon.
Fertilizer Subsidy	Urea accounts for two-thirds of the ₹1.88 lakh crore subsidy; globally cheapest at ~$70/ tonne.
Imbalanced Fertilizer Use	Punjab uses 61% more nitrogen and 89% less potash than recommended.

Factors Impacting Soil:

1. **Water Erosion:** Heavy rainfall and poor land management practices result in topsoil loss in over 94 million hectares.
2. **Wind Erosion:** Affects 9 million hectares in arid regions like Rajasthan and Gujarat.
3. **Salinity:** Improper irrigation practices lead to salinization, impacting coastal and irrigated zones.
4. **Chemical Overuse:** Excessive use of urea and other fertilizers causes nutrient imbalance and soil acidification.
5. **Deforestation:** Removal of vegetation increases vulnerability to erosion and loss of soil cover.

Regional Differences in Soil Deterioration

- **Arid Regions:** Rajasthan faces severe wind erosion and desertification.
- **Flood-Prone Areas:** States like Bihar and Assam suffer from erosion due to recurrent floods.
- **Coastal Zones:** Odisha and Tamil Nadu experience salinity ingress affecting fertility.
- **Hilly Areas:** Uttarakhand faces landslides and soil erosion due to deforestation.
- **Semi-Arid Zones:** Telangana and Maharashtra deal with overgrazing and drought-induced soil degradation.

Effects of Soil Degradation:

1. **Land Degradation:** Loss of fertile land due to erosion and contamination reduces agricultural productivity.
2. **Desertification:** Poor practices exacerbate aridity, leading to drought and biodiversity loss.
3. **Loss of Arable Land:** About 40% of agricultural land worldwide is no longer productive.
4. **Increased Flooding:** Degraded soil has reduced water absorption, increasing runoff and flooding risks.
5. **Waterway Pollution:** Fertilizer runoff pollutes rivers, harming aquatic ecosystems and water availability.

Challenges in the Fertilizer Sector:

1. **Imbalanced Use**: Overuse of nitrogen and underuse of phosphate and potash due to subsidy distortions.
2. **Low Nutrient Use Efficiency**: Only 35-40% of applied fertilizers benefit crops; the rest pollutes the environment.
3. **Subsidy Dependence**: Heavy reliance on subsidies hinders innovation and efficiency.
4. **Leakage and Misuse**: Urea is diverted for non-agricultural uses and smuggling to neighboring countries.
5. **Environmental Impact**: Excess nitrogen emissions contribute to global warming and soil degradation.

Government Initiatives to Control Soil Degradation:

1. **Soil Health Card Scheme:** Provides farmers with nutrient information for balanced fertilizer use.
2. **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY):** Promotes efficient irrigation practices to reduce soil erosion.
3. **National Mission for Sustainable Agriculture (NMSA):** Encourages organic farming and soil conservation.
4. **Watershed Management Programs:** Focus on restoring degraded lands and improving water resources.
5. **Afforestation Drives:** Promotes reforestation to restore soil cover and prevent erosion.

Reforms Needed:

1. **Subsidy Deregulation:** Replace price controls with direct income transfers to farmers via digital coupons.
2. **Promote Balanced Fertilizer Use:** Incentivize the appropriate use of N, P, and K through education and policy.
3. **Encourage Micronutrient Use:** Focus on micronutrient availability for improved crop productivity.
4. **Triangulated Data Use:** Integrate soil health cards, fertilizer sales, and farmer data for targeted policy interventions.
5. **Innovation and Efficiency:** Encourage private investment and research in fertilizers by deregulating the industry.

Conclusion:

Protecting India's soils is vital for sustainable agriculture, food security, and environmental health. Coordinated efforts and policy reforms are essential to restore soil vitality and enhance productivity.

PYQ:

1. Which of the following statements regarding laterite soils of India are correct? (UPSC-2013)
    1. They are generally red in colour.
    2. They are rich in nitrogen and potash.
    3. They are well-developed in Rajasthan and UP.
    4. Tapioca and cashew nuts grow well on these soils.

    Select the correct answer using the codes given below:
    a) 1, 2 and 3
    b) 2, 3 and 4
    c) 1 and 4
    d) 2 and 3 only

    Answer: c)

Topics: Infrastructure: Energy, Ports, Roads, Airports, Railways etc.

10. INDIA'S DIGITAL INFRASTRUCTURE

Context:

India's digital infrastructure has transformed significantly in recent years, driven by initiatives in cloud computing, AI, and digital governance. With platforms like Aadhaar, UPI, and DigiLocker leading the charge, the country is now a global leader in digital adoption.

About India's Digital Revolution:

- **Aadhaar:** The world's largest digital identity system with 138.34 crore enrolments, enabling seamless authentication.
- **UPI:** Facilitates digital payments with 24,100 crore transactions (as of June 2024), driving financial inclusion.
- **DigiLocker:** A cloud-based platform with over 37 crore users, enabling secure document storage and verification.
- **Digital Knowledge Sharing:** DIKSHA has imparted over 556.37 crore learning sessions.
- **Cloud Ecosystem:** Platforms like MeghRaj and NIC cloud services bolster e-governance and digital public infrastructure.

Apps Leading India's Digital Revolution:

- **UMANG:** Integrates 2,077 services from 207 departments, offering access to government schemes.
- **MeriPehchaan:** Single Sign-On (SSO) platform with 132 crore transactions.
- **API Setu:** Facilitates data exchange with over 6,000 APIs supporting 312 crore transactions.
- **e-Hastakshar:** Enables 81.97 crore digital signatures for document authentication.
- **e-Sanjeevani:** Telemedicine platform improving healthcare access with over 12.4 crore consultations.

Significance:

1. **Empowers Citizens:** Platforms like UPI and DigiLocker ensure accessibility and inclusivity in services.
2. **Boosts Economy:** Digital infrastructure supports e-commerce, start-ups, and innovation.
3. **Enhances Governance:** Reduces red tape with paperless governance via e-Office and DigiLocker.
4. **Global Influence:** Strengthens India's leadership in digital solutions for the Global South.
5. **Climate-Friendly:** Reduces paper use and promotes energy-efficient digital solutions.

Challenges:

1. **Digital Divide:** Rural and marginalized communities face unequal access to digital resources.
2. **Cybersecurity Risks:** Rising cyber threats pose challenges to secure transactions and data privacy.
3. **Infrastructure Gaps:** Inadequate digital infrastructure in remote areas limits accessibility.
4. **Skill Deficit:** Lack of digital literacy hinders effective utilization of platforms.
5. **Interoperability Issues:** Challenges in integrating systems across departments and states.

Limitations

1. **Connectivity Gaps:** Limited broadband access in rural India hampers inclusivity.
2. **Over-Reliance on Digital Platforms:** Excludes citizens with limited tech skills.
3. **Data Privacy Concerns:** Increased digital footprints raise risks of misuse.
4. **Slow Implementation:** Bureaucratic delays in adopting digital tools in some states.
5. **Dependence on Imports:** High reliance on imported technology for digital infrastructure.

Way Ahead:

1. **Expand Rural Connectivity:** Strengthen **BharatNet** to cover rural and underserved regions.
2. **Enhance Cybersecurity:** Implement robust data protection laws like the **Digital Personal Data Protection Act 2023**.
3. **Promote Digital Literacy:** Launch targeted campaigns like **PMGDISHA** to bridge the skill gap.
4. **Encourage Domestic Innovation:** Support initiatives like **PLI schemes** for digital hardware manufacturing.

Conclusion:

India's digital revolution is a testament to its commitment to innovation, inclusivity, and governance. By addressing challenges like the digital divide and cybersecurity, India can continue to lead globally in digital solutions. The collaborative synergy between technology and policy ensures a future of empowered citizens and sustainable growth.

PYQ:

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

11. SHIPPING LAWS

Context:

The introduction of the Merchant Shipping Bill, 2024, aims to overhaul outdated laws, align with international standards, and enhance maritime safety, environmental sustainability, and economic efficiency.

Need for a New Law in Shipping Industry:

1. **Outdated Framework:** The Merchant Shipping Act, 1958, and Coasting Vessels Act, 1838, fail to address modern maritime needs.
2. **Global Standards:** India's maritime laws need alignment with international conventions for competitive integration.
3. **Regulatory Gaps:** Current laws inadequately regulate offshore vessels, training institutes, and foreign-flagged seafarers.
4. **Ease of Doing Business:** Existing regulations hinder investments and technological advancements in the shipping sector.
5. **Environmental Concerns:** Urgent need for comprehensive measures to combat marine pollution.

Existing Laws in India:

1. **Merchant Shipping Act, 1958:** Regulates Indian-flagged vessels but excludes foreign-flagged vessels employing Indian seafarers.
2. **Coasting Vessels Act, 1838:** Focused on coastal shipping but lacks provisions for modern vessel types.
3. **Regulatory Limitations:** Fails to address maritime education, offshore operations, and modern vessel registration.

International Conventions on Shipping:

1. **MARPOL (Marine Pollution):** Focuses on preventing ship-based pollution.
2. **Maritime Labour Convention (MLC):** Protects seafarers' rights and ensures fair working conditions.
3. **Bunker Convention:** Addresses liability for oil pollution damage from ship bunkers.
4. **Wreck Removal Convention:** Mandates safe removal of shipwrecks to avoid hazards.
5. **Civil Liability Convention:** Establishes liability for oil pollution incidents.

Key Features of Merchant Shipping Bill, 2024:

1. **Ease of Vessel Registration:** Allows ownership by NRIs, OCIs, LLPs, and foreign entities with majority Indian ownership.
2. **Expanded Scope:** Covers all types of mechanized and non-mechanized vessels, enhancing safety and transparency.
3. **Temporary Registration:** Facilitates ship recycling and final voyages for demolition.
4. **Seafarer Welfare:** Extends welfare measures to Indian seafarers on foreign-flagged ships, aligned with the Maritime

Labour Convention.

5. **Maritime Training:** Introduces a legal framework for regulating maritime education, eliminating unauthorized institutes.

Significance:

1. **Modernized Framework**: Brings India's maritime laws in sync with global standards.
2. **Investment Promotion**: Eases entry into the shipping sector and fosters economic growth.
3. **Enhanced Safety**: Ensures stricter regulations for vessel operations and coastal security.
4. **Environmental Sustainability**: Incorporates measures to combat marine pollution.
5. **Global Competitiveness**: Positions India as a leader in maritime innovation and trade.

Conclusion:

The **Merchant Shipping Bill, 2024**, reflects India's commitment to modernizing its maritime laws, ensuring safety, fostering economic growth, and safeguarding the environment. It promises to unlock the sector's potential, aligning with global best practices for a sustainable future.

PYQ:

1. With respect to the South China sea, maritime territorial disputes and rising tension affirm the need for safeguarding maritime security to ensure freedom of navigation and overflight throughout the region. In this context, discuss the bilateral issues between India and China. (UPSC-2014)

12. THE PULSE OF PROGRESS: INDIA LOGISTICS MOVEMENT

Context:

India's logistics sector is transforming with initiatives like the National Logistics Policy and PM Gati Shakti to cut costs, boost efficiency, and enhance connectivity. Contributing 14% to GDP, it is pivotal to the $5 trillion economy goal.

Logistics Movement Data in India:

- **Logistics Cost Reduction:** Declined by 0.8-0.9 percentage points of GDP between FY14-FY22.
- **Sector Contribution:** Logistics contributes 14% to India's GDP and is valued at $250 billion.
- **Transportation Efficiency:** Average truck travel distance increased from 225 km to 300-325 km due to GST implementation.
- **Bilateral Trade Facilitation:** Unified Logistics Interface Platform (ULIP) has processed 382 use cases for automation and trade facilitation.
- **Rail vs. Road Share:** Road accounts for 66% of freight, rail 31%, waterways 3%, and air 1%.

Modes of Logistics Movements in India:

- **Road:** Largest contributor, with 66% share; key for short-haul and last-mile delivery.
- **Rail:** 31% share, suited for bulk goods and long-haul transportation; expanding with dedicated freight corridors.
- **Waterways:** 3% share; cost-effective for heavy goods; potential for coastal and inland navigation.
- **Air:** 1% share; critical for high-value, time-sensitive goods.

Importance of a Strong Supply Chain:

- **Cost Reduction:** Efficient logistics reduce production costs and improve profitability.
- **Global Competitiveness:** Enhances India's export potential and competitiveness in global markets.
- **Economic Growth:** Drives investment and supports MSMEs by reducing inefficiencies.
- **Sustainability:** Promotes eco-friendly practices like rail and waterway usage, reducing emissions.
- **Employment:** Generates jobs across transportation, warehousing, and technology sectors.

2024 Recent Government Initiatives:

- **PM Gati Shakti:** Multi-modal integration of transportation infrastructure for seamless connectivity.
- **ULIP:** Facilitating data-driven logistics through process digitization and automation.
- **NLP Marine Policy:** Boosts port logistics and coastal shipping efficiency.
- **Capital Expenditure:** 11.1% rise in infrastructure spending to support logistics networks.
- FAME II **Scheme:** Promoting electric vehicles for clean logistics.

Challenges Faced by Logistics Movement:

- **High Costs:** Logistics costs remain at 14% of GDP, higher than the global average.
- **Infrastructure Gaps:** Limited last-mile connectivity and inadequate warehousing facilities.
- **Modal Imbalance:** Over-dependence on road transport, underutilization of rail and waterways.
- **Skilling Deficiency:** Lack of trained workforce for advanced logistics management.
- **Environmental Concerns:** High emissions from diesel-powered trucks and poor fuel efficiency.

Way Ahead:

- **Modal Diversification:** Increase rail and waterway share through investments in infrastructure.
- **Technology Adoption:** Expand digital platforms like ULIP for efficient operations and tracking.
- **Sustainable Practices:** Promote electric vehicles and alternative fuels.
- **Policy Alignment:** Streamline regulations and ensure implementation of logistics-focused policies.
- **Skill Development:** Invest in training programs to enhance workforce capabilities.

Conclusion:

India's logistics sector is on a transformative journey, driven by robust policies and investments. With continuous advancements in technology, infrastructure, and sustainable practices, the sector is poised to be a cornerstone in India's economic aspirations.

Topics: Awareness in space.

13. FROM SATELLITES TO SPACE DEBRIS: UNDERSTANDING SPACE POLLUTION

Context:

The rapid expansion of space activities has led to significant environmental challenges, including emissions from rocket launches and the growing issue of orbital debris.

Present Space Pollution Data and Trends:

- **Orbital Debris:** Over 13,230 satellites remain in orbit, with 10,200 still operational.
- **Fragmentation Events:** Around 650+ collisions and break-ups have created over 36,860 trackable objects.
- **Mass in Orbit:** The total mass of space objects exceeds 13,000 tonnes, significantly raising collision risks.
- **Growth Rate:** Increasing satellite launches by private and public entities exacerbate overcrowding in Low Earth Orbit (LEO).

Major Sources of Space Pollution:

- **Defunct Satellites:** Non-operational satellites remain in orbit, contributing to debris.
- **Rocket Stages:** Spent stages left in orbit after launches.
- **Fragmentation Debris:** Pieces from satellite collisions and explosions.
- **Satellite Burnup Ash:** Metallic residues released during atmospheric re-entry.

Rockets Impact Pollution:

1. **Emission Composition:** Rocket launches release carbon dioxide, black carbon, and water vapor.
2. **Black Carbon Effects:** Absorbs sunlight 500 times more efficiently than CO_2, amplifying warming.
3. **Ozone Depletion:** Chlorine-based propellants disrupt the ozone layer.
4. **Energy Intensity:** Rocket manufacturing consumes large amounts of energy and resources.

Major Initiatives to Counter Space Debris:

1. **Kessler Syndrome Mitigation (NASA):** Studies and strategies to avoid cascading collisions in orbit by limiting debris generation.
2. **European Space Agency's (ESA) ClearSpace-1:** A robotic mission to remove a single large piece of debris from orbit by 2025.
3. **Japan's ELSA-d Mission:** A demonstration by Astroscale for capturing and de-orbiting defunct satellites using magnetic capture technology.
4. **United Nations' Guidelines for Long-Term Sustainability of Outer Space Activities:** Non-binding recommendations for safe satellite operations, debris mitigation, and international cooperation.
5. **Active Debris Removal (ADR) Projects:** Development of technologies like nets, harpoons, and lasers to capture or de-orbit debris (e.g., ESA and JAXA).

Dangers of Outer Space Pollution:

1. **Collision Risks:** High-velocity debris can destroy operational satellites, disrupting communication and navigation.
2. **Climate Monitoring Disruption:** Space junk interferes with data collection for weather prediction and disaster management.
3. **Human Spaceflight Hazards:** Threatens missions like those on the International Space Station (ISS).
4. **Cost Escalation:** Avoiding debris through shielding or orbital adjustments increases mission expenses.

Barriers to Space Sustainability:

1. **Lack of Regulation:** No binding international laws govern emissions or debris management.
2. **Commercial Resistance:** Companies prioritize cost-efficiency over sustainable practices.
3. **Data Sharing Issues:** Security and proprietary concerns hinder the creation of a unified debris tracking system.
4. **Outer Space Treaty Gaps:** Absence of enforceable provisions for environmental safeguards.

Way Ahead:

1. **Regulatory Frameworks:** Establish binding agreements through The Committee on the Peaceful Uses of Outer Space (COPUOS) for emissions, debris mitigation, and data-sharing.
2. **Green Technology Investment:** Prioritize reusable rockets, biodegradable satellites, and cleaner fuels.
3. **Debris Management:** Develop Autonomous Debris Removal (ADR) systems and incentivize their adoption.
4. **Global Collaboration:** Foster international cooperation for equitable space access and environmental protection.
5. **Sustainable Practices:** Encourage private actors through financial incentives and penalties for eco-friendly approaches.

Conclusion:

Space exploration must balance technological advancement with environmental responsibility. By implementing stringent regulations, fostering innovation, and encouraging global collaboration, humanity can secure a sustainable future for both the earth and outer space.

PYQ:

1. 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 pose and suggest ways to contain the threat. (UPSC-2014)

Topics: Conservation related issues, environmental pollution and degradation, environmental impact assessment.

14. TALKS COLLAPSE, PLASTICS PERSIST - BUSAN SUMMIT

Context:

The fifth Intergovernmental Negotiating Committee (INC-5) meeting for the Global Plastics Treaty concluded in Busan, South Korea, without achieving consensus on a legally binding framework to eliminate plastic pollution.

Busan INC-5:

- **Objective**: Establish a legally binding global treaty to address plastic pollution across its life cycle.
- **Participants**: 170 nations, under the United Nations Environment Programme (UNEP).
- **Timeline**: INC meetings began in 2022, with INC-5 held in November 2024 as the "final" scheduled session.
- **Outcome**: No consensus; negotiations extended to a probable INC-5.2 session in 2025.

Need for the plastic treaty

• Global plastic production doubled from 234 million tonnes in 2000 to 460 million tonnes in 2019.
• Only 9% of global plastic waste is recycled.
• Annual marine pollution of over 8 million tonnes.
• Promising triple plastic production by 2050 due to microplastics.
• Plastics contribute 3.4% to global greenhouse gas emissions.

Busan INC-5 Summit Draft Key Features:

• Global targets for plastic reduction: Capturing virgin plastic production and reducing harmful products.
• Life-Cycle Approach: Addressing plastic pollution from production to disposal.
• Phase Out Harmful Plastics: Gradual elimination of single-use plastics and microplastics contributing to marine pollution.

• Financial Mechanisms: Calling for a multilateral fund for technology transfer and compensation to developing countries.
• Chemical Management: Proposed regulation of over 3,000 toxic chemicals in plastics.
• Monitoring and Accountability: Frameworks for tracking plastic pollution and transparent reporting.
• Flexibility for Nations: Allowing countries to design implementation strategies.

Busan INC-5 Failure Causes:

• Diverse Plastic Production Stances: Oil-dependent nations like Saudi Arabia opposed plastic production cap, while over 100 countries demanded ambitious cuts.
• Lack of Consensus on Treaty Scope: Delegates couldn't agree on focusing on reducing production or managing waste.
• Procedural Challenges: Some nations stalled progress, avoiding binding commitments.
• Undefined Terminologies: Key terms like "plastic" and "control measures" remained ambiguous, complicating negotiations.
• Economic Priorities of Developing Nations: Countries like India emphasized financial aid and technology transfer to manage plastic control costs.

India's Role in INC-5:

- **Position:** Opposed production caps, emphasizing development rights and national circumstances.
- **Proposal:** Called for technology transfer, financial compensation, and a multilateral fund for a "just transition."
- **Plastic Management:** Despite banning several single-use plastics, struggles to control waste persist.

Way Ahead:

- **Clarify Definitions:** Establish clear and universally accepted terms in treaty discussions.
- **Strengthen Negotiations:** Transition from consensus to majority voting for smoother decision-making.
- **Financial Mechanisms:** Develop equitable financing models for developing nations to adopt sustainable practices.
- **Global Collaboration:** Enhance cooperation among nations to reduce plastic production and promote alternatives.
- **Regional Agreements:** Encourage regional initiatives as interim solutions while global consensus builds.

Conclusion:

The Busan INC-5 underscores the urgent need for a unified approach to combat plastic pollution. While global consensus remains elusive, sustained dialogue and regional cooperation can pave the way for an ambitious and binding treaty to protect the planet from the mounting plastic crisis.

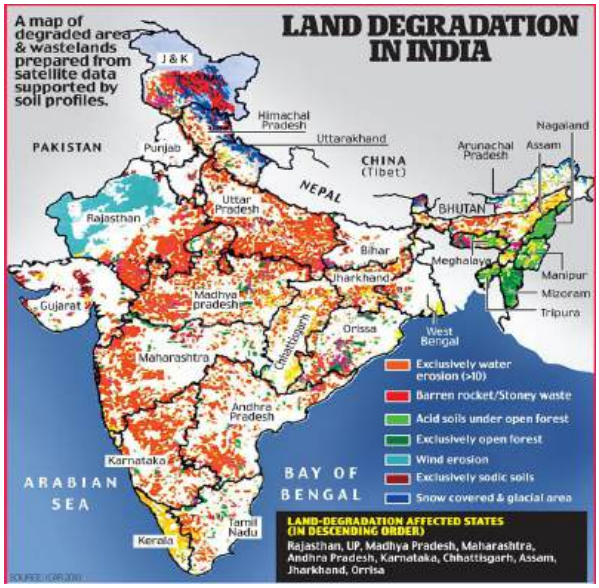
PYQ:

1. What are the impediments in disposing the huge quantities of discarded solid waste which are continuously being generated? How do we remove safely the toxic wastes that have been accumulating in our habitable environment? (UPSC-2018)

15. LOSING GROUND: THE FIGHT AGAINST DEGRADATION

Context:

Land degradation is undermining Earth's capacity to sustain humanity, and failure to reverse it will pose challenges for generations to come, a new United Nations report found.



What is Land Degradation?

Land degradation refers to the decline in the biological, economic, and ecological productivity of land due to unsustainable practices, deforestation, soil erosion, and climate change. It diminishes the capacity of land to provide essential services like food, water, and carbon sequestration.

Aspects of land degradation

• **Soil Erosion:** Reduces soil fertility and productivity.
• **Soil Salinization:** Causes salt accumulation due to irrigation.
• **Desertification:** Turns fertile land into desert.
• **Loss of Vegetation:** Destabilizes soil, increases erosion vulnerability.

• **Pollution:** Chemical and waste contaminants degrade soil and water resources.

Present Status of Land Degradation: (Source: UNCCD)

- **Scale:** 15 million km² globally degraded.
- **Expansion:** Degraded land area grows by 1 million km² annually.
- **Impacts on Carbon Sequestration:** Land ecosystems' capacity to absorb CO_2 reduced by 20% in the last decade.
- **Regional Disparities:** Drylands, covering 46% of Earth's land area, house a third of humanity and suffer severe degradation.

Land Degradation Causes:

Anthropogenic Causes:

• Unsustainable agriculture: Excessive use of fertilizers, pesticides, and water.
• Deforestation: Clearing forests for cropland and urbanization.
• Urbanization: Rapid expansion of cities.
• Overgrazing: Livestock pressure on grasslands.

Natural Causes:

• Climate Change: Extreme weather events like droughts and floods.
• Water Scarcity: Depletion of aquifers and altered water cycles.
• Natural Disasters: Landslides, hurricanes, prolonged droughts.

Impacts of Land Degradation:

- **Food Security:** Declines in crop yield and nutritional quality increase malnutrition risks.
- **Biodiversity Loss:** Habitat destruction impacts species survival and ecosystem stability.
- **Climate Change:** Degraded land emits CO_2, worsening global warming.
- **Human Migration:** Loss of livelihoods forces displacement and fuels conflicts.
- **Water Pollution:** Fertilizer runoff contaminates water bodies, harming aquatic ecosystems.

Initiatives Taken So Far:

1. **Global Initiatives:**
    - **UNCCD (1994):** Legally binding framework to address desertification and land degradation.
    - **Land Degradation Neutrality Fund (2018):** Invests in sustainable land management projects.
    - **UN Decade on Ecosystem Restoration (2021–2030):** Prevents, halts, and reverses ecosystem degradation.
    - **Glasgow Declaration (2021):** Pledged by 145 nations to halt deforestation by 2030.

2. **Indian Initiatives:**
    - **Desertification and Land Degradation Atlas (ISRO):** Tracks land degradation across India.
    - **National Action Programme to Combat Desertification (2001):** Strategies to address desertification.
    - **National Afforestation Programme (NAP):** Restores degraded forests.
    - **Desert Development Programme (1977):** Focuses on addressing land degradation in arid regions.

Measures to Control Land Degradation:

• **Promote sustainable agriculture**: no-till farming, intercropping, organic fertilizers.
• **Protect forests**: reforestation and afforestation projects.
• **Adopt efficient water use**: drip irrigation and water harvesting.
• **Transition to green infrastructure**: floodplain restoration.
• Align agricultural subsidies with sustainability goals and enforce stricter regulations.

Conclusion:

Tackling land degradation is essential to ensure environmental sustainability and human survival. Coordinated global and local efforts, innovative solutions, and equitable governance can restore degraded ecosystems and preserve Earth's capacity to support future generations.

PYQ:

1. The process of desertification does not have climate boundaries. Justify with examples (UPSC-2020)

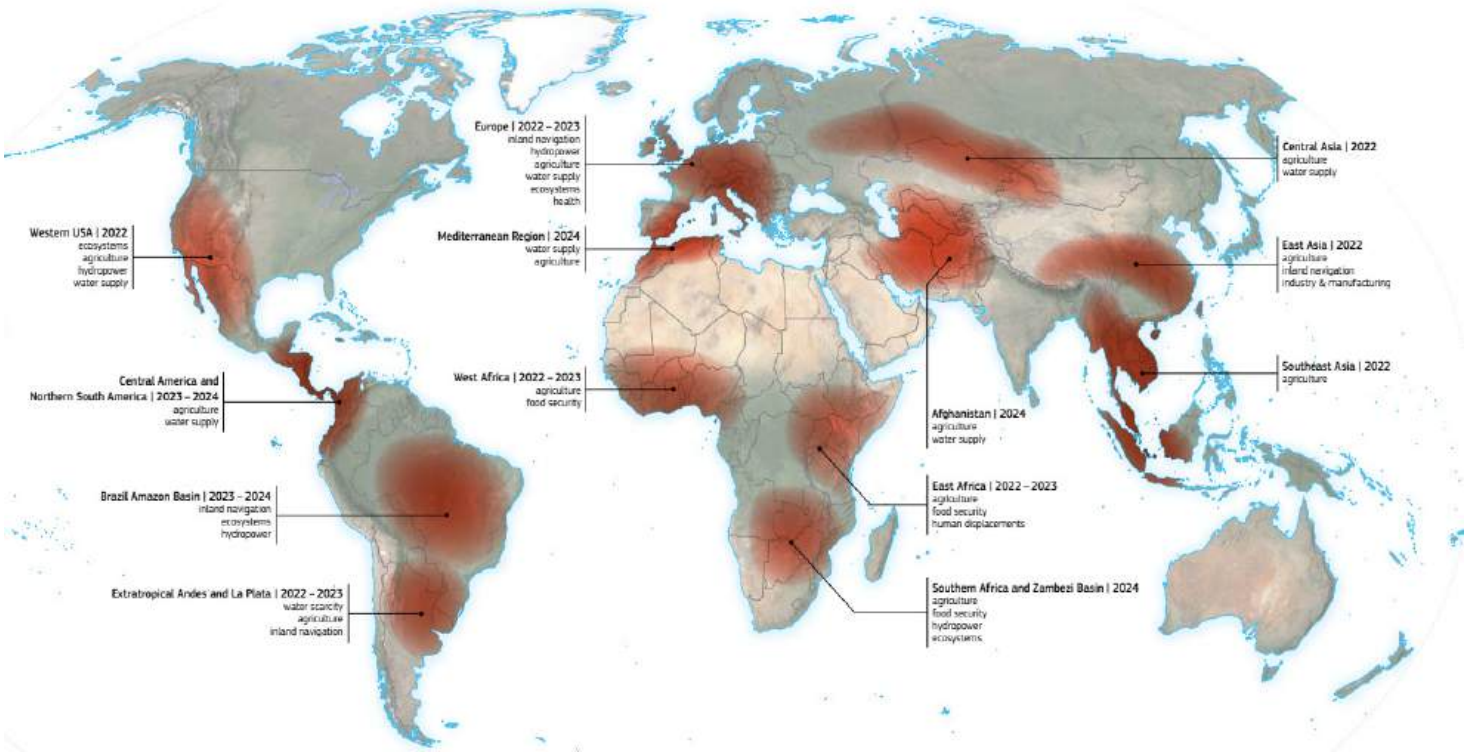
16. WORLD DROUGHT ATLAS

Context:

The United Nations Convention to Combat Desertification (UNCCD) and the European Commission Joint Research Centre launched the "World Drought Atlas" during their 16th conference in Riyadh.

About UNCCD's Drought Atlas:

- **Released By:** UNCCD and European Commission Joint Research Centre.
- **Aim:** To provide data-driven insights and guidelines to combat the increasing global drought risks and foster resilience.
- **Factors Driving Drought Expansion:**
  - Unsustainable water usage and competition.
  - Poor land management practices.
  - Climate change-induced rainfall variability.
  - Rapid urbanization and resource mismanagement.
- **Key Data Points:**
  - 75% of the global population could be affected by drought by 2050.
  - India faces substantial drought risks, with soybean yield losses and crop failures threatening millions in the agricultural sector.
  - "Day Zero" scenarios, like Chennai's 2019 water crisis, exemplify the dangers of urban mismanagement.



NOTE: Try to understand this map from mains perspective as well specially GS3.

17. CAP, TRADE, TRANSFORM: THE CARBON MARKET STORY

Context:

With COP29 approving standards for establishing an international carbon market, countries aim to create a structured mechanism for trading carbon credits and offsets to meet their climate goals effectively.

Carbon Market Overview

- Enables trading of carbon credits.
- Grants rights to emit one tonne of CO_2.
- Operates on emission limit and rights allocation.
- Originated in U.S. in 1990s under cap-and-trade system.

Working of a Carbon Market:

1. **Issuance of Carbon Credits:**
   - Governments allocate a limited number of carbon credits, restricting total emissions.
   - Each credit permits the emission of one tonne of CO_2.
2. **Trading:**
   - Companies that need more credits can buy from those with surplus.
   - Market forces determine the price based on supply and demand.
3. **Offsets:**
   - Companies purchase offsets by funding activities like afforestation or renewable energy projects to balance their emissions.
4. **International Mechanism:**
   - Articles 6.2 and 6.4 of the Paris Agreement allow cross-border trading of emission reductions.

India's Initiatives in Carbon Markets:

- **Perform, Achieve, Trade (PAT) Scheme**: Targets industries to improve energy efficiency and trade surplus credits.
- **Renewable Energy Certificates (REC):** Facilitates trade in renewable energy to meet energy compliance targets.
- **Energy Conservation Act, 2022 Amendment:** Introduced a domestic carbon trading market to incentivize low-carbon technologies.
- **Climate Action:** Committed to a 45% reduction in emission intensity by 2030 as part of its Nationally Determined Contributions (NDCs).

Positive Consequences of Carbon Markets:

- **Emission Reduction:** Imposes financial costs on emissions, encouraging companies to adopt cleaner technologies.
- **Economic Efficiency:** Allows cost-effective allocation of emission rights through market trading.
- **Financial Support for Green Projects:** Funds projects like afforestation and renewable energy.
- **Global Cooperation:** Encourages international partnerships under Paris Agreement mechanisms.

Limitations of Carbon Markets:

1. **Loopholes:** Lack of stringent monitoring can lead to fraudulent claims or over-allocation of credits.
2. **Price Volatility:** Fluctuating credit prices can create market uncertainty.
3. **Limited Impact on Emission Levels:** Without strong caps, markets may fail to drive significant reductions.
4. **Accessibility Issues:** Small businesses and developing countries may struggle to participate effectively.
5. **Criticism of Offsets:** Offsets are seen as superficial solutions that don't address the root cause of emissions.

Way Ahead:

1. **Stricter Regulations**: Enforce robust monitoring and verification to prevent misuse.
2. **Capacity Building:** Support developing countries in accessing carbon markets effectively.
3. **Incentives for Green Projects:** Encourage innovative projects to offset emissions.
4. **Transparency:** Ensure clear guidelines and public reporting of emissions and credits.

Conclusion:

Carbon markets offer a promising mechanism to reduce emissions and achieve global climate targets. However, addressing regulatory gaps, ensuring equity, and fostering international cooperation are essential to maximize their potential and ensure sustainable outcomes.

PYQ:

1. Consider the following statements (UPSC-2023)
   Statement—I Carbon markets are likely to be one of the most widespread tools in the fight against climate change.
   Statement—II Carbon markets transfer resources from the private sector to the State.
   Which one of the following is correct in respect of the above statements?
   a) Both Statement—I and Statement—II are correct and Statement—II is the correct explanation for Statement—I
   b) Both Statement—I and Statement—II are correct and Statement—II is not the correct explanation for Statement—I
   c) Statement—I is correct but Statement—II is incorrect

d) Statement—I is incorrect but Statement—II is correct

Answer: b)

18. FORESTS IN FOCUS: A DEEP DIVE INTO ISFR 2023

Context:

The India State of Forest Report 2023 (ISFR 2023) was released by the Union Minister for Environment, Forest and Climate Change, at the Forest Research Institute, Dehradun.

India State of Forest Report 2023

- **Launched in:** December 2023
- **Department Involved:** Forest Survey of India (FSI), under the Ministry of Environment, Forest, and Climate Change
- The **biennial report** by the Forest Survey of India (FSI) is an assessment of the country's forest resources.
- **Aim:**
  - Assess forest and tree resources in India.
  - Support natural resource management and policy evaluation.
  - Monitor progress towards Nationally Determined Contributions (NDC) for climate change mitigation.
- **Key Features:**
  - Forest and tree cover analysis using **satellite imagery** (ISRO's Resourcesat) and **field-based National Forest Inventory (NFI)**.
  - Thematic focus on forest health, biodiversity, carbon sequestration, mangrove cover, and agroforestry.
  - Tracks **carbon stock changes**, critical for NDC targets under the Paris Agreement.
  - Information on **forest fire trends, bamboo cover, and soil health**.

- **Key findings from report:**

Table: Forest and Tree Cover of India

in km²

Class	Area	Percentage of GA
Forest Cover	7,15,342.61	21.76
Tree Cover	1,12,014.34	3.41
Total Forest and Tree Cover	**8,27,356.95**	**25.17**
Scrub	43,622.64	1.33
Non Forest	24,16,489.29	73.50
Geographical Area of the country	**32,87,468.88**	**100.00**

  - The total forest and tree cover of the country is **8,27,356.95 km2** which is **25.17%** of the geographical area of the country.
  - The total Forest Cover has an area of **7,15,342.61 km2 (21.76%)** whereas the **Tree Cover has an area of 1,12,014.34 km2 (3.41%).**
  - **Increase in Forest and Tree Cover:** Chhattisgarh> UP>Odisha>Rajasthan
  - **Decrease in Forest and Tree Cover:** MP>Karnataka>Ladakh>Nagaland
  - The total forest and tree cover in the **North Eastern region is 1,74,394.70 km2**, which is **67%** of geographical area of these states.
  - **Composition of Mangrove Cover in India:**
    - The total Mangrove cover of the country is **4,991.68 km2,** which accounts for **0.15 %** of the country's total geographical area.
  - Area wise **top three states** having **largest forest and tree cover are Madhya Pradesh (85,724 sq km) followed by Arunachal Pradesh (67,083 sq km) and Maharashtra (65,383 sq km)**
  - **Bamboo:**
    - The total bamboo bearing area of the country has been estimated to be **1,54,670 km².**

- There is an increase of **5,227 km²** in the bamboo bearing area of the country as compared to the previous assessment.
- States: MP>ArP>MH>Odisha

- **Carbon Stock:**
  - The carbon stock for 2023 has been estimated as **7,285.5 Mt.**
  - There is an increase of **81.5 Mt of carbon stock** as compared to the estimates of previous assessment.

PYQ:

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

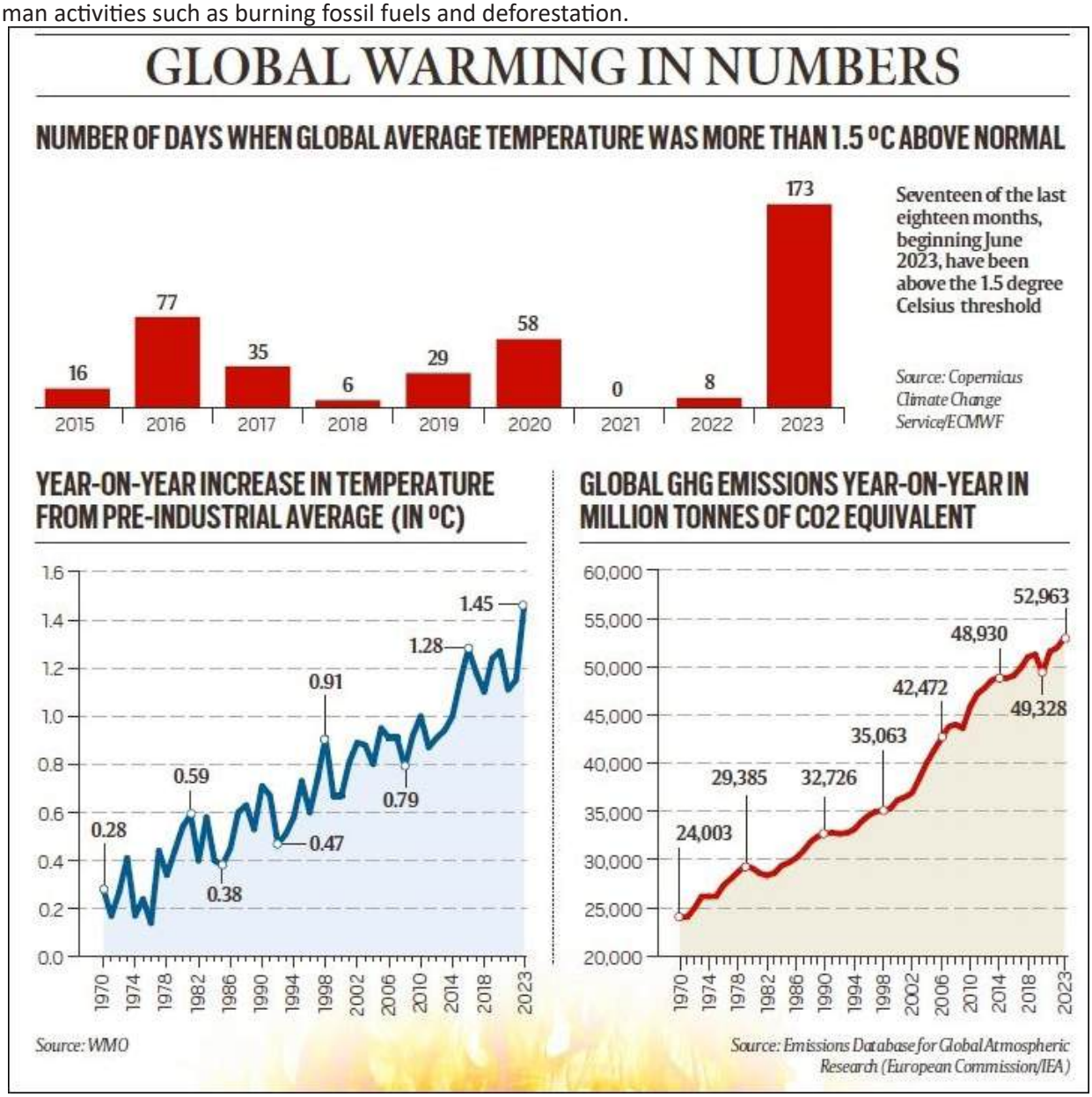
19. MELTING EARTH: A WAKE-UP CALL FOR GLOBAL WARMING

Context:

The year 2024 marked a grim milestone as global temperatures breached the 1.5°C threshold for the first time.

Definition:

Global warming refers to the long-term increase in Earth's average temperature due to the accumulation of greenhouse gases (GHGs) like carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) in the atmosphere, primarily caused by human activities such as burning fossil fuels and deforestation.

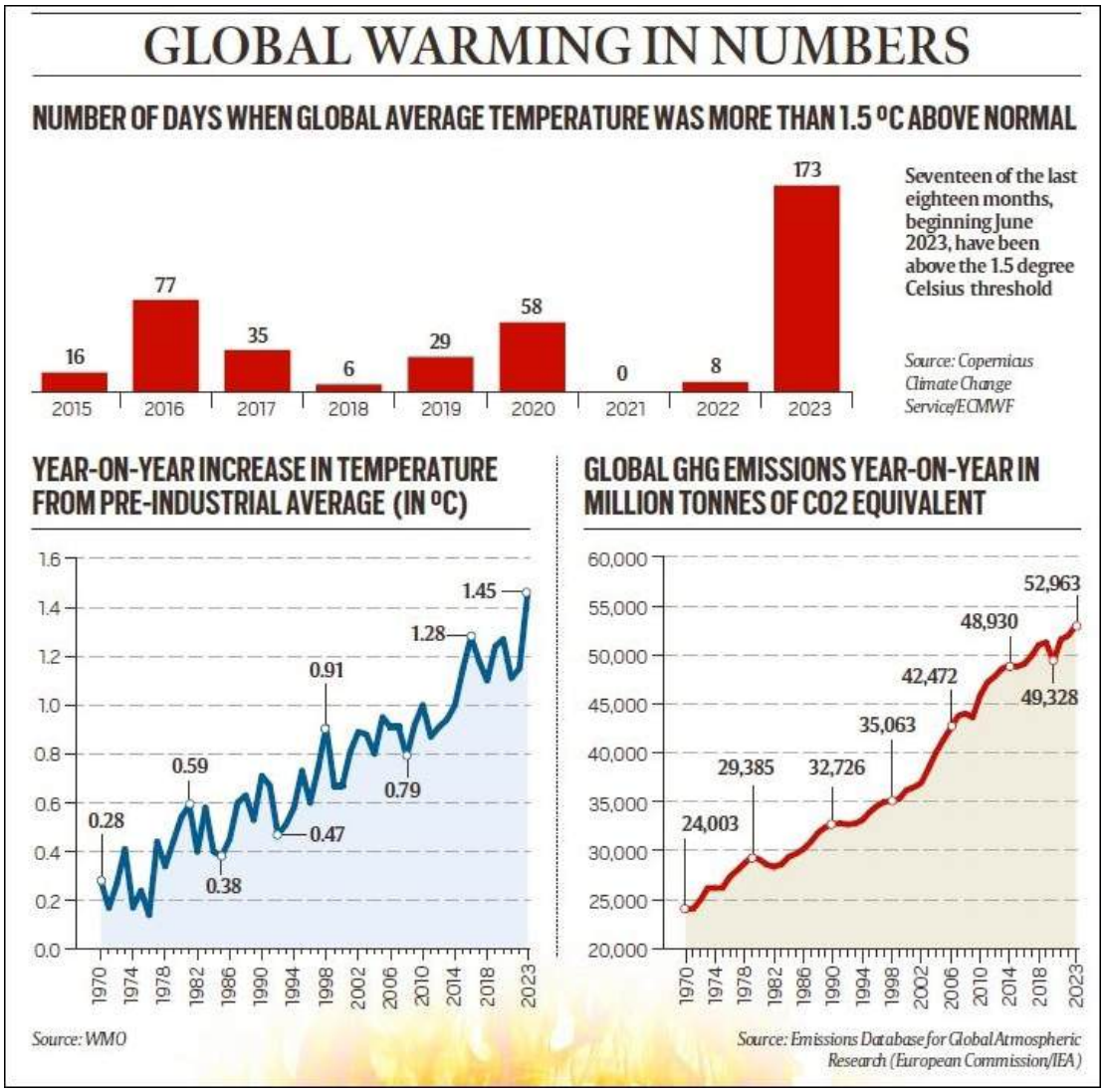


Mechanism of Global Warming:

- **Solar Radiation Absorption:** Sunlight reaches Earth, and the surface absorbs solar energy, heating up the planet.
- **Infrared Radiation Emission:** Earth radiates the absorbed energy back into the atmosphere as infrared radiation (heat).
- **Greenhouse Gas Trapping:** GHGs like CO_2, CH_4, and N_2O trap this heat in the atmosphere, preventing it from escaping into space.
- **Enhanced Greenhouse Effect:** Increased GHG concentrations amplify the natural greenhouse effect, causing more heat retention and warming.
- **Feedback Loops**: Melting ice reduces albedo (reflectivity), absorbing more heat, while warming oceans release stored CO_2, further accelerating warming.

2024 Data on Global Warming:

- **Average Global Temperature:** 1.55°C above pre-industrial levels; the **warmest year on record**.
- **Days Breaching 1.5°C:** 173 days in 2023; projections for 2024 indicate over 200 days exceeding the threshold.
- **Sea Level Rise:** Accelerated melting of polar ice caps and glaciers contributing to **higher sea levels**.
- **Emissions Gap:** IPCC data shows only a **2% reduction** in global emissions by 2024, far below the required **43% cut** by 2030.



Government Schemes to Tackle Global Warming:

- **Global Initiatives:**
  - Paris Agreement **(2015):** Limit warming below 2°C with updated Nationally Determined Contributions (NDCs).
  - **Green Climate Fund:** Provides financial resources to developing nations for climate-resilient projects.
  - **UNFCCC and Kyoto Protocol:** Frameworks for global cooperation in emissions reduction.
- **Indian Schemes:**

- **National Action Plan on Climate Change (NAPCC):** Includes missions on renewable energy, water conservation, and energy efficiency.
- **Faster Adoption and Manufacturing of Electric Vehicles (FAME):** Promotes e-mobility to reduce fossil fuel dependence.
- **National Green Hydrogen Mission:** Aims to develop clean energy solutions.
- **State Action Plans on Climate Change (SAPCCs):** Tailored state-level initiatives under the NAPCC.
- **Perform, Achieve, and Trade (PAT) Scheme:** Enhances energy efficiency in industries and power plants.

Consequences of Global Warming:

- **Human Impact:**
  - **Health Risks:** Heat stress, asthma, and vector-borne diseases are on the rise.
  - **Food Security:** Crop failures and reduced yields due to droughts and floods.
  - **Migration:** Displacement from coastal and drought-affected regions.
  - **Economic Losses:** Damage to infrastructure and loss of livelihoods from extreme events.
  - **Social Inequalities:** Marginalized communities bear disproportionate impacts.
- **Environmental Impact:**
  - **Loss of Biodiversity:** Habitat destruction leading to species extinction.
  - **Polar Melting:** Accelerated ice melt increases sea levels and alters ecosystems.
  - **Ocean Acidification:** Absorption of CO_2 harms marine life and ecosystems.
  - **Extreme Weather Events:** Increased frequency and severity of cyclones, heatwaves, and droughts.
  - **Deforestation and Desertification:** Degraded landscapes reduce Earth's carbon-absorbing capacity.

Way Ahead:

- **Accelerate Emissions Reductions:** Shift to renewables and phase out fossil fuels globally.
- **Climate Adaptation:** Invest in infrastructure to withstand extreme weather, such as early warning systems.
- **Technological Innovations:** Focus on AI, quantum systems, and carbon capture technologies for clean energy.
- **Global Cooperation:** Fulfill commitments under the Paris Agreement and provide financial aid to vulnerable nations.
- **Local Action:** Promote sustainable agriculture, urban planning, and reforestation projects.

Conclusion:

The year 2024 highlights the urgency to act against global warming. While the 1.5°C target seems unattainable, accelerating adaptation and mitigation efforts can minimize its adverse impacts and secure a sustainable future.

PYQ:

1. Which of the following statements is/are correct about the deposits of 'methane hydrate'? (UPSC-2019)
   1. Global warming might trigger the release of methane gas from these deposits.
   2. Large deposits of 'methane hydrate' are found in Arctic Tundra and under the sea floor.
   3. Methane in atmosphere oxidizes to carbon dioxide after a decade or two.

   Select the correct answer using the code given below.
   a) 1 and 2 only
   b) 2 and 3 only
   c) 1 and 3 only
   d) 1, 2 and 3

   Answer: d)

2. 'Climate change' is a global problem. How India will be affected by climate change? How Himalayan and coastal states of India will be affected by climate change? (UPSC-2017)

Topics: Challenges to internal security through communication networks, role of media and social networking sites in internal security challenges, basics of cyber security; money-laundering and its prevention.

20. THE RED SHADOW: NAXALISM AND INDIA'S INTERNAL STRUGGLES

Context:

Union Home Minister reiterated the commitment to eliminate Naxalism from Chhattisgarh by 2026.

What is Naxalism?

- **Definition**: Naxalism is a form of **Left-Wing Extremism (LWE)** that aims to overthrow the state using violent means, inspired by **Maoist ideology**.
- **Origin:** Began in **Naxalbari village**, West Bengal, in **1967** as a tribal-peasant uprising.
- **Ideology:** Driven by **Marxist-Leninist** principles, with a focus on addressing issues like land reforms and exploitation.
- **Objective:** Establish a **People's Democratic Republic** through armed insurgency.
- **Affected Regions:** Mainly impacts the **Red Corridor** – states like Chhattisgarh, Jharkhand, Odisha, and Bihar.

Evolution of Naxalism in India:

- **1967 (First Stage):** Peasant uprising in **Naxalbari**, West Bengal, led by Charu Majumdar, Kanu Sanyal, and Jangal Santhal.
- **1975-2004:** Groups fragmented; **People's War Group** (PWG) in Andhra Pradesh and **MCCI** in Bihar strengthened.
- **2004 Onwards:** PWG and MCCI merged to form **CPI (Maoist)**, consolidating the Naxal movement.
- **Spread of Red Corridor:** Expansion into states like **Chhattisgarh, Odisha, Jharkhand**, and forays into southern states.
- **Current Status:** Naxal violence reduced by 47% (2015-2020) but remains concentrated in core regions.

Types of Naxalism:

- **Rural Naxalism**: Dominant in forested and tribal regions; targets government symbols and infrastructure.
- **Urban Naxalism**: Maoist infiltration in **urban centres** to radicalize intellectuals, students, and labour groups.

Reasons Behind Naxalism:

1. **Economic Inequality:** Unequal distribution of land and lack of employment opportunities for marginalized communities.
2. **Exploitation of Tribals:** Displacement of tribals due to mining, deforestation, and lack of forest rights.
3. **Lack of Development:** Absence of infrastructure like **roads, schools, healthcare**, and clean water.
4. **Governance Deficit:** Weak local governance, corruption, and failure to implement welfare schemes.
5. **Political Marginalization:** Exclusion of **Dalits, Adivasis**, and landless peasants from political participation.

Government initiatives to counter Naxalism:

1. **Security Operations:** Deployment of **Central Armed Police Forces (CAPFs)** and anti-Naxal units like **Greyhounds** and **Bastariya Battalion**.
2. **Development Programs:** Initiatives like **Road Connectivity Project**, **Aspirational Districts Program**, and **ROSHNI Scheme**.
3. **Rehabilitation Policies:** Surrender and rehabilitation programs to reintegrate former Naxals into society.
4. **Intelligence Strengthening:** Multi-Agency Centers (MACs) and UAV surveillance for real-time intelligence sharing.
5. **Skill Development:** Programs like **Pradhan Mantri Kaushal Vikas Yojana (PMKVY)** to provide employment opportunities.

SAMADHAN STRATEGY

- **S**– Smart Leadership
- **A**– Aggressive Strategy
- **M**– Motivation and Training
- **A**– Actionable Intelligence
- **D**– Dashboard Based KPIs and KRAs
- **H**– Harnessing Technology
- **A**– Action plan for each Theatre
- **N**– No access to Financing

Challenges to Counter Naxalism:

1. **Terrain Complexity:** Naxals exploit remote forests and inaccessible areas for guerrilla warfare.
2. **Inadequate Coordination:** Poor inter-state coordination among security forces and agencies.
3. **Lack of Intelligence:** Inadequate actionable intelligence and reliance on outdated technology.
4. **Social Support Base:** Strong Naxal influence among marginalized tribals and landless farmers.
5. **Urban Maoism:** Growing infiltration into intellectual and urban circles, complicating countermeasures.

Way ahead to tackle naxalism in India:

1. **Holistic Development:** Focus on **roads, education, healthcare**, and livelihood opportunities in affected regions.
2. **Improved Governance:** Address governance deficits with transparent implementation of welfare schemes.
3. **Community Engagement:** Win trust through tribal empowerment, forest rights, and inclusive policies.
4. **Modernized Security Forces:** Equip forces with advanced technology, better training, and intelligence tools.
5. **Peace Dialogues:** Open channels for political dialogue to reintegrate Naxals into the mainstream society.

Conclusion:

As **Karl Marx** aptly said, **"The philosophers have only interpreted the world, in various ways; the point, however, is to change it."** Tackling Naxalism requires a balanced approach of security measures, development, and inclusive governance to end decades of unrest and ensure lasting peace.

PYQ:

1. What are the determinants of left-wing extremism in Eastern part of India? What strategy should the Government of India, civil administration and security forces adopt to counter the threat in the affected areas? (UPSC-2020)
2. Left Wing Extremism (LWE) is showing a downward trend, but still affects many parts of the country. Briefly explain the Government of India's approach to counter the challenges posed by LWE. (UPSC-2018)

GENERAL STUDIES – 4

1. ACADEMIA'S AI DILEMMA: ETHICS OVER EASE

Context:

The rise of Generative AI in academia raises ethical concerns. A Punjab and Haryana High Court case underscored challenges in regulating AI-driven submissions, balancing its benefits with risks to academic integrity.

Key Applications of AI in Academia:

- **Personalized Learning:** AI platforms like Coursera offer tailored lessons and progress tracking.
- **Automated Grading and Feedback:** Tools like Gradescope streamlines evaluation and provides instant feedback.
- **Research Assistance:** AI systems like Semantic Scholar suggest relevant studies and identify research gaps.
- **Plagiarism Detection and Academic Integrity**: Tools like Turnitin ensure originality in submissions.
- **Accessibility and Inclusivity:** AI tools make education more inclusive for differently-abled and multilingual students.
- **Data-Driven Academic Insights**: AI analytics identify at-risk students and optimize institutional strategies.

Consequences of AI in Academia:

Positive Consequences:

1. **Improved Access:** AI tools democratize access to resources, enabling students from underserved areas to learn effectively.

   E.g. Duolingo AI provides affordable language learning globally.
2. **Efficient Research:** AI accelerates literature reviews, identifying key research gaps.

   E.g. PubMed uses AI to enhance biomedical research searches.
3. **Enhanced Writing Skills:** Tools like Grammarly refine academic drafts, improving readability and coherence.
4. **Data Analysis Support:** AI simplifies complex data interpretation, essential for empirical studies.

   E.g. Climate researchers use AI to predict environmental patterns.
5. **Innovative Teaching:** AI-powered simulations and virtual labs provide hands-on experiences.

   E.g. Virtual dissection in biology labs.

Negative Consequences:

1. **Academic Malpractice:** Unethical use of AI-generated content compromises originality.

   E.g. Instances of AI plagiarism detected by tools like Turnitin.
2. **False Positives:** Over-reliance on AI detection tools can lead to unfair accusations.

   E.g. Students flagged incorrectly by AI-based plagiarism software.
3. Skill **Erosion:** Excessive dependence on AI undermines critical thinking and writing skills.

4. **Bias in Algorithms:** AI models trained on biased datasets perpetuate inequities in academic evaluations.

E.g. Gender-biased recommendations in AI-generated hiring solutions.

5. **Overburdened Faculty:** Rigorous oral evaluations to counteract AI misuse increase faculty workloads.

Way Ahead:

1. **Define AI Guidelines:** Establish clear rules on permissible AI use in academic work, with discipline-specific nuances.
2. **Transparency and Disclosure:** Encourage mandatory declarations of AI usage in submissions.

E.g. Including "AI-assisted" tags in research papers.

3. **Robust Assessments:** Blend written evaluations with oral exams to ensure originality.
4. **Faculty Training:** Equip educators with tools and strategies to handle AI-generated submissions.
5. **Policy Reforms:** Shift focus from "publish-or-perish" to quality-oriented evaluations.

E.g. Encouraging open-access research over journal metrics.

Conclusion:

Navigating the role of AI in academia requires a balanced approach that values innovation while upholding academic integrity. By fostering transparency, redefining evaluation methods, and empowering educators, institutions can harness AI's potential responsibly.

2. CODE OF CONDUCT FOR JUDGES

Context:

Law Minister recently addressed the lack of a formal code of conduct for judges, pointing to existing frameworks like the Supreme Court's Restatement of Values of Judicial Life (1997) and the in-house procedure for action against errant judges.

What is a Code of Conduct?

A code of conduct is a set of ethical guidelines that define acceptable behaviour and standards for individuals in a specific role or profession. For judges, it emphasizes impartiality, accountability, and adherence to constitutional principles.

Present Code of Conduct for Judges:

- **Restatement of Values of Judicial Life (1997):** Adopted by the Supreme Court, it outlines standards for judicial behaviour, such as impartiality, transparency, and integrity.

E.g. Judges must refrain from public commentary on pending cases.

- **Constitutional Provisions:** Articles 124 and 217 prescribe the appointment and removal of judges, emphasizing ethical behaviour as part of their duties.
- **In-house Procedure (1997):** Allows the Chief Justice of India (CJI) to act on complaints against judges for misconduct.
- **Judges (Inquiry) Act, 1968:** Provides a legal framework for investigating allegations of misconduct or incapacity.
- **Declaration of Assets:** Judges are expected to disclose their assets as part of accountability, though enforcement mechanisms are weak.

Need for a Code of Conduct for Judges:

- **Prevent Judicial Misconduct:** Ensures accountability and prevents misuse of judicial powers.

E.g. Allegations against some judges have raised concerns over ethical lapses.

- **Strengthen Public Trust:** Reinforces confidence in the judiciary's impartiality.

E.g. The Andhra Pradesh HC case in 2021 highlighted public distrust due to alleged bias.

- **Uniform Standards:** A formal code provides consistency in handling ethical violations across states and courts.
- **Combat Corruption:** Addresses issues of financial irregularities and nepotism in judicial processes.
- **International Obligations:** Aligns India with global practices like the Bangalore Principles of Judicial Conduct.

Government Efforts:

- **Restatement of Judicial Values:** Reaffirmed by the Supreme Court in 1997 to guide judicial behaviour.
- **Judges (Inquiry) Act, 1968:** Legal mechanism to investigate allegations of misconduct.
- **Judicial Standards and Accountability Bill, 2010:** Proposed but not passed, aiming to enforce ethical standards.
- **Judicial Training Programs:** Conducted by the National Judicial Academy to promote ethical awareness.

Significance of a Code of Conduct for Judges:

1. **Ensures Judicial Independence:** Protects judges from undue influence by clearly defining ethical boundaries.
2. **Strengthens Rule of Law:** Reinforces fair and impartial judicial processes.

E.g. The Ayodhya verdict highlighted adherence to legal principles over religious biases.

3. **Enhances Credibility:** A formal code enhances the judiciary's reputation globally.
4. **Encourages Accountability:** Prevents arbitrary behaviour and ensures adherence to constitutional mandates.
5. **Addresses Systemic Bias**: Provides a mechanism to curb favouritism and discrimination in judgments.

Challenges to a Code of Conduct:

1. **Lack of Enforceability:** Existing guidelines are advisory and lack binding enforcement mechanisms.
2. **Judicial Independence vs. Accountability:** Overregulation could undermine judicial autonomy.
3. **Resistance to Change:** Judges often resist external scrutiny, citing concerns over independence.
4. **Political Interference:** Risk of using the code to target dissenting judges.
5. **E.g.** Allegations of executive overreach in recent judicial appointments.
6. **Lack of Awareness:** Absence of regular training on ethical guidelines limits their effectiveness.

Way Ahead

1. **Formalize the Code:** Introduce a legally binding code of conduct for judges.
2. **Strengthen Oversight Mechanisms:** Establish an independent judicial accountability body.
3. **Regular Training Programs:** Conduct ethics workshops for judges to familiarize them with the code.
4. **Transparency in Appointments:** Enhance transparency in the appointment and removal of judges.
5. **Public Engagement:** Foster trust by involving civil society in discussions on judicial accountability.

Conclusion:

A robust code of conduct is essential to safeguard judicial integrity and public trust. By balancing accountability with independence, it ensures that the judiciary remains a pillar of democracy.

PYQ:

1. Explain the reasons for the growth of public interest litigation in India. As a result of it, has the Indian Supreme Court emerged as the world's most powerful judiciary? (UPSC- 2024)
2. Critically examine the Supreme Court's judgement on 'National Judicial Appointments Commission Act, 2014' with reference to appointment of judges of higher judiciary in India. (UPSC-2017)

FACTS FOR PRELIMS

GS-1

Art & Culture

1. AJMER SHARIF DARGAH

Context:

Ajmer Sharif Dargah, the revered shrine of Sufi saint Khwaja Moinuddin Chishti, has recently come under scrutiny due to a petition claiming it was built on demolished temples.

- Ajmer, historically **known as Ajaymeru,** has seen significant cultural and religious evolution.

Ajmer Sharif Dargah Overview

- Built in the 15th century by Khalji rulers of Malwa.
- Situated in Ajmer, Rajasthan, at the centre of the city's historical and spiritual landscape.
- Features include Buland Darwaza, White Marble Dome, and Akbari Masjid.
- Served as a spiritual refuge for all faiths under Khwaja Moinuddin Chishti's philosophy of inclusivity.

Khwaja Moinuddin Chishti's Life and Legacy

- Born in Sistan in 1141 CE.

- Preached Sufism focusing on love, tolerance, and service to humanity.
- Travelled across Central and South Asia before settling in Ajmer in 1191 CE.
- Founded the Chishtiyya Sufi order in India.
- Attracted kings, nobles, and commoners through his teachings.
- Influenced by immediate disciples like Qutbuddin Bakhtiyar Kaki.

2. INDIRA GANDHI PEACE PRIZE, 2024

Context:

The Indira Gandhi Peace Prize for Peace, Disarmament, and Development for 2024 will be awarded to Michelle Bachelet, former President of Chile and global advocate for human rights, gender equality, and democracy.

About Indira Gandhi Peace Prize:

- **Origin:** Instituted in **1986** by the **Indira Gandhi Memorial Trust** in memory of India's former Prime Minister, Indira Gandhi.
- **Aim:** Honors contributions to **peace, disarmament, and development**, fostering global harmony, scientific progress, and human betterment.
- **Award Components:**
  - **Monetary Prize:** ₹25 lakh
  - **Citation:** Recognizing exemplary achievements.
- **Award Given By:**
  - Selected by an **international jury**, chaired this year by Shivshankar Menon, former National Security Adviser.
- **Recipient for 2024:**
  - **Michelle Bachelet:** Former Chilean President and UN High Commissioner for Human Rights, for championing **gender equality, democracy, and human rights** globally.
- **Notable Past Recipients:**
  - **Mikhail Gorbachev** (1987)
  - **UNICEF** (1989)
  - **Jimmy Carter** (1997)
  - **Angela Merkel** (2013)
  - **ISRO** (2014)
  - **Sir David Attenborough** (2019)
  - **Pratham NGO** (2021)
  - **Indian Medical Association and the Trained Nurses Association of India** (2022)

3. USTAD ZAKIR HUSSAIN

Context:

Ustad Zakir Hussain, the globally celebrated tabla maestro, passed away in San Francisco due to Idiopathic Pulmonary Fibrosis (IPF).

About Zakir Hussain:

- **Birth:** Born on March 9, 1951, in **Mumbai, India**.
- **Family & Roots:** Son of legendary tabla player **Ustad Alla Rakha**; trained in the **Punjab Gharana** tradition.
- **Music Legacy:** A pioneer in **Indian classical and fusion music**, blending tabla with jazz, film, and world music.
- **Achievements & Awards:**
  - Winner of **five** Grammy Awards, including one for the fusion group **Shakti**.
  - Awarded **Padma Shri** (1988), **Padma Bhushan** (2002), and **Padma Vibhushan** (2023).
  - Collaborated with artists like **John McLaughlin, Pandit Ravi Shankar**, and **Ali Akbar Khan**.
- **Global Influence:** Popularized the tabla globally through concerts, commercials, and innovative collaborations.

About Idiopathic Pulmonary Fibrosis (IPF):

- **What it is:** A chronic, progressive lung disease causing **scarring (fibrosis)** of lung tissue, making breathing difficult.

- **Causes**:
  - Exact cause unknown (idiopathic).
  - Triggered by **environmental factors** (smoke, dust, pollution), genetic predisposition, and chronic inflammation.
- **Symptoms**:
  - Shortness of breath (dyspnea)
  - Dry cough
  - Fatigue and unintended weight loss
  - Low oxygen levels leading to complications like pulmonary hypertension and respiratory failure.
- **Diagnosis**: Confirmed via **high-resolution CT scans**, pulmonary function tests, and occasionally lung biopsy.
- **Treatment**:
  - **Antifibrotic medications**: Pirfenidone, Nintedanib (slows progression).
  - **Oxygen therapy** and **lung exercises**.
  - Lung transplantation for advanced cases.

4. PRADHAN MANTRI RASHTRIYA BAL PURASKAR

Context:

The Pradhan Mantri Rashtriya Bal Puraskar, India's highest civilian honor for children, was conferred by President in 2024, recognizing 17 young achievers in art, bravery, and innovation.

About Pradhan Mantri Rashtriya Bal Puraskar:

- **What it is:** India's highest civilian award for children, celebrating exceptional achievements in various fields.
- **Awarded by:** President of India on behalf of the Government of India.
- **Ministry involved:** Organized by the **Ministry of Women and Child Development**.
- **Categories:**
  - Art & Culture
  - Bravery
  - Innovation
  - Science & Technology
  - Social Service
  - Sports
  - Environment
- **Eligibility:**
  - Must be an Indian citizen.
  - **Age:** 5–18 years as of July 31 of the respective year.
  - Achievements must have occurred **within two years prior** to the nomination deadline.
  - Up to 25 awards are conferred annually, with flexibility at the discretion of the National Selection Committee.
- **Award details**: Winners receive a medal, a certificate, and a citation booklet.

5. INTANGIBLE CULTURAL HERITAGE

Context:

The recognition of Bosnia's Sevdalinka, also known as **"Balkan Blues,"** as part of UNESCO's National Inventory of Intangible Cultural Heritage highlights global efforts to preserve and celebrate diverse cultural traditions.

About UNESCO's National Inventory of Intangible Cultural Heritage:

- **Established in:** Adopted in 2003, came into force in 2006 under the Convention for the Safeguarding of Intangible Cultural Heritage.
- **Aim:** To safeguard cultural practices, expressions, and knowledge systems endangered by globalization, ensuring respect for community heritage.
- **Criteria:**
  1. Must demonstrate the importance of the practice for cultural identity.

2. Should involve active community participation.
3. Must align with the principles of human rights and sustainable development.

- **Types of Lists:**
  - Representative List of Intangible Cultural Heritage of Humanity.
  - List of Intangible Cultural Heritage in Need of Urgent Safeguarding.
  - Register of Good Safeguarding Practices.
- **India and UNESCO:**
  - **UNESCO Committees Membership:** India is a member of the Intangible Cultural Heritage (ICH) Committee (2022–2026) and the World Heritage Committee (2021–2025).
  - **Previous Tenures:** India served on the ICH Committee from 2006–2010 and 2014–2018.
  - **Nodal Office:** The Sangeet Natak Akademi, under the Ministry of Culture, manages intangible cultural heritage matters and prepares nomination dossiers for UNESCO's Representative List.

About Balkan Blues (Sevdalinka):

- **What it is:** A melancholic urban love song blending South Slavic oral poetry and Ottoman music, often referred to as the "Balkan Blues."
- **Nation:** Bosnia.
- **Features:**
  - Traditionally performed a cappella or with instruments like the saz (lute).
  - Originates from the 16th century, carrying themes of love and melancholy.
  - Recognized as a cultural symbol of Bosnia's history and identity.

6. SANSKRIT INSCRIPTIONS

Context:

A recent discovery of an ancient Sanskrit inscription in Gilgit, Pakistan-Occupied Kashmir was decoded by the Archaeological Survey of India (ASI).

About Sanskrit Inscription:

- **Location Found:**
  - **Gilgit, Pakistan-Occupied Kashmir** – Written in Brahmi script, **4th century CE.**
  - **Near Peshawar, Pakistan** – Written in Sharada script, **10th century CE**.
- **About the Inscription:**
  - **Gilgit Inscription:**
    - Mentions **"Pushpasingha,"** who installed a Mahesvaralinga for his guru's merit.
    - Written in **Brahmi script.**
    - Indicates strong religious ties, specifically to Shaivism.
  - **Peshawar Inscription:**
    - Fragmentary, engraved on a slab.
    - Written in **Sharada characters**.
    - Refers to Buddhist **Dharini (chants)** in line six.

7. WAVES

Context:

India is set to host the **World Audio Visual Entertainment Summit (WAVES)** for the first time in November 2025 in Goa.

About WAVES:

- **Full form:** World Audio Visual Entertainment Summit.
- **What it is:** A global platform fostering dialogue, trade collaboration, and innovation in the media and entertainment industry.
- **Established in:** To be held for the first time in 2025.
- **Aim:** To position India as a global powerhouse in media and entertainment (M&E), promoting innovation, investment, and skill development.

Features of WAVES 2025:

- **Host Location:** Goa, India.
- **Organizers:** Ministry of Information and Broadcasting, Government of India, in collaboration with the Goa government.
- **Key Focus Areas:**
  - Content Production and Innovation.
  - Animation, VFX, and Gaming.
  - Music and Intellectual Property (IP) Creation.

History

8. KINGDOMS AND HYDROLOGY CONTRIBUTIONS

Context:

Deccan empires, from Mauryans to Vijayanagara, excelled in monsoon-driven water management, offering lessons for addressing modern water scarcity amid climate change.

About Kingdoms and Hydrology Contributions:

- **Mauryan Empire (322 BCE - 185 BCE):**
  - Established the **first hydraulic civilization** during a century-long drought.
  - Constructed dams, tanks, and lift irrigation systems.

  E.g. References to water pricing and tank construction in Brihat Samhita.
- **Satavahanas (228 BCE - 224 CE):**
  - Introduced **waterwheels** for advanced irrigation.
  - Managed droughts with improved tank systems.

  E.g. Evidence of irrigation systems in Nashik and Mathura inscriptions.
- Cholas **(850-1200 CE):**
  - Renowned for building vast **tanks, reservoirs, and canals** to mitigate droughts.

  E.g. Grand Anicut (Kallanai), still functional, built for irrigation.
- Vijayanagara **Empire (1336-1646 CE):**
  - Transformed valleys into **tanks and vast reservoirs**.
  - Actively promoted agriculture through extensive irrigation projects.

  E.g. The Tungabhadra tank system for water storage and agriculture.
- **Bahamani Sultanate (1347-1527 CE):**
  - Introduced the **karez system** for groundwater extraction.
  - This system uses underground shafts and sloping tunnels to bring water from an upland aquifer to the surface. It is eco-friendly, relying on gravity instead of fuel-powered machines.

  E.g. Karez networks in Bidar and Gulbarga regions.

9. KUMHRAR SITE

Context:

The Kumhrar site, linked to Mauryan history, is under Archaeological Survey of India (ASI) excavation to uncover the 80-pillar assembly hall, the site of Emperor Ashoka's third Buddhist Council.

About Kumhrar site:

- **Found in:** First excavated between **1912–15 by D.B. Spooner.**
- **Location:** Kumhrar, near Patna, Bihar.
- **Historical Significance:** Believed to be the conference hall for the third Buddhist Council under Emperor Ashoka's reign.
- **Architectural Features:**
  - **Eighty Pillared Hall:**
    - Parallel rows of **72 pillars** found initially, with 8 more pillars unearthed later.
    - Sandstone pillars from Chunar, Uttar Pradesh, stood about 32 feet tall, with a lustrous finish typical

of Mauryan architecture.
    - Wooden roof and floor with an entrance located on the southern side.
- **Arogya Vihar (Gupta Period):**
    - Hospital-cum-monastery run **by Dhanvantari**, evidenced by a terracotta seal inscribed with **"Sri Arogyavihare Bhikshusamghasya."**

10. RAJAGOPALACHARI

Context:

On Shri C. Rajagopalachari's birth anniversary, PM Modi honored his multifaceted contributions to governance, literature, and social empowerment.

About C. Rajagopalachari:

- **Born:** December 10, 1878, in Thorapalli, Madras Presidency (now Tamil Nadu, India).
- **Family**: Belonged to a Tamil-speaking Iyengar Brahmin family; father was a lawyer.
- **Contribution to the Freedom Movement:**
    - **Indian National Congress (INC):** Served as a legal advisor and General Secretary.
    - **Non-Cooperation Movement**: Promoted boycotts of British goods and institutions.
    - **Civil Disobedience Movement**: Led Salt Satyagraha in Madras Presidency.
    - **Rajaji Formula (1944)**: Proposed a framework to resolve conflicts between INC and the Muslim League on partition.
    - **Diplomatic Efforts**: Represented Indian National Congress (INC) in Round Table Conferences and advocated peaceful negotiations for independence.
- **Post-Independence Contributions:**
    - **Governor-General of India (1948–1950)**: Last Governor-General; oversaw the transition to the Republic of India.
    - **Chief Minister of Madras State (1952–1954)**: Introduced reforms in education, agriculture, and rural development.
    - **Founder of Swatantra Party (1959)**: Advocated free-market principles and economic liberalization.
- **Literary Works:**
    - **Translations**:
        - *Mahabharata* and *Ramayana* (English).
        - Tamil translation of Ramayana (*Chakravarthi Thirumagan*), which won the Sahitya Akademi Award in 1958.
    - **Hinduism: Doctrine and Way of Life**: Explored Hindu scriptures and philosophy.
    - **Autobiography**: *Rajaji: A Life*.
- **Awards and Recognitions:**
    - **Bharat Ratna (1954)**: For contributions to politics, literature, and public service.
    - **Ramon Magsaysay Award (1958)**: For leadership during his tenure as Madras Chief Minister.
    - **Sahitya Akademi Fellowship**: Honored for contributions to literature.
    - **Ramanujan Award (1962)**: For translating *Thirukkural* into English.
- **Death**: December 25, 1972, in Chennai, Tamil Nadu, at age 94.

11. SUBRAMANIA BHARATI

Context:

Prime Minister released the complete works of the eminent Tamil poet and freedom fighter Subramania Bharati.

About Subramania Bharati:

- **Birth and Early Life**:
    - **Born:** December 11, 1882.
    - **Location:** Ettayapuram, Tamil Nadu.
- **Literary Contributions**:
    - Revolutionized Tamil literature with his innovative style and social themes.

- Translated the Bhagavad Gita into Tamil.
- Promoted themes of equality, women's empowerment, and freedom through his poetry.

- **Major Works:**
  - **Kuyil Pattu:** A poem celebrating the simplicity of nature.
  - **Kannan Pattu:** Depicts divine love and spirituality.
  - **Panchali Sabatham:** A poetic re-telling of the Mahabharata's Draupadi episode with a focus on justice and valor.
  - **India Weekly (1906):** First Tamil newspaper to include political cartoons.
- **Significance:**
  - Infused patriotism and cultural pride among Indians during the freedom struggle.
  - Advocated for women's rights and education, breaking societal barriers.
  - His vision for a united and progressive India continues to inspire generations.

12. NEOLITHIC SITE

Context:

A Neolithic ash mound, dating back 4,000 to 5,000 years near **Sangankallu Hiregudda** on the outskirts of Ballari, Karnataka, has been completely destroyed by landowners.

About Neolithic Sites:

- **What it is:**
- Neolithic sites represent the early agricultural and animal husbandry practices of human civilization, dating back to 7000–1000 BCE.
- **Features:**
  - **Ash mounds:** Formed by burning dung and other materials during rituals.
  - **Artifacts:** Includes tools, pottery, and remnants of early settlements.
  - **Cultural Practices:** Evidence of Nandi worship and community-based agriculture.
- Neolithic Sites **in India:**
  - **Sangankallu** (Karnataka): Known for ash mounds and agricultural heritage.
  - **Mehrgarh** (Balochistan, Pakistan): Early farming and storage practices.
  - **Chirand** (Bihar): Pottery and animal domestication evidence.
  - **Burzahom** (Kashmir): Pit dwellings and burial sites.
  - **Payyampalli** (Tamil Nadu): Early agricultural settlements.

13. AKBAR

Context:

Akbar, the third Mughal emperor, is celebrated for his administrative brilliance, religious tolerance, and cultural patronage, which have inspired leadership lessons in modern contexts.

About Akbar:

- **Management System:**
  - **Mansabdari System:** Military-administrative system assigning ranks (mansabs) to nobles, ensuring accountability and military efficiency.
  - **Land Revenue System:**
    - **Zabt System:** Standardized land revenue collection.
    - Land categorized into **Polaj, Parauti, Chachar, and Banjar** based on fertility.
  - **Centralized Administration:**
    - **Subhas, Sarkars, Paraganas, Villages:** Organized hierarchy with specific officials like Subhadars and Muqaddams.
    - Councils like **Diwan-i-Arz** (military), **Diwan-i-Kohi** (agriculture), and **Diwan-i-Khairat** (charity).
- **Art and Architecture:**
  - **Fatehpur Sikri:** Built iconic structures like Buland Darwaza, Panch Mahal, and Jama Masjid, reflecting Persian, Islamic, and Indian styles.
  - **Agra Fort:** Renovated with structures like Jahangir Mahal.
  - **Mughal Paintings:** Emphasized naturalism and realism in miniature paintings, showcasing court scenes, historical events, and nature.
- **Religious Policy:**
  - **Religious Tolerance:**
    - Abolished **jiziya** and pilgrimage tax for non-Muslims.
    - Prevented Sati and promoted equality.
  - **Ibadat Khana:** Established a platform for interfaith dialogues at Fatehpur Sikri.
  - **Din-i-Ilahi:** Introduced a syncretic religious doctrine promoting universal harmony.
  - **Sulh-i-Kul:** Governance policy advocating peace and inclusivity.
- **Historians and Books on Akbar:**
  - **Akbarnama and Ain-i-Akbari by Abu'l-Fazl:** Detailed records of Akbar's reign and administration.
  - **Hamzanama:** Commissioned by Akbar, narrating Persian epic tales.
  - **Razmnama:** Persian translation of the Mahabharata.
- **Literature:**
  - Encouraged translations of Hindu and Persian texts, such as **Yogavashishtha** and Mahabharata.
  - Patronized poets and scholars like **Faizi and Tansen.**

14. BELAGAVI CONGRESS SESSION

Context:

The 39th Congress Session, chaired by Mahatma Gandhi in Belgaum (now Belagavi) in 1924, marks a century as a landmark in India's freedom struggle.

About Belagavi Congress Session, 1924:

- **Year and Presidentship:** Held in December 1924; chaired by **Mahatma Gandhi**, marking the only Congress session he presided over.
- **Blend of Political and Social Reform**: Unlike other sessions, it focused equally on **social issues** like untouchability eradication, khadi promotion, sanitation, and **Hindu-Muslim unity**, alongside political goals like Swaraj.
- **Institutional Transformation**: Gandhi restructured the Congress into a mass movement by reducing the **membership fee by 90%,** making it accessible to all social classes.
- **Focus on Grassroots Empowerment**: The session mandated contributions to **hand-spun khadi**, promoting **self-reliance** and village industries, and marked a shift from urban-centric strategies to **rural revitalization**.
- **Cultural and Ethical Impact**:
  1. Advocated equality, with Brahmin volunteers engaging in sanitation work.
  2. Iconic cultural performances by **Vishnu Digambar Paluskar** and **Gangubai Hangal**.
  3. Gandhi's famous declaration, **"If I am to be born again, may I be born a Bhangi,"** emphasized **social justice** and upliftment.
- **Infrastructure Legacy:** The construction of **Pampa Sarovara**, a well for the session, continues to serve Belagavi, symbolizing sustainable contributions from the event.
- **Visionary Resolutions:** Unique resolutions on **urban planning** and **cow protection** linked economic development

with cultural preservation, showcasing Gandhi's holistic approach.

Geography

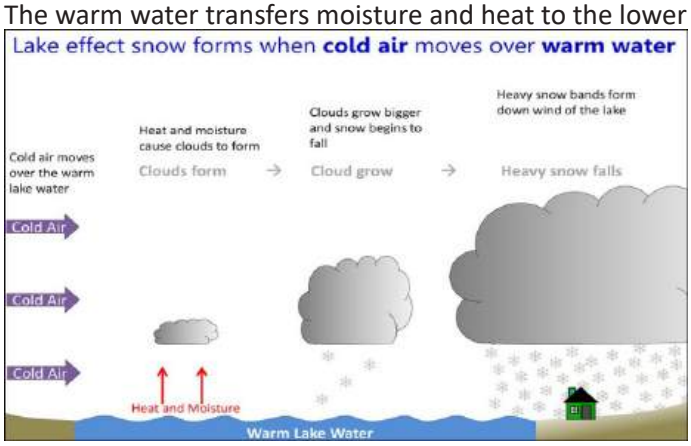
15. LAKE-EFFECT SNOW

Context:

Lake-effect snow, a weather phenomenon associated with the Great Lakes region, has recently buried towns in upstate New York, Pennsylvania, Ohio, and Michigan under several feet of snow.

About Lake-Effect Snow:

- **What it is:** A localized weather phenomenon producing intense snowfall due to the interaction of cold air with the warmer waters of large lakes.
- **Found in:** Common in regions near the Great Lakes in the United States, particularly in states like New York, Michigan, Ohio, and Pennsylvania.
- **How it forms:**
  - Cold air, often from Canada, moves over the unfrozen and warmer Great Lakes.
  - The warm water transfers moisture and heat to the lower atmosphere.



  - Rising air cools, forming narrow bands of clouds that generate snowfall at rates of 2–3 inches per hour or more.
- **Factors responsible:**
  - **Cold Air:** Must be significantly colder than lake surface temperatures.
  - **Wind Direction:** Dictates the specific areas affected by snowfall.
  - **Geography:** Physical features of land and water influence the intensity and location.
- **Impacts:**
  - Localized heavy snowfall, often creating significant differences in snow accumulation over small distances.
  - Infrastructure disruptions, including roof collapses and stranded vehicles.
  - Annual snowfall in some areas exceeds 20 feet, impacting daily life and regional economies.

16. COPPER

Context:

India is confronting a significant copper shortage due to the implementation of the Quality Control Order (QCO) on refined copper, effective December 1, 2024.

- **Japan** which **accounts for 80%** of **India's copper imports** are still awaiting certification, leading to a potential supply disruption.

About Copper:

- Copper is a **reddish-brown, malleable, and ductile** metal known for its excellent thermal and electrical conductivity.
- **Properties**: It is corrosion-resistant and possesses antimicrobial qualities, making it indispensable in electrical wiring, electronics, and various industrial applications.
- **Major mines in India:**
  - **Malanjkhand Mine**: Located in Madhya Pradesh, it's the largest copper mine in India, producing approximately 17.62 thousand tonnes in 2023.

- **Banwas Mine**: Situated in Rajasthan.
- **Surda Mine**: Located in Jharkhand.

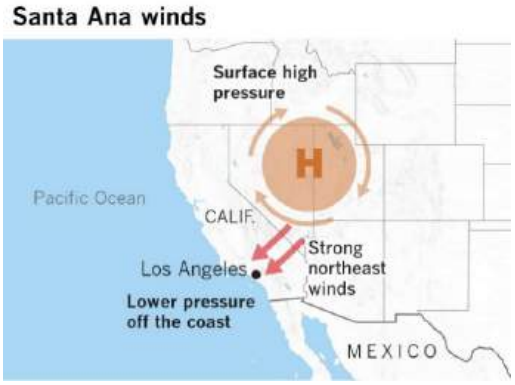
- **India's Copper Imports:** Due to limited domestic production, India **imports 30-40%** of its refined copper needs.
- **Reasons for Copper Shortage:**
  - **Quality Control Order (QCO):** BIS certification for imported refined copper has halted imports, risking shortages.
  - **Sterlite Closure:** Tamil Nadu's Sterlite smelter, once producing 36% of India's copper, remains shut.
- **Impacts on India**
  - **Renewable energy delays:** Copper scarcity threatens solar, wind, and EV projects, crucial for India's net-zero goals by 2070.
  - **Higher industrial costs**: Increased copper prices escalate production costs for wires, electronics, and infrastructure, affecting industries nationwide.
  - **Import dependency risks**: Heavy reliance on imports exposes India to global price fluctuations and geopolitical uncertainties.
  - **Slow infrastructure development**: Delays in copper supply hamper progress on smart cities, EV networks, and energy transition projects.

17. SANTA ANA WINDS

Context:

Santa Ana winds are a seasonal weather phenomenon unique to California, characterized by hot, dry, and gusty conditions that significantly increase the risk of wildfires and cause damage across affected regions.

What Are Santa Ana Winds?



- **Definition**: Santa Ana winds are strong, dry winds that blow from inland deserts toward the coast, significantly affecting Southern California's weather.
- **Seasonality**: These winds typically occur during fall but can also happen in winter.

How Are Santa Ana Winds Formed?

- **High-Pressure Systems:** A high-pressure system forms over the Great Basin (northeast of California), creating a strong pressure gradient.
- **Airflow Dynamics:** The high-pressure forces cooler, north-to-northeasterly winds to flow toward the lower-pressure coastal regions.
- **Downslope Effect:** As winds descend through mountain passes, the air compresses, warms, and dries out, reducing relative humidity and intensifying the gusts.
- **Wind Speed:** Gusts can reach up to 80 mph, creating hazardous conditions.

Regions Affected by Santa Ana Winds:

- **Primary Impact Area:** Southern California, particularly areas around Los Angeles, San Diego, and Ventura counties.
- **Secondary Impact:** Parts of Baja California and other coastal regions may also experience similar conditions.

Impacts of Santa Ana Winds:

- **Wildfire Risk:** The hot, dry winds rapidly dry vegetation, creating ideal conditions for wildfires to ignite and spread.
- **Structural Damage:** High wind speeds can damage buildings, power lines, and trees.
- **Health Effects:** Dust and allergens stirred by the winds can worsen respiratory conditions.
- **Power Disruptions:** Utility companies may implement precautionary power outages to prevent wildfire ignition from downed lines.

18. CYCLONE CHIDO

Context:

Cyclone Chido, a super cyclone with winds exceeding 200 km/h, struck **Mayotte**, a French overseas territory in the Indian Ocean, causing unprecedented destruction.

About Cyclone Chido:

- **Origin:** Developed over the **warm waters of the Indian Ocean**, intensifying rapidly due to rising sea surface temperatures.
- **Classification:** A **super cyclone** with sustained wind speeds exceeding **200 km/h** and gusts surpassing **250 km/h**.
- **Criteria for a** Super Cyclone
    - **Wind Speed:** Sustained wind speeds of **over 220 km/h (137 mph)** or higher.
    - **Classification:** Categorized as a **Category 4 or 5** storm on the **Saffir-Simpson scale**.
    - **Low Central Pressure:** Extremely low central pressure, often below **920 hPa**.

About Mayotte:

- **Location:** Situated in the **Mozambique Channel**, between **northwestern Madagascar** and **northeastern Mozambique** in the Indian Ocean.
- **Capital:** **Mamoudzou**, located on the main island, Grande-Terre.
- **Controlled by:** Overseas **department of France**.
- Consists of **Grande-Terre** (main island), **Petite-Terre**, and surrounding islets.

19. ARCTIC TUNDRA EMISSIONS

Context:

The Arctic tundra, once a carbon sink, is now emitting CO2 and methane (CH4) due to rising temperatures and wildfires, as noted in 2024 Arctic Report Card.

About Arctic Tundra:

- **What is** Tundra **Vegetation?**

    - Tundra vegetation refers to the **sparse plant life found in cold, treeless regions** like the Arctic and Alpine tundra.
    - It includes **mosses, lichens, grasses, sedges, and small shrubs**, all adapted to harsh conditions.
- **Latitude Found:** The Arctic tundra lies between **66.5°N to 75°N**, stretching across regions in Alaska, Canada, Greenland, Scandinavia, and Russia.
- **Features:** Characterized by **permafrost, low temperatures, short growing seasons**, and limited vegetation like mosses, lichens, and small shrubs.
- **Habitat:** Home to species such as Arctic foxes, caribou, polar bears, and migratory birds, adapted to harsh climates.
- **Significance:**
    - **Carbon Storage:** Stores more than **1.6 trillion metric tonnes of carbon** in permafrost soils.
    - **Climate Regulation:** Acts as a cooling agent for the planet by reflecting solar radiation with its ice-covered surfaces.

Arctic tundra is emitting more carbon because:

- **Thawing Permafrost:** Rising temperatures (warming four times the global rate) activate microbes, breaking down

organic matter and releasing CO2 and CH4.

- **Increased Wildfires:** The frequency and intensity of wildfires have surged, emitting GHGs and accelerating permafrost thaw.
- **Temperature Records:** 2024 recorded the second-highest Arctic surface air temperatures since 1900, further exacerbating emissions.
- **GHG Feedback Loop:** Released GHGs from thawing permafrost amplify global warming, perpetuating a cycle of higher emissions.

20. COLD WAVE

Context:

The India Meteorological Department (IMD) has issued forecasts for cold wave conditions in northern states like Himachal Pradesh, Punjab, and Rajasthan, along with dense fog in parts of Assam and Rajasthan.

About Cold Wave:

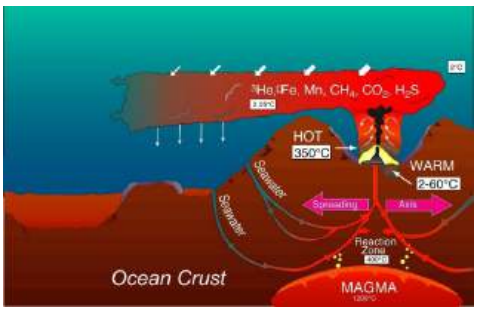
- **Definition:** A **cold wave** is a condition of extreme cooling over a region, with temperatures dropping significantly below normal levels for that time of year.
- **Criteria to Declare Cold Wave:**
  - When **minimum temperatures** fall below **10°C** in plains and are **4.5°C to 6.4°C below normal**.
  - **Severe cold wave:** When temperatures are **6.5°C or more below normal**.
  - **For hills:** Temperatures below **0°C** are a marker.
- **Geographic Reasons Behind Cold Wave in India:**
  - **Western Disturbances:** Weak or no western disturbances allow cold air from the north to penetrate deeply into India.
  - **Snowfall in Himalayas:** Leads to cold winds sweeping across northern plains.
  - **Clear Skies:** Enable radiative cooling during nights.
- **Is Cold Wave a Declared Disaster in India?**
  - Yes, the **National Policy on Disaster Management (NPDM)** includes cold waves under its disaster classification, enabling relief measures.
- **Impacts on India:**
  - **Human Health:** Increased cases of hypothermia and respiratory issues, especially among vulnerable populations.
  - **Agriculture:** Damage to standing crops like wheat and mustard due to frost.
  - **Energy Demand:** Higher energy consumption for heating, stressing power supply systems.
  - **Livelihoods:** Adverse effects on outdoor workers, particularly farmers and labourers.
  - **Transportation:** Disruption due to dense fog, impacting air, road, and rail traffic.

21. HYDROTHERMAL VENT

Context:

Indian oceanographers have achieved a milestone by capturing an image of an active hydrothermal vent located 4,500 meters below the Indian Ocean.

About Hydrothermal Vents:



- **What they are:** Hydrothermal vents are underwater springs formed in tectonically active regions where seawater interacts with magma beneath the ocean floor.
- **Location:**
  - Found near tectonic plate boundaries, ridges, and volcanic arcs. **E.g.** Central and Southwest Indian Ridges.
- **Geographical formation:**
  - **Cold Seawater Penetration:** Water seeps through cracks in the ocean crust near tectonic plate boundaries.
  - **Heating by Magma:** Water gets superheated (up to 370°C) as it comes into contact with magma.
  - **Emergence as Plumes:** Hot water emerges through vents, forming mineral-rich plumes and structures like

chimneys.

- **Significance:**
  - **Mineral Deposits:** Rich in economically beneficial minerals like copper, zinc, cobalt, nickel, gold, and silver.
  - **Ecosystem Insights:** Hosts unique chemosynthetic organisms, providing insights into life in extreme environments.
  - **Economic Potential:** Long activity spans (hundreds to thousands of years) make them valuable for sustained exploration.
  - **Scientific Research:** Offers understanding of deep-sea geological processes and resource potential for strategic missions like India's Deep Ocean Mission.

GS-2

Comparison of Constitution

22. PARDON POWER

Context:

President Joe Biden recently made history by becoming the first US president to pardon his son, sparking debates about the use of clemency powers.

About US President's Pardon Procedure:

- **Constitutional Basis:** Article II, Section 2, Clause 1 of the U.S. Constitution grants the President power to pardon federal offenses, except impeachment.
- **Scope:**
  - Applies to **federal crimes only.**
  - Does not erase the criminal record but relieves penalties and restores specific rights.
- **Discretionary Nature:** The President exercises clemency **independently,** without needing Congressional approval.
- **Conditions:**
  - Acceptance of a pardon implies an admission of guilt **(Burdick vs. U.S., 1915).**
  - Does not shield against civil lawsuits or related investigations.

Comparison of US and Indian Pardon Powers:

Aspect	US	India
Constitutional Basis	Article II, Section 2, Clause 1	Article 72
Scope	Federal crimes only	Union and state offenses, including military and death penalties.
Independence	Fully independent	Based on advice from the Council of Ministers.
Death Sentences	State governors may pardon death sentences for state crimes.	The President can pardon death sentences.
Governors' Role	Can pardon state crimes	Limited to state crimes, excluding death sentences (Article 161).
Process	President exercises authority unilaterally.	President follows ministerial advice under Article 74.

NOTE: Article is important also from mains perspective specially GS2.

Functioning of Parliament and State Legislatures

23. LOK SABHA SEATING ARRANGEMENT

Context:

The seating arrangements for the 18th Lok Sabha have been finalized, reflecting the allocation of seats in the chamber as per parliamentary rules.

About Seating Arrangement in Lok Sabha:

- **What It Is:**
  - The systematic allocation of seats for Members of Parliament (MPs) in the Lok Sabha chamber. It reflects the party's strength and promotes organized conduct of proceedings.
- **Law Governing:**
  - **Rule 4** of the Rules of Procedure and Conduct of Business in Lok Sabha.
  - **Direction 122(1)(a)** under Directions by the **Speaker provides the framework** for seat allocation.
- **Who Does It:**
  - The Speaker **of the Lok Sabha** determines the seating arrangement.
- **Procedure:**
  - Seats are allocated based on the **proportionate strength of parties**.
  - Ruling party members sit on the right side of the Speaker; opposition parties sit on the left.
  - Smaller parties (**fewer than 5 members**) and independents are placed at the Speaker's discretion.
  - The following formula is applied to decide allotment of seats for parties that have a **strength of 5 or more** members in the house.

$$\text{Number of Seats in each Row for a Party/Group} = \frac{\text{Strength of the Party or Group} \times \text{Seats available in that row}}{\text{Total Seats in the Chamber}}$$

  - Parties submit recommendations, and the Speaker finalizes the individual placements.

24. NO-TRUST MOTION

Context:

The Opposition is preparing to move a no-trust motion against Rajya Sabha Chairperson Jagdeep Dhankhar during the Winter Session.

About No-Trust Motion:

- **What is a No-Trust Motion?**
  - A procedural tool to express a lack of confidence in the presiding officer of a House.
  - Aimed at holding leaders accountable and upholding parliamentary integrity.
- **Constitutional Article:**
  - **Article 67(b):** Governs the removal of the Vice-President and Rajya Sabha Chairperson.
  - **Article 90:** Pertains to the removal of the Deputy Chairperson of the Rajya Sabha.
- **Rules and Procedure:**
  - **Notice Requirement:** Must be submitted with at least **14 days' notice**.
  - **Majority Vote:** Requires a majority of votes in the Rajya Sabha to pass.
  - **Concurrence of Lok Sabha:** The motion must also be approved by the Lok Sabha for removal.
- **Criteria:**
  - Alleged violation of parliamentary procedures, fairness, or constitutional principles.
  - Requires strong justification and political consensus for success.
- **History of No-Trust Motions:**
  - **2020**: A no-confidence motion was submitted against Deputy Chairman Harivansh over the contentious farm Bills debate.
  - **Previous Cases**: Precedents of motions against Lok Sabha Speakers include G.V. Mavalankar (1951), Sardar Hukam Singh (1966), and Balram Jakhar (1987).
  - **Unique Aspect**: No motion has ever been successfully moved against a Rajya Sabha Chairperson.

25. JOINT PARLIAMENTARY COMMITTEE (JPC)

Context:

The Constitution (129th) Amendment Bill, proposing simultaneous federal and state elections, has been referred to a Joint Parliamentary Committee (JPC) for wider consultation.

About Joint Parliamentary Committee (JPC):

- **What is it:** A JPC is an ad-hoc and bipartisan committee constituted to examine specific matters such as proposed legislation or policy issues in detail.
- **Law governing formation:** Formed under the Rules of Procedure and Conduct of Business in Lok Sabha.
- **Who forms it:** The Lok Sabha Speaker constitutes the JPC, and members are drawn from both Houses of Parliament.
    - Once formed, the committee **will have 90 days** to submit its report, though this deadline **can be extended** if needed.
- **Members Selection:** Typically, up to 31 MPs (21 from Lok Sabha and 10 from Rajya Sabha) are selected, reflecting proportional party strength.
- **Powers and Function:**
    - The JPC is an ad-hoc Committee.
    - Examines bills, policies, or specific issues referred to it.
    - Consults stakeholders, experts, and officials for comprehensive analysis.
    - Can summon documents, witnesses, and experts for deliberations.
    - The committee's recommendations are **advisory** and **not mandatory** for the government to follow.
- **Reports to:** Submits its detailed findings and recommendations to the Parliament for further discussion and action.

Judiciary

26. SUPREME COURT CASE SCHEDULING

Context:

The Supreme Court is prioritizing special leave petitions (SLPs) to address its backlog, dedicating three workdays to these cases while reserving Mondays and Fridays for fresh matters.

About Scheduling of Cases in the Supreme Court:

- **Who is in Charge?**
    - **Chief Justice of India (CJI):** Acts as the master of the roster, deciding the allocation and scheduling of cases.
    - **Supreme Court Registry:** Administers filing, scrutiny, listing, and scheduling of cases.
- **Law Governing Case Scheduling:**
    - Governed by **Supreme Court Rules, 2013**, outlining procedural aspects like filing, listing, and hearing.
- **Procedure for Case Scheduling:**
    - **Filing Process:** Cases are filed through the court's e-portal or physical counter by Advocates-on-Record (AoR).
    - **Scrutiny:** Cases are verified for defects by the Registry and allotted a diary number.
    - **Listing:** After verification, cases are listed for hearing based on their type:
        - **Miscellaneous Days (Mondays and Fridays):** Fresh matters for issuing notices.
        - **Non-Miscellaneous Days (Tuesdays to Thursdays):** After-notice or regular hearing matters.
    - **Admission:** Cases requiring full hearings are admitted after preliminary consideration.
    - **Hearing and Judgment:** Admitted cases are scheduled for detailed hearings, leading to verdicts.

27. REMOVAL OF JUDGES

Context:

The Opposition parties in the Rajya Sabha are gearing up to submit a motion for the impeachment of Allahabad High Court judge Justice Shekhar Kumar Yadav, following his controversial remarks made at a Vishwa Hindu Parishad (VHP) event.

Procedure for Removal of Judges:

- **Constitutional Provisions: Article 124**: Governs the removal of Supreme Court judges, **Article 218**: Governs the removal of High Court judges.
- **Grounds for Removal**: A judge can be removed on grounds of **'proven misbehaviour or incapacity'**

Judges Inquiry Act, 1968:

- The procedure for removal is elaborated in the Judges Inquiry Act, 1968, which outlines the following steps:
- **Initiation of Motion**:

- A motion for impeachment can originate in either house of Parliament.
- Requires:
  - At least **100 members** from the Lok Sabha to sign a notice to the Speaker.
  - At least **50 members** from the Rajya Sabha to sign a notice to the Chairman.

- **Admission of Motion**:
  - The Speaker or Chairman may consult relevant individuals and materials before deciding whether to admit or reject the motion
- **Investigation Committee Formation**:
  - If admitted, a **three-member committee** is constituted:
    - A Supreme Court judge.
    - The Chief Justice of a High Court.
    - A distinguished jurist.
  - The committee investigates the charges and frames them accordingly
- **Report Submission**:
  - After investigation, the committee submits its report to the Speaker or Chairman.
  - If misbehaviour or incapacity is found, the motion is taken up for consideration in Parliament.
- **Parliamentary Approval**:
  - The motion must be adopted by both houses:
    - Requires a **majority of total membership** and a **two-thirds majority** of those present and voting in each house
    - **Presidential Order**:
      - Once both houses pass the motion, it is sent to the President, who issues an order for removal
- **History:** No Supreme Court judge has been successfully impeached so far; notable attempts include those against Justice V. Ramaswami and Justice Dipak Misra, both of which did not succeed in Parliament

28. ECOURTS MISSION MODE PROJECT

Context:

Minister of Law and Justice has informed that the eCourts Mission Mode Project is under implementation for the Information and Communication Technology (ICT) development of the Indian Judiciary.

About eCourts Project:

- **Origin:** Conceptualized in **2005** by the eCommittee, Supreme Court of India.
- **Launched:** **2007**, under the **Department of Justice**, **Ministry of Law and Justice**.
- **Aim:**
  - To digitize the judiciary for enhanced judicial productivity.
  - To ensure cost-effective, predictable, and reliable access to justice.
  - To automate processes and enable transparency for all stakeholders.
- **Implementing Agency:** High Courts of respective jurisdictions.
- **Phases:**
  - **Phase I (2007-2015):** Basic computerization, internet connectivity, and establishment of Case Information Systems.
  - **Phase II (2015-2023):** ICT enablement, video conferencing facilities, citizen-centric services like e-payment gateways and certified online documents.
  - **Phase III (2023-2027):** Focus on digital and paperless courts, digitization of legacy records, expansion of video conferencing to hospitals and jails.
- **Key Features:**
  - **Citizen-Centric Services:** Online certified copies, e-filing, and e-payment gateways.
  - **Infrastructure Development:** Installation of hardware, LAN, and video conferencing facilities.
  - **National Judicial Data Grid (NJDG):** Provides real-time case statistics.
  - **Capacity Building:** Training for judicial officers and staff in digital tools.
  - **Process Re-engineering:** Improved court procedures for efficiency.
  - **Cloud Computing Architecture**: Ensures cost-effectiveness and seamless data management.

Governance

29. INNER LINE PERMIT SYSTEM

Context:
Recently, the Manipur government launched a review of the ILP system following violations, highlighting the importance of stringent implementation.

About Inner Line Permit (ILP):

- **What it Is:** ILP is a travel document required by Indian citizens from outside certain states to enter and stay for a limited period in protected regions.
- **Origin:** Originated during the colonial era under the **Bengal Eastern Frontier Regulation Act, 1873**, to protect Crown interests.
- **Law governing:** Currently regulated under the **Foreigners (Protected Areas) Order, 1958** for foreign tourists and state-specific ILP guidelines for Indian citizens.
- **States under ILP:** Arunachal Pradesh, Nagaland, Mizoram, and Manipur.
- **Departments involved:** The Home Department and the concerned state government oversee implementation.
- **Issuing authority:** ILP is issued by the respective state authorities.
- **Features:**
    - Mandatory for non-residents to enter designated states.
    - Specifies a limited stay period.
    - Includes different categories, such as labour permits, regular permits, and tourist permits.
    - Aims to preserve local cultural, demographic, and economic interests.

30. PLACES OF WORSHIP (SPECIAL PROVISIONS) ACT, 1991

Context:
The Supreme Court of India has constituted a three-judge Special Bench to hear petitions challenging the constitutional validity of the Places of Worship (Special Provisions) Act, 1991.

About Places of Worship (Special Provisions) Act, 1991:

- **Objective:**
    - Freezes the status of places of worship as they existed on August 15, 1947.
    - Prevents religious conversion of these sites to maintain their original character.
- **Major Provisions:**
    - **Prohibition of Conversion (Section 3):** Disallows conversion of places of worship between denominations or sects.
    - **Maintenance of Religious Character (Section 4):** Ensures preservation of religious identity as of August 15, 1947.
    - **Abatement of Cases (Section 4(2)):** Terminates pending legal proceedings and prohibits new cases related to conversions before the cut-off date.
    - **Exceptions (Section 5):**
        1. Ram Janmabhoomi-Babri Masjid case.
        2. Ancient monuments under the **Ancient Monuments and Archaeological Sites and Remains Act, 1958**.
        3. Disputes settled by mutual agreement before the Act.
- **Penalties (Section 6):**
    - Imposes up to three years of imprisonment and fines for violations.

31. CRIME AND CRIMINAL TRACKING NETWORK AND SYSTEMS (CCTNS)

Context:
The Crime and Criminal Tracking Network and Systems (CCTNS) has achieved full integration by linking all 17,130 police stations across India.

About Crime and Criminal Tracking Network and Systems (CCTNS):

- **Launched in:** 2009 under the Ministry of Home Affairs with a budget of ₹2,000 crore.
- **Aim:** To create a comprehensive and integrated system for enhancing the efficiency and effectiveness of policing across the country through IT-enabled solutions.
- **Nodal agency:** The National Crime Records Bureau (NCRB) is the central nodal agency that would manage CCTNS.
- **Objectives:**
  - Provide **citizen-centric police services** via a web portal.
  - Enable **pan-India search** on a national database of crime and criminal records.
  - Generate crime and criminal reports at **State and Central levels**.
  - **Computerize police processes** for better coordination and accountability.

About National Crime Records Bureau (NCRB):

- **Founded:** 1986.
  - Based on the recommendations of the **Tandon Committee** and National Police Commission (1977).
- **Headquarters:** New Delhi.
- **Ministry:** Ministry of Home Affairs (MHA).
- **Functions:**
  - Acts as a repository of crime and criminal data.
  - Publishes reports like **Crime in India, Accidental Deaths & Suicides in India, and Prison Statistics.**
  - Houses the **Central Finger Print Bureau** for fingerprint data.
  - Supports States with capacity building in IT, CCTNS, digital forensics, and network security.
  - Aids investigators in crime analysis and criminal tracking.

32. S.A.F.E ACCOMMODATION REPORT

Context:

NITI Aayog released its report on Site Adjacent Factory Employee (S.A.F.E.) Accommodation, emphasizing the importance of secure and affordable housing for industrial workers to boost India's manufacturing sector.

- Report highlights the need for **secure, affordable, and flexible housing near industrial sites** to support India's manufacturing growth.

About NITI Aayog:

- **Established in:** 2015, replacing the Planning Commission.
-
- **Aim:** To foster cooperative federalism and catalyze economic development with a bottom-up approach.
- **Headed by:** Prime Minister of India as the Chairperson.
- **Members:**
  - Vice-Chairperson nominated by the Prime Minister.
  - Chief Ministers of all states and UTs.
  - Lieutenant Governors of Union Territories.
  - **Ex-Officio Members:** Up to four members from the Union Council of Ministers are nominated by the PM.
  - **Chief Executive Officer:** Appointed by Prime-minister for a fixed tenure, in rank of Secretary to Government of India.
- **Functions:**
  - Policy formulation and strategic planning.
  - Promoting cooperative federalism.
  - Monitoring and evaluating government programs.
  - Facilitating investments and fostering innovation.
  - Advocating sustainable development and inclusion.

33. TELECOMMUNICATIONS (PROCEDURES AND SAFEGUARDS FOR LAWFUL INTERCEPTION OF MESSAGES) RULES, 2024

Context:

The Indian government notified the Telecommunications (Procedures and Safeguards for Lawful Interception of Messages) Rules, 2024.

About Telecommunications (Procedures and Safeguards for Lawful Interception of Messages) Rules, 2024:

- **Key Features**
  - **Competent Authority:**
    - **Union Home Secretary** and **State Home Secretaries** are designated as the competent authorities to authorize interception.
    - **Joint Secretary-level** officers can authorize interception in "unavoidable circumstances."
  - **Agency Authorization:**
    - Central Government can authorize law enforcement or security agencies for interception under **Section 20(2) of the** Telecommunications Act, **2023**.
  - **Emergency Provisions:**
    - In **"remote areas" or "operational reasons,"** heads or second senior-most officers of authorized agencies can issue interception orders, subject to confirmation within seven working days.
  - **Data Retention and Destruction:**
    - Interception records must be destroyed **every six months** unless required for functional or legal reasons.

New Features:

- **Expanded Grounds:**
  - Interception can now occur in **"remote areas or for operational reasons,"** not limited to "emergent cases."
- **Limits on Officers:**
  - Only **the head and one additional senior-most officer (IGP rank or above)** at the state level can authorize interception.
- **Accountability for non-confirmation:**
  - Interception orders not confirmed **within seven days** cannot be used for any purpose, including as evidence in court.
- **Relaxed Procedure for Agencies:**
  - Greater flexibility for agencies to issue interception orders without immediate approval, subject to **post-facto confirmation.**

34. CONDUCT OF ELECTION RULES, 1961

Context:

The Government of India recently amended **Rule 93(2)(a)** of the Conduct of Election Rules, 1961, restricting public access to certain electronic election records, such as CCTV footage and webcasting recordings.

About Conduct of Election Rules, 1961:

- **Aim:** To ensure free and fair elections by outlining comprehensive procedures for conducting elections to Parliament and State Legislatures.
- **Key features of the rules:**
  - **Framework for Elections:** Details nomination, polling, counting, and declaration of results under various sections and rules.
  - **Public Transparency:** As per **Rule 93(2)(a)** (prior to the amendment), "all papers relating to elections" were open for public inspection.
  - **Voter Secrecy:** Ensures confidentiality of voters' identities and actions during elections.
  - **Election Officers' Duties:** Specifies roles and responsibilities for polling and returning officers.
  - **Resolution of Disputes:** Procedures for addressing disputes and complaints during the election process.
- **Recent amendments:**
  - **Revised Access Clause:**
    - **Old Version:** Allowed public inspection of "all papers relating to elections."
    - **New Version:** Limited access to "all other papers as specified in these rules," excluding electronic records like CCTV footage, webcasting recordings, and video logs.
  - **Reason for Amendment:**
    - Aimed at preventing potential misuse of electronic records, including risks to voter secrecy and manipulation using artificial intelligence (AI).
  - **Retention of Candidate Access:**
    - **Clause Added:** Candidates and their agents retain access to all election records, including electronic materials.

- **Judicial Oversight:** Restricted materials can still be accessed by approaching the courts for specific cases.
- **Scope of the Change:** Addresses ambiguities in **Rule 93** and restricts public inspection of electronic records not explicitly specified, including forms and observer reports.

35. NO-DETENTION POLICY

Context:

The Central Government has recently amended the Right to Education Act, 2009, scrapping the no-detention policy in schools governed by it.

- It includs **Kendriya Vidyalayas**, **Jawahar Navodaya Vidyalayas**, and other institutions under the Ministry of Defence and Tribal Affairs.

About No Detention Policy (NDP):

- **What is the No-Detention Policy?**
  - Introduced under Section 16 of the **Right to Education Act, 2009** to prohibit the detention of students until Class 8.
  - Aimed to **ensure minimum education levels** for all children by promoting automatic promotion.
- **Key Clause in RTE Act, 2009:**
  - **Section 16:** No child shall be detained in any class until the completion of elementary education (Classes 1-8).
  - **Amended in 2019:** Allowed States to hold back students in Classes 5 and 8 based on academic performance.
    - At present, **14 states and UTs** are continuing the no-detention policy.
- **Reasons for Removal:**
  - **Declining Learning Outcomes:** Students reportedly lacked seriousness about studies due to assured promotions.
  - **Accountability:** Schools failed to focus on learning, as emphasized by the HRD Ministry.
  - **States' Feedback:** Many states demanded policy removal to improve quality and accountability in elementary education.
  - **National Alignment:** Linked with the goals of the National Education Policy **(NEP) 2020** for holistic education.

36. PM CARES FUND

Context:

The Prime Minister's Citizen Assistance and Relief in Emergency Situations Fund (PM CARES Fund) received Rs 912 crore in contributions during the financial year 2022-23.

About PM CARES Fund:

- **Established in:** March 27, 2020, registered under the Registration Act, 1908.
- **Under ministry:** Administered directly by the Prime Minister's Office (PMO).
- **Administered by:** Managed by honorary officials including Additional Secretary/Joint Secretary in charge of the PM CARES Fund.
- **Trustees:**
  - **Ex-Officio Trustees:** Prime Minister (Chairman), Minister of Defence, Minister of Home Affairs, and Minister of Finance.
  - **Nominated Trustees:** Justice K.T. Thomas (Retd.), Kariya Munda.
  - **Advisory Board Members:** Rajiv Mehrishi, Sudha Murthy, Anand Shah.
- **Aim:** To address public health emergencies, natural disasters, and calamities by providing financial assistance, creating infrastructure, and funding research for relief efforts.
- **Features:**
  - Entirely funded through **voluntary contributions** from individuals and organizations (domestic and foreign).
  - **Exempt from FCRA** and eligible for 80G benefits under the Income Tax Act, 1961.
  - Qualifies as **CSR expenditure** under the Companies Act, 2013.
  - Focuses on relief activities like healthcare infrastructure, assistance for affected individuals, and upgradation of emergency services.
  - Managed **without direct budgetary support** from the government.

Quick Updates

- **PM e-Vidya -** In a historic move, the Indian government launched Channel 31 under the PM e-Vidya initiative to promote Indian Sign Language (ISL), fostering inclusivity and accessibility.
- **UPI Lite -:** The Reserve Bank of India (RBI) has increased the wallet limit for UPI Lite from ₹2,000 to ₹5,000 and raised the transaction limit for offline payments from ₹500 to ₹1,000.

News in a Line

- **Jalvahak Initiative:** The Indian government has launched the Jalvahak initiative, a cargo promotion scheme incentivizing long-haul cargo movement through India's national waterways, launched by the Ministry of Ports, Shipping & Waterways.

Constitutional and Non-Constitutional Bodies

37. NATIONAL HUMAN RIGHTS COMMISSION

Context:

Justice **V. Ramasubramanian**, former Supreme Court judge, has been appointed as the new Chairperson of the National Human Rights Commission (NHRC) by President.

About National Human Rights Commission (NHRC):

- **Established:**
  - Formed on **12 October 1993** under the **Protection of Human Rights Act, 1993 (PHRA)**.
  - Created in accordance with the Paris Principles, 1991, endorsed by the UN General Assembly in 1993.
- **Statutory:** Statutory body established by the **PHRA Act, 1993**.
- **Aim:**
  - To promote and protect **human rights** as defined under **Section 2(1)(d)** of PHRA, including rights to life, liberty, equality, and dignity guaranteed by the Constitution.
- **Composition:**
  - **Chairperson:** A former Chief Justice of India or a Supreme Court judge.
  - **Members:**
    - One former or sitting Supreme Court judge.
    - One former or sitting Chief Justice of a High Court.
    - Three members, at least one woman, with experience in human rights matters.
  - **Ex-Officio Members:** Chairpersons of various National Commissions (e.g., SC/ST, Women, Minorities, etc.) and the Chief Commissioner for Persons with Disabilities.
- **Functions and Powers:**
  - **Inquiry into Human Rights Violations:** By public servants or negligence thereof.
  - **Recommendations:** On protection, promotion, and effective implementation of human rights.
  - **Review of Laws:** Assess treaties and international instruments for human rights.
  - **Research and Awareness:** Promote research, publications, and awareness of human rights safeguards.
  - **Visit Institutions:** Inspect jails and other places of detention.

38. NATIONAL COMMISSION FOR MINORITY EDUCATIONAL INSTITUTIONS (NCMEI)

Context:

Union Minister addressed the 20th Foundation Day of the National Commission for Minority Educational Institutions (NCMEI), emphasizing the rights of minorities under the Constitution.

National Commission for Minority Educational Institutions (NCMEI):

- **Founded In:** Established in 2004 under the National Commission for Minority Educational Institutions Act, 2004.
- **Ministry:** Operates under the Ministry of Education.
- **Aim:** To safeguard and promote educational rights of religious and linguistic minorities as per Article 30(1) of the Constitution.
- **Powers and Functions:**

- Quasi-judicial body with civil court powers.
- Decides minority status and no objection certificate disputes for educational institutions.
- Enquires complaints on deprivation of minority educational rights.
- Advises and recommends to authorities regarding minority education issues.
- Has appellate and original jurisdiction as per SC rulings.

International Relations

39. UN COMMISSION ON NARCOTIC DRUGS

Context:

India has been elected to **Chair the 68th Session** of the UN Commission on Narcotic Drugs (CND), with Ambassador Shambhu S. Kumaran assuming the Chairmanship.

- This marks the **first time India holds this position**, emphasizing its commitment to global leadership in addressing international drug policy issues.

About UN Commission on Narcotic Drugs (CND):

- **Origin:**
  - Established by the **Economic and Social Council (ECOSOC)** in **1946** through Resolution 9(I).
  - Expanded in **1991** to function as the governing body of the **UN Office on Drugs and Crime (UNODC)**.
- **Headquarters:** Vienna, Austria
- **Aim:**
  - **Monitor and oversee:** Implementation of international drug control treaties.
  - **Promote balanced policies:** Address illicit drug production, trafficking, and substance abuse.
  - **Support evidence-based strategies:** Enhance access to controlled substances for medical and scientific purposes.
- **Membership:** Comprises **53 Member States**, elected by ECOSOC for a four-year term, ensuring equitable geographical representation.
- **Functions:**
  - **Normative Role:** Discharges treaty-based responsibilities and strengthens global drug control mechanisms through decisions and resolutions.
  - **Operational Role:** Oversees UNODC's budget, conducts annual sessions, and facilitates intersessional policy reviews and collaboration.
  - **Policy Commitments:** Leads the 2019 Ministerial Declaration follow-up, with a mid-term review in 2024 and final review in 2029.

40. MANAMA DIALOGUE

Context:

External Affairs Minister attended the 20th Manama Dialogue in Bahrain, highlighting India's diplomatic efforts in addressing challenges across the Middle East, from Gaza to Syria.

About Manama Dialogue:

- **Origin:** Initiated in **2004** in the **Kingdom of Bahrain**.
- **Nations involved:** Includes participants from Middle East, North America, Europe, Asia, and Africa.
- **Organized by:** The **International Institute for Strategic Studies (IISS)** in collaboration with Bahrain's **Ministry of Foreign Affairs**.
- **Aim:**
  - To provide a platform for national leaders, policymakers, and strategic thinkers to address pressing regional security issues.
  - Facilitate policy discussions on geopolitics, security trends, and conflict resolution.
- **2024 Theme:** "Middle East Leadership in Shaping Regional Prosperity and Security"

41. MOST FAVOURED NATION

Context:

Switzerland has recently revoked India's Most Favoured Nation (MFN) clause in Double taxation avoidance agreement status following a Supreme Court ruling in an adverse tax case involving Nestle.

About Most Favoured Nation (MFN):

- **What It Is:**
  - MFN is a principle under the World Trade Organization (WTO) that mandates non-discrimination among member countries in trade policies.
  - Members are treated equally in terms of tariffs, quotas, and trade barriers.
- **Designation Given By:**
  - WTO grants the MFN designation automatically to its 164 members.
- **Features of MFN:**
  - Ensures lowest tariffs, highest import quotas, and minimal trade barriers among member countries.
  - Aims to promote fair trade and equitable market access.
- **Origin:**
  - Established post-World War II as a cornerstone of the multilateral trading system under the WTO framework.
- **Exceptions:**
  - Bilateral or regional trade agreements.
  - Special access for developing nations.
  - Non-WTO countries like Iran or North Korea are not bound by these rules.
- **Removal of MFN:**
  - No formal WTO procedure for suspending MFN status exists.
  - Members are not obligated to notify the WTO when removing MFN treatment.
- **Recent Development:**
  - Effective January 1, 2025, Indian companies face a 10% withholding tax on income in Switzerland.

42. UNITED NATIONS INTERNAL JUSTICE COUNCIL (IJC)

Context:

Former Supreme Court Judge Justice Madan B Lokur has been appointed as the Chairperson of the United Nations Internal Justice Council (IJC) for a four-year term.

About United Nations Internal Justice Council (IJC):

- Created by the **UN General Assembly** as part of the reformed internal justice system to uphold accountability, independence, and professionalism.
- **Functions under:** Operates under the **UN Secretary-General** with oversight from the **General Assembly**.
- **Aim:** To strengthen the **administration of justice** within the UN by ensuring a fair and transparent system for dispute resolution among staff and management.
- **Powers and Functions:**
  - **Search for Judges:** Identifies and interviews candidates for vacancies in the UN Dispute Tribunal (UNDT) and the UN Appeals Tribunal (UNAT).
  - **Recommendations:** Recommends two or three candidates for each vacancy to the General Assembly, ensuring geographical diversity.
  - **Oversight:** Provides inputs on the **implementation of the justice system** to the General Assembly.
  - **Independence:** Monitors the independence and accountability of internal justice mechanisms.
- **Appointment of Chairperson:**
  - **Procedure:**
    - The Chairperson is selected by **consensus** from four other members of the Council.
    - Appointed officially by the UN Secretary-General.
  - **Term:** Four years, with Justice Lokur's current tenure ending on November 12, 2028.
- **Structure:**
  - **Total Members:** Five members, including:
    - **1 Staff Representative**

- **1 Management Representative**
- **2 Distinguished External Jurists** (nominated by staff and management)
- **1 Chairperson** (selected by consensus).

43. AFRICAN UNION STABILIZATION AND SUPPORT MISSION IN SOMALIA (AUSSOM)

Context:

The United Nations Security Council (UNSC) has authorized the African Union Stabilization and Support Mission in Somalia (AUSSOM), effective from January 1, 2025.

About African Union Stabilization and Support Mission in Somalia (AUSSOM):

- **Full form:** African Union Stabilization and Support Mission in Somalia.
- **Established by:** United Nations Security Council (UNSC) in collaboration with the African Union (AU).
- **Aim:** To stabilize Somalia by supporting its security infrastructure, addressing terrorism threats, and fostering sustainable peace and development.
- **Features:**
  - **Transition from Anti-Terrorism Focus:** Replaces the AU anti-terrorism operation with broader stabilization goals.
  - **Scalable Peacekeeping Force:** Ensures a sustainable and effective security presence while considering funding limitations.
  - **Global Collaboration:** Backed by international partners like the EU and the U.S., despite their funding concerns.

About Somalia:

- **Location:** Located in the Horn of Africa, Eastern Africa.
- **Capital:** Mogadishu.
- **Neighbours:** Ethiopia, Djibouti, and Kenya; coastline along the Indian Ocean.
- **Geographic Features:**
  - **Rivers: Jubba and Shabelle** are the major rivers, supporting agriculture.
  - **Mountains:** The **Cal Madow and Karkaar ranges** dominate the northern region.
  - **Plateaus:** Features plateaus and flatlands, including the **Haud Plateau**.
  - **Climate:** Predominantly arid and semi-arid, with drought-prone regions.

44. INDIA-AUSTRALIA ECONOMIC COOPERATION AND TRADE AGREEMENT

Context:

The India-Australia Economic Cooperation and Trade Agreement (Ind-Aus ECTA) has completed two years, marking a significant milestone in bilateral trade relations and fostering mutual growth.

About India-Australia Economic Cooperation and Trade Agreement:

- **Established in:** Signed in 2022.
- **Nations:** India and Australia.
- **Features of the Agreement:**
  - **Trade Preferences:** Provides preferential market access for key goods, including textiles, chemicals, and agriculture products.
  - **Diversification:** Promotes trade in new areas such as gold-studded diamonds and turbojets.
  - **Raw Material Imports:** Facilitates imports of metalliferous ores, cotton, and wood products for industrial support.
  - **MSMEs Focus:** Special emphasis on empowering MSMEs and fostering employment generation.
  - **Bilateral Trade Target:** Aims to reach **USD 100 billion** in trade by 2030.

- **Recent Trends:**
  - **Trade Growth:** Bilateral merchandise trade grew from USD 12.2 billion in 2020-21 to USD 26 billion in 2022-23.
  - **Utilization Rates:** Export utilization at 79% and import utilization at 84% in 2023.
  - **Moderation:** Total trade reached USD 24 billion in 2023-24, with India's exports growing by 14%.

45. H1B VISA

Context:
Weeks before he returns as US President, Donald Trump's supporters are locked in a public row about skilled immigration and H-1B visas.

What is the H-1B Visa?

- **Definition:** A non-immigrant visa allowing U.S. employers to hire skilled foreign workers for specialized occupations.
- **Nation:** United States of America.
- **Aim:** To bridge the skills gap by employing foreign talent in industries like IT, engineering, healthcare, and research.
- **Key Features:**
  - Requires at **least a bachelor's degree** or equivalent.
  - Issued for an initial period of **3 years**, extendable up to 6 years.
  - Allows dual intent, meaning visa holders can apply for permanent residency (Green Card).
  - Annual cap of 65,000 visas, with an additional 20,000 for advanced degree holders from U.S. universities.
- **Conditions:**
  - Employers must demonstrate a lack of available qualified U.S. workers.
  - Minimum salary requirements may apply to prevent wage suppression.
  - H-1B visa holders cannot switch employers without filing a new petition.

GS-3

Indian Economy

46. DESIGN LINKED INCENTIVE (DLI) SCHEME

Context:
India's first indigenously designed 3GPP compliant modem system-on-chip (SoC), developed by WiSig Networks under the government's Design Linked Incentive (DLI) scheme, faces production challenges despite significant funding.

About Design Linked Incentive (DLI) Scheme:

- **Objective:** Supports the growth of domestic companies, startups, and MSMEs in semiconductor design, fostering import substitution and value addition in the electronics sector.
- **Scope:** Provides financial incentives and infrastructure for semiconductor design, including Integrated Circuits (ICs), chipsets, System on Chips (SoCs), IP cores, and other linked designs, over five years.
- **Components:**
  - **Chip Design Infrastructure Support:** C-DAC will establish the India Chip Centre for advanced design tools, IP cores, MPW fabrication, and post-silicon validation.
  - **Product Design Incentive:** Reimbursement of up to 50% of eligible costs, capped at ₹15 crore per application.
  - **Deployment Linked Incentive:** Incentive of 4%-6% on net sales turnover over five years, capped at ₹30 crore per application.
- **Duration:** Initially planned for three years from January 1, 2022, with possible extensions.
- **Nodal Agency:** Centre for Development of Advanced Computing (C-DAC).

47. WINDFALL GAINS TAX

Context: The Government of India recently withdrew the windfall gains tax on domestic crude oil production and exports of diesel, petrol, and aviation turbine fuel (ATF).

About Windfall Gains Tax:

- **Introduced in:** July 2022 amid soaring global oil prices post-Russia's invasion of Ukraine.
- **What it is:** A tax imposed to capture super-normal profits earned by oil producers and fuel exporters during times of high global crude prices.
- **Aim:** To curb export-induced domestic shortages and capture excess profits for government revenue.
- **Products covered:** Domestic crude oil, diesel, petrol, and ATF.
- **GST Status:** Not under GST; levied as Special Additional Excise Duty (SAED) and Additional Excise Duty (AED).
- **Applicable to both domestic and private** oil firms, including multinational corporations operating in India.
- **Impacts on Indian Economy:**
  - **Positive:**
    - Helped generate ₹25,000 crore in FY23, cushioning revenue loss from domestic fuel duty cuts.
    - Ensured steady domestic fuel supply during global energy turmoil.
  - **Negative:**
    - Discouraged private refiners from boosting production.
    - Created an unpredictable tax regime, affecting investor sentiment.

48. DE-DOLLARISATION

Context:

RBI Governor Shaktikanta Das clarified that India is not taking steps toward de-dollarisation despite discussions within BRICS about a common currency to reduce reliance on the U.S. dollar.

About De-dollarisation:

- **What is De-dollarisation?**
  - **Definition:** The process of reducing reliance on the U.S. dollar in international trade and reserves to mitigate risks associated with currency volatility.
  - **Global Context:** Countries like China and Russia have initiated measures such as bilateral trade in local currencies and increasing gold reserves.
- **India's Initiatives:**
  - **Local Currency Trade Agreements:** India has signed agreements with select nations for bilateral trade in local currencies, reducing transaction costs and exchange rate volatility.
  - **Diversification of Forex Reserves:** Increased focus on gold and other currencies in reserves.
  - **Promoting INR Trade:** Steps to internationalize the Indian rupee for global trade settlements.
- **Impact of De-dollarisation:**
  - **On the Global Economy:**
    - **Reduced Dollar Dominance:** Weakens the U.S. dollar's role as a global reserve currency.
    - **Geopolitical Tensions:** May lead to trade blocs and financial realignments.
    - **Alternative Currencies:** Promotes regional currencies or gold as trade and reserve assets.
  - **On India's Economy:**
    - **Trade Diversification:** Enhances resilience against dollar volatility.
    - **Risk Mitigation:** Shields the economy from sudden dollar-driven shocks.

49. MULEHUNTER.AI

Context:

Digital fraud in India's financial sector is rising, with mule accounts aiding cybercrime. To combat this, the RBI has launched MuleHunter.AI, an AI-powered tool developed by its Innovation Hub in Bengaluru.

- **What is MuleHunter.AI?**
  - **Definition**: MuleHunter.AI is an AI-driven solution designed to detect and mitigate mule bank accounts effectively.
  - **Developed by**: Reserve Bank Innovation Hub (RBIH), Bengaluru.
  - **Aim**: To curb the misuse of mule accounts in online financial frauds.
  - **Functions**:
    - Real-time identification of mule accounts.
    - Collaborative framework with banks for advanced fraud detection.
    - Uses AI/ML technologies for enhanced monitoring and fraud prevention.

- **What are Mule Bank Accounts?**
  - **Definition**: Accounts used by fraudsters for illegal activities such as laundering illicit funds.
  - **Operation**: Often acquired from individuals with limited financial knowledge.
  - **Impact**: Innocent account holders, or "money mules," are implicated in fraud investigations, while actual criminals evade detection.
- **Scale of the Problem**
  - **Magnitude**: Over 4.5 lakh mule accounts identified in India, with prominent cases in banks like SBI, PNB, and Canara Bank.

50. BIMA SAKHI YOJANA

Context:

Prime Minister launched the Bima Sakhi Yojana in Panipat, Haryana, on December 9, 2024, reinforcing his vision for women empowerment and financial inclusion.

About Bima Sakhi Yojana:

- **Launched by:** Life Insurance Corporation of India (LIC).
- **Aim:** To empower women economically by training them as LIC agents and promoting financial literacy and insurance awareness.
- **Eligibility criteria:**
  - **Age**: 18-70 years.
  - **Qualification**: Minimum Class X pass.
- **Features:**
  - **Training and Stipend**: Women receive specialized training and a stipend for the first three years.
  - **Employment Opportunity**: Trained Bima Sakhis can serve as LIC agents, with opportunities to advance as Development Officers.
  - **Insurance Coverage**: Promotes insurance awareness and access to affordable insurance products.
  - **Economic Independence**: Offers sustainable livelihood and additional income for women.
- **Significance:**
  - **Financial Inclusion**: Extends banking and insurance services to underserved communities.
  - **Economic Empowerment**: Provides women with an opportunity to earn ₹1.75 lakh annually on average.
  - **Social Impact**: Enhances the role of women in rural and urban economic ecosystems.
  - **National Vision**: Supports India's resolution to become a developed nation by 2047 by leveraging women's participation in economic growth.

51. SOVEREIGN GOLD BOND SCHEME

Context:

The Indian government is considering discontinuing the Sovereign Gold Bond (SGB) Scheme due to high financing costs, despite its role in offering a secure, interest-earning alternative to physical gold.

About Sovereign Gold Bond Scheme:

- **Launched:** November 2015.
- **What It Is:** A government-backed debt security denominated in grams of gold, offering a substitute for holding physical gold.
- **Issuer:** Reserve Bank of India (RBI) on behalf of the Government of India.
- **Eligibility:** Indian residents, including individuals, Hindu Undivided Family (HUFs), trusts, universities, and charitable institutions. Minors can invest through guardians.
- **Minimum and Maximum Investment:**
  - **Minimum:** 1 gram of gold.
  - **Maximum:** 4 kg for individuals and Hindu Undivided Family (HUFs); 20 kg for trusts per fiscal year.
- **Benefits:**
  - Periodic interest of 2.5% per annum.
  - No risks of theft or purity concerns like physical gold.
  - Exemption from capital gains tax on redemption.

- Market value of gold assured at redemption.

- **Risks:**
  - Potential capital loss if market prices of gold fall.
  - Returns tied to market price fluctuations of gold.

52. GST SLABS

Context:

The 55th GST Council Meeting, chaired by Finance Minister, introduced several revisions to the GST slabs for various items and services, impacting everyday commodities and specialized goods.

Revised GST rates on certain items:

Item Name	New GST Slab
Resale of Cars (Old & Used)	18%
Popcorn (Caramelized)	18%
Popcorn (Salted & Pre-Packed)	12%
Electric Vehicles	18% on Used EV Cars & 5% on new EV cars
Ethanol (Supplied to Refineries)	5%
Ready-to-Eat Pre-Packed Snacks	12%
Fortified Rice Kernels (FRK)	5%
Gene Therapy	Exempt
Bank Penalties	Exempt

53. MONETARY AND FISCAL POLICY

Context:

A finance ministry report cited monetary policy, macroprudential measures, and structural factors as possible contributors to the demand slowdown, highlighting differing views with the RBI on growth and inflation.

About Fiscal Policy:

- **Definition:** Fiscal policy refers to the government's use of taxation, spending, and borrowing to influence economic activity.
- **Tools of Fiscal Policy:**
  - **Taxation**: Adjusting tax rates to influence disposable income and spending.
  - **Government Spending**: Expenditure on public goods, infrastructure, and social programs.
  - **Public Borrowing**: Managing deficits through domestic or international borrowing.
  - **Subsidies**: Providing financial assistance to specific sectors to boost demand.
  - **Transfers**: Welfare payments like unemployment benefits and pensions.
- **Impact of Fiscal Policy on Growth and Demand:**

Type	Tools	Impact on Growth	Impact on Demand
Expansionary Fiscal Policy	- Tax cuts	- Boosts infrastructure and employment	- Increases disposable income
	- Increased public spending	- Promotes GDP growth	- Stimulates aggregate demand
	- Subsidies		

Contractionary Fiscal Policy	- Higher taxes - Reduced public spending - Austerity measures	- Controls fiscal deficit - Slows down economic growth	- Reduces disposable income - Lowers aggregate demand to control inflation

About Monetary Policy:

- **Definition:** Monetary policy involves the central bank's regulation of money supply and interest rates to maintain price stability and foster economic growth.
- **Tools of** Monetary Policy**:**
  - **Open Market Operations (OMO)**: Buying or selling government securities to control liquidity.
  - **Cash Reserve Ratio (CRR)**: Adjusting the percentage of deposits banks must hold as reserves.
  - **Repo and Reverse Repo Rates**: Influencing short-term interest rates.
  - **Bank Rate**: Long-term interest rate adjustments to influence credit availability.
  - **Quantitative Easing (QE)**: Injecting money into the economy by purchasing financial assets.
- **Impact of Monetary Policy on Growth and Demand:**

Type	Tools	Impact on Growth	Impact on Demand
Expansionary Monetary Policy	- Lower interest rates	- Encourages borrowing and investment	- Increases consumer spending
	- Reduce CRR	- Stimulates economic activity	- Boosts aggregate demand
	- Quantitative Easing (QE)		
Contractionary Monetary Policy	- Higher interest rates	- Reduces overheating in the economy	- Decreases consumer and business spending
	- Increase CRR	- Slows down GDP growth	- Controls inflation by reducing aggregate demand
	- Open Market Sales		

54. DR. PUSHPAK BHATTACHARYYA COMMITTEE

Context:

The Reserve Bank of India (RBI) has constituted an eight-member committee to develop a framework for the ethical and responsible adoption of Artificial Intelligence (AI) in the financial sector.

About Dr. Pushpak Bhattacharyya Committee:

- **Established by**: Reserve Bank of India (RBI).
- **Total Members:** 8.
  - Chaired by Dr. Pushpak Bhattacharyya, a Professor at IIT Bombay.
- **Aim:** To create a Framework for Responsible and Ethical Enablement of AI (FREE-AI) in the financial sector to guide AI adoption ethically and securely.
- **Need:**
  - **Global and Domestic AI Assessment:** Review AI adoption trends in financial services both globally and in India.
  - **Risk Mitigation:** Identify risks associated with AI in finance and recommend evaluation, mitigation, and monitoring strategies.
  - **Compliance:** Propose compliance requirements for financial entities like banks, NBFCs, fintech firms, and payment system operators.
  - **Governance:** Recommend a governance framework for ethical AI use in the Indian financial sector.

Agriculture

55. ATMANIRBHAR CLEAN PLANT PROGRAMME

Context:

India and ADB have signed a $98 million loan to boost horticulture productivity by providing disease-free planting materials under the Atmanirbhar Clean Plant Programme.

About Atmanirbhar Clean Plant Programme:

- **Origin:** Announced in Budget 2023-24 with an allocation of ₹2,200 crore for seven years until 2030.
- **Ministry:** Ministry of Agriculture and Farmers Welfare.
  - Atmanirbhar Clean Plant Programme is implemented under the **Mission for Integrated Development of Horticulture (MIDH).**
- **Aim:**
  - Increase horticulture yield.
  - Promote climate-resilient and disease-free plant varieties.
  - Enhance productivity and profitability for farmers.
- **Features:**
  - Establishment of 10 world-class **Clean Plant Centres (CPCs)** for fruits like apple, walnut, almond, mango, and pomegranate.
  - The centres will be **fully funded by the Centre**
  - Advanced **diagnostic labs and tissue culture** technologies for disease control.
  - Affordable access to **high-quality planting material**, including a robust certification and traceability system.
  - Active engagement with women farmers and **region-specific technologies**.
- **Implementing Agency:**
  - Anchored by the National Horticulture Board **(NHB)** in partnership with the Indian Council of Agricultural Research (ICAR).
  - Operates in **Public-Private Partnership (PPP)** mode with research organizations, agriculture universities, and private sector partners.

56. GI TAG PRODUCTS

Context:

Ashtalakshmi 2024 showcased the North East region's rich heritage, highlighting its GI-tagged products, which reflect its unique cultural and agricultural traditions.

About GI Products in News:

GI Product Name	State	Speciality
Adi Kekir Ginger	Arunachal Pradesh	Grown in Dibang Valley; medicinal properties aiding digestion and menstrual pain relief.
Wakro Orange	Arunachal Pradesh	High nutritional value; cultivated using traditional farming methods.
Monpa Maize	Arunachal Pradesh	Nutrient-rich crop; showcases traditional agricultural practices.
Dalle Khursani	Sikkim	Fiery red chili; used in pickles, pastes; known for pungency and medicinal benefits.
Naga King Chili	Nagaland	Among the world's hottest chilies; integral to Naga cuisine.
Chak Hao Rice	Nagaland	Aromatic black rice; highlights agricultural diversity.
Naga Cucumber	Nagaland	Nutrient-rich, distinctive cucumber variety.
Kaji Nimu	Assam	Large lemon variety; known for sharp tang, size, and aroma.
Tezpur Litchi	Assam	Juicy litchis; significant to Assamese heritage.
Joha Rice	Assam	Aromatic rice variety; reflects rich Assamese agricultural traditions.

57. APICULTURE

Context:

In Assam, migratory beekeeping is thriving as beekeepers from states like West Bengal and Bihar bring their bee boxes to pollinate mustard fields and produce honey.

What is Apiculture?

- **Definition**: Apiculture, or beekeeping, involves the maintenance of bee colonies in artificial hives for honey, beeswax, and pollination services.
- **Purpose:** It supports sustainable agriculture and the production of honey and related products.

Types of Bees in Apiculture:

1. **Apis mellifera (European Honeybee):** Widely used for commercial honey production due to high yield.
2. **Apis dorsata (Rock Bee):** Known for large honeycombs; found in the wild.
3. **Apis cerana (Asian Honeybee):** Indigenous to South and Southeast Asia; suited for small-scale farming.
4. **Trigona (Stingless Bee):** Produces medicinal honey; used for niche markets.

Impact of Beekeeping on Agriculture:

- **Improved Pollination:** Bees facilitate cross-pollination, boosting crop yields for mustard, mango, coconut, and lychee.
- **Enhanced Crop Quality**: Pollination improves the size, taste, and nutritional value of fruits and vegetables.
- **Biodiversity Conservation**: Bees support wild plant reproduction, maintaining healthy ecosystems.
- **Economic Benefits**: Beekeepers earn through honey production and indirectly increase farmers' income via higher yields.

58. COCONUT OIL

Context:

The Supreme Court of India ruling stated that coconut oil in small bottles is to be taxed as **edible oil** (5% GST) unless explicitly labelled and marketed as **hair oil**, which would attract an 18% GST.

About Coconut Oil Tax Dispute:

- **Case Background**:
  - The dispute centred on whether coconut oil, packaged in quantities from 5 ml to 2 litres, should be taxed as **edible oil** or **hair oil** under GST and the **Central Excise Tariff Act, 1985.**
  - The **Revenue Department** argued for higher taxation (18%) by categorizing it as hair oil.
- **GST Issue**:
  - **Edible oil** is taxed at 5% under GST, while **hair oil** attracts an 18% GST rate.
  - Classification confusion arose for small-sized coconut oil packages with dual-use potential.
- **Supreme Court Judgment**:
  - Coconut oil not explicitly marketed as hair oil is classified under **edible oil** and taxed at 5%.
  - Packaging size (small or large) alone cannot determine classification. Clear labelling is crucial for classification as hair oil.
  - Aligns with Harmonized System of Nomenclature (HSN) for global consistency.
- **Facts:**
  - The coconut palm is a remarkable and versatile crop found in **tropical regions** across the globe.
  - **Kerala state in India** is a leading producer of coconuts, coconut oil and their products.
  - **World ranking in coconut production:** Indonesia > Philippines > India > Brazil.

59. SUGAR PRODUCTION

Context:

Erratic monsoon rainfall and warmer winter temperatures have negatively impacted sugar production in India, resulting in an estimated 12% decrease this season.

Sugar Production in India:

- **India's Global Ranking**: India ranks **second globally in sugar production**, behind Brazil, as of October 2024

Characteristics of Sugarcane in India:

- **Climatic Requirements:** Thrives in tropical and subtropical regions; requires **75-150 cm** rainfall annually and temperatures between **20°C–40°C.**
- **Soil Preference:** Grows best in deep, fertile loam soils with good drainage.
- **Seasonality:** Harvested primarily in **October-March** in tropical states and **February-May** in subtropical regions.
- **Water Demand:** Highly water-intensive crop, often grown with irrigation.
- **Uses:** Apart from sugar production, widely used for ethanol **production** and as fodder.

60. OPERATION GREENS SCHEME

Context:

The government's flagship Operation Greens scheme, designed to stabilise crop prices and benefit farmers, has **spent just 34 per cent of its allocated budget** for 2024-25, according to a parliamentary report.

About Operation Greens:

- **What it is**: A Central Sector Scheme under the Pradhan Mantri Kisan SAMPADA Yojana to stabilize crop prices and ensure farmers' welfare.
- **Ministry**: Ministry of Food Processing Industries (MoFPI).
- **Launched**: November 2018, with an initial outlay of ₹500 crore.
- **Aims**:
    - Enhance farmers' income through targeted interventions.
    - Reduce price volatility in agricultural markets.
    - Minimize post-harvest losses.
    - Create robust farm-to-market linkages.
- **Crops Covered:** Initially covered **Tomato, Onion, and Potato (TOP)**; expanded in 2021 to include **22 perishable crops**, including mango, banana, apple, guava, ginger, and shrimp.
- **Features:**
    - **Long-Term Interventions:**
        - Strengthen production clusters and Farmer Producer Organizations (FPOs).
        - Build farm-gate infrastructure like storage and processing facilities.
        - Enhance food processing and value addition capacities.
    - **Short-Term Interventions:**
        - Provide subsidies (50%) on transportation and storage for eligible crops to protect growers from distress sales.
        - Mitigate post-harvest losses through immediate logistical solutions.
- **Expanded Scope:**
    - Included all fruits and vegetables (TOTAL) under short-term measures during the **Aatmanirbhar Bharat Package** (2020).
    - Integrated value chain development extended to **22 perishable crops** under the **15th Finance Commission Cycle (2021-26)**.

News in a Line
• **Rangeen Machhli App:** The ICAR-Central Institute of Freshwater Aquaculture (ICAR-CIFA) launched the "Rangeen Machhli" app under the Pradhan Mantri Matsya Sampada Yojana (PMMSY) to empower farmers, hobbyists, and professionals in the ornamental fish sector. • **Matsya Seva Kendras:** One-stop solution centres providing extension services to fish farmers and hatcheries. Under the **Pradhan Mantri Matsya Sampada Yojana (**PMMSY**)** in 2020. • **Sagar Mitra:** A field-level interface between government and coastal fishers. To support fishers with data dissemination, market insights, and sustainable fishing practices. • **Anna Chakra:** Union Minister of Consumer Affairs, Food and Public Distribution, launched 'Anna Chakra', a PDS Supply Chain Optimization Tool. The objectives are to enhance PDS logistics efficiency, optimize delivery routes, reduce transportation costs, minimize carbon footprint, and ensure timely delivery of essential commodities. • **SCAN Portal (Subsidy Claim Application for NFSA):** A single-window portal for subsidy claims submission and processing under the National Food Security Act (NFSA). • **Kisan Kavach:** It is India's first-of-its-kind anti-pesticide bodysuit, aimed at safeguarding farmers from the harmful effects of pesticide exposure. A washable and reusable anti-pesticide bodysuit designed by Biotechnology Research and Innovation Council (BRIC-inStem), Bangalore, in collaboration with Sepio Health Pvt. Ltd.

Energy and Infrastructure

61. HYPERLOOP

Context:

India's first hyperloop test track, a collaboration between Indian Railways, IIT-Madras, and TuTr Hyperloop, was inaugurated at IIT-Madras' Discovery Campus in Chennai.

About Hyperloop:

- **What is Hyperloop?**
  - A high-speed transport system where pods travel inside low-pressure vacuum tubes, achieving speeds comparable to aircraft.
  - Operates using **magnetic levitation and propulsion**, eliminating the need for traditional tracks.
- **Developed by**:
  - Concept proposed by Elon Musk in 2013.
  - India's test track is developed by Indian Railways, IIT-Madras' Avishkar Hyperloop team, and TuTr Hyperloop.
- **India's Status in Hyperloop**:
  - India's first 410-meter-long test track launched in Chennai, tested successfully at 100 km/h.
  - Plans underway to achieve speeds of 600 km/h in the next phase.
  - Feasibility studies for Hyperloop projects between Chennai Airport and Parandur, Mumbai-Pune, and Amritsar-Chandigarh.
- **How Hyperloop Works**:
  - Pods travel in vacuum tubes using magnetic levitation and propulsion technology.
  - Minimal air resistance and friction allow ultra-fast travel speeds.
  - Pods can accommodate 40-100 passengers, depending on design specifications.

62. THE RAILWAYS (AMENDMENT) BILL, 2024

Context:

The Railways (Amendment) Bill, 2024 aims to modernize and streamline the legal framework governing Indian Railways by incorporating the provisions of the colonial-era Indian Railway Board Act, 1905 into the Railways Act, 1989.

About The Railways (Amendment) Bill, 2024:

- **Purpose**:
  - Repeals the Indian Railway Board Act, 1905.
  - Incorporates its provisions into the Railways Act, 1989, simplifying the legal framework.

- **Key Features**:
  - Grants **statutory backing** to the Railway Board, ensuring legal authority.
  - Empowers the central government to determine the number of board members, their qualifications, terms, and conditions of service.
  - Establishes an **independent regulator** to oversee tariffs, safety, and private sector participation.
- **Operational Improvements**:
  - Decentralizes decision-making to railway zones for greater autonomy.
  - Aims to fast-track infrastructure and train service approvals, benefiting underserved regions.
- **Historical Context**:
  - The Indian Railways Board Act, 1905, was enacted to separate railways from the Public Works Department.
  - Its incorporation into the 1989 Act aligns with recommendations from committees like the **2014 Sreedharan Committee** and the **2015 Restructuring Railways Committee**.

63. SMILE PROGRAM

Context:

The Government of India and the Asian Development Bank (ADB) signed a $350 million policy-based loan under the SMILE program to enhance India's **logistics ecosystem** and strengthen its manufacturing sector.

About SMILE Program:

- **What It Is:** Strengthening Multimodal and Integrated Logistics Ecosystem (SMILE Program), a policy-based loan program.
- **Ministry:** Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry.
- **Funded By:** Asian Development Bank (ADB).
- **Aim:** Enhance logistics efficiency, expand manufacturing, and improve supply chain resilience.
- **Features:**
  - Strengthens multimodal logistics infrastructure at national, state, and city levels.
  - Standardizes warehousing and logistics assets to attract private investment.
  - Improves efficiencies in external trade logistics.
  - Promotes smart systems for efficient and low-emission logistics.

NOTE: Under Ministry of Social Justice and Empowerment an umbrella scheme **"SMILE - Support for Marginalized Individuals for Livelihood and Enterprise"** exist which focus on empowerment of transgenders.

About Asian Development Bank (ADB):

- **Headquarters:** Mandaluyong, Metro Manila, Philippines.
- **Established In: December 19, 1966.**
- **Members:** 69 countries, including regional (e.g., India, China) and non-regional (e.g., USA, Japan) members.
  - The bank admits the members of the UN Economic and Social Commission for Asia and the Pacific (UNESCAP) and non-regional developed countries.
- **Functions:**
  - Promotes social and economic development in Asia and the Pacific.
  - Provides loans, grants, and technical assistance for development projects.
- **Features:**
  - Weighted voting system based on capital subscriptions.
  - **Major shareholders:** Japan (15.57%), USA (15.57%), India (6.32%), China (6.43%), and Australia (5.77%).

News in a line

- **Linen Inspection and Sorting Assistant (LISA) System - Context:** Indian Railways has launched the AI-powered Linen Inspection and Sorting Assistant (LISA) system to enhance the quality and hygiene of linens provided to passengers in air-conditioned coaches.
- **India's First Fully Solar-Powered Border Village - Masali village** in Gujarat's Banaskantha district has become India's first fully solar-powered border village under the PM Suryaghar Yojana. It is a part of the **Border Development Project** to solarize villages.

64. UNDERWATER CABLE

Context:

India is strengthening its digital connectivity with the launch of two new undersea cables, **India Asia Xpress (IAX)** and **India Europe Xpress (IEX).**

About Underwater Cables:

- **What it is:** Fiber-optic cables laid under the ocean to transmit data at high speeds globally.
- **New Cables:**
  - **IAX:** Connects Chennai and Mumbai with Singapore, Thailand, and Malaysia.
  - **IEX:** Connects Chennai and Mumbai with France, Greece, Saudi Arabia, Egypt, and Djibouti.
- **How they work:**
  - Fiber-optic technology transmits data using laser beams through thin glass fibres.
  - Protected by layers of insulation, plastic, and steel wires.
  - Buried under seabed near shores; laid directly on the ocean floor in deep sea.
- **Features:**
  - **Depth and Placement:** Buried near shores; placed directly on seabed in deep waters.
  - **Data Capacity:** Can carry up to **224 Tbps** in new-generation cables.
  - **Durability:** Protected with multiple layers; routed to avoid fault zones, fishing areas, and anchors.
  - **Speed:** Faster and **more cost-efficient than satellite** communication for large-scale data transfer.
- **Why Underwater Cables over Satellites?**
  - **Higher Capacity:** Cables handle far more data than satellites.
  - **Cost-Effective:** Cheaper on a bit-for-bit basis for large-scale data transfer.
  - **Reliability:** More stable connections compared to satellites, especially for high-volume data.

65. BIO-BITUMEN-BASED NATIONAL HIGHWAY

Context:

Union Minister inaugurated India's first bio-bitumen-based National Highway stretch on NH-44, Nagpur-Mansar Bypass.

About Bio-Bitumen:

- **What is Bio-Bitumen?**
  - **Definition:** A sustainable bio-based binder derived from renewable sources like crop stubble, vegetable oils, algae, or lignin.
  - **Origin:** Primarily extracted from lignocellulosic biomass or refined from residues of crude oil distillation.
- **NH-44 Bio-Bitumen Stretch**
  - **Nagpur-Mansar Bypass** on **National Highway 44** in Maharashtra.
- **Production of Bio-Bitumen**
  - **Primary Source:** Lignin, a by-product of agricultural waste and plant-based materials.
  - **Process:** Biomass is processed to extract lignin, which is converted into bio-bitumen.
- **Characteristics of Bio-Bitumen**
  - **Eco-Friendly:** Reduces greenhouse gas emissions by 70% compared to petroleum-based bitumen.
  - **Strength:** Offers superior durability and load-bearing capacity.
    - Bio-bitumen is 40% stronger than conventional asphalt.
  - **Sustainability:** Promotes the use of agricultural residues, reducing stubble burning.
- **Applications of Bio-Bitumen**
  - **Road Construction:** Direct replacement for petroleum bitumen in asphalt pavements.
  - **Modifier:** Enhances traditional bitumen properties.
  - **Rejuvenator:** Restores aged asphalt's elasticity and functionality.
  - **Industrial Use:** Applicable in waterproofing and adhesive materials.

66. KAMARAJAR PORT

Context:

Tamil Nadu's Kamarajar Port, with a 154% capacity growth, has become a key driver of India's port-led industrialization under the Sagarmala Programme.

About Kamarajar Port:

- **Established:** Declared a major port under the **Indian Ports Act, 1908 in March 1999**; incorporated **as Ennore Port Limited** under the Companies Act in October 1999.
- **Location:** Situated on the Coromandel Coast, about 24 km north of Chennai Port, Tamil Nadu.
- **Features:**
  - It was declared as **12th Major port** of India.
  - **First corporatized major port** in India, registered as a public company.
  - Integral to the National Perspective Plan of the Sagarmala Programme, fostering port-led industrialization.

Science & Technology

67. NANO BUBBLE TECHNOLOGY

Context:

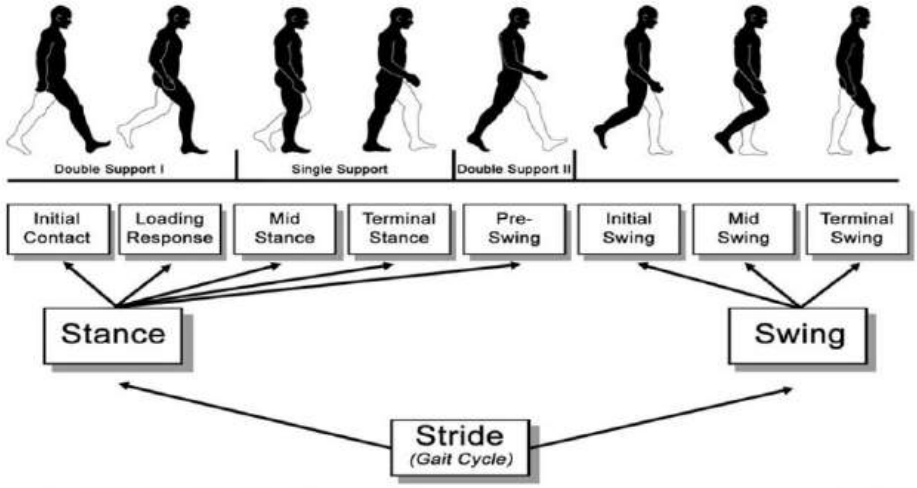
Union Minister of State for Forest, Environment, and Climate Change launched the innovative 'Nano Bubble Technology' at the National Zoological Park, Delhi.

- **What is Nano Bubble Technology?**
  - **Definition:** It uses nanobubbles, which are ultra-tiny bubbles less than 200 nanometres in diameter, to purify water.
  - **Innovative Nature:** Nanobubbles are neutrally buoyant and remain suspended in water for months, enabling efficient gas transfer and surface reactions.
- **Properties of Nanobubbles:**
  - **Size:** 70-120 nanometres, 2500 times smaller than a grain of salt.
  - **Surface Charge:** Strong negative charge prevents coalescing and supports microbiological stimulation.
  - **Neutral Buoyancy:** Ensures prolonged interaction with water for effective cleaning.
  - **Hydrophobic Nature:** Repels water, helping to lift organic and inorganic impurities.
- **How Does it Clean & Purify Water?**
  - **Algae Removal:** Breaks down algae and prevents buildup in stagnant water.
  - Waste Treatment: Efficiently digests biological waste and separates particles like oils and grease.
  - **Gas Transfer:** Facilitates hyper-efficient oxygen transfer, improving water quality.
  - **Surface Cleaning:** Removes organic materials without the use of harmful chemicals.
- **Significance of Nano Bubble Technology:**
  - **Aquatic Health:** Ensures clean water, benefiting aquatic animals and preventing diseases.
  - **Environmental Impact:** Provides a chemical-free, sustainable solution for water purification.
  - **Wider Applications:** Useful in wastewater treatment, fermentation, and improving biological processes in diverse industries.

68. GAIT ANALYSIS

Context:

Kolkata police used walking gait analysis to solve a child rape case. They matched the accused's walking pattern with CCTV footage from the day of the crime.



Perry, J., and Burnfield, J. M. (2010). Gait Analysis: Normal and Pathological Function. New York, NY: Slack Inc

About Gait Analysis:

- **What it is:** Gait analysis evaluates the way the body moves, primarily through walking or running, to detect abnormalities and understand movement dynamics.
- **Types:**
  - **Observational Gait Analysis:** Visual assessment of walking patterns.
  - **Instrumented Gait Analysis:** Advanced methods using sensors, video cameras, and infrared markers.

- **How it works:**
  - Analyses step length, stride length, cadence, and joint angles using advanced tools.
  - Uses devices like infrared markers, sensors, and electrodes to evaluate kinetic and kinematic data.
  - Detects abnormalities in gait phases: **Stance Phase** (60% of cycle) and **Swing Phase** (40% of cycle).
- **Significance:**
  - **Injury Prevention:** Detects asymmetries before they result in injuries.
  - **Diagnosis and Treatment:** Identifies skeletal misalignments, muscle dysfunction, and disease progression.
  - **Sports Performance:** Optimizes athletic performance through personalized training plans.
  - **Criminal Investigations:** Assists in identifying suspects based on unique walking patterns.

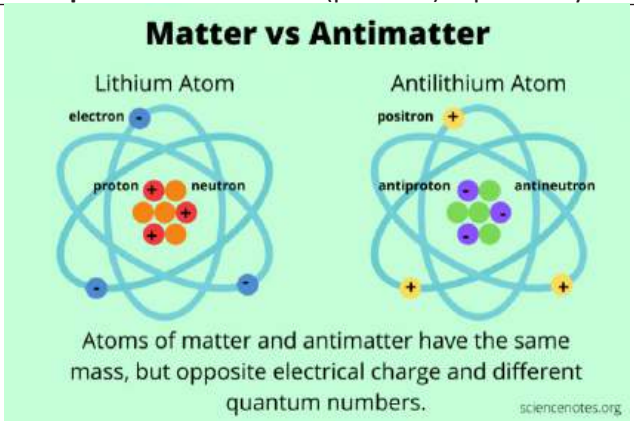
69. ANTIMATTER

Context:

A recent study sheds light on antimatter, the elusive partner of matter, and its role in solving the cosmic mystery of why matter dominates the universe.

About Antimatter:

- **What is Antimatter?**
  - Antimatter consists of antiparticles, each having the same mass but opposite charge as their matter counterparts.
  - **Example:** The antielectron (positron) is positively charged, unlike the negatively charged electron.



- **Discovered by:**
  - **Theorized by**: Paul A.M. Dirac (1928).
  - **Observed by**: Carl Anderson in cosmic rays (1932).
- **Characteristics:**
  - **Charge**: Opposite to that of corresponding matter particles.
  - **Mass**: Identical to matter particles.
  - **Behavior**: Annihilates upon contact with matter, producing energy.
  - **Existence**: Scarce in the observable universe.

- **Origin of Antimatter:**
  - Antimatter was formed during the Big Bang alongside matter.
  - A tiny asymmetry in matter-antimatter populations led to the annihilation of antimatter, leaving matter dominant.

- **Difference Between Matter and Antimatter are:**

Aspect	Matter	Antimatter
Definition	Composed of particles like electrons, protons, and neutrons.	Composed of antiparticles with the same mass but opposite charge to matter particles.
Charge	Particles have positive or negative charges (e.g., proton is positive).	Antiparticles have opposite charges (e.g., antiproton is negative).

Interaction	Interacts normally within the universe.	Annihilates matter on contact, releasing energy.
Abundance	Predominates in the observable universe.	Extremely rare; largely annihilated after the Big Bang.
Examples	Electron (-), Proton (+), Neutron (neutral).	Positron (+), Antiproton (-), Antineutron (neutral).
Formation	Naturally formed during the Big Bang and persists.	Formed during the Big Bang; most annihilated, with a trace remaining.

Significance of Antimatter:

- **Understanding Cosmic Origins:** Helps explain the asymmetry between matter and antimatter in the universe.
- **Energy Source:** Annihilation of matter and antimatter produces immense energy, potentially useful for advanced energy systems.
- **Medical Applications:** Used in positron emission tomography (PET) scans for accurate medical imaging.
- **Testing Fundamental Physics:** Provides insights into quantum mechanics and the Standard Model of particle physics.

70. GENE THERAPY FOR HAEMOPHILIA A

Context:

Researchers has achieved a milestone by conducting a successful gene therapy trial for severe haemophilia A using a lentivirus vector.

Gene Therapy for Haemophilia A:

What is Haemophilia A?

- **Definition**: A hereditary bleeding disorder caused by the deficiency of clotting Factor VIII.
- **Genetic Cause**: It arises due to a defective gene on the X chromosome.
- **Prevalence**: More common in males; females are typically carriers.

Symptoms

1. **Prolonged Bleeding:** Following injury or surgery.
2. **Spontaneous Bleeding:** Internal bleeding in joints and muscles without apparent cause.
3. **Bruising:** Unusual or frequent bruises.
4. **Hemarthrosis:** Bleeding into joints, causing pain and swelling.

What is Replacement Therapy?

- **Definition**: A standard treatment where clotting factors are injected into the veins to replace the deficient Factor VIII.
- **Mechanism**: Derived from human plasma or produced synthetically (recombinant clotting factors).
- **Challenges**:
  - Short lifespan of clotting factors in the body.
  - Antibodies may neutralize the clotting factors, reducing effectiveness.

What is Roctavian?

- **Definition**: The first FDA-approved gene therapy for severe haemophilia A.
- **How It Works**:
  - Uses an **adeno-associated virus (AAV)** vector to deliver a corrected gene encoding Factor VIII.
  - The gene integrates into liver cells to produce clotting Factor VIII.
- **Efficacy**: Reduces annual bleeding rates but requires corticosteroids to suppress immune reactions.
- **Limitations**: Treatment response may wane over time, and pre-existing antibodies to AAV may limit its use.

Lentivirus Vector in Gene Therapy:

- **Advantages**:
  - Rarely triggers pre-existing antibodies.
  - Integrates into host cells, ensuring long-term production of clotting factors.

- **Indian Approach**: Gene transfer into adult stem cells for lifelong efficacy.

71. SPEED GUN

Context:

Traffic police have started using speed guns to crack down on speeding vehicles all over India lately.

About Speed Gun:

- **What is a Speed Gun?**
  - A device to measure the speed of a moving object without physical contact.
  - Widely used in law enforcement, sports, and industrial applications.
- **How it Works:**
  - Utilizes electromagnetic radiation to emit waves towards the moving object.
  - Captures the reflected waves and calculates the speed based on the Doppler effect.
  - Consists of a transmitter, receiver, and processing unit for speed calculation.
- **The Doppler Effect:**
  - **Concept:** Change in the frequency of waves due to the relative motion between the source and the observer.
  - **Application in Speed Guns:**
    - Moving objects alter the frequency of reflected waves.
    - Higher frequency indicates the object is approaching; lower frequency signals it is moving away.
- **Shortcomings of Speed Guns:**
  - **Beam Divergence:** Radio waves spread out, potentially measuring multiple objects simultaneously.
  - **Continuous-Wave Radar Issues:** Prone to interference from multiple vehicles.
  - **Technological Limitations:** Requires advanced compensation systems for accurate targeting, increasing costs.
  - **Replacement by LIDAR:** Laser-based speed guns provide better accuracy and focus, overcoming radio wave divergence limitations.

News in a line
• **Solid Phase Alloying:** A groundbreaking study demonstrates that solid phase alloying can transform metal scrap into high-performance alloys without the need for traditional melting processes. (**Benefits**: Energy Efficiency, sustainability, cost effectiveness). • **GenCast:** Google DeepMind recently unveiled GenCast, a groundbreaking AI-based weather forecasting model. It is a **diffusion-type AI model** designed for probabilistic weather forecasting, predicting weather conditions using machine learning techniques.

Space

72. PROBA – 3 MISSION

Context:

The Proba-3 mission, a joint venture between ESA and ISRO, marks a milestone in space technology. It was launched from Sriharikota, India.

About Proba-3 Mission:

- **Agency Involved:**
  - Led by the European Space Agency (ESA).
  - Launch facilitated by ISRO under its commercial arm, NewSpace India Ltd (NSIL).
- **Full Form:**
  - **Proba-3**: "Project for Onboard Autonomy."

- **Aim:**
  - To demonstrate high-precision formation flying in space.
  - To study the Sun's corona and its influence on space weather.
- **Features:**
  - **Two Spacecraft:** Coronagraph and Occulter designed for tandem operation.
  - **Formation Flying:** Precision down to the millimeter to create artificial solar eclipses.
  - **Scientific Goals:** Advanced study of the solar corona and its impact on Earth.
  - **Solar Eclipses on Demand:** Allowing extended observation periods for solar phenomena.
- **India's Role:**
  - Providing the PSLV-XL **launch vehicle**, renowned for reliability and payload capacity.
  - Managing satellite deployment and mission execution.
  - Enhancing expertise in solar science following ISRO's Aditya-L1 mission.

73. ARTIFICIAL SOLAR ECLIPSE

Proba-3 is set to create artificial solar eclipses for extended Sun corona studies using precise formation flying.

What is an Artificial Solar Eclipse?

- **Definition:** An artificial solar eclipse mimics the natural phenomenon where the moon blocks sunlight, allowing detailed observation of the Sun's corona.
- **Created By:** Two satellites align to block the Sun's light, creating a controlled shadow for scientific study.
- **Purpose:** To observe the Sun's corona and study phenomena such as why it is hotter than the Sun's surface.

How Artificial Solar Eclipse Works

- **Satellite Pair:** Two satellites — the Coronagraph Spacecraft (CSC) and the Occulter (OSC) — maintain precise alignment to simulate an eclipse.
- **Shadow Creation:** The Occulter spacecraft casts a shadow onto the Coronagraph spacecraft, mimicking the moon's role in a natural eclipse.
- **Precision:** Millimetres-level accuracy ensures a consistent eclipse for up to six hours per orbit.

Significance of Artificial Solar Eclipse

- **Extended Observations**: Enables studying the Sun's corona for hours, unlike natural eclipses, which last only minutes.
- **Space Weather Predictions**: Helps predict geomagnetic storms and mitigate disruptions to satellites and Earth-based systems.
- **Scientific Insight**: Unveils the mysteries of the corona, including its temperature anomaly and solar flares.

What is Precise Formation Flying (PFF) Technology?

- **Definition**: A technology that enables satellites to maintain an exact position and orientation relative to each other in orbit.
- **Mechanism**: Uses GPS, inter-satellite radio links, and automated control systems for alignment.
- **Implementation in Proba-3**: The satellites stay 150 meters apart, maintaining millimetre-level precision to simulate an eclipse.
- **Benefits**: Enhances mission accuracy and provides a platform for advanced observational techniques.

74. HUMAN RATED LAUNCH VEHICLE MARK-3 (HLVM-3)

Context:

ISRO has initiated the assembly of the Human Rated Launch Vehicle Mark-3 (HLVM-3) for Gaganyaan's first uncrewed flight.

About Human Rated Launch Vehicle Mark-3 (HLVM-3):

- **What it is:** HLVM-3 is a human-rated version of ISRO's LVM3 designed for India's Gaganyaan mission to carry humans to space.
- **Aim:** To enable safe human spaceflight by incorporating advanced reliability and safety features.
- **Features:**
  - **Three-Stage Design:** Combines solid, liquid, and cryogenic stages.

- **Payload Capacity:** Carries 10 tonnes to Low Earth Orbit (LEO).
- **Height and Weight:** 53 meters tall, weighing 640 tonnes.
- **Crew Escape System (CES):** Operational until atmospheric flight separation, ensuring astronaut safety.

- **How It Differs from Other ISRO Launch Vehicles:**
  - **Human-Rated:** Enhanced reliability and redundant systems tailored for human safety.
  - **Crew Escape System:** Specific to manned missions, absent in other vehicles.
  - **Payload and Design:** Optimized for carrying the crew module with life-support systems, unlike PSLV or GSLV.
  - **Precursor for BAS**: Provides data and technology critical for Bharatiya Antariksh Station development.

75. IRIS² SPACE PROGRAMME

Context:
The EU has launched an ambitious IRIS² space programme with a constellation of 290 satellites to rival Elon Musk's Starlink.

About IRIS²:
- **Nations involved:** European Union member states through the European Space Agency (ESA).
- **Launched in:** Announced and initiated in 2024.
- **Aim:**
  - To provide secure, resilient, and uninterrupted connectivity for governmental and commercial purposes.
  - To strengthen European autonomy and competitiveness in space technology.
- **Significance:**
  - **Strategic Asset:** Bolsters EU sovereignty in space technology.
  - **Supports Security:** Provides resilience against cyber and communication disruptions.
  - **Commercial Boost:** Delivers high-end connectivity services to businesses.
  - **Complementary Programme:** Adds to existing EU initiatives like Copernicus (Earth observation) and Galileo (satellite navigation).

76. QUANTUM SATELLITE

Context:
India plans to launch its first quantum satellite within the next 2-3 years under the National Quantum Mission (NQM).

About Quantum Satellite:
- **What it is:**
  - A **quantum satellite** is a communication satellite that uses quantum physics principles, such as quantum entanglement and superposition, to enable highly secure data transmission.
- **Science behind its working:**
  - **Quantum Cryptography**: Utilizes quantum principles like entanglement and quantum measurement to secure data.
  - **Quantum Key Distribution (QKD)**: Ensures encryption keys are shared securely between parties. Any eavesdropping alters the quantum state, alerting users.
  - **Photon Transmission**: Encodes information in photons, which are transmitted through free space or fibre-optic cables.
- **Features:**
  - **Quantum Key Distribution (QKD):** Facilitates secure encryption key exchanges.
  - **Quantum Entanglement:** Ensures instantaneous detection of tampering.
  - **High-Speed Communication:** Enhanced data security without sacrificing speed.
  - **Global Reach:** Enables long-distance secure communication through satellite-ground systems.
- **Advantages:**
  - **Enhanced Security:** Virtually immune to hacking due to quantum measurement principles.
  - **Future-Proof Encryption:** Counters threats posed by quantum computers to classical cryptographic systems.
  - **Strategic Applications:** Useful in defence, banking, and secure government communications.
  - **Technological Leadership:** Positions India as a global leader in quantum technologies.
- **Limitations:**
  - **High Costs:** Development, deployment, and maintenance are resource-intensive.

- **Distance Challenges**: Signal loss over long distances due to atmospheric and technical constraints.
- **Denial-of-Service Risks**: Eavesdroppers can disrupt transmissions without stealing data.
- **Hardware Limitations**: Difficult to upgrade or patch quantum hardware.

77. STARLINK SATELLITE

Context:

The recovery of a Starlink satellite device in Manipur has raised concerns about potential misuse by militants, despite Starlink not being authorized to operate in India.

About Starlink Satellite System:

- **What is Starlink?**
  - **Designed by:** SpaceX (owned by Elon Musk).
  - **Purpose:** To provide high-speed, low-latency internet globally, especially in remote and underserved areas.
- **How Starlink Works:**
  - **Satellite Constellation:** Operates using thousands of satellites in **low Earth orbit (LEO)** (~550 km above Earth).
  - **Data Transmission:**
    - Satellites communicate with ground stations and user terminals.
    - Use laser links to transmit data efficiently between satellites.
  - **User Equipment:** Includes a small antenna and router that users install to access the service.
- **Key Features:**
  - **High-Speed Internet:** Speeds often exceed 100 Mbps, suitable for streaming, video calls, and browsing.
  - **Low Latency:** 20-70 milliseconds.
  - **Global Coverage:** Particularly effective in remote regions and areas with poor traditional internet infrastructure.
  - **Resilient Connectivity:** Maintains service during disasters or in areas with restricted internet access.

78. SPADEX MISSION

Context:

India's SpaDeX mission, intended to develop and demonstrate technology required to dock and undock spacecraft in space, will be launched using PSLV-C60 on December 30.

About SpaDeX Mission:

- **What it is:** SpaDeX (Space Docking Experiment) is a cost-effective technology demonstrator by ISRO for in-space docking of two small spacecraft.
- **Launch vehicle:** PSLV-C60 will carry two spacecraft (**Chaser: SDX01** and **Target: SDX02**) into **low Earth orbit** (470 km).
- **Objectives:**
  - **Primary:**
    - Demonstrate **rendezvous, docking, and undocking** of two spacecraft.
  - **Secondary:**
    - **Transfer electric power** between docked spacecraft for future robotic applications.
    - Composite **spacecraft control and post-docking** payload operations.
- **New Technologies:**
  - **Docking Mechanism:** Low-impact androgynous docking system with two motors.
  - **Sensor Suite:** Advanced sensors like Laser Range Finder (LRF), Proximity and Docking Sensor (PDS), and video monitors for precise docking.
  - **RODP Processor:** GNSS-based system for accurate inter-satellite position and velocity determination.
  - **ISL Communication:** Autonomous inter-satellite link for communication and real-time state sharing.
- **Significance of Mission:**
  - **Technological Milestone:** Positions India as the fourth country to develop space docking technology.
  - **Space Exploration:** Paves the way for Chandrayaan-4, space stations, and sample return missions.
  - **Cost-Effective Innovation:** Develops indigenous, scalable solutions for complex space operations.
  - **Global Collaboration:** Adopts standards similar to the International Docking System, fostering future international cooperation.

79. KAVERI ENGINE

Context:

The Kaveri engine, an indigenous gas turbine engine developed by the Gas Turbine Research Establishment (GTRE) under DRDO, has been cleared for inflight testing.

About Kaveri Engine:

- **Developed by:** Gas Turbine Research Establishment (GTRE), under DRDO.
- **History:**
  - Initiated in **1986** for powering the **Light Combat Aircraft (**LCA) Tejas.
  - Experienced **setbacks and was decertified for the LCA** program but repurposed for UAVs.
  - Revival efforts in **2016 with SAFRAN** partnership for technical assistance.
- **Features:**
  - Current version produces **49-51 kN thrust**, suitable for UAVs like **Ghatak UCAV.**
  - Future plans include integrating an afterburner to **achieve 73-75 kN thrust** for advanced applications.
  - Tested extensively in **high-altitude simulations (Russia)** and ground trials (India).

Health & Diseases

80. NOTIFIABLE DISEASES

Context:

The Government of India has urged States and Union Territories to classify snakebite cases and deaths as "notifiable diseases" to enhance surveillance and improve public health interventions.

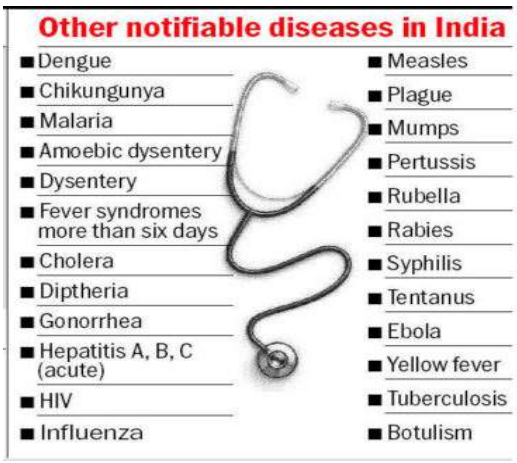
- This move aligns with the **National Action Plan for Prevention and Control of Snakebite Envenoming (NAPSE),** which aims to reduce snakebite-related deaths and disabilities by **50% by 2030.**

About Snake Bites:

- **Epidemiology:** India records the highest number of snakebite incidents globally, with over 58,000 deaths annually (WHO estimate).
- **High-Risk Areas:** Rural regions with agricultural activity and forested areas report the majority of cases.

About Notifiable Diseases in India:

- **Definition:** Diseases legally required to be reported to government authorities for effective monitoring and response.
- **E.g.** Cholera, tuberculosis, AIDS, dengue.
- **Power to Declare Notifiable Disease:**
  - Lies with the **State Government** under public health legislation.
  - The Centre can recommend diseases for notification.
- **Impacts of Declaring Notifiable Disease:**
  - **Improved Surveillance:** Ensures accurate tracking of cases and deaths.
  - **Early Outbreak Warning**: Helps prevent large-scale epidemics.
  - **Targeted Interventions:** Enables better allocation of healthcare resources.
  - **Global Collaboration:** Aligns with WHO's International Health Regulations for global disease monitoring.

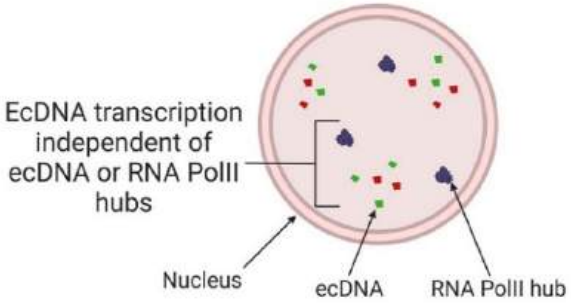


- **Features:**
  - **Mandatory Reporting:** Doctors and healthcare facilities must report cases.
  - **Legal Implications:** Non-compliance can lead to penalties under state laws.
  - **Burden Analysis:** Provides comprehensive data on disease prevalence.
  - **Disease Control:** Facilitates public health planning and preventive measures.

81. EXTRACHROMOSOMAL DNA (ECDNA)

Context:

Extrachromosomal DNA (ecDNA) has emerged as a groundbreaking area in cancer biology, challenging foundational genetic principles and offering new insights into cancer progression and drug resistance.



About Extrachromosomal DNA (ecDNA):

- **What is ecDNA?**
  - **Definition:** ecDNA is a circular fragment of genetic material that breaks away from chromosomes and floats freely in the cell nucleus.
  - **Formation:** Created by DNA damage, chromosomal rearrangements, or errors during cell replication.
- **Where is ecDNA Found?**
  - Commonly present in **cancer cells**.
  - Detected in **17% of tumor samples**, with higher prevalence in liposarcomas, brain tumors, and breast cancers.
- **Key Features of ecDNA**
  - **Carries Oncogenes:** Contains multiple copies of cancer-causing genes.
  - **Dynamic Interactions:** Moves freely in the nucleus, forming concentrated hubs that amplify oncogene expression.
  - **Violates Mendel's Third Law:** ecDNA clusters are inherited together, preserving advantageous genetic combinations.

Additional info: Mendel's law of independent assortment states that the alleles of two (or more) different genes get sorted into gametes independently of one another. In other words, the allele a gamete receives for one gene does not influence the allele received for another gene.

- **Significance of the Study**
  - **Challenges Genetic Dogma:** Overturns the assumption that non-linked genes inherit independently.
  - **Accelerates Cancer Progression:** Enhances tumor evolution and drug resistance by increasing oncogene activity.
  - **New Drug Development:** Researchers identified **BBI-2779**, a CHK1-inhibiting drug, that selectively targets ecDNA-driven cancer cells, paving the way for novel treatments.

82. HIGH RISK FOODS

Context:

The Food Safety and Standards Authority of India (FSSAI) has recently categorized packaged **drinking water and mineral water** as "high-risk foods," intensifying regulatory measures to ensure safety and quality.

- This decision follows the **removal of mandatory** BIS certification, focusing instead on regular inspections and audits under the FSSAI's purview.

About High-Risk Food Classification:

- **What it is:** High-risk foods are those requiring stringent safety protocols due to their potential to impact public health if mishandled.
- **Authority:** Governed by the **Food Safety and Standards Authority of India (FSSAI)**.
- **Law Governing:** Regulated under the **Food Safety and Standards Act, 2006**.
- **Why Classification:**
  - To ensure enhanced consumer safety through rigorous testing and monitoring.
  - To replace the dual certification process, streamlining regulatory requirements.

- **Other Products Under High-Risk Category:**
  - Dairy products and analogues.
  - Meat, poultry, fish, and seafood.
  - Eggs and egg products.
  - Prepared and fortified foods (e.g., fortified rice kernels).
  - Specialised food products for nutritional uses.
- **Significance of Classification:**
  - Promotes higher safety standards via mandatory inspections and audits.
  - Simplifies industry compliance by eliminating redundancy, such as BIS certification.
  - Increases consumer trust in food safety measures.

83. NAFITHROMYCIN

Context:

India has achieved a groundbreaking milestone in the fight against antimicrobial resistance (AMR) with the development of Nafithromycin, the country's first indigenous macrolide antibiotic.

About Nafithromycin:

- **Developed by:** Wockhardt Ltd., with support from the **Biotechnology Industry Research Assistance Council (BIRAC)** under the Biotech Industry Program.
- **Aim:**
  - To combat **Community-Acquired Bacterial Pneumonia (CABP)** and address infections caused by **drug-resistant bacteria**.
  - Reduce the global and national burden of **antimicrobial resistance**.
- **Effectiveness:**
  - **10 times more effective** than existing treatments like azithromycin.
  - Offers a **three-day treatment regimen**, significantly reducing recovery time.
  - Effective against **typical and atypical drug-resistant bacteria**, with superior safety and minimal side effects.
- **Significance:**
  - **First in its Class:** Marks the first global introduction of a new macrolide antibiotic in over 30 years.
  - **Addresses AMR:** A critical tool in tackling **AMR-related infections** affecting vulnerable groups such as children and the elderly.

84. MALARIA

Context:

The World Malaria Report 2024 by WHO highlights India's significant progress in reducing malaria cases but underscores the country's continued burden in Southeast Asia.

About Malaria:

- **What is Malaria?**
  - A life-threatening disease caused by *Plasmodium* parasites, primarily *P. falciparum* and *P. vivax*, transmitted through infected female *Anopheles* mosquito bites.
- **How it Spreads**: Non-contagious; transmitted via mosquito bites.
- **Vectors**: Female *Anopheles* mosquitoes.
- **Symptoms**:
  - Begin 10–15 days after a mosquito bite.
  - Common symptoms: fever, chills, and headache; can be mild in partially immune individuals.
- **Prevention and Cure**:
  - **Prevention**:
    - Vector control (e.g., insecticide-treated bed nets, indoor residual spraying).
  - **Treatment**:
    - Preventable and curable with early diagnosis and prompt treatment to reduce disease transmission and fatalities.

India's Present Status on Malaria:

- **Reduction in Cases**:
  - From 22.8 million (2000) to 4 million (2023) — an 82.4% decrease.
- **Decrease in Deaths**:
  - From 35,000 (2000) to 6,000 (2023) — an 82.9% reduction.
- **Case Incidence**: 93% reduction since 2000.

85. AFRICAN SWINE FEVER

Context:

An outbreak of African Swine Fever (ASF), a highly contagious disease affecting pigs, has been reported in **Kerala's Kottayam** district. Authorities have initiated culling measures and declared infected zones to contain the disease's spread.

About African Swine Fever (ASF):

- **Origin:**
  - ASF is endemic to sub-Saharan Africa but has spread globally to regions like Asia and Europe.
- **Vector:**
  - Transmitted through direct contact with infected animals, contaminated clothing, vehicles, or bites by infectious soft ticks.
- **Mode of Spread:**
  - Direct contact with infected pigs or pork products.
  - Indirect contact via contaminated surfaces and equipment.
- **Disease Found In:**
  - Affects domestic and wild pigs exclusively.
- **Zoonotic or Not:**
  - ASF is not zoonotic; it poses no risk to human health.
- **Symptoms:**
  - Fever, loss of appetite, inflamed eye membranes, red skin, diarrhoea, and vomiting.
- **Cure:**
  - No vaccine or cure is available. Culling infected pigs is the only effective containment measure.

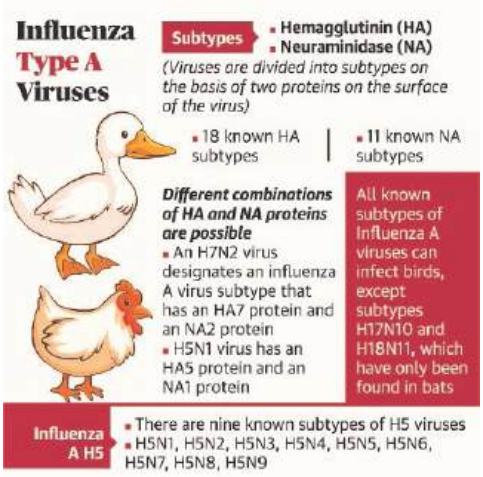
86. H5N1 AVIAN FLU

Context:

California has declared a state of emergency due to the widespread outbreak of the H5N1 avian flu, significantly impacting its dairy industry and resulting in human infections.

About H5N1 Bird Flu:

- **What it is:** A highly pathogenic strain of avian influenza caused by the influenza A(H5N1) virus, affecting birds and occasionally humans.



- **Types:** Includes subtypes like **A(H5N1) and A(H7N9),** based on proteins on the virus surface.
- **Symptoms:**

- Mild: Pink eye, cough, sore throat, fatigue.
- Severe Fever, shortness of breath, nausea, diarrhea, and respiratory complications.

- **Spread:** Humans contract it through contact with infected animal fluids (saliva, feces, milk). Rarely spreads human-to-human.
- **Zoonotic nature:** It is zoonotic in nature can jump from animals to humans but is not easily transmissible between humans.
- **Treatment:**
  - Antiviral medications like **oseltamivir (Tamiflu).**
  - Supportive care for respiratory symptoms.
  - Preventive measures include avoiding contact with infected animals and proper cooking of poultry products.

87. GLP-1 RECEPTOR AGONISTS

Context:

The WHO has endorsed GLP-1 receptor agonists, a new class of drugs for managing obesity, marking a shift in global health strategies to combat the growing obesity epidemic.

About GLP-1 Receptor Agonists:

- **What it is:** A class of medicines that mimic the Glucagon-Like Peptide-1 (GLP-1) hormone, which regulates appetite and blood sugar levels.
- **Uses:**
  - Effective in treating obesity by reducing appetite and promoting weight loss.
  - Initially developed for **type 2 diabetes** management.
  - Drugs like **semaglutide (Ozempic, Wegovy) and tirzepatide** have shown up to 25% body weight reduction in trials.
- **Significance:**
  - Addresses a global obesity pandemic, affecting **nearly 1 in 8 people worldwide**.
  - Reduces risk factors associated with non-communicable diseases like cardiovascular diseases and diabetes.
  - Holds transformative potential for both individual health outcomes and global healthcare costs, estimated to reach **$3 trillion by 2030.**

88. NEVER EVENTS

Context:

"Never events" are serious and largely preventable healthcare incidents that should not occur if proper safety protocols are followed.

About Never Events:

- **What it is:** Serious, preventable incidents in healthcare that result in severe consequences, such as wrong-site surgeries or medication errors.
- **Coined in:** Introduced in 2002 by the National Quality Forum (NQF), USA, and adopted in other nations like the U.K. and Canada.
- **Significance:**
  - Enhances focus on implementing stringent safety protocols.
  - Promotes accountability in healthcare systems.
  - Reduces patient harm and medical negligence cases.

89. METABOLIC DYSFUNCTION-ASSOCIATED STEATOTIC LIVER DISEASE

Context:

Exercise is a cornerstone in managing metabolic dysfunction-associated steatotic liver disease (MASLD), according to a study led by an Indian-origin researcher.

- Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD), previously known as Non-Alcoholic Fatty Liver

Disease (NAFLD), is a chronic liver condition linked to fat accumulation in the liver.

About Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD):

- **What it is:** MASLD is a liver disease caused by excessive fat build-up in the liver, often linked to metabolic dysfunction. It can progress to inflammation (MASH) and severe complications like liver fibrosis or cirrhosis.
- **Causes:**
  - Obesity (BMI ≥ 30).
  - Insulin resistance leading to poor blood sugar management.
  - Type 2 diabetes.
  - Dyslipidemia (high cholesterol and lipids).
- **Symptoms:**
  - Fatigue and weakness.
  - Right upper abdominal ache.
  - Swollen belly and yellowing skin (in advanced cases).
  - Severe cases may lead to cirrhosis or liver cancer.
- **Diseases Associated:**
  - MASH (inflammation with scarring).
  - Hepatocellular carcinoma (liver cancer).
  - Increased risks of cardiovascular diseases, breast cancer, and colon cancer.
  - Type 2 diabetes in non-diabetic individuals.
- **Treatment:**
  - **Lifestyle Changes:** Weight loss and regular exercise to reduce liver fat and improve insulin sensitivity.
  - **Dietary Adjustments:** Avoiding high-fat, high-sugar foods.
  - **Pharmacotherapy:** For managing metabolic risk factors like diabetes and cholesterol.
  - **Exercise Protocols:** Tailored regimens can benefit all patients, including those with advanced liver disease like cirrhosis.

90. NOROVIRUS

Context:

Norovirus, often referred to as the **"winter vomiting bug,"** has seen a significant rise in outbreaks across the USA.

About Norovirus:

- **Definition:** Norovirus is a highly contagious virus causing gastroenteritis, inflammation of the stomach and intestines.
- **Common Name:** Also known as the "stomach flu" or "winter vomiting bug."
- **Primary Vector:** Spreads through stool or vomit of infected individuals.
- **Transmission Modes:**
  - Consuming contaminated food or water.
  - Touching contaminated surfaces and then touching the mouth.
  - Close contact with infected individuals.
- **High-Risk Locations:** Crowded environments such as schools, healthcare facilities, cruise ships, and restaurants.
- **Symptoms of Norovirus:**
  - Vomiting and diarrhoea.
  - Nausea and stomach cramping.
  - Additional symptoms: body aches, headaches, fever, reduced urination, and dehydration.

Environment & Ecology

91. GREEN STEEL

Context:

The steel industry contributes 8% of global CO_2 emissions. Decarbonization efforts have spurred innovations in green steel using renewable energy and sustainable practices.

About Green Steel:

- **What It Is:**
  - Green steel refers to steel produced using renewable energy and sustainable processes, minimizing carbon emissions.

- **Various Methods in Prodcution:**
  - **Electric Arc Furnaces (EAF):** Use renewable electricity to melt scrap metal, significantly reducing CO2 emissions.
  - **Green Hydrogen-Based Reduction:** Replaces coal with hydrogen derived from renewable sources to process iron ore.
  - **Direct Electrolysis:** A method similar to aluminium production, using renewable electricity to extract iron from ore (e.g., Boston Metal's innovation).
  - **Dismantled ships scrap:** Green steel is also made using **ferrous scrap mix** in the raw material chain to ensure a proportionate reduction in carbon dioxide emissions.
- **Significance:**
  - **Environmental Benefits:** Reduces dependence on fossil fuels, cutting up to 75% of CO2 emissions in some methods.
  - **Circular Economy:** Promotes recycling of ferrous scrap from end-of-life products like ships and vehicles.
  - **Economic Potential:** Creates demand for renewable energy and green hydrogen, driving innovation and job creation in decarbonization technologies.
  - **Global Climate Goals:** Aligns with initiatives like SteelZero, aiming for zero-emission steel by 2050.

Hong Kong Convention:

- **What It Is:** The Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships was adopted in June 2009 to regulate ship dismantling practices globally.
- **Aim:** Ensure safe, environmentally sound ship recycling and protect worker health.
- **Timeline:** Takes effect globally in June 2025 after ratification.
- **India's Status:** Ratified by India; 50% of Alang yards are compliant.
- **Limitations:** Allows the "beaching" method and focuses on safety standards, not eliminating harmful practices.

92. ARAVALLI GREEN WALL PROJECT

Context:

At United Nations Convention to Combat Desertification (UNCCD) COP16 in Riyadh, India will showcase its innovative Aravalli Green Wall Project (AGWP), a comprehensive initiative to combat land degradation and desertification.

About Aravalli Green Wall Project:

- **Origin:**
  - Inspired by Africa's Great Green Wall initiative, which spans from Senegal to Djibouti.
  - Conceptualized to combat desertification spreading from the Thar Desert to northern India.

- **States Covered:** Haryana, Rajasthan, Gujarat, and Delhi.
- **Aim:**
  - Restoration of 1.15 million hectares of degraded land by 2027.
  - Mitigation of soil degradation, erosion, and drought impacts.
  - Rejuvenation of 75 water bodies in the initial phase.
- **Features:**
  - Creation of a **1,400 km long and 5 km wide green belt** along the Aravalli Range.
  - Integration of **indigenous afforestation, biodiversity conservation**, and advanced **water management**.

- Use of **GIS tools** and **Nature-Based Solutions** to stabilize ecosystems.
- Community engagement for sustainable restoration and green employment opportunities.

93. INTERNATIONAL CENTRE FOR INTEGRATED MOUNTAIN DEVELOPMENT (ICIMOD)

Context:

The International Centre for Integrated Mountain Development (ICIMOD) has launched an innovative Air Quality Dashboard to address the persistent issue of hazardous air pollution across the Indo-Gangetic plain and Himalayan foothills.

- The dashboard offers real-time tracking, advanced forecasting, and actionable insights to mitigate the health and environmental risks associated with **rising PM2.5 levels** in the region.

About International Centre for Integrated Mountain Development (ICIMOD):

- **Origin:** Established on December 5, 1983.
- **Headquarters:** Kathmandu, Nepal.
- **Member Countries:** Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan.
- **Aims:** To foster sustainable, inclusive, and climate-resilient development in the Hindu Kush Himalaya (HKH) region.
- **Functions:**
  - Generate and share innovative knowledge to address mountain-specific challenges.
  - Bridge science with actionable policies and practices.
  - Facilitate a regional platform for collaboration among experts, policymakers, and practitioners.

94. GRIHA SUMMIT

Context:

The 16th GRIHA Summit commenced in New Delhi, focusing on "Accelerating Climate Action in the Built Environment."

About GRIHA Summit:

- **Origin:** GRIHA (Green Rating for Integrated Habitat Assessment) was established in 2007 by the Ministry of New and Renewable Energy (MNRE) and TERI to promote green buildings in India.
- **16th Summit Host:** New Delhi
- **Theme:** "Accelerating Climate Action in the Built Environment," emphasizing sustainable urban development and climate resilience.
- **Organized By:** GRIHA Council in collaboration with MNRE, TERI, and global partners.
- **Features:**
  - Launch of GRIHA V 6.0 for advanced resource efficiency and green building benchmarks.
  - Recognition through GRIHA awards for 4-star and 5-star projects.

More in news:

- The Inland Waterways Authority of India (IWAI's) Intermodal Terminal at Kalughat, Bihar, earned a **five-star SVAGRIHA** rating.
- The terminal, developed under the World Bank-funded **Jal Marg Vikas Project** (JMVP), is a key initiative aimed at enhancing the capacity of National Waterway 1 on the River Ganga.

About GRIHA (Green Rating for Integrated Habitat Assessment):

- **Launched in:** 2007.
- **Ministry:** Ministry of New and Renewable Energy (MNRE), Government of India.
- **Aim:** To promote sustainable and green building practices by evaluating environmental performance across a building's lifecycle.
- **Function:** Provides a green building rating system tailored to Indian climates and construction practices, focusing on energy efficiency, site planning, resource conservation, and climate change mitigation.

About TERI (The Energy and Resources Institute):

- **Launched in:** 1974.
- **Agency involved:** Independent research organization based in India.
- **Aim:** To advance research and innovation in energy, environment, climate change, and sustainability.
- **Function:** Conducts policy research, technology development, and implementation in sustainability, addressing

energy efficiency, renewable energy, and environmental conservation.

95. UNEP CHAMPION OF THE EARTH 2024

Context:

Indian ecologist Madhav Gadgil, renowned for his work on the Western Ghats, has been named a UNEP Champion of the Earth 2024 in the lifetime achievement category.

About UNEP Champions of the Earth Awards:

- **Origin:**
  - **Established in:** 2005.
  - **Awarded by:** United Nations Environment Programme (UNEP).
- **Aim:** To honour individuals, groups, and organizations making transformative environmental contributions.
- **Categories:**
  - Lifetime Achievement
  - Policy Leadership
  - Inspiration and Action
  - Science and Innovation
  - Entrepreneurial Vision
- **Winners of UNEP Champions of the Earth 2024:**

Winner	Country/Organization	Category	Contribution
Madhav Gadgil	India	Lifetime Achievement	Advocacy for ecosystem conservation, especially in the Western Ghats.
Sonia Guajajara	Brazil	Policy Leadership	Advocating Indigenous rights and combating deforestation.
Amy Bowers Cordalis	USA	Inspiration and Action	Restoring the Klamath River ecosystem and advocating for Indigenous rights.
Gabriel Paun	Romania	Inspiration and Action	Protecting Europe's last old-growth forests in the Carpathians.
Lu Qi	China	Science and Innovation	Leading efforts in desertification reversal and afforestation projects.
SEKEM	Egypt	Entrepreneurial Vision	Promoting sustainable agriculture and transforming desert areas into farms.

96. MANGANESE CONTAMINATION

Context:

A study by the Mahavir Cancer Sansthan in Patna revealed significant manganese (Mn) contamination in water as a contributing factor to rising cancer cases in Bihar's Gangetic region.

About Manganese Water Contamination:

- **What is Manganese?**
  - Manganese is a naturally occurring metal found in oxides, carbonates, and silicates. It is essential in trace amounts but toxic in higher concentrations.
- **WHO Limits for Manganese in Water**
  - The permissible limit for manganese in drinking water is **100 µg/L,** as recommended by WHO.
- **Reasons for Manganese in water:**
  - **Geogenic Sources:** Naturally occurring manganese deposits in sedimentary and igneous rocks leach into groundwater.
  - **Industrial Pollution:** Discharge from mining, steel, and battery industries contaminates water sources.
  - **Agricultural Runoff:** Excessive use of fertilizers and pesticides introduces manganese into the water table.
  - **Erosion and Sedimentation:** Natural soil erosion and sedimentation contribute to elevated manganese

levels in water.

- **Health Impacts of Excess Manganese in Water:**
  - **Neurological Disorders:** Overexposure can cause weakness, clumsiness, emotional instability, and difficulty in movement.
  - **Carcinogenesis:** Chronic exposure is linked to cancer, with the study indicating higher contamination levels in advanced cancer stages.
- **Regions Affected**
  - **India:** Elevated Mn levels found in Bihar's Gangetic plains, West Bengal's Murshidabad and 24 Parganas, and Tumkur, Karnataka.
  - **Global:** High Mn levels reported in Nigeria, Bangladesh, China, Japan, and Greece.

97. HYDROXYMETHANESULPHONATE

Context:

A study reveals hydroxymethanesulphonate, a secondary aerosol, forming in cold urban areas like Fairbanks, Alaska, reshaping understanding of aerosol chemistry in extreme conditions and its air quality impact.

About Hydroxymethanesulphonate:

- **What it is:** A secondary aerosol that forms from chemical reactions involving **formaldehyde** and **sulphur dioxide** in the presence of liquid water.
- **How it is formed:**
  - Occurs when formaldehyde reacts with **sulphite ions** in aerosol particles.
  - Requires **liquid water** within aerosol particles, even in extremely cold conditions (supercooled state).
- **Factors favoring its formation:**
  - **Low temperatures:** Inhibit ammonium volatilization, reducing aerosol acidity.
  - **High ammonium ion concentrations:** Neutralize acidity, enabling reactions.
  - **Supercooled liquid water:** Present in aerosols at sub-zero temperatures.
- **Impact on environment:**
  - Contributes to PM2.5 pollution, worsening air quality.
  - Influences **cloud formation** and radiative properties, affecting climate.
- **Impact on humans:**
  - Aggravates respiratory illnesses, **lung diseases**, and cardiovascular conditions.
  - Long-term exposure increases risks of **premature mortality** in polluted regions.

98. SACRED GROVES

Context:

The Supreme Court has directed the Union Government to formulate a comprehensive policy to manage sacred groves, emphasizing their ecological and cultural importance.

About Sacred Groves:

- **What they are:** Sacred groves are patches of forest traditionally preserved by local communities due to their religious, cultural, or spiritual significance.
- **Classification:**
  1. **Traditional Sacred Groves:** Dedicated to village deities represented by natural symbols.
  2. **Temple Groves:** Forests preserved around temples for worship.
  3. **Cremation/Burial Ground Groves:** Forest patches maintained near burial sites for rituals.
- **Distribution in India:**
  - Found across India, predominantly in **Kerala, Karnataka, Maharashtra, Tamil Nadu**, and the **Western Ghats**.
- **Importance and Significance:**
  - **Cultural and Spiritual Value:** Links nature and culture, fostering a sense of identity and heritage.
  - **Biodiversity Conservation:** Acts as sanctuaries for endangered species and genetic diversity.
  - **Water Resource Management:** Associated with water bodies, aiding aquifer recharge.
  - **Soil Conservation:** Vegetative cover prevents soil erosion and enhances fertility.
  - **Environmental Indicator:** Reflects potential vegetation in degraded areas.

Case Study: Piplantri Model

Rajasthan's Rajsamand district, which under the leadership of its Sarpanch Shyam Sundar Paliwal, started the initiative to plant 111 trees for every girl child born.

SC quotes Bhagavad Gita: While pronouncing the judgement, the Supreme Court also cited a verse from the Bhagavad Gita to underscore the importance of the environment. "Nature is the source of all material things: the maker, the means of making, and the things made. Spirit is the source of all consciousness which feels pleasure and feels pain," the court cited Verse 20 from Chapter 13 of the Bhagwad Gita.

99. NEXUS REPORT

Context:

The Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) launched the Nexus Report, a comprehensive scientific assessment of the interconnections among **biodiversity, water, food, health, and climate change.**

About Nexus Report:

- **Full Name:** Assessment Report on the Interlinkages Among Biodiversity, Water, Food and Health.
- **Aim:** To analyze the complex interdependencies among **biodiversity, water, food, health, and climate change,** offering over 60 specific response options to optimize co-benefits and tackle global challenges effectively.

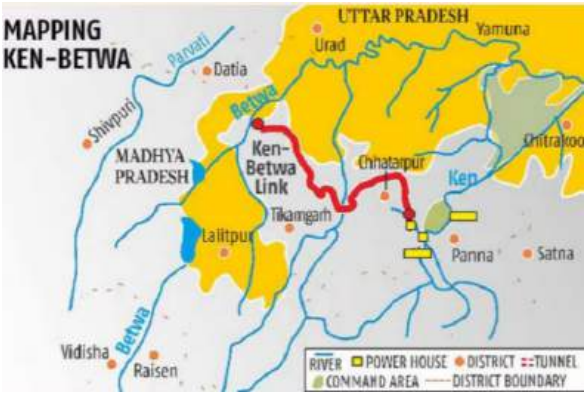
About Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES):

- **Established in:** April 21, 2012, in Panama City by 94 governments.
- **Headquarters:** Bonn, Germany.
- **Aim:** To strengthen the science-policy interface for biodiversity and ecosystem services, ensuring sustainable use and long-term human well-being.
- **Functions:**
  - **Assess global biodiversity** and ecosystem service trends.
  - Promote **sustainable practices** and conservation efforts.
  - Provide decision-makers with **actionable scientific insights.**
  - Bridge the gap between **science and policy** for biodiversity management.

100. KEN-BETWA LINK PROJECT

Context:

Prime Minister will lay the foundation stone for the Ken-Betwa Link Project, India's first interlinking of rivers project, in Khajuraho, Madhya Pradesh.



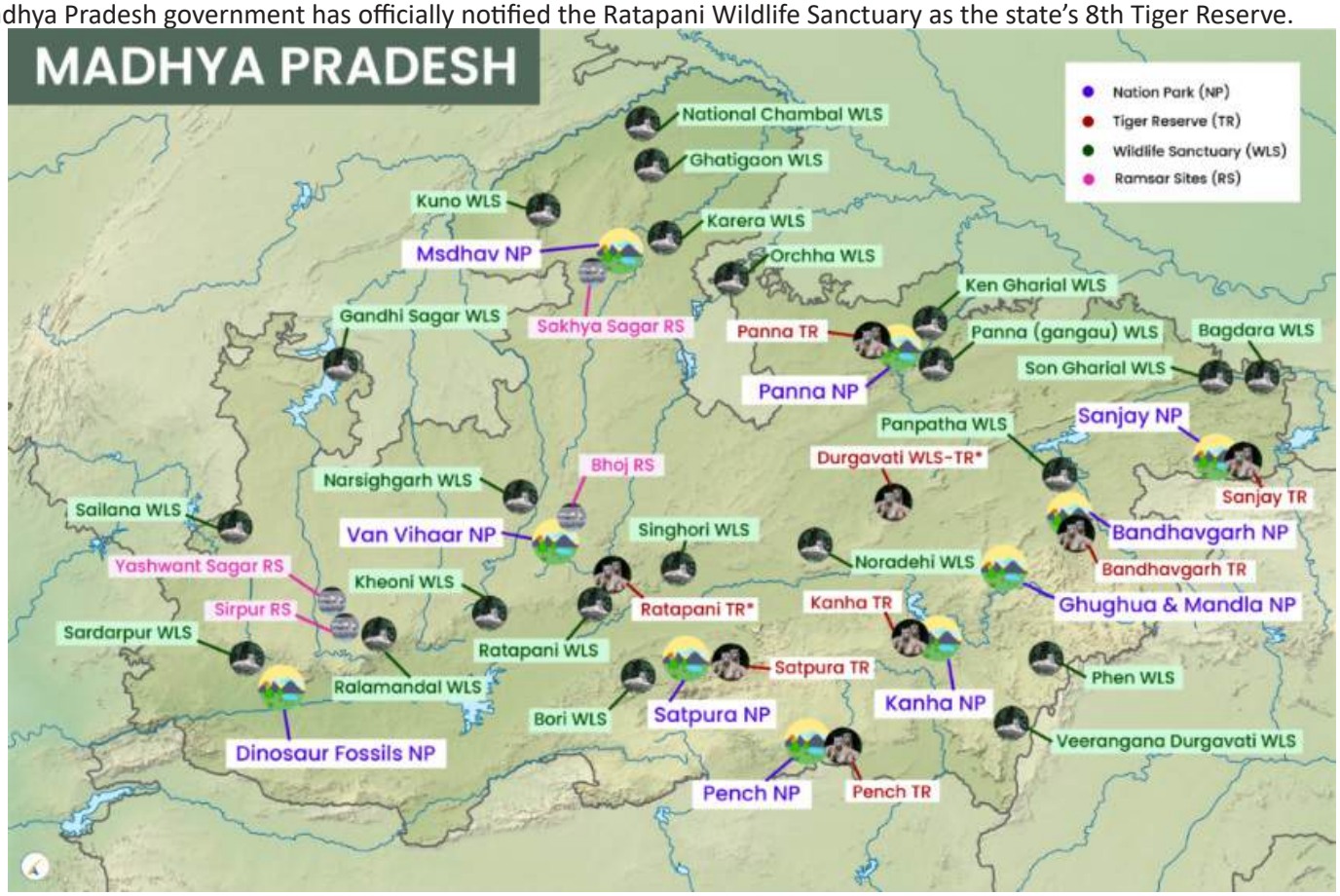
About Ken-Betwa Link Project:

- **What it is:**
  - India's first interlinking of rivers project under the National Perspective Plan **(NPP)** for river interlinking.
  - **Estimated cost:** ₹44,605 crores, with 90% funded by the Central Government.
- **Rivers involved:**
  - Connects the **Ken River** and **Betwa River**, both tributaries of the Yamuna River.
- **Phases of the Project:**
  - **Phase I**: Includes the construction of the **Daudhan Dam** in Panna Tiger Reserve, Low-Level and High-Level Tunnels, the Ken-Betwa Link Canal, and Powerhouses.
  - **Phase II**: Includes the **Lower Orr Dam**, **Bina Complex Project**, and **Kotha Barrage**.
- **Regions Covered:**
  - Provides irrigation to over **8 lakh hectares** in **10 districts of Madhya Pradesh** and **Uttar Pradesh**.

101. RATAPANI TIGER RESERVE

Context:

The Madhya Pradesh government has officially notified the Ratapani Wildlife Sanctuary as the state's 8th Tiger Reserve.



About Ratapani Tiger Reserve:

- **Location:** Situated in the **Vindhyachal Mountain Ranges** across Raisen and Sehore districts of Madhya Pradesh.
- **Origin:** Initially declared a wildlife sanctuary in 1976, extended in 1983, and received NTCA's approval for a tiger reserve in 2008.
- **Rivers and Water Bodies:** The **Kolar River** forms its western boundary, while the Dahod reservoir and Ratapani reservoir are key water sources within the reserve.
- **Flora:** Features **dry and moist deciduous forests**, hosting diverse vegetation.
- **Fauna:** Home to 56 tigers, 70 leopards, sloth bears, chinkaras, crocodiles, and the paradise flycatcher, the state bird of Madhya Pradesh (2022 census).
- **Significance:** Includes **Bhimbetka rock shelters**, a UNESCO World Heritage Site of international importance, adding cultural and historical value to the reserve.
- **Other Tiger Reserves in Madhya Pradesh:** Bandhavgarh, Kanha, Panna, Pench, Sanjay-Dubri, Satpura, and Veerangana Durgavati.

Species in news

102. LAYSAN ALBATROSS

Context:

Wisdom, a 74-year-old Laysan albatross, has set a world record as the oldest wild bird, continuing to contribute to her species' survival.

About Laysan Albatross:

- **Name:** Laysan Albatross (*Phoebastria immutabilis*)
  - It is a pelagic bird found predominantly in the North Pacific Ocean.

- **Region found in:** Primarily the **North Pacific Ocean**, with 99.7% of its population nesting in the **Northwestern Hawaiian Islands**, particularly at Midway Atoll National Wildlife Refuge.
- **Key Characteristics:**
  - Medium-sized seabird resembling a gull, with **long, slender wings** for sustained flight.
  - Feeds on squid, fish eggs, and crustaceans far from land.
  - **Mates for life**, laying a single egg per year with shared incubation duties.
  - Notable lifespan, often exceeding 60 years, with some individuals like Wisdom reaching 74 years.
- **IUCN Status:** Near Threatened

103. INDIAN STAR TORTOISE

Context:

The Indian star tortoise (Geochelone elegans), an endangered species endemic to the Indian subcontinent, faces threats from illegal wildlife trade and habitat loss. Recent research highlights its genetic diversity, offering insights into conservation strategies.

About Indian Star Tortoise:

- **Scientific Name:** Geochelone elegans
- **IUCN Status:**
  - **Vulnerable** under the **IUCN Red List**.
- **Types:**
  - **Northwestern Group:** Genetically less diverse.
  - **Southern Group:** Highly diverse, showing greater genetic variations.
- **Features:**
  - **Shell:** Obsidian black with sun-yellow star-like patterns.
  - **Size:** Small to medium-sized, dome-shaped shells in the wild, pyramid-shaped shells in captivity due to nutritional deficiencies.
  - **Diet:** Herbivorous, feeding on grass, leaves, and fruits.
- **Habitat:**
  - Endemic to the subcontinent, Indian star tortoises reside in arid pockets of northwest India (bordering Pakistan), South India, and Sri Lanka

104. OLIVE RIDLEY TURTLES

Context:

Carcasses of Olive Ridley turtles continue to wash ashore along the Visakhapatnam coast during their breeding season. Experts attribute the deaths to marine pollution and accidental entanglement in fishing trawlers.

About Olive Ridley Turtles:

- **Smallest and Most Abundant:** They are the smallest and most abundant sea turtles globally.
- **Name Origin:** *Lepidochelys olivacea*.
- **Unique Nesting (Arribada):** Known for mass nesting, thousands of females lay eggs simultaneously on the same beach.
- **Geographic Distribution:** Found in the warm waters of the Pacific, Atlantic, and Indian Oceans.
  - Odisha's Gahirmatha Marine Sanctuary is the world's largest rookery.
- **Physical Features:** Adults measure 62-70 cm, weigh 35-45 kg, and have paddle-like flippers with one or two claws.
- **Diet and Habitat:** They are omnivorous and solitary, spending most of their lives in the open ocean.
- **Migration:** Travel thousands of kilometers annually between feeding and mating grounds.
- **Conservation Status:**
  - **IUCN Red List:** Vulnerable.
  - **Wildlife Protection Act, 1972:** Schedule 1 (highest protection in India).
  - **CITES:** Appendix I (international trade ban).

105. HIMALAYAN BRICH TREE

Context:
Climate change is shifting the tree line landscape in the central Himalayas, where Himalayan birch trees (Betula utilis) are being replaced by fir trees (Abies spectabilis).

About Fir Trees *(Abies spectabilis):*

- **What it is:** A slow-growing evergreen conifer commonly found in mountainous regions.
- **Features:**
  - Needle-like leaves and conical shape.
  - Adapted to colder climates with moderate moisture.
  - Retains foliage year-round, contributing to high water-use efficiency.
- **Found in:**
  - Mid to high altitudes of the Himalayas (2,500–3,700 meters).
  - Prefers cooler and less moisture-stressed environments.

About Himalayan Birch *(Betula utilis):*

- **What it is:** A deciduous broadleaved tree species native to the Himalayan region.
- **Features:**
  - Known for peeling bark and bright green leaves.
  - Requires abundant water and cooler climates for survival.
  - Sheds leaves in winter, contributing to nutrient cycling.
- **Found in:**
  - Upper altitudes of the Himalayas (2,900–4,500 meters).
  - Thrives in wetter, snow-fed environments.

Comparison: Fir Tree vs. Himalayan Birch

Feature	Fir Tree (Abies spectabilis)	Himalayan Birch (Betula utilis)
Type	Evergreen conifer	Deciduous broadleaf
Preferred Altitude	2,500–3,700 meters	2,900–4,500 meters
Water Needs	Moderate	High
Climate Adaptation	Thrives in warmer conditions	Struggles with warming and dryness
Growth	Slower, but more drought-tolerant	Faster, but water-dependent

106. WROUGHTON'S FREE-TAILED BAT

Context:
A Wroughton's Free-tailed Bat (*Otomops wroughtoni*), a rare and Critically Endangered species, was sighted for the first time in northern India at Delhi's Yamuna Biodiversity Park.

About Wroughton's Free-tailed Bat:

- **What it is:** A free-tailed bat species **first discovered in 1913**, known for its powerful flight and preference for cave-like roosting habitats.
- **Habitat:**

- Historically found in the **Western Ghats (Karnataka),** northeastern India **(Meghalaya), and Cambodia.**
- Prefers dark, damp, and slightly warm places to roost.

- **Conservation Status:**
  - Classified as **Critically Endangered** by the IUCN due to habitat loss and limited known populations.

About Yamuna Biodiversity Park:

- **Location:** Situated along the Yamuna riverfront in Delhi.
- **Developed by:** Delhi Development Authority (DDA) with technical support from the Centre for Environmental Management of Degraded Ecosystems (CEMDE).
- **Features:**
  - Alternative habitat for migratory and resident bird species.
  - Conservation of wild genetic resources of agricultural crops.
  - Enhances groundwater recharge and freshwater availability.

107. GANGES RIVER DOLPHIN

Context:

For the first time, Indian wildlife experts successfully tagged a Ganges River dolphin, marking a historic milestone in the conservation of this endangered species.

- The initiative under Project Dolphin, supported by the Ministry of Environment, Forest, and Climate Change.
- **Aim:** To track the dolphin's movement, habitat use, and migratory patterns using advanced satellite-compatible lightweight tags.

About Ganges River Dolphin:

- **Scientific name**: *Platanista gangetica gangetica*
- **Common name**: Susu
- **Habitat**: Found in **freshwater river** systems, including the Ganga-Brahmaputra-Meghna and Karnaphuli-Sangu in India, Nepal, and Bangladesh.
- **Characteristics**:
  - Nearly blind, relying on **echolocation** for navigation and hunting.
  - Lives exclusively in freshwater ecosystems.
  - Sturdy, flexible body with large flippers and low triangular dorsal fins.
  - Females are larger than males and **reproduce every 2-3 years**, giving birth to a single calf.
  - Newborns are chocolate brown, turning grey-brown as adults.
- **Conservation status:**
  - **IUCN:** Endangered
  - **Wildlife (Protection) Act, 1972:** Schedule-I
  - **CITES:** Appendix I

108. NORTHERN GIANT HORNET

Context:

The United States successfully eradicated the invasive **Northern Giant Hornet**, commonly known as the "Murder Hornet," which posed significant threats to native pollinators and agriculture.

About Murder Hornet (Northern Giant Hornet)

- **Scientific name:** *Vespa mandarinia*.
- **Habitat:** Native to Asia; prefers forested areas and underground cavities for nesting.
- **Features:**
  - Up to 2 inches long.
  - Delivers **venom** nearly seven times stronger than that of honeybees.
  - Can sting multiple times and **penetrate** beekeeper **suits.**
- **Threats:**
  - Can **decimate entire honeybee hives** within 90 minutes by decapitating bees.
  - Competes with native pollinators, disrupting ecosystems and agriculture.
  - Deadly to humans; caused fatalities and injuries in China in 2013.

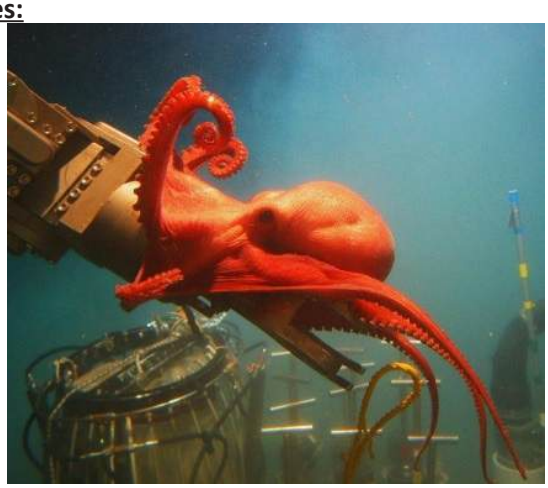
109. CEPHALOPODS

Context:

Cephalopods, like octopuses and squids, are gaining attention for their intelligence, prompting calls for humane treatment regulations akin to those for vertebrates.

About Cephalopods:

- **Classification:**
  - Belong to the **class Cephalopoda** in the **phylum** Mollusca.
  - Includes species like **Octopus vulgaris**, **Sepia officinalis**, and **Architeuthis dux** (giant squid).
- **What they are:**
  - Marine invertebrates with **soft bodies** and distinct features like tentacles, beak-like jaws, and highly developed nervous systems.
- **Features:**



  - **Blood Type:** Cold-blooded (ectothermic).
  - **Biological Traits:**
    - **Chromatophores** for skin colour change (camouflage and communication).
    - Unique W-shaped pupils for enhanced vision.
  - **Physical Characteristics:**
    - Tentacles with suction cups or hooks for grasping prey.
    - Arm "mini-brains" with distributed neurons.
- **Various species:**
  - **Octopuses**: E.g., **Octopus vulgaris** (common octopus), **Octopus cyanea** (day octopus).

- **Cuttlefish**: E.g., **Sepia officinalis** (common cuttlefish).
- **Squids**: E.g., **Architeuthis dux** (giant squid).
- **Nautilus**: Chambered mollusc with external shell.

- **Special features:**
  - **Learning Abilities:**
    - Associative learning and memory comparable to vertebrates.
    - Ability to delay gratification (e.g., choosing a preferred snack over immediate lesser options).
  - **Problem-Solving:** Uses tools and strategies to escape enclosures or hunt.
  - **Camouflage Skills:** Advanced use of chromatophores for disguise and communication.

110. LION-TAILED MACAQUE

Context:

The lion-tailed macaque endemic to the Western Ghats, faces growing threats from increased human interaction due to habitat encroachment, tourism, and road crossings.

About Lion-Tailed Macaque:

- **What it is**:
  - **Scientific name:** *Macaca silenus*
  - An Old-World monkey named for its **lion-like tufted tail** and grey mane, also called a **bearded monkey**.
  - Known for **distinct vocalizations (17 types)** used for communication and territory marking.
- **Endemic to**:
  - Found exclusively in the **rainforests of the** Western Ghats in Karnataka, Kerala, and Tamil Nadu, India.
- **Unique features**:
  - Characterized by a grey **mane-like fur** around the face and a **long, tufted tail**.
  - Primarily arboreal, relying on dense rainforest canopies for food and safety.
- **IUCN Status**:
  - Listed as **Endangered** on the **IUCN Red List**.
  - Protected under **Appendix I of CITES** and **Schedule I of the Wildlife (Protection) Act, 1972**.
- **Habitat:**
  - Inhabits small, fragmented patches of rainforests in the Western Ghats, vulnerable to deforestation, fragmentation, and human intrusion.

111. YANA: MAMMOTH

Context:

The discovery of Yana, a 50,000-year-old baby mammoth in the melting permafrost of Yakutia, Russia, is one of the most exceptional finds in palaeontology.

About Mammoth:

- **What it is:** Mammoths are extinct species of the elephantid genus **Mammuthus**, known for their large size and adaptations to cold climates.
- **Scientific Name:** *Mammuthus primigenius* (Woolly Mammoth).
- **IUCN Status:** Extinct; they disappeared approximately 4,000 years ago.
- **Features:**
  - **Tusks:** Spirally twisted, long tusks.
  - **Cold Adaptations:** Thick fur, fat layers, and smaller ears to minimize heat loss.
  - **Habitat:** Inhabited Africa, Asia, Europe, and North America during different epochs.
- **Similarity Between Asian Elephants and Mammoths:**
  - **Genetics:** Asian elephants are more closely related to mammoths than to African elephants.
  - **Physical Features:** Both share similar body structures like domed skulls and high foreheads.

112. DODO

Context:
Kashmiri artisans are reviving the memory of the extinct dodo (Raphus cucullatus) through papier mache art, with over 50,000 colourful models exported to markets in Europe.

About Dodo:

- **Scientific Name:** *Raphus cucullatus*.
- **Classification:**
  - **Family:** Columbidae (related to pigeons and doves).
  - **Subfamily:** Raphinae (extinct flightless birds).
- **IUCN Status:** Extinct (1681).
- **Features:**
  - Flightless bird, approximately 3 feet tall.
  - Grey or brown plumage with yellow-tipped hooked beak.
  - Native to Mauritius, with stout legs and curly rear feathers.
- **Closest Relative:** Nicobar pigeon (living), and Rodrigues solitaire (extinct).

113. SEA OTTERS

Context:
A recent study highlights the ecological role of endangered southern sea otters in controlling the invasive green crab population at **Elkhorn Slough, California.**

About Sea Otter:

- **What it is:** An aquatic member of the weasel family (*Mustelidae*), primarily found along Pacific Ocean coasts in North America and Asia.
- **Scientific name:** *Enhydra lutris*.
- **Habitat:** Coastal waters and estuaries, often in kelp forests and seagrass beds; occasionally rests onshore.
- **IUCN Status:** Endangered.
- **Features:**
  - **Webbed feet and water-repellent fur** for warmth and buoyancy.
  - Eats up to 25% of its body weight daily.
  - **Nostrils and ears close in water** for underwater foraging.
- **Role in Ecosystem Conservation:**
  - **Keystone Species:** Vital for maintaining marine ecosystem balance.
  - **Kelp Forest Protection:** Preys on sea urchins, preventing their overpopulation and subsequent destruction of kelp forests.
  - **Biodiversity Sustenance:** Supports marine habitats by ensuring a balanced food web, aiding species diversity.

114. FISHING CAT

Context: The Coringa Wildlife Sanctuary (CWS) in Andhra Pradesh, India, is witnessing an increase in the population of the endangered Fishing Cat, attributed to its thriving mangrove ecosystem.

- The sanctuary is set to host **India's first Fishing Cat Collaring Project**, aimed at studying the behaviour and ecology

of this elusive species, crucial for wetland conservation efforts.

About Fishing Cat:

- **Scientific Name:** *Prionailurus viverrinus*
- **Habitat:** Found in wetlands, swamps, mangroves, and marshy areas; prefers oxbow lakes, reed beds, and tidal creeks.
- **Characteristics:**
  - Skilled swimmer, often dives to catch fish.
  - Nocturnal predator; feeds on fish, frogs, crustaceans, and small mammals.
  - Breeds year-round; muscular, short tail with 6-7 dark bands.
- **IUCN Status:** Vulnerable
- **Significance in Ecology:** Acts as an indicator species for wetland health and plays a vital role in balancing aquatic ecosystems.

About Coringa Wildlife Sanctuary (CWS):

- **Location:** In the Godavari estuary, where the Coringa River meets the Bay of Bengal in Kakinada district, Andhra Pradesh.
- **Unique Features:**
  - India's second-largest mangrove forest.
  - Habitat for endangered species like the **Fishing Cat, Indian smooth-coated otter**, and Olive Ridley turtles.
  - Rich biodiversity including mangroves **and unique fauna like the Brahminy kite** and black-capped kingfisher.
  - Contains **Hope Island,** a natural barrier protecting the sanctuary from direct sea erosion.

Internal Security

115. DIRECTORATE OF REVENUE INTELLIGENCE

Context:

The Smuggling in India Report 2023-24 by the Directorate of Revenue Intelligence (DRI) sheds light on evolving narcotics smuggling routes and the major drug hubs impacting India.

About Smuggling in India Report 2023-24:

- **Major Narcotics Hubs**:
  - **The *Death Crescent*** (Afghanistan, Iran, Pakistan) as a primary heroin source.
  - **The *Death Triangle*** (Myanmar, Laos, Thailand) for synthetic drugs and heroin, affecting northeastern states like Manipur and Mizoram.
- **Trafficking Routes**:
  - **Maritime Routes**: Drugs concealed in shipping containers and fishing vessels due to India's vast coastline.
  - **Land Routes**: Porous borders and difficult terrain along the Indo-Myanmar region facilitate drug entry.
    - Key vulnerable sectors include **Moreh and Churachandpur (Manipur) and Zokhawthar (Mizoram).**
  - **Air Routes**: Increasing use of international air traffic for smuggling via luggage, courier packages, or drug mules.
- **Significant Seizures**:
  - 123 kg of methamphetamine confiscated in Assam and Mizoram during April-September 2023.

About Directorate of Revenue Intelligence (DRI):

- **Origin:** Established in 1957.
- **Headquarters:** New Delhi, India.
- **Ministry:** Operates under the Ministry of Finance, Government of India.
- **Functions:**
  - Preventing and investigating smuggling of narcotics, gold, counterfeit currency, and wildlife.
  - Collaborating with international agencies to combat transnational crimes.
  - Enforcement of the Customs Act and related laws.

116. PROTECTED AREA PEMIT

Context:

The Indian government has reinstated the Protected Area Permit (PAP) regime in Manipur, Mizoram, and Nagaland due to

security concerns stemming from the influx of people from neighbouring countries.

About Protected Area Permit (PAP):

- **What it is:** An official document required for foreign nationals to visit certain "protected" areas in India under the Foreigners (Protected Areas) Order, **1958.**
- **States Under PAP:**
  - Arunachal Pradesh
  - Manipur
  - Mizoram
  - Nagaland
  - Sikkim (partly protected)
  - Parts of Himachal Pradesh, Jammu & Kashmir, Rajasthan, and Uttarakhand
- **Authority to Declare PAP:** Declared by the **Ministry of Home Affairs (MHA)** under the Foreigners (Protected Areas) Order, 1958.
- **Procedure to Obtain PAP:**
  - Application submitted to Indian Missions abroad or competent local authorities in India.
  - Cases requiring **special clearance referred to MHA** with state government recommendations.
  - PAP valid for **group tourists or individuals** with extra-ordinary reasons.
- **Features of PAP:**
  - Valid for group tourists **(minimum of 2 people).**
  - Restricted to **specified circuits/routes** and entry/exit points.
  - Foreigners must register with the district **Foreigners Registration Officer** within 24 hours.
  - PAP is **time-bound,** and overstaying is prohibited.
  - Citizens from **Afghanistan, China, and Pakistan require prior MHA** approval.

Defence

117. RAFALE-MARINE (RAFALE-M)

Context:

India is set to finalize the procurement of 26 **Rafale-Marine (Rafale-M)** fighter jets, manufactured by France's Dassault Aviation, for deployment on aircraft carriers **INS Vikrant** and potentially **INS Vikramaditya**.

About Rafale-M:

- **Manufactured By:** Designed and built by Dassault Aviation, a French aerospace company.
- **Features:**
  - Multi-role, single-seat 4+ generation fighter aircraft with advanced avionics and AESA radar.
  - Capable of deep strikes, air defense, reconnaissance, and maritime operations.
  - Equipped with advanced armaments like Meteor, Multi-mission air-to-air missile system (MICA), SCALP missiles, and EXOCET anti-ship weapons.
- **Differences from Air Force Rafale:**
  - **Heavier airframe** due to additional reinforcements for naval operations.
  - **Optimized radar** and electronic warfare systems for maritime applications.
  - Enhanced landing capabilities for Catapult Assisted Take-Off Barrier Arrested Recovery (**CATOBAR**) and Short Take-Off, Barrier Arrested Recovery (**STOBAR**) systems.
- **Shared Features with** Air Force Rafale**:**
  - Common suite of armaments and avionics, ensuring cost efficiency in maintenance and logistics.

118. INS TUSHIL

Context:

Defence Minister commissioned INS Tushil, a stealth missile frigate under **Project 1135.6**, at the Yantar Shipyard in Kaliningrad.

About INS Tushil:

- INS Tushil is part of the **upgraded Krivak III class** of Project 1135.6 frigates. It is the seventh ship in this series.
- **Built at:** Yantar Shipyard, Kaliningrad, Russia.
- **Contract:** Signed in October 2016 between the Indian Navy, JSC Rosoboronexport, and the Government of India.
- **Significance:**
    - **Strategic Asset:** Strengthens India's maritime security and naval firepower.
        - It incorporates both Indian and Russian technologies, with Indian components accounting for 26 percent of its construction.
    - **Indo-Russian Collaboration:** Highlights robust military and technical cooperation between India and Russia.
    - **Modernization:** Enhances India's blue-water navy capabilities with state-of-the-art technology.
    - **Regional Stability:** Contributes to India's efforts in maintaining peace and stability in the Indo-Pacific region.

119. JOINT MILITARY EXERCISES

About Military Exercises in News:

- **Surya Kiran 2024:**
    - **Exercise name:** Surya Kiran 2024
    - **Held at:** Saljhandi, Nepal
    - **Nations involved:** India and Nepal
    - **Focus:** Jungle warfare, counter-terrorism, and humanitarian operations under the UN Charter.
- **SLINEX-24:**
    - **Exercise name:** SLINEX 24
    - **Held at:** Visakhapatnam, India
    - **Nations involved:** India and Sri Lanka
    - **Focus:** Maritime cooperation and interoperability between navies.

- **Desert Knight Exercise**
    - **Exercise name: Desert Knight Exercise**
    - **Held at:** Arabian Sea
    - **Nations involved:** India, France, and the UAE
    - **Focus:** Strengthen trilateral defence cooperation

SPORTS CORNER

1. WORLD CHESS CHAMPIONSHIP 2024

Context: The World Chess Championship 2024 marked a historic moment in chess history as 18-year-old Indian Grandmaster D. Gukesh claimed the title, becoming the youngest World Chess Champion ever.

About World Chess Championship 2024:

- **Held At**: Singapore, from November 25 to December 12, 2024.
- **Played Between**: Reigning champion Ding Liren (China) and challenger D. Gukesh (India).
    - Gukesh is also only the **18th world champion** in history, which dates back to **1886.**
- **History:** Established in **1886**, the World Chess Championship began as a contest between **Wilhelm Steinitz and Johannes Zukertort.**
    - Steinitz emerged as the first official World Chess Champion.
- **Governing Body:** The event is now organized by **FIDE (Fédération Internationale des Échecs)**, which assumed responsibility in **1948**.
- **Procedure in Tournament**:
    - The championship consisted of 14 classical games with tiebreaks scheduled if necessary.
    - Gukesh won the match 7½–6½ after 14 games.
- **FIDE Challenger Selection Process**:
    - Ding Liren was the reigning champion, winning in 2023 after Magnus Carlsen declined to defend his title.
    - Gukesh earned his spot by winning the Candidates Tournament held in Toronto in April 2024.
- **Indian Winners So Far**:
    - Viswanathan Anand (5-time World Chess Champion).
    - D. Gukesh (2024 World Chess Champion).

About D. Gukesh:

- **Birth**: Born on May 29, 2006, in Chennai, India.
- **Grandmaster Title**: Achieved at age 12 years, 7 months, and 17 days, making him the third-youngest Grandmaster.
- **Achievements**:
    - Youngest undisputed World Chess Champion (18 years old).
        - Gukesh is **only the third Asian** to win the World championship. Viswanathan Anand, who is now a mentor for Gukesh, was the first, and Ding the second.
    - Youngest to reach a chess rating of 2750.
    - Winner of one team and two individual gold medals at the 45th Chess Olympiad (2024).
    - Bronze medal in team events at the Asian Games 2024.

MAPPING

1. Phlegraean Fields (Campi Flegrei): The Phlegraean Fields (Campi Flegrei), a massive supervolcano in Italy, are exhibiting increased activity, raising concerns within the scientific community.

About the Phlegraean Fields (Campi Flegrei):

- **Location**: Situated in the western suburbs of Naples, Italy, within the Campanian volcanic arc.
- **Features**:
    - A 13-km wide caldera formed by collapsed volcanic craters.
    - Emits between 4,000–5,000 tons of carbon dioxide daily.

About Super volcanoes:

What they are:

- A super volcano is a volcanic centre capable of producing eruptions ejecting **over 1,000 km³ of material.**
- They form vast depressions in the Earth's crust called **calderas**.

Key Characteristics:

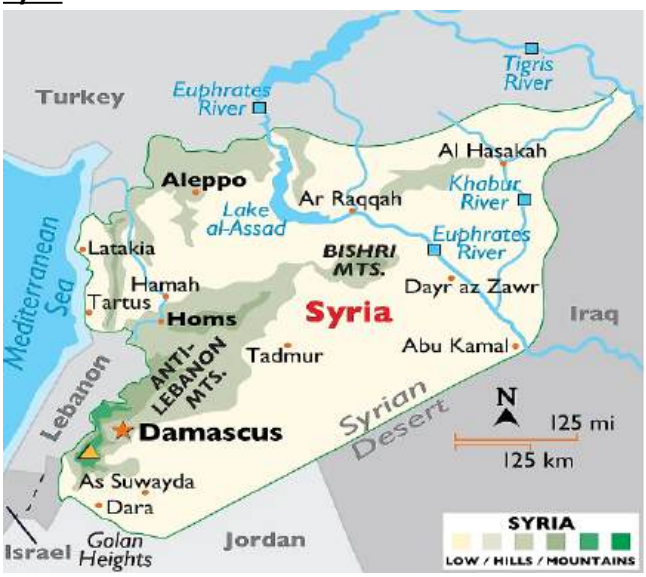
- Long formation timescales (thousands of years).
- Massive energy release and global impact during eruptions.
- Formation results in depressions rather than steep volcanic peaks.

Example: Yellowstone Caldera (USA), Toba (Indonesia), and Phlegraean Fields (Italy).

Difference Between Volcano and Supervolcano:

Aspect	Volcano	Super volcano
Size	Smaller, conical structure	Massive calderas spanning dozens of kilometres
Eruption Volume	Less than 1,000 km³ of material	More than 1,000 km³ of material
Frequency	More frequent eruptions	Extremely rare, occurring over millennia
Impact	Local or regional effects	Global climate and ecosystem impact
Visibility	Typically, visible as steep mountains	Often subtle depressions difficult to identify

2. WHERE IN THE WORLD?

Place	Why in news
Georgia 	**Why in news:** Georgia is witnessing turmoil as protests erupted following the government's decision to delay European Union (EU) membership talks until 2028. **Georgia Overview** • Capital: Tbilisi. • Neighbours: Russia, Azerbaijan, Armenia, Turkey, Black Sea. • Geographical Features: Mount Shkhara, Inguri river, Rioni river, Kodori rivers. • Conflict Regions: Abkhazia, South Ossetia, Ajaria.
South Korea 	**Why in news:** South Korea faced a political crisis as President Yoon Suk Yeol declared martial law over alleged "anti-state forces." however parliament swiftly overturned the declaration, restoring democracy. • **Capital City:** Seoul. • **Government:** Presidential system. **o Land Borders:** North Korea: Separated by the Korean Demilitarized Zone (DMZ). **o Maritime Borders:** Yellow Sea (West), Sea of Japan (East), East China Sea (South). **Major rivers:** Han River, Nakdong River. • **Demilitarized Zone (DMZ):** 250-kilometer buffer zone post-Korean War. • **Yeonpyeong Island:** Military tensions with North Korea.
Syria 	**Why in news:** The Syrian civil war has reignited with a fresh offensive by Islamist militants led by Hayat Tahrir al-Sham (HTS), capturing key territories, including Aleppo, and threatening the stability of President Bashar al-Assad's regime. **Syrian Locations:** • **Douma:** Site of alleged chemical attacks in 2018. • **Homs:** A focal point of early civilian protests against the Assad regime. • Aleppo: Symbol of the humanitarian crisis, with mass civilian casualties during prolonged battles between rebels and regime forces. • **Palmyra:** Historic site devastated by ISIS, highlighting the cultural cost of Syria's conflict. • **Daraa:** Known as the "cradle of the revolution," where the 2011 Arab Spring protests began in Syria. • **Saydnaya Military Prison: :** Near Damascus, Syria, infamous for severe human rights violations. **Organizations Involved:** • Hayat Tahrir al-Sham (HTS): Led by Abu Mohammad al-Julani, linked to al-Qaeda. • Syrian Democratic Forces (SDF): Kurdish-led forces controlling northeastern Syria. • Hezbollah: Shia militia supporting Assad, weakened by Israel conflicts

Golan Heights:

The Economist

Why in News: The Israeli government recently announced plans to double its population in the Golan Heights, a region it occupied during the 1967 Six-Day War.

About Golan Heights:

- **Location:** The Golan Heights is a hilly region overlooking the **upper Jordan River** Valley in the west.
- **Neighbours:** It shares borders with Israel to the west, Syria to the east, and Jordan to the south.
- **Geographic Features:** Enclosed by the **Jordan River**, **Sea of Galilee**, **Mount Hermon**, **Wadi Al-Ruqqād**, and **Yarmūk River**.
- **History:**
  - Captured by Israel from Syria in the **1967 Six-Day War** and annexed in 1981, an act not internationally recognized.
  - In 2019, the U.S, recognized Israeli sovereignty over the Golan Heights.
- **Significance of the Region:**
  - **Strategic Security:** Serves as a buffer zone between Israel **and Syria.**
  - **Water Resources:** Includes critical aquifers and supplies to the Jordan River and Sea of Galilee.
  - **Agricultural Importance:** Fertile soil supports vineyards, orchards, and grazing lands.
  - **Tourism and Settlements:** Home to Israeli settlements and the **Druze community**, contributing to local economies.

Democratic Republic of Congo:

Why in news: In November 2024, an unidentified disease with flu-like symptoms claimed 143 lives in the Kwango province of the Democratic Republic of Congo (DRC).

- **Location:** Central sub-Saharan Africa, within the **Congo Basin**.
- **Capital:** Kinshasa
- **Neighbouring Countries:** Borders Republic of Congo, Central African Republic, South Sudan, Uganda, Rwanda, Burundi, Tanzania, Zambia, Angola.
- **Rivers:** Home to the **Congo River**, Africa's second-longest river, and the **Congo Basin**, the second-largest tropical rainforest globally.
- **Mountains:** Features mountain terraces and plateaus, along with diverse ecosystems like the **Miombo woodlands** and **cloud forests**.
- **Climate:** Predominantly **equatorial**, with hot and humid conditions in the north and west, and cooler, drier climates in the south and east.

Caspian Sea

Why in News: Kazakhstan's state-owned energy company, KazMunayGas, recently announced the cleanup of significant Soviet-era oil waste along the Caspian Sea, highlighting the environmental challenges faced by this body of water.

- **Location:** The Caspian Sea is situated between **Asia and Europe**.
- **Neighbouring Nations:** Russia, Azerbaijan, Kazakhstan, Turkmenistan, Iran.
- **Major Rivers:** The Caspian Sea receives water primarily from three major rivers: **Volga River:** Contributes about 80% of inflow, Ural River, Terek River
- **Formation:** A landlocked remnant of the **ancient Paratethys Sea,** isolated due to tectonic uplift and sea-level changes.
- **Water Characteristics:** Varies from fresh (north) to salty (south). **Mean salinity:** ~one-third of ocean salinity.

Salar de Uyuni:

Why in News: : Salar de Uyuni, **world's largest salt flat** in Bolivia, is crucial for global energy transition due to its vast lithium reserves, highlighting the strategic importance of salt flats in modern energy resources.

Formation of Salt Flats: Originates from prehistoric lakes that existed around 40,000 years ago but evaporated over time. Formed by the deposition of minerals, especially salts, left behind as water evaporates.

Other Major Salt Flat Regions: Chile: Salar de Atacama, **Argentina:** Salinas Grandes, **USA:** Bonneville Salt Flats, Utah.

Special Features: Renowned for its flatness with elevation variations within one meter across the entire surface. Converts into the world's largest mirror after rainfall, reflecting the sky. Used to calibrate altimeters of Earth observation satellites.

Cameroon

Why in News: A group of 47 migrant workers from Jharkhand stranded in Cameroon due to unpaid wages have received partial payment after intervention by Chief Minister of Jharkhand.

- **Location:** Cameroon is situated at the junction of western and central Africa.
- **Capital:** Yaoundé, located in the south-central region.
- **Bordering Nations:** Nigeria, Chad, Central African Republic, Republic of the Congo, Gabon and Equatorial Guinea, and the Atlantic Ocean.
- **Geography:** Diverse landscapes include northern savannas, central highlands, southern coastal plains, and western volcanic mountains (e.g., Mount Cameroon).
- **Drainage:** Major rivers include **Sanaga, Wouri, Nyong** (Atlantic-bound), and Benue (flows into Nigeria's Niger Basin).
- **Soil:** Rich, fertile soils in the south and vulnerable, fertile soils in the north.

Morocco:

Why in News: Morocco is becoming a key partner for India in defence and high-tech, inviting Indian firms to set up production units as a gateway to Africa and Europe.

- **Location:** Situated in western North Africa, across the Strait of Gibraltar.
- **Morocco borders:** Algeria, Western Sahara, and has coastlines along the Atlantic Ocean and the Mediterranean Sea.
- **Capital:** Rabat.
- **Largest City:** Casablanca, known for its industrial and commercial prominence.
- **Geography:** Features the Atlas and Rif Mountain ranges.
- **Coastlines:** Only African nation with exposure to both the Atlantic Ocean and the Mediterranean Sea.
- **Places in News in Morocco: Casablanca:** Morocco's industrial and commercial hub, showcasing its modern economic aspirations, **Rabat:** The capital city and venue for the India-Morocco Defence Industry Seminar.

. **Kerch Strait**

Why in News: A Russian oil tanker, **Volgoneft-212**, split during a storm in the Kerch Strait, causing a significant oil spill.

- **Geographical Location**: Connects the Black Sea and the Sea of Azov. Separating Crimea's Kerch Peninsula (west) from Russia's Taman Peninsula (east).
- **Historical Significance**: Known historically as the **Cimmerian Bosporus** and later as the **Straits of Yenikale**, named after the Yeni-Kale fortress in Kerch.
- **Strategic Importance**: Vital for Russian exports of crude oil, grain, and liquefied natural gas, and a key geopolitical point due to its proximity to Crimea.
- **Key Harbor**: The Crimean city of **Kerch**, known for its historical and economic relevance, lends its name to the strait.

Cremia

Why in News: A severe environmental crisis unfolded in the Black Sea following a collision between two oil tankers in the Kerch Strait near Crimea, resulting in a major oil spill.

- **Location:** Located in Eastern Europe, Crimea is almost entirely surrounded by the **Black Sea and the** Sea of Azov.
  - It connects to mainland **Ukraine via the Isthmus of Perekop** and to Russia via the Crimean Bridge over the Kerch Strait.
- **Borders:** Shares maritime proximity with Romania to the west and Turkey to the south across the Black Sea.
- **Historical Significance:** Known as the **Tauric Peninsula** in early modern history, it has been under Russian occupation since 2014 after annexation.
- **Geological Features:**
  - The **Crimean Mountains** dominate the southern region, with Ai-Petri being a notable peak.
  - **Rivers:** Includes small rivers like **Salhir and Alma**.
  - The **Arabat Spit** separates the Syvash lagoons from the Sea of Azov.

Moldova

Why in News: India extended gratitude to Moldova for its crucial support during Operation Ganga, which helped evacuate over 20,000 Indian nationals stranded in Ukraine in February 2022.

- **Capital:** Chișinău
- **Neighbours: Romania** (West), **Ukraine** (North, East, and South)
- **European Union Status:** Moldova is **not part of the EU** but has **EU candidate status** as of 2022.
- **Transnistria Region:**
  - A **breakaway territory** on Moldova's eastern border across the Dniester River.
  - It is **unrecognized internationally** and has ongoing geopolitical significance.
- **Geographic Features:**
  - **Rivers:** Dniester River (major river), Prut River (border with Romania).
  - **Mountains:** Mostly **low-lying terrain** with rolling hills; **Bălți Steppe** and **Codru hills** are prominent.
  - Known for fertile land and a temperate continental climate.

Vanuatu:

Why in News: A massive earthquake of magnitude 7.3 struck Vanuatu, an island nation in the South Pacific, causing significant damage and potential casualties.

- **Location:** Vanuatu is located in the **South Pacific Ocean**.
  - East of Australia, west of Fiji, and southeast of the Solomon Islands.
- **Capital:** Port Vila, situated on the island of Efate.
- **Geographic Features:** The nation comprises **13 principal volcanic islands** and many smaller islands, with active volcanoes like Yasur, Manaro, and Garet.
- **Colonization:** Originally inhabited by Melanesians, it became a joint **Anglo-French colony** known as the New Hebrides, achieving **independence in 1980.**
- **Climate Change Vulnerability:** Vanuatu faces rising sea levels at twice the global average, making it the most at-risk country globally under the **UN's World Risk Index**

Arakan Army

Why in News: Bangladesh faces a critical threat from Myanmar's insurgent group, the Arakan Army, which has reportedly encroached on parts of its territory near **Teknaf**, heightening tensions in the region.

- **Founded in:** 2009
- **What it is:** The Arakan Army is an ethno-nationalist armed organization and the military wing of the United League of Arakan (ULA), representing the Rakhine ethnic group.
- **Aim:** Seeks greater autonomy for the Rakhine people and restoration of their sovereignty, challenging Myanmar's central government.
- **Region found in:** Based in Myanmar's Rakhine State, with operations expanding into strategic areas near Bangladesh, including the Teknaf region and Saint Martin Island.

Libya

Why in News: Sixteen Indian workers employed at Libya Cement Company in Benghazi, Libya, have alleged being held in "prison-like conditions" since protesting against contractual violations.

- **Location:** Situated in North Africa, bordered by the Mediterranean Sea to the north.
- **Capital:** Tripoli.
- **Border Nations:** Egypt (east), Sudan (southeast), Chad (south), Niger (southwest), Algeria (west), and Tunisia (northwest).
- **Geographic Features:**
  - **Mountains:** Nafusa Mountains and Jebel Akhdar are prominent.
  - **Desert:** Majority of Libya is covered by the Libyan Desert (part of the Sahara Desert).
  - **Rivers & Lakes:** Libya lacks perennial rivers; the Great Man-Made River (artificial water project) is significant.
  - **Coastline:** Over 1,770 km along the Mediterranean Sea, making it a key geographical location for trade.

Caucsus Mountain

Why in News: A recent gas leak at an Indian restaurant has drawn attention to a ski resort located in the Caucasus Mountains of Georgia.

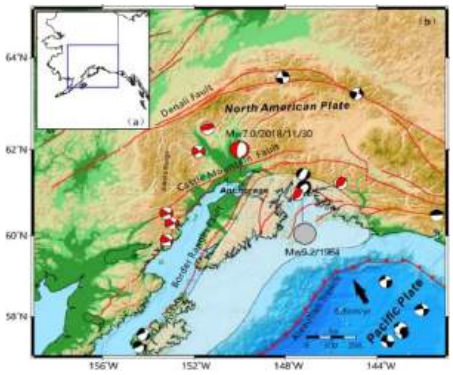
- **Spread over:** Extends across **Russia**, **Georgia**, **Armenia**, and **Azerbaijan**.
- **Peak point:** **Mount Elbrus** (5,642 meters), the highest peak in Europe.
- **Rivers:** Originates major rivers like the **Terek**, **Kura**, and **Rioni**.
- **Significance:**
  - Geopolitical boundary between Europe and Asia.
  - Biodiversity hotspot with unique flora and fauna.
  - Popular for tourism and winter sports.

Kuwait

Why in News: Indian Prime Minister will visit Kuwait for a two-day trip, marking the first visit by an Indian Prime Minister to the country in 43 years.

- **Location:** Situated in West Asia at the northern tip of the Arabian Peninsula.
- **Neighbours:** Borders **Iraq** to the north, **Saudi Arabia** to the south, and shares a maritime boundary with **Iran** in the Persian Gulf.
- **Capital:** Kuwait City.
- **Geographical Features:** Lacks major rivers or mountains; primarily a desert terrain.

Denali Fault



Why in News: New research reveals that three geologic sites along the Denali Fault were once part of a single feature that united two landmasses' millions of years ago.

- The study identifies three locations **Clearwater Mountains, Kluane Lake, and Coast Mountains** linked by 300 miles of horizontal movement, showcasing the Denali Fault's role in plate integration and crustal deformation.
- The Denali Fault is a prominent **intracontinental dextral (right-lateral)** strike-slip fault in western North America. It stretches from northwestern **British Columbia, Canada**, to **central Alaska** in the United States.
- **Tectonic Setting:** The fault lies along the boundary where the **Pacific Plate is subducting beneath the North American Plate,** marking a zone of active tectonic interaction.
- **Key sites and their locations:**
    a. **Clearwater Mountains:** Located in Southcentral Alaska (USA).
    b. **Kluane Lake Region:** Located in Southwestern Yukon, Canada.
    c. **Coast Mountains:** Located in Near Juneau, southeastern Alaska (Canada & USA).

Panama Canal

Why in News: The Panama Canal, a crucial global shipping route, has recently been at the centre of geopolitical tension as former U.S. President Donald Trump threatened to reclaim control over it.

- **Location and Connection:** Situated in Panama, **Central America,** the canal connects the **Atlantic and** Pacific Oceans.
- **History:**
    - **Initial Efforts:** Spanish colonizers envisioned the canal in the 16th century, with the French starting construction in 1878, which ultimately failed.
    - **U.S. Construction:** Post-Panama's independence in 1903, the **U.S. built the canal (1914**), overcoming engineering challenges but witnessing over 5,000 worker deaths.
    - **Transfer to Panama:** In 1977, a treaty under U.S. President Jimmy Carter and Panamanian leader Omar Torrijos paved the way for Panama's full control, effective from **December 31, 1999.**
- **Present Ownership:** The Panama Canal is managed by the **Panama Canal Authority**, a government entity of Panama.
- **Features:** Spanning **82 km (51 miles)**, it uses interconnecting locks to lift ships **26 meters** (85 feet) above sea level via **Gatun Lake.**
- **Working of the Canal:** Ships are transported through **a lock system that balances water levels** to move vessels efficiently between the two oceans, saving around 8,000 miles of travel.

Kilauea Volcano

- **Location:** Situated on the **southeastern shore of Hawaii's Big Island**, within Hawaii Volcanoes National Park.
- **Type of Volcano**: An **active shield volcano**, characterized by its broad, sloping profile and fluid lava flows.
- **Geographic Formation**: Part of the Hawaiian hotspot and the **Hawaiian-Emperor seamount chain**, Kilauea is the second-youngest volcanic product of this hotspot.
    - Features a **large caldera** at the summit and two active rift zones.

Greenland:

Why In News: : US President has once again expressed interest in buying Greenland, and Greenland has again stated it is not for sale.

About Greenland:

- **Location:** Greenland is the world's largest island, situated between the Arctic and Atlantic Oceans, east of the Canadian Arctic Archipelago.
- **Controlled by:** An autonomous territory under the Kingdom of Denmark.
- **Features:**
    - **Three-quarters of its surface** is permanently covered by an ice sheet.
    - Inhabited predominantly by **Inuit communities** who migrated from Alaska via Northern Canada.
- **Significance for the USA**:
    - **Geopolitical Strategy:** Greenland's location supports U.S. control over vital Arctic passages, including the Northeast, Northwest, and Central routes.
    - **Military Significance:** Historical use by the U.S., such as Camp Century, highlights its potential for Arctic defence and operations.
    - **Economic Potential:** The melting ice unveils vast reserves of minerals and energy resources.
    - **Global Influence:** Crucial for countering China's Polar Silk Road initiative and securing strategic dominance in the Arctic.

3. WHERE IN INDIA?

Dal Lake

Why in news: Uber has launched its first water transport service in Asia, **Uber Shikara**, on Dal Lake in Jammu and Kashmir.

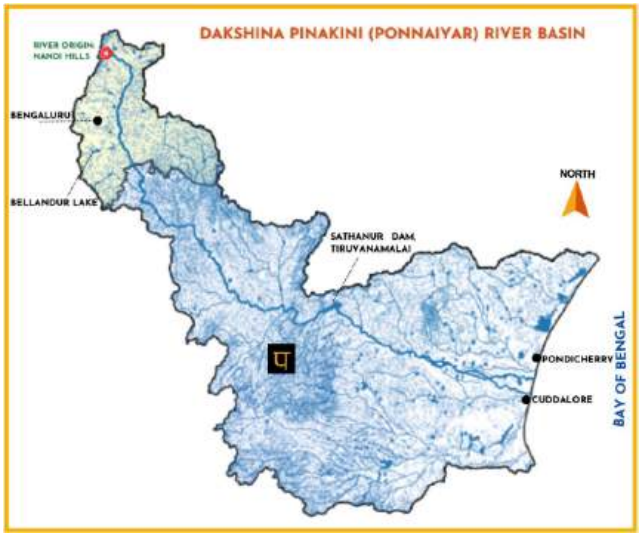
- Known as the "Jewel in the crown of Kashmir" and "Srinagar's Jewel", surrounded by Pir Panjal
- Sprawls 18 square kilometres, part of a 21.1 square kilometres natural wetland.
- Features floating gardens called "Raad" blooming with lotus flowers in July and August.
- Divided into four basins: Gagribal, Lokut Dal, Bod Dal, and Nagin
- Features a vibrant floating market selling goods from wooden shikaras.
- Depth varies from 6 meters at the deepest to 2.5 meters at the shallowest.
- Winter freezes can cause parts of the lake to freeze.

Jammu & Kashmir

Why in news: The Government of India, in collaboration with the World Bank and the Jammu and Kashmir administration, plans to develop four new tourist destinations in the Union Territory.

- **Kokernag:** Anantnag district. Famous for its freshwater springs and lush gardens, it is known as the "**Botanical Garden of Kashmir**."
- **Baradari:** Reasi district. An architectural marvel near the **Chenab River**, known for its historical significance and picturesque surroundings.
- **Bhadarwah:** Doda district. Often called "**Mini Kashmir**," it is renowned for its scenic beauty, forests, and adventure tourism.
- **Doodhpathri:** Budgam district. A pristine meadow surrounded by coniferous forests, it is popular for its serene ambiance and the **Shaliganga River.**

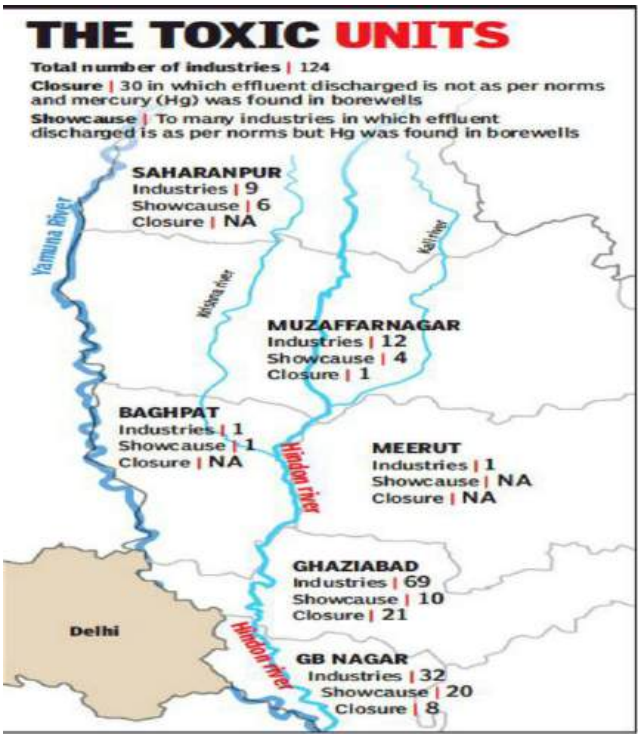
Pennaiyar river



Why in News: Cyclone Fengal brought unprecedented rainfall to Tamil Nadu's Pennaiyar river basin, resulting in heavy inflows into the Sathanur Dam, which was already at 95% capacity. It is built across the **Pennaiyar River** in Tamil Nadu.

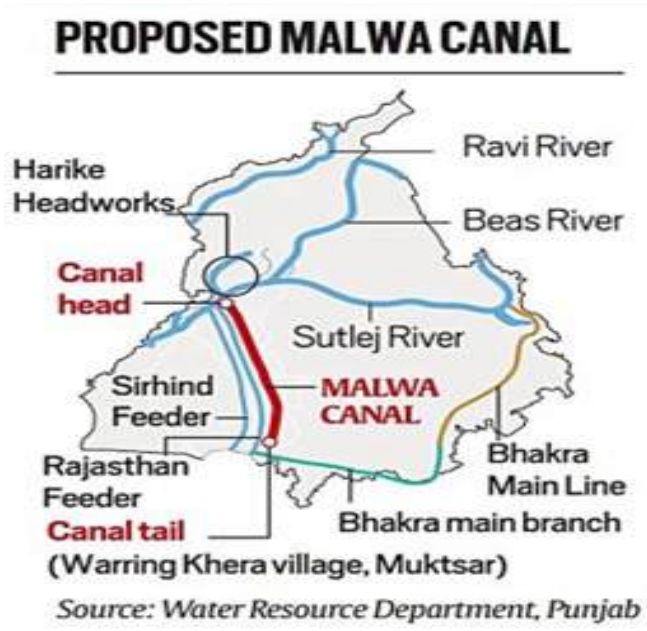
- **Origin:** Nandi Hills, Karnataka.
- **Course:** Flows through Karnataka, Tamil Nadu, and Andhra Pradesh before draining into the Bay of Bengal.
- **Length:** 497 km, making it Tamil Nadu's second-longest river after the Kaveri.
- **Other Names:** South Pennar River, Dakshina Pinakini in Kannada, Thenpennai or Ponnaiyar in Tamil.
- **Cities on Banks:** Bangalore, Hosur, Tiruvannamalai, and Cuddalore.

Hindon River



Why in News: The Hindon River, once vital for communities in Western Uttar Pradesh, is now a toxic stretch due to unchecked industrial and domestic waste.

- Its pollution has caused severe health and environmental challenges, leading to its declaration as a **"dead river"** by the CPCB.
- **Source**: Lower Shivalik ranges, Saharanpur District, Uttar Pradesh.
- **Flows through**: Uttar Pradesh only.
- **Course**: Travels for approximately **400 km**, merging into the Yamuna River in Noida.
- **Major Cities**: Saharanpur, Muzaffarnagar, Shamli, Baghpat, Ghaziabad, Gautam Buddh Nagar.
- **Tributaries**:
  - **Kali (West) River**: Carries industrial and domestic pollutants.
  - **Krishni River**: Contributes additional pollution from agricultural runoff and industrial waste.



Malwa Canal:

Why in News: The Malwa Canal project in Punjab seeks to improve irrigation in southern regions but raises environmental concerns over forest land impacts.

- **States Involved:** Punjab and Rajasthan.
- **River Source:** Originates from the Sutlej River at Harike Headworks in Ferozepur district.
- **Length and Depth:** The canal spans 149.53 kilometers and is 12 feet deep.
- **Aim:** Designed to irrigate nearly 2 lakh acres of farmland in southern Punjab.
- **Significance:** Alleviates water scarcity in southern Punjab, provides equitable water distribution within Punjab while maintaining allocations to Rajasthan and Haryana, boosts agricultural productivity and addresses drought-prone areas.

Brahmaputra River

Why in News: China has approved the construction of the world's largest dam, stated to be the planet's biggest infra project costing $137 billion, on the Brahmaputra River.

- **Different Names: Tibet**: Yarlung Tsangpo, **India**: Dihang in Arunachal Pradesh; Brahmaputra in Assam, **Bangladesh**: Jamuna.
- **Origin: Source:** Chemayungdung Glacier, near Mount Kailash, Tibet. Divided from Manasarovar Lake by **Mariam La Pass**.
- **Course: Tibet**: Gentle slope through the Tsangpo valley, receiving tributaries like Raga Tsangpo. **India**: Breaks through the Himalayas to enter Arunachal Pradesh as Dihang, merging with Lohit and Dibang to become Brahmaputra. **Bangladesh**: Merges with the Ganga as Jamuna to form the Sunderbans delta.
- **Major Tributaries: Left Bank**: Dibang, Lohit, Burhi Dihing, Dhansiri. **Right Bank**: Subansiri, Manas, Teesta, Kameng.
- **Dams on Brahmaputra: Zam Hydropower Station** (China, operational since 2015).