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- Foreign Investment and Indian Economic Goals
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SHORT ARTICLES

1. POLITY & GOVERNANCE

1.1 SPECIAL CATEGORY STATUS

Context

- The demand for Special Category Status (SCS) by Andhra Pradesh (AP) stems from the significant economic and financial challenges the state faced post its bifurcation in 2014, which led to the creation of Telangana.

Background and Reasons for Demand

- **Loss of Hyderabad:** Hyderabad, a major economic hub, was retained by Telangana post-bifurcation, leaving Andhra Pradesh with a reduced revenue base. Hyderabad was a major contributor to the state's revenue, particularly from sectors like software exports.
- **Economic Disparities:** Post bifurcation, Andhra Pradesh faced challenges such as a larger population base and debt burden but a reduced share of revenues and economic resources.
- **Developmental Needs:** Andhra Pradesh, primarily an agrarian state, struggled with economic buoyancy and revenue deficits compared to the newly formed Telangana.

What is Special Category Status (SCS)?

- Special Category Status (SCS) is a classification granted by the Government of India to certain states based on specific criteria. **This status was introduced by the Fifth Finance Commission in 1969 to provide preferential treatment in the form of financial assistance and other benefits to states that face geographical and socio-economic disadvantages.**

Criteria for Special Category Status

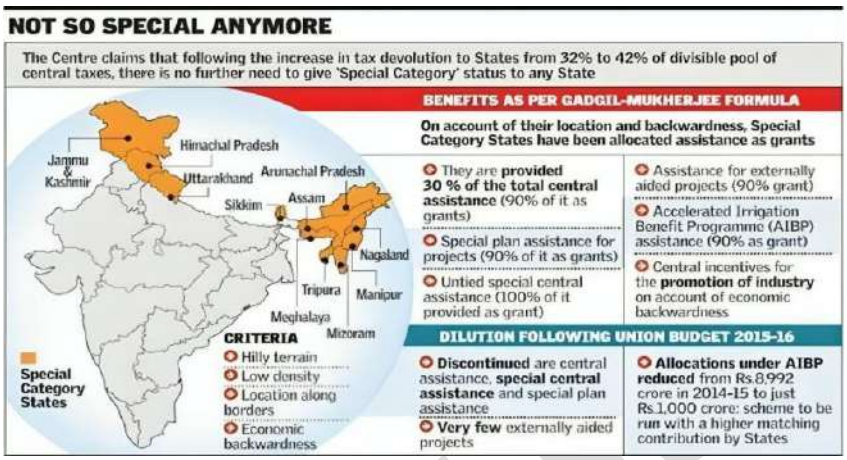
There's no officially defined set of criteria, but several factors are generally considered when determining a state's eligibility for SCS. These factors can be broadly categorized as follows:

- **Hilly and difficult terrain:** Rugged terrain can pose significant challenges to infrastructure development, agriculture, and overall economic activity. (e.g., Himachal Pradesh)
- **Low population density:** States with sparse populations may have limited resources and struggle to develop infrastructure efficiently. (e.g., Arunachal Pradesh)
- **Economic backwardness:** States with low levels of economic development, measured by factors like GDP per capita or poverty rates, may require additional support to catch up with other regions. (e.g., some Northeastern states)
- **Strategic location along borders:** States bordering other countries may require additional resources for security purposes and infrastructure development along the border. (e.g., Jammu & Kashmir)
- **Presence of indigenous populations:** States with a high proportion of tribal populations may face challenges related to social inclusion, education, and healthcare. Tribal communities often reside in remote areas and may require targeted development programs.

Current Status of SCS

- The **14th Finance Commission recommendations (2015) removed the special category status** for all states except for the Northeastern states and three hill states:
  - **Northeastern states:** Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura
  - **Hill states:** Jammu & Kashmir, Himachal Pradesh, Uttarakhand

Benefits of Special Category Status



- **Financial Aid and Grants:** SCS states receive higher grants-in-aid from the central government, which is crucial for funding development projects and improving infrastructure. Central schemes in SCS states are funded up to 90%, compared to 70% in non-SCS states, providing significant fiscal relief.
- **Industrial and Economic Incentives:** SCS provides special incentives like income tax exemptions, custom duty waivers, reduced excise duty, corporate tax exemptions, GST concessions, and lower state and central taxes. These incentives are aimed at attracting investments and promoting industrialization, essential for economic growth.
- **Special development schemes:** Considering the unique challenges faced by SCS states, the central government may design special development programs to address their specific needs. These programs may focus on infrastructure development in difficult terrain, promoting tourism in remote areas, or improving healthcare and education services for tribal populations.

Challenges of Special Category Status (SCS)

- **Potential dependency on central funds:** Over-reliance on central government assistance can discourage SCS states from developing their own revenue sources and taking greater ownership of their development process. This can lead to a situation where states wait for central government funds instead of proactively seeking out investments and economic opportunities.
- **Coordination between central and state governments:** Effective implementation of SCS benefits requires smooth coordination between the central and state governments. Delays or disagreements in planning and execution can hinder the effectiveness of SCS programs.
- **Influence on state politics and governance:** The benefits associated with SCS can become a point of contention in state politics. Political parties may focus on securing SCS benefits for their states, potentially overshadowing broader development goals and good governance practices.

Current Issues and Debates

Reevaluation of Criteria

- **Changing Economic Landscape:** There are ongoing calls to reevaluate the criteria for SCS in light of the evolving economic and developmental landscapes. The economic dynamics have changed significantly since the criteria were first established in 1969.
- **Equitable Development:** Some argue that the current criteria do not adequately address the diverse needs of states and that new metrics of development and economic performance should be considered.

14th Finance Commission's Recommendations

- **Shift to Increased Tax Devolution:** The 14th Finance Commission recommended increasing the tax devolution from the central government to the states from 32% to 42%, suggesting that this would better address the resource gaps of states instead of continuing with the SCS mechanism.
- **Phasing Out SCS:** Following the recommendations, there has been a move towards phasing out SCS in favour of a more

uniform approach to financial support for all states.

Political and Regional Demands

- **New Applications:** Several states, such as Andhra Pradesh, Bihar, and Odisha, have made strong cases for being granted SCS due to their specific developmental challenges. This has led to a debate about the fairness and consistency of granting SCS.
- **Balancing Interests:** The central government faces the challenge of balancing the demands of states requesting SCS with the need to maintain fiscal discipline and ensure equitable development across the country.

Way Forward

- **Revisiting the Criteria:** A comprehensive review of the existing SCS criteria might be undertaken. This could involve including new factors like climate vulnerability indices, infrastructure development needs, and social development indicators alongside traditional considerations like geographical terrain and economic backwardness.
- **Multi-Tiered System:** A system with different levels of support based on the specific challenges faced by each state could be explored. This would allow for a more nuanced approach to addressing regional disparities.
- **Focus on Specific Challenges:** Instead of a broad-brush SCS designation, the central government could focus on providing targeted support for specific challenges. This might involve launching dedicated programs for infrastructure development in difficult terrain, promoting economic activity in remote areas, or improving healthcare and education services in tribal regions.
- **Alternative Mechanisms:** Exploring alternative mechanisms for supporting disadvantaged states is also an option. This could involve:
  - Formula-based allocation of central government funds that considers a wider range of developmental needs.
  - Performance-based incentives that reward states for achieving specific development goals.

Conclusion

- The Special Category Status (SCS) in India has been instrumental in addressing regional disparities, but it needs to be reassessed to adapt to changing economic and developmental conditions. A flexible, inclusive approach can ensure benefits reach the most needy states, promoting balanced and equitable development, addressing historical disadvantages and preparing states for future challenges.

1.2 SHORT ARTICLES

National Crisis Management Committee

Context

- The Cabinet Secretary chaired a National Crisis Management Committee (NCMC) meeting to review and discuss preparedness measures for heat waves and forest fires.

About National Crisis Management Committee (NCMC)

- The **Cabinet Secretary, the highest-ranked civil officer in the Union government**, is in charge of the NCMC.
- The convenor of the committee is an officer of the Cabinet Secretariat who is in charge of running meetings, keeping minutes, and making sure everything runs well.

Functions

- **Crisis Coordination**: Ensures efficient decision-making by bringing together key officials from different ministries and agencies to assess the situation and formulate response strategies.

- **Resource Allocation**: Prioritizes needs and mobilizes support from relevant departments and organizations, ensuring efficient allocation of resources during crises.
- **Information Dissemination**: Ensures accurate and timely information is shared with all stakeholders, including the public, media, and international partners.
- **Policy Formulation**: Contributes to developing policies and guidelines for disaster preparedness, response, and recovery.

About Cabinet Secretary

- The top executive official and senior civil servant of the Government of India, heading the Cabinet Secretariat.
- The **term length of the Cabinet Secretary has been fixed to a maximum of four years.**

Functions and Powers

- **Chief Coordinator**: Heads the Cabinet Secretariat, acting as the chief coordinator of the central government.
- **Chairmanship**: Chairs the Civil Services Board, the Committee of Secretaries on Administration, the Conference of Chief Secretaries of States, and the Senior Selection Board.
- **Information Management**: Ensures that the President of India, the Vice-President, and ministers are kept informed of major activities across departments.

Council of Ministers

Context

- The Central Council of Ministers, led by the Prime Minister, forms the backbone of the country's governance structure, with distinct roles and responsibilities allocated to different categories of ministers.

Composition of the Council of Ministers

- **Prime Minister**: As the head of the Central Council of Ministers, the Prime Minister holds the highest executive authority. Key responsibilities include decision-making on policies, overseeing ministries, and chairing Cabinet meetings. The Prime Minister plays a pivotal role in the administration of the country.
- **Cabinet Ministers**: These are the senior-most members after the Prime Minister and oversee

significant ministries such as Home Affairs, Finance, Defence, etc. They participate in policy formulation, attend Cabinet meetings, and collectively bear responsibility to the Lok Sabha (House of the People).

- **Ministers of State (Independent Charge)**: These ministers head specific ministries or departments independently, without direct oversight from Cabinet Ministers. They have the authority to make decisions within their portfolios and report directly to the Prime Minister.
- **Ministers of State (MoS):** Assist Cabinet Ministers in their duties, handling specific responsibilities delegated by their respective ministers. They support policy implementation, and participate in parliamentary proceedings, but do not independently administer a ministry.

Duties and Responsibilities

- **Policy Formulation and Implementation**: The Council of Ministers is responsible for formulating policies and implementing government programs across various sectors like education, health, infrastructure, etc.
- **Parliamentary Responsibilities**: Ministers participate in parliamentary sessions, debates, and committee meetings. They represent their ministries, respond to questions from legislators, and contribute to legislative processes.
- **Administrative Oversight**: Cabinet Ministers and MoS oversee the functioning of their ministries, ensuring efficient administration and adherence to government policies. They intervene in matters concerning operations and strategic planning within their portfolios.
- **Collective Responsibility**: As per Article 75 of the Constitution, the Council of Ministers is collectively responsible to the Lok Sabha. They are accountable for government decisions and must resign collectively if they lose the confidence of the lower house of Parliament.

Difference Between MoS and MoS with Independent Charge

- **Minister of State (MoS):** Assists Cabinet Ministers in their responsibilities, handles specific tasks as assigned, and supports policy implementation. MoS does not independently administer a ministry or department.
- **Minister of State (Independent Charge):** Administers a ministry or department independently, without oversight from Cabinet Ministers. They have significant decision-making authority within their portfolios and report directly to the Prime Minister.

Conclusion

- The Central Council of Ministers in India operates under constitutional provisions and statutory frameworks to ensure effective governance, policy implementation, and parliamentary accountability. With defined roles for Cabinet Ministers, MoS (Independent Charge), and MoS, they collectively contribute to addressing national challenges, fostering development, and upholding governance integrity across the country. Their roles are crucial in shaping policies, executing government programs, and representing the interests of the public in the legislative arena.

Post Office Act, 2023

Context

- The Post Office Act 2023 replaced the Indian Post Office Act after 125 years on June 18, 2024.

Key Provisions of the Post Office Act, 2023

- The **Union government can authorize officers to intercept, open, or detain any postal item.**
- The **Post Office and its officers are exempted from liability for loss, misdelivery, delay, and damage during the course of postal services.**
- The new Act removes penalties and offences outlined in the 1898 Act, **reducing accountability and oversight of postal officials.**
- **The Act includes private courier services under its regulatory framework**, extending the government's authority to intercept and detain postal articles.
- The Act abolishes Section 4 of the 1898 Act, which granted the Centre exclusive privilege to convey all letters by post.

Legislative Context and Criticism

- **Retention of Colonial Era Provisions:** The Act retains broad interception powers similar to

colonial-era provisions, criticized for maintaining harsh measures from the old law.

- **Lack of Accountability:** The elimination of penalties for misconduct and other offences by postal officials is viewed as reducing accountability and potentially undermining public trust in postal services.
- **Impact on Fundamental Rights:** Concerns that the Act's interception and detention provisions could infringe on privacy rights and freedom from arbitrary state action.
- **Regulation of Modern Postal Services:** The Act recognizes the decline in exclusive postal privileges and is criticized for not offering innovative solutions to adapt India's postal infrastructure to contemporary challenges and opportunities.

India Post

- India Post, operated by the Department of Posts under the Ministry of Communications.
- **Established in the 1850s during British rule,** it has evolved into the world's largest postal network, with over 1.50 lakh post offices predominantly serving rural areas.
- **Services Provided by India Post**
  - Delivery of letters and parcels across India.
  - Money transfer services through money orders.
  - Management of Small Savings Schemes like the Public Provident Fund (PPF), National Savings Certificates (NSC), and Post Office Savings Schemes.
  - Retail outlets for bill payments, sale of forms, and distribution of government services like pensions and wages.
  - **India Post Payments Bank (IPPB) launched in 2018**, offering banking services like savings accounts, current accounts, and digital payments.
  - Major role in e-commerce logistics, partnering with online retailers for parcel delivery, including cash-on-delivery services.

India's Law against use of Unfair Means in Exams

Context

- The Public Examinations (Prevention of Unfair Means) Act, 2024 aims to tackle paper leaks and maintain the integrity of public exams.

Background

- **Frequent Paper Leaks**: The Act was enacted in response to numerous incidents of paper leaks across different states, disrupting recruitment processes and negatively impacting millions of candidates.
- **Lack of Existing Legislation**: Prior to this Act, there was no comprehensive legislative framework to effectively address and penalize those involved in such malpractices.

Key Highlights of the Law

- **Enhancing Transparency and Fairness**: The primary goal of the Act is to enhance the transparency, fairness, and credibility of public examinations in India. This involves preventing the use of unfair means and malpractices that can compromise the integrity of these examinations.
- **Section 3 of the Act**: This section provides a broad definition of "unfair means," including:
  - **Leakage of Question Papers or Answer Keys**: Unauthorized distribution of examination materials before or during the exam.
  - **Unauthorized Access to Examination Materials**: Gaining access to confidential examination content without permission.
  - **Tampering with Answer Sheets or Computer Systems**: Interfering with answer sheets or digital systems used in the examination process.
  - **Providing Unauthorized Assistance**: Unauthorized persons offering solutions or help to candidates during exams.
  - **Creating Fake Websites or Conducting Fake Examinations**: Establishing fraudulent websites or holding bogus

exams to deceive candidates.
    - **Other Acts Undermining Fairness**: Any additional actions that compromise the fairness of the examination process.
- **Coverage of Public Examinations:** The Act covers examinations conducted by authorities such as: the Union Public Service Commission (UPSC), Staff Selection Commission (SSC), Railway Recruitment Boards, Institute of Banking Personnel Selection (IBPS), National Testing Agency (NTA), Other central government ministries or departments involved in recruitment or admissions.
- **Empowerment of Law Enforcement**: Law enforcement agencies are empowered to investigate and prosecute offenders, with stringent measures to combat organized crime related to examination malpractices.

Specific Offenses and Punishments

Criminal Offenses

- **Cognizable Offenses**: Offenses under the Act are cognizable, meaning police can arrest without a warrant.
- **Non-bailable Offenses**: Bail is not guaranteed and is at the discretion of the magistrate.
- **Non-compoundable Offenses**: Cases cannot be withdrawn even if the parties reach a settlement.

Penalties

- **Individuals**: Offenders can face imprisonment ranging from three to five years and a fine of up to Rs 10 lakh.
- **Service Providers**: Entities involved in supporting the examination process, such as those providing computer resources, can be fined up to Rs 1 crore.
- **Organized Crime**: For organized paper leaks involving groups conspiring for wrongful gain, the punishment includes imprisonment for a minimum of five years, extendable up to ten years, and a fine of at least Rs 1 crore.

Conclusion

- The Public Examinations (Prevention of Unfair Means) Act, 2024, represents a significant and comprehensive response to the challenges of paper leaks and unfair practices in public examinations in India. By establishing strict penalties and expanding the scope of punishable offences, the Act aims to protect the integrity of crucial examinations for admissions and recruitment.

Leader of Opposition (LOP)

- The **LOP is the head of the largest opposition party in Lok Sabha with at least one-tenth of the seats.**
- They are **not mentioned in the Constitution** but still hold significant responsibilities. They lead crucial committees like Public Accounts, Public Undertakings, and Estimates, as well as Joint Parliamentary Committees.
- The LOP is **part of selection committees for appointing heads of bodies like the Central Vigilance Commission and the CBI.**
- They offer constructive criticism of government policies and present an alternative government.
- The **LOP in both Houses receives statutory recognition and benefits under the Salaries and Allowances of Leader of Opposition in Parliament Act, 1977**, on par with a cabinet minister.

Crime and Criminal Tracking Network Systems (CCTNS)

Context:

- Ahead of the implementation of new criminal laws, at least 23 modifications have been made to the Crime and Criminal Tracking Network Systems (CCTNS), an online platform used by over 16,000 police stations to register FIRs.

Details

- **CCTNS was conceptualized under the National e-Governance Plan (NeGP) of India in 2009**. It operates as a Mission Mode Project (MMP), aimed at enhancing the efficiency and effectiveness of policing at the police station level across the country.

- The primary objectives include making police functioning citizen-friendly, transparent, and automated, improving service delivery, facilitating crime investigation, and enabling better police management.

Key Features and Objectives

- **Integrated System:** CCTNS aims to interlink all police stations under common application software. This integration allows for seamless sharing of crime and criminal records among police stations, district headquarters, state/UT headquarters, and other police agencies.
- **Citizen Services:** It provides citizen-centric services such as reporting and tracking complaints, requests for antecedent verifications, and other police-related services through digital platforms.
- **Investigation Support:** Provides investigating officers with tools, technology, and information to aid in the investigation of crimes and detection of criminals. This includes access to centralized databases and analytics capabilities.
- **Enhanced Police Functionality:** Improves police functioning in various domains including law and order maintenance, traffic management, and overall operational efficiency.
- **Case Management:** Tracks the progress of cases, from registration to court proceedings, thereby reducing manual record-keeping and redundant paperwork.
- **Collaborative Approach:** Implemented through close collaboration between the states/UTs and the Union Government, facilitated by the National Crime Records Bureau (NCRB) as the central nodal agency.

National Crime Records Bureau (NCRB)

- Founded in 1986 under the Ministry of Home Affairs (MHA).
- **Purpose:** Serves as a repository of information on crime and criminals, as well as a central agency for collecting, analyzing, and disseminating crime-related data.
- **Functions:** Collects data on crime statistics, accidental deaths, suicides, and prison statistics which it compiles and publishes annually.
- **Central Finger Print Bureau:** Operates as a national repository for fingerprints across the country, aiding in the identification and verification of individuals involved in criminal activities.
- **IT Support:** Assists states in capacity building related to Information Technology, including CCTNS implementation, network security, and digital forensics.
- **Training:** Provides training and support to enhance the technical capabilities of law enforcement agencies in utilizing modern technology for crime prevention and investigation.

Naming of States

Context

- The resolution passed by the Kerala State Legislative Assembly advocating the renaming of the state from 'Kerala' to 'Keralam' represents a significant move rooted in cultural identity and linguistic heritage.

Details

- The name 'Keralam' is derived from Malayalam, the predominant language of Kerala, and has historical roots dating back to ancient times. **References to 'Keralaputra' in Emperor Ashoka's Rock Edict II (257 BCE)** indicate the antiquity of the term, associated with the Chera dynasty, one of the ancient dynasties of southern India.
- 'Keralam' is the Malayalam form of the state's name, whereas 'Kerala' is the Anglicized version used in English and official documents. Renaming the state to 'Keralam' aims to align administrative practices more closely with local sentiment and affirm Kerala's cultural and linguistic identity.

Renaming a state

- Renaming a state involves a **constitutional process outlined primarily in Articles 3 and 4 of the Indian Constitution**.

- The process of renaming a state **involves initiation either by Parliament or by the concerned state legislature,** preparation of a Constitution Amendment Bill, parliamentary approval by a simple majority, and finally, assents by the President. This ensures that changes to state names reflect a democratic and constitutional process, respecting both national unity and regional identity.

Initiation of the Renaming Process

Initiation by Parliament

Proposal and Preparation of Bill:

- The process can be initiated by a proposal from either Parliament or the State Legislature concerned.
- If the proposal comes from a state, it is forwarded to the Home Ministry of the Union Government.
- The Home Ministry then prepares a note for the Union Cabinet detailing the proposed amendment to the First Schedule of the Constitution, which lists the names of states and their territorial jurisdictions.

Introduction of Constitution Amendment Bill:

- Once approved by the Union Cabinet, a Constitution Amendment Bill is introduced in Parliament. This bill aims to amend the First Schedule of the Constitution to reflect the new name of the state.
- The bill must be introduced in either House of Parliament (Lok Sabha or Rajya Sabha). It requires the recommendation of the President before being introduced.

Procedure in Parliament

Referral to State Assembly:

- Before the bill is introduced in Parliament, the President sends the bill to the Legislative Assembly of the concerned state(s) for their views.
- The state legislature has a specified period to express its views on the proposed renaming. However, these views are not binding on either the President or Parliament.

Passing of the Bill:

- After receiving the views of the state legislature (or after the specific period expires), the bill is discussed in Parliament.
- The bill must pass in both Houses of Parliament (Lok Sabha and Rajya Sabha) by a simple majority of members present and voting. A simple majority means more than 50% of the members present and voting provided the quorum (minimum number of members required to be present for valid proceedings) is met.

Presidential Assent:

- Once passed by Parliament, the bill is sent to the President for assent.
- Upon receiving the President's assent, the Constitution Amendment Bill becomes law.
- The name of the state is officially modified as per the provisions of the amended First Schedule of the Constitution.

Key Points to Note

- **State Legislature Views:** While the views of the state legislature are sought, Parliament is not bound by these views when deciding on the renaming.
- **Constitutional Amendments:** Renaming a state requires a constitutional amendment because it involves altering the First Schedule of the Constitution, which lists the states and their names.
- **Legal Status:** Once the President gives assent to the Constitution Amendment Bill, the new name of the state becomes legally binding and official.

Oath of MPs

Context

- The first session of the 18th Lok Sabha has started, and MPs have taken the oath before starting their legislative duties.

Parliamentary Oath in India

- **An MP's election win does not guarantee their participation in House proceedings; they must take an oath or affirmation, as per the Constitution (Article 99),** to debate and vote in the Lok Sabha.
- The parliamentary oath is a constitutional requirement that all Members of Parliament (MPs) must fulfill before they can participate in the proceedings of the Lok Sabha (House of the People) or Rajya Sabha (Council of States).

- The **oath is prescribed in the Third Schedule of the Indian Constitution**.

Contents of the Oath

- MPs swear or affirm to bear true faith and allegiance to the Constitution of India.
- They pledge to uphold the sovereignty and integrity of India and to faithfully discharge their duties as MPs.

Initiation and Process

- **Initiation:** The oath-taking ceremony is presided over by the Speaker (pro tem), who is appointed by the President under Article 95(1) of the Constitution until a new Speaker is elected.
- **Process:** MPs must submit their election certificate to the Lok Sabha staff before taking the oath. This requirement was introduced to prevent incidents like a mentally unsound individual posing as an MP and taking the oath in 1957.
- **Languages:** MPs can take their oath in either English or any of the 22 languages specified in the Eighth Schedule of the Constitution.
- **Variations:** MPs are required to follow strictly to the text of the oath. Any deviations, such as adding suffixes or personal phrases, are not recorded, and MPs may be asked to retake the oath if such deviations occur.

Consequences of Not Taking Oath

- It is mandatory for MPs to take the oath or affirmation to participate in debates and voting in the Parliament.
- **Article 104 of the Constitution imposes a financial penalty of Rs 500 if an MP participates or votes without taking the oath.**

Evolution of the Oath

- The oath has undergone amendments over the years. Initially, the draft Constitution did not include references to God in oaths, but amendments were made during the Constituent Assembly debates to accommodate religious beliefs while also allowing non-believers to affirm solemnly.
- The oath was again amended in 1963 to include a commitment to uphold India's sovereignty and integrity, reflecting national integration concerns.

Conclusion

- The parliamentary oath in India is not just a procedural formality but a constitutional requirement that highlights the commitment of MPs to uphold the Constitution and serve the nation faithfully. It ensures that MPs fulfill their duties responsibly and in accordance with the democratic principles enshrined in the Constitution.

Special Cases - MPs in Jail: If an MP is in jail, they can take the oath in Parliament to avoid their seat being declared vacant due to non-attendance for 60 days, as specified by the Constitution.

Telecom Act

Context

- The Union Government enforced the Telecommunications Act, 2023 to modernize the regulation of telecommunication services, replacing older colonial laws.

Objectives and Scope

The Telecommunications Act, 2023, was enacted to amend and consolidate laws related to telecommunication services and networks. Its primary objectives include:

- **Modernization and Consolidation:** The Act aims to replace outdated legislation like the Indian Telegraph Act, 1885, and the Indian Wireless Telegraph Act, 1933, to align the regulatory framework with current technological advancements and operational needs.
- **Regulatory Environment:** Creating a conducive regulatory environment that fosters growth, innovation, and investment in the telecommunications sector.

Salient Features

Definitions

- **Clarity and Certainty:** The Act provides clear definitions of terms used in the telecommunications sector. This clarity reduces ambiguity and enhances investor confidence, thereby promoting ease of doing business.

Right of Way (RoW) Framework

- **Efficient Deployment:** A robust RoW

framework applicable to both public and private properties ensures smooth deployment of telecommunication infrastructure.

- **Non-Discriminatory Grants:** Mandating non-discriminatory RoW grants broadens the scope of entities eligible for RoW permissions, aiming to reduce disputes and streamline operations.

Telecommunication Standards

- **Security and Conformity:** The Act empowers authorities to establish telecommunication standards and conformity measures. This is crucial for ensuring national security, promoting indigenous technology development, and maintaining interoperability.

National Security and Public Safety

- **Critical Infrastructure Protection:** Strong provisions are included to safeguard national security and public safety. These measures ensure that telecommunication networks, being critical infrastructure, are resilient against potential threats.

Inclusive Service Delivery, Innovation, and Technology Development

- **Universal Service Obligation Fund (USOF):** Expansion of the USOF aims to promote inclusive growth by extending telecommunication services to underserved areas.
- **Regulatory Sandbox:** Establishing a Regulatory Sandbox fosters innovation by allowing controlled testing of new technologies and business models in a supportive regulatory environment.

Protection of Users

- **Consumer Protection:** Measures against unsolicited communication and robust grievance redressal mechanisms protect consumer interests and empower users in their interactions with service providers.

Digital Implementation

- **Operational Efficiency:** Mandating digital implementation enhances operational efficiency, facilitates online dispute resolution, and supports digital transformation within the sector.

Transitional Measures

- **Continuity and Stability:** Sections 61 and 62 ensure a smooth transition from existing regulations to the new framework. This provides continuity and maintains a business-friendly environment during the transition phase.

Conclusion

- The enforcement of the Telecommunications Act, 2023, marks a significant milestone in India's regulatory journey for the telecommunications sector. It not only modernizes the legal framework but also addresses crucial aspects like infrastructure development, national security, consumer protection, and innovation promotion.

Pro Tem Speaker

Context

- The pro-tem Speaker of the Lok Sabha holds a critical role in the parliamentary proceedings of India, particularly during the transitional phase between the dissolution of the previous Lok Sabha and the election of a new Speaker for the newly elected Lok Sabha.

About Pro-tem Speaker

- The **pro-tem Speaker is a temporary position appointed to facilitate the essential functions of the Speaker** until a regular Speaker is elected by the members of the newly constituted Lok Sabha.

Key Responsibilities

- **Administering Oaths:** The primary duty of the pro-tem Speaker is to administer the oath or affirmation to all newly elected Members of Parliament (MPs) before they can officially take their seats in the Lok Sabha. This duty is mandated by Article 99 of the Indian Constitution.
- **Conducting Initial Proceedings:** The pro-tem Speaker presides over the first session of the newly elected Lok Sabha. This includes convening the House, administering oaths to MPs, and overseeing any preliminary proceedings necessary for the functioning of the Lok Sabha until a regular Speaker is elected.

Appointment of the Pro-tem Speaker

- The pro-tem Speaker is usually the senior most member of the Lok Sabha in terms of continuous years of membership. This seniority ensures that the pro-tem Speaker has substantial experience and familiarity with parliamentary procedures.

Process

- **Identification:** After a general election, the Government of India prepares a list of the senior most Lok Sabha members based on their years of continuous service in the House.
- **Approval and Appointment:** This list is submitted to either the Minister of Parliamentary Affairs or directly to the Prime Minister for approval.
- **Presidential Appointment:** Upon approval, the President of India appoints the pro-tem Speaker from this list. The appointment is formalized through an oath-taking ceremony held at the Rashtrapati Bhavan (President's House).
- **Assistance in Oath Administration:** Alongside appointing the pro-tem Speaker, the President also appoints three other elected members of the Lok Sabha to assist in administering oaths to the newly elected MPs.

Significance of the Pro-tem Speaker

- **Ensuring Continuity:** The pro-tem Speaker ensures the continuity of parliamentary proceedings immediately after a general election, facilitating the swearing-in of MPs and the initial functioning of the Lok Sabha.
- **Smooth Transition:** By overseeing the initial sessions and administering oaths, the pro-tem Speaker ensures that parliamentary business can commence without delay until a regular Speaker is elected.
- **Constitutional Role:** The role of the pro-tem Speaker is crucial in upholding the constitutional framework of parliamentary democracy in India, ensuring that the legislative branch can function effectively and democratically.

Conclusion

- The pro-tem Speaker of the Lok Sabha plays an important role in the initial stages of parliamentary functioning after general elections. By administering oaths to MPs and presiding over the early sessions, the pro-tem Speaker facilitates the smooth transition and commencement of legislative activities until a regular Speaker is elected.

1.3 SNIPPETS

Topics	Details
Living Will	• **A living will, also known as a personal directive, medical directive, or advance decision**, is a legal document that outlines the actions a person should take for their health if they cannot make decisions for themselves due to illness or incapacity. • **It can also be a power of attorney or health care proxy, allowing someone to make decisions on their behalf when they are incapacitated.** • In 2018, the **Supreme Court of India permitted living wills and passive euthanasia**, extending the right to a dignified life to the point of having a dignified death.

Principle Of Res Judicata	• The **principle of Res Judicata, meaning "a matter already judged", consists of two main components:**
	  ○ Claim Preclusion, which prevents re-litigation of the same cause of action.
	  ○ Issue Preclusion, which prevents the re-litigation of specific issues that have been already determined in a prior lawsuit between the same parties.
	• **This principle serves important purposes in the legal system such as promoting finality**, conserving resources, preventing abuse of the legal process, and ensuring consistency in legal outcomes.

	• **Exceptions to Res Judicata include cases involving fraud, collusion, clear mistakes, significant changes in circumstances**, new evidence, or matters of public interest.
Central Board Of Film Certification (Cbfc)	• It is a **statutory body under the Ministry of Information and Broadcasting** tasked with certifying films for public display in cinemas and on television. • Initially established as **the Central Board of Film Censors in 1952, it was later renamed CBFC in 1983.** • The CBFC, led by a Chairperson and 23 government-appointed members, operates from Mumbai with regional offices in major Indian cities. • It categorizes films into U (Universal), U/A (Parental Guidance), A (Adults Only), and S (Special), based on age-appropriateness and content considerations.
Security In Parliament	• Security at the Indian Parliament has been in the spotlight following the recent **shift from the Parliament Security Service (PSS) to the Central Industrial Security Force (CISF).** • Historically, the PSS and the Watch and Ward Committee managed security within the complex, ensuring the safety of Parliament proceedings, members, officials, and visitors. However, a security breach in December 2023 prompted the transition to CISF to enhance security protocols and address vulnerabilities.
Bhuvan Panchayat	• The Union Minister of State for Science and Technology launched two Geoportals, Bhuvan Panchayat and the National Database for Emergency Management (NDEM). • Bhuvan Panchayat is an **online platform developed by Regional Remote Sensing Centres (RRSCs) NRSC, Indian Space Research Organisation (ISRO)**, to provide geospatial data and services for governance and research at the Gram Panchayat level. • NDEM portal is a national geospatial database for situational assessment and decision-making during emergencies, supporting disaster forecasting organizations.
Doctrine Of Merger	• The Supreme Court has ruled that **the court's extraordinary constitutional powers under Article 142 remain unaffected and are always preserved as an exception to the doctrine of merger** and the rule of stare decisis. • The Doctrine of Merger states that **when an appellate court passes an order, the lower court's order is merged with it.** ○ This doctrine is important when multiple orders are passed by both subordinate and superior courts on a single issue, aiming to instil discipline in subordinate adjudicating authorities. • The **doctrine of Stare Decisis refers to the concept that courts must follow previously made judicial decisions** when the same legal issues are brought before them in subsequent matters.
Tele Manas	• The Ministry of Health & Family Welfare and the Ministry of Defence have signed a Memorandum of Understanding to establish a dedicated mental health helpline for the Armed Forces. • **Tele MANAS, launched in October 2022**, provides free tele-mental health services nationwide, especially in remote or under-served areas. • The **service is organized into two-tier systems**: Tier 1 includes state Tele-MANAS cells and Tier 2 includes specialists at District Mental Health Programme resources. • **The programme aims to integrate all systems providing mental health care**, including the National tele-consultation service, e-Sanjeevani, Ayushman Bharat Digital Mission, mental health professionals, Ayushman Bharat health and wellness

	centres, and emergency psychiatric facilities.
Postal Ballot Rule	• **Before the 2019 Lok Sabha elections, postal ballots were counted first, followed by EVM votes 30 minutes later**. The completion of postal ballot counting was required before the completion of EVM vote counting. ○ However**, after the 2019 elections, the Election Commission introduced new guidelines. Postal ballot counting now begins 30 minutes before EVM counting but does not have to be completed before EVM counting.** • Voters must apply by submitting Form 12 D to the Returning Officer of their constituency, who verifies eligibility and issues the postal ballot if requirements are met. The process involves receiving the postal ballot, marking the ballot, filling out a declaration form, sealing the envelope, and returning the ballot. • Postal ballots allow **registered voters, including Service Voters, Absentee Voters, Electors on Election Duty, Preventive Detainees, Essential Services Personnel, and Persons with Disabilities (PwDs) aged 85 and above, to vote via mail.**

National Testing Agency (NTA)	• It was established in 2017, as an autonomous agency within the Union Ministry of Education.
	• Its primary function is to organize and conduct national-level examinations across various fields, ensuring a standardized and efficient testing process for students seeking admission to higher educational institutions.
	• **Key Examinations Conducted by NTA:**
	  ○ Joint Entrance Examination-Main (JEE Main)
	  ○ National Eligibility cum Entrance Test-Undergraduate (NEET-UG)
	  ○ National Eligibility Test (NET)
	  ○ Common Management Admission Test (CMAT)
	  ○ Graduate Pharmacy Aptitude Test (GPAT)

1.4 ADDITIONAL TOPICS FOR READING

TOPIC NAME	UPLOADED ON IAS GYAN WEBSITE ON:
Proportional Representation	12th June, 2024
Deputation Of All India Service (Ais) Officers	15th June, 2024
Standards For Awarding Death Sentence	15th June, 2024
Burnt Memory Of EVMs	25th June, 2024

2. INTERNATIONAL RELATIONS

2.1 IS THE FUTURE PALESTINE STATE IS POSSIBLE?

Context

- Hamas's October 7, 2023 attack in Israel and the latter's continuing war on Gaza have brought the Palestine question back to the fore of West Asia.

Introduction

- The two-state solution has long been proposed as the best hope for peace in the Israeli-Palestinian conflict. It would see an independent Palestinian state established alongside the existing one of Israel - giving both peoples their own territory.

Historical Context

- Israel, a Jewish state, was created in Palestine in 1948. Palestinian territories have been under Israeli occupation since 1967. So, a two-state solution today means the creation of a legitimate, sovereign Palestine state, which enjoys the full rights like any other nation state under the UN Charter.

Origins of the two states solution

- During 1930s when the British ruled over Palestine in 1936, the British government appointed a commission headed by **Lord William Robert Peel (known as the Peel Commission)** to investigate the causes of Arab-Jewish clashes in Palestine.
- In 1937 the commission proposed a partition of Palestine into a Jewish and an Arab state. the West Bank, Gaza and **Negev desert** would make up the Arab state, while much of **Palestine's coast** and **the fertile Galilee region** would be part of the Jewish state.
- **Arabs rejected the proposal.**

UN Special Commission on Palestine (UNSCOP) partition plan

- **On 15 May 1947**, the General Assembly **(Resolution 181)** established **UNSCOP**, the Commission put forward another partition plan.

Proposal:

- Palestine be divided into three territories - a Jewish state, an Arab state and an international territory (Jerusalem). Jews, who made up roughly 32% of Palestine's population, were to have 56% of the Palestine land as per the UNSCOP plan.
- Arabs rejected the plan (India voted against it), while the Zionist leadership of Israeli settlers in Palestine accepted it.
- **On May 14, 1948** Zionists unilaterally declared the state of Israel. This triggered the first Arab-Israeli war.

Post 1948 developments

- **1967 Six-Day War:** Israel captured several territories: **West Bank and East Jerusalem** from **Jordan**, **Gaza Strip and Sinai Peninsula** from **Egypt**, **Golan Heights from Syria. Israel returned** the **Sinai Peninsula to Egypt after the 1978 Camp David Accords**.
- **Emergence of Palestinian Nationalism and the PLO:**1960s: Palestinian nationalism strengthened under the leadership of the **Palestine Liberation Organization (PLO).** The PLO initially sought the **"liberation"** of all of Palestine but later shifted to recognizing a **two-state solution based on the 1967 borders.**
- **Camp David Accords (1978):** Followed the 1973 **Yom Kippur War,** where **Egypt and Syria launched a surprise attack** on Israel. Israel and Egypt agreed to the **Framework for Peace in the Middle East**, which included:
  - ✓ The establishment of an **autonomous self-governing Palestinian** authority in the **West Bank and Gaza** and implementation of **UN Resolution 242**, calling for Israel to withdraw from territories **occupied in 1967.**
- **Oslo Accords (1993 and 1995):** Built upon the principles of the **Camp David Accords** the accord **Formalized the two-state solution**

concept led to the creation of **the Palestinian National Authority (PNA),** a self-governing body in the West Bank and Gaza, the accord never has never been materialised

Post 1995 events

- **Second Intifada:** 'The Second Uprising'; also known as the Al-Aqsa Intifada, was a major uprising by Palestinians against the Israeli occupation, characterized by a period of heightened violence in the Palestinian territories and Israel between 2000 and 2005.
- **Israel's disengagement from Gaza**: unilateral withdrawal of all Israeli security forces and settlements from the Gaza Strip in August–September 2005.

Challenges to achieving the two-state solution

Setbacks to the Oslo Process

- **In November 1995** Yitzhak Rabin, the Israeli Prime Minister who signed the Oslo Accords, was assassinated by a Jewish extremist. Yitzhak Rabin's Labour Party was defeated in subsequent elections.
- **Hamas**, an Islamist militant group, **opposed the Oslo Accords**.
- Multiple **diplomatic attempts** were made to revive the two-state plan post-Oslo **none of these efforts successfully progressed**.

Structural Factors Hindering the Two-State Solution

- **Boundary Issues**: Israel captured more territories in 1948 than promised by the UN and expanded further in 1967 by taking control of historical Palestine.
- **Status of Settlers**: Approximately 700,000 Jewish settlers live in the West Bank and East Jerusalem and withdrawal to the 1967 borders would require relocating settlers.
- **Status of Jerusalem**: Palestinians want East Jerusalem, **hosting Al Aqsa Mosque**, as the capital of their future state and Israel claims the whole of Jerusalem, hosting the Western Wall, as its "eternal capital."
- **Right of Refugees to Return**: **UN resolution 194** grants them the **right to return to their homes** but Israel refuses to allow the return of Palestinian refugees.

Current Context and Leadership Stance

- Israel's **right-wing leadership** shows no willingness to make concessions and prefers to maintain the **status quo of occupation**.
- Palestinians seek to break this **status quo and establish a sovereign state**.

Conclusion

- Any effective peace initiative must address the longstanding obstacles that have hindered the peace process the issues surrounding West Bank borders and settlements, Israeli security concerns, the Palestinian refugee crisis, and the status of Jerusalem.

2.2 COLOMBO PROCESS

Context

- India assumes chair of Colombo Process for 2024-26.

Introduction

- The Colombo Process comprises is a regional consultative forum comprising 12 Asian member states and aims to share best practices related to overseas employment for South and Southeast Asian countries that send migrant workers abroad.
- **Established:** 2003

Objectives

The Regional Consultative Process on Overseas Employment and Contractual Labor for Countries of Origin in Asia (formerly called the **Ministerial Consultation on Overseas Employment and Contractual Labor for Countries of Origin in Asia**):

- Share experiences, lessons learned and best practices.

- Consult on issues faced by overseas workers, and offer practical solutions.
- Optimise development benefits from organised overseas employment.
- Review and monitor the implementation of the ministerial recommendations.

Five thematic priority areas and while also incorporating four crosscutting themes into these priority areas:

Current Thematic Focus	Crosscutting Themes
• Skills and Qualification Recognition Processes. • Fostering Ethical Recruitment Practices • Pre-departure Orientation and Empowerment • Promote Cheaper, Faster and Safer Transfer of Remittances • Labor Market Analysis	• **Migrant Health** • Operationalization of the Migration-related Elements of the Sustainable Development Goals. • **Promotion of equality** for women migrant workers. • **Consular Support for Migrant Workers.**

The forum

- **Chairing Country: Past Chairs:** Afghanistan, Nepal, Sri Lanka, Philippines, Indonesia, Bangladesh and India has become chair of regional grouping Colombo **Process for 2024-26, first time** since its inception in 2003.
- **Secretariat:** International Organization for Migration provides technical and administrative support to the Colombo Process. **The Colombo Process Technical Support Unit (CPTSU),** based in **IOM Sri Lanka**.

Members

- **Member States (12 States):** Afghanistan, Bangladesh, Cambodia, China, India, Indonesia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, Viet Nam.
- **Observers: Australia, Bahrain, Italy, Kuwait, Malaysia, Qatar, Republic of Korea, Saudi Arabia, Switzerland, United Arab Emirates, United Kingdom, United States of America**) have been invited on an ad hoc basis to observe Colombo Process events depending on the theme.

Achievements:

- A **regional workshop for employment agencies** in Asia on placing workers in Europe and ethical recruitment was held in Manila (2006).
- To establish an **Overseas Workers Resource Centre (OWRC)** in the **Gulf Cooperation Council (GCC)** has been completed.
- Organised the first **"Asia-EU Consultation on Labour Migration"** held in Brussels in 2008 attended by Colombo Process countries.

Conclusion

- The Colombo Process is a collaborative initiative undertaken by Asian nations that export labour to address the challenges of labour migration more effectively.

2.3 UN GLOBAL SUPPLY CHAIN FORUM

Context

- UN global supply chain forum calls for resilience amid world trade disruptions.

Organisation

- The first-ever UN Global Supply Chain Forum, organized by the UN Trade and Development (UNCTAD) and the Government of Barbados, was successfully held from May 21 to 24, 2024, in Barbados.

Purpose

- The event brought together over 1,000 participants from around the globe to address global disruptions, geopolitical tensions, climate change, and the impacts of the COVID-19 pandemic on international trade.

Participants

- The forum included trade and transport Ministers from various small island developing states (SIDS), representatives from UN agencies, major global ports such as the Port of Seattle, and leaders in the shipping and logistics sectors.

Important Initiatives and Outcomes

Manifesto for Intermodal, Low-Carbon, Efficient and Resilient Freight Transport and Logistics

- **Transitioning to Zero-Emission Fuels**: The manifesto calls for the adoption of zero-emission fuels such as green hydrogen, biofuels, and synthetic fuels.
- **Optimizing Logistics Systems**: Digital technologies, better route planning, and efficient cargo handling are key components of optimized logistics systems.
- **Creating Sustainable Value Chains**: Every link in the supply chain must adopt sustainable practices, from raw material extraction to final delivery.
- **Meeting Global Climate Targets**: The overarching goal is to keep global warming below 1.5°C, in line with the Paris Agreement. **Decarbonizing global shipping** is a critical component of achieving this target.

The launch of the UN Trade and Development Trade-and-Transport Dataset, developed with the World Bank.

- **Coverage**: Covering all countries and trading partners with data on over 100 commodities and various transport modes.
- **Holistic View of Trade**: The dataset offers a comprehensive view of trade, including modes of transport and associated costs.
- **Accessibility and Impact**: Accessible for free, the dataset is expected to contribute significantly to better understanding and optimizing global trade flows, and improving evidence-based policymaking.

Collaboration and the Road to Saudi Arabia 2026

- **Memorandum of Understanding:** UN Trade and Development and the China Council for the Promotion of International Trade (CCPIT) signed a Memorandum of Understanding to expand collaboration in trade and investment promotion, trade facilitation, supply chain-themed exhibitions, public-private dialogues, business matchmaking events, and exchanges between experts, scholars, and think tanks.
- **Strengthening Supply Chains and SIDS Resilience**: The forum's outcomes are expected to strengthen global supply chains and the resilience of SIDS. The Kingdom of Saudi Arabia will host the second forum in 2026.

Conclusion

- Decarbonizing global shipping is a multifaceted challenge that requires concerted efforts from all stakeholders, particularly ports and developing countries with renewable energy potential.

2.4 CHINA PAKISTAN ECONOMIC CORRIDOR

Context

- The second phase of the China-Pakistan Economic Corridor (CPEC) is expected to be formally announced during the visit of Pakistan's Prime Minister Shehbaz Sharif to China.

Introduction

- The **China-Pakistan Economic Corridor (CPEC)** is a major bilateral project aimed at improving infrastructure within Pakistan to enhance trade with China and further integrate South Asia.

Inception and Investment

- It is part of China's larger **Belt and Road Initiative (BRI),** announced in 2013, to improve connectivity, trade, communication, and cooperation across Eurasia.
- The CPEC project was officially launched on April 20, 2015, with the signing of 51 agreements and memorandums of understanding between Chinese President Xi Jinping and Pakistani Prime Minister Nawaz Sharif.
- These agreements were valued at $46 billion.
- **Objectives** of CPEC include transforming Pakistan's economy by modernizing its road, rail, air, and energy transportation systems.
- The project aims to connect Pakistan's **deep-sea ports of Gwadar and Karachi** to China's Xinjiang Uygur Autonomous Region and beyond through overland routes.

CPEC Project achievements

- **Power Projects:** Of the 21 proposed, 14 completed, 2 under construction, and 5 yet to start.
- **Transport-Related Projects**: Of the 24 proposed, 6 completed, no work started on 13.
- **Special Economic Zones (SEZs):** Of the 9 proposed, only 4 have seen progress, none completed.
- **Direct Investment:** Brought $25.4 billion to Pakistan until 2022.

India's concerns about BRI

- The Indian demand that connectivity initiatives must be based on **the universally recognized international norms** and must be pursued in a manner that respects sovereignty and territorial integrity.
- **Gwadar port's development** threatens India's maritime security in Arabian Sea and energy/oil import through Gulf of Oman.
- Economic non-viability of many of the BRI projects that led to **"debt trap" situations in countries like Sri Lanka.**

The position of the Indian government

- India's own plans of regional connectivity, the **2016 Raisina Dialogue had focussed** on Asian connectivity.
- **Chabahar port In Iran,** to enhance connectivity and counter Gawadar port.

- International **North-South Transport Corridor, connecting India to central Asia and Eurasia bypassing Pakistan**.
- Full Membership at Sanghai Coopration Organisation.

Conclusion

- CPEC's multifaceted objectives include reducing transportation costs and times, enhancing energy security for China, and fostering rapid economic growth within Pakistan but India has been severely critical of the CPEC, as it passes through Pakistan-occupied Kashmir.

2.5 INDIA'S NEIGHBOURHOOD FIRST POLICY

Context

- India kept up with its neighbourhood-first policy and invited dignitaries from 7 neighbouring nations and the Indian Ocean region for the Prime minister-designate Narendra Modi's third swearing-in ceremony.

Introduction

- India's 'Neighbourhood First policy' guides its approach towards the management of relations with countries in its immediate neighbourhood, that is, Afghanistan, Bangladesh, Bhutan, Maldives, Myanmar, Nepal, Pakistan and Sri Lanka.

Evolution

- **Colonial phase:** Anti-colonialism, anti-imperialism, anti-racism, (Asian Relation Conference of 1948) cemented India's relations with its neighbours.
- **1950s and 1960s:** India chose to deal with its neighbourhood by engaging in bilateral talks and treaties and not in a regional framework.
- **1960s- 1990s:** Phase of regional assertion and establishing sub-continental hegemony.
- **1990s- 2000s:** Gujral Doctrine attempted to assure India's support to neighbours through unilateral concession.
- **2008 onwards:** With growing footprint of Chinese in neighbouring region conceived 'Neighbourhood First Policy (NFP).
- **2014 onwards:** Revamping NFP to strengthen ties through economic cooperation, development, etc.

Different regional Policies and relations

Act East Policy

- India's **'Look East Policy' launched in 1992**, was upgraded to the **'Act East Policy' in 2014 with an** objective **to promote economic cooperation, cultural ties and developing strategic relationships** with countries in the Indo-Pacific region.
- India's relationship with the **Association of South-East Nations (ASEAN)** is at the core of India's **'Act East Policy'.**

Think West Policy

- Relations with countries in **West Asia** have continued to deepen through sustained high-level visits, increased trade and investment and strengthening of relations in areas including energy, security, defence, culture, education, health, and enhanced investments.

Connect Central Asia Policy

- This has been implemented by the continuous efforts taken in this direction, in particular, the institutionalization of the **'India-Central Asia Summit' mechanism.**
- **Sanghai Coopration Organisation full membership**.

SAGAR

- The **'Security and Growth for All in the Region' (SAGAR)** concept was first articulated by the Prime Minister in Mauritius in 2015.
- Under this concept, India envisages a free, open, inclusive, 4 peaceful, and prosperous Indo-Pacific region, one which is built on a rules-based international order, sustainable and transparent infrastructure investment,

freedom of navigation and overflight, unimpeded lawful commerce, mutual respect for sovereignty, peaceful resolution of disputes, as well as equality of all nations.

Bilateral Relations

- **Bangladesh:** India has significantly improved its relations with Bangladesh, focusing on resolving border issues, improving trade and collaborating on water-sharing agreements.
- **Nepal:** While historical and cultural ties are strong, India-Nepal relations have faced challenges, particularly on political issues and border disputes. Efforts are on to strengthen bilateral ties through economic cooperation and infrastructural projects.
- **Sri Lanka:** India's relationship with Sri Lanka has seen ups and downs. The focus is on addressing shared security concerns, such as **maritime security, and improving economic ties**.
- **Pakistan:** India-Pakistan relations remain strained due to historical conflicts, terrorism and border disputes. While Neighbourhood First aims at regional cooperation, progress **with Pakistan has been limited**.
- **Myanmar:** India has fostered strong relations with Myanmar, focusing on connectivity projects, economic cooperation and security collaboration, particularly in the northeastern region.

Major initiatives

- **SAARC (South Asian Association for Regional Cooperation):** India has played a major role in SAARC, aimed at promoting regional cooperation. However, the effectiveness of SAARC has been limited due to political differences, particularly between India and Pakistan.
- **BIMSTEC (Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation):** BIMSTEC has gained prominence as an alternative to SAARC, focusing on economic cooperation, security, and cultural exchange among countries bordering the Bay of Bengal.
- **Vaccine diplomacy:** India has played a significant role in the region's fight against COVID-19 by providing vaccines to its neighbours.

Infrastructure projects

- **BBIN Initiative** (Bangladesh, Bhutan, India, Nepal): Improving road and rail connectivity.
- **Kaladan Multi-Modal Transit Transport Project**: Connecting India with Myanmar and further with Southeast Asia.
- **Chabahar Port**: Developing a strategic port in Iran to improve connectivity with Afghanistan and Central Asia.

Challenges to India's Neighbourhood First Policy

- **Border disputes**: Particularly with **China (Line of Actual Control)** and **Pakistan (Line of Control),** which have led to military conflicts and tensions.
- **Terrorism:** India has been a victim of terrorism perpetrated by groups based in neighbouring states, especially Pakistan. India maintains the stance that "**terror and talks can't go together."**
- **China challenge**: India's growing geopolitical and economic influence in the region has led to competition with China. Most of the countries in India's neighbourhood are part of **China's belt and road initiative**, with the exception of Bhutan.
- **Water sharing:** India shares rivers with several of its neighbours like Bangladesh, Pakistan, and Nepal, and water sharing has been a source of tension over the allocation and use of water resources, which has led to disputes. **Example**: Disputes over the **Indus water treaty with Pakistan,Teesta River with Bangladesh**
- **Political instability:** Several of India's neighbours have experienced political instability and internal conflicts, which has had an impact on regional stability and security. **Example**: **Military coup in Myanmar, Pakistan political crisis.**

Conclusion

- The delivery of promises and sustenance of India's relations with its neighbours will depend on India's ability to overcome the hurdles owing to the domestic and regional pressures.

2.6 SETTLING TRADE DISPUTES THROUGH 'LITIGOTIATION'

Context

- India and the U.S. settled their last lingering WTO poultry dispute, marking the end of seven trade disputes resolved since Prime Minister Modi's U.S. visit.

Trade dispute on poultry products between India and USA at the WTO

Background:

- The poultry dispute was initiated by the U.S. in 2012 over India's import restrictions on poultry products due to avian influenza concerns.
- It was the oldest of the seven disputes and involved sanitary and phytosanitary (SPS) measures.
- The U.S. argued that India's measures deviated from internationally recognized standards and lacked scientific justification.

WTO Rulings:

- Both the WTO panel and the Appellate Body ruled in favor of the U.S., mandating India to amend its measures.

Settlement:

- After a decade, India avoided a $450 million annual retaliation claim by agreeing to reduce tariffs on select products, marking a significant diplomatic breakthrough.

Standards set by the World Organization for Animal Health

The Terrestrial Animal Health Code

- **First published in 1968**, these standards should be used by **Veterinary Services** to set up measures for the early detection, reporting and control of **pathogenic agents, including zoonotic agents, and preventing their spread.**

The Manual of Diagnostic Tests and vaccines for Terrestrial Animals

- First published in 1989, provides a **standardised approach** to the diagnosis of the diseases listed in the *Terrestrial Code*, to contribute to the improvement of animal health worldwide, and to facilitate **health certification** for trade in **animals and animal products**.

The Aquatic Animal Health Code

- Introduced in **1995,**these standards should be used by **Aquatic Animal Health Services** to set up measures for the prevention, early detection, reporting and control of pathogenic agents in aquatic animals (amphibians, crustaceans, fish and molluscs).

The Manual of Diagnostic Tests for Aquatic Animals

- First published in **1995**, provides a **standardised approach to the diagnosis of the diseases listed in the Aquatic Code,** to contribute to the improvement of aquatic animal health worldwide and to facilitate health certification for trade in aquatic animals and aquatic animal products.

Litigotiation

- 'Litigotiation' is a blend of "**litigation" and "negotiation**," referring to a strategic process where legal disputes are managed through a **combination of courtroom litigation and settlement negotiations**.
- This approach recognizes that **most legal disputes** do not end with a court verdict but rather with a negotiated settlement reached during the litigation process.

Other settled disputes

- The six disputes which have been already settled include

- ✓ **Countervailing measures** on certain **hot-rolled carbon steel flat products** from India.
- ✓ Certain measures relating to **solar cells and modules**.
- ✓ Measures relating to the **renewable energy sector**.
- ✓ India's export-related measures, **certain measures on steel**.
- ✓ Aluminum products.
- ✓ **Additional duties** on some products from the US.

Conclusion

- The resolution of seven WTO disputes between India and the U.S. represents a significant diplomatic achievement, highlighting the efficacy of bilateral negotiations in resolving complex trade issues.

2.7 G7 SUMMIT

Context

- The Group of Seven (G7) countries will meet for the Leaders' Summit in Italy's Apulia region between June 13 and 15, with the Mediterranean nation assuming the group's presidency earlier this year.

Introduction

- The G7 Summit is an international forum held annually for the leaders of the G7 member States of Canada, France, Germany, Italy, Japan, the UK, and the US.

Historical Background

- The Group was established as a platform for economic and financial cooperation in response to the **1973 energy crisis**.
- The first Summit of **Heads of State and Government** was **held in 1975 in Rambouillet, France**.
- **In 1976,** with the **admission of Canada**, the G7 took its current configuration.
- ince 1977, representatives of the European Economic Community, now the European Union, also participate in the work of the Group.
- The **G7 expanded into the G8 between 1997 and 2013**, with the inclusion of Russia. Russia's participation was suspended in 2014 following the illegal annexation of Crimea.

Working

- The G7 is **not a formal institution** with **a charter and a secretariat**.
- The **presidency, which rotates annually among member states**, is responsible for **setting the agenda of each year's summit**
- In 2024**, Italy is acting as president**.

Agenda for 2024 Summit

- Defending the "**rules-based international system**" amid Russia's aggression towards Ukraine.
- Addressing the **Middle East conflict.**
- **Strengthening partnerships with developing nations**, especially in Africa.
- Key priorities include **migration, climate change, food security, and the implications of artificial intelligence (AI) for humanity.**
- Aims to coordinate **economic policies to stabilise the global economy** amidst concerns over inflation and trade tensions.
- The summit will focus on addressing **climate change**.
- In light of the lessons **learned from the Covid-19 pandemic**, the G7 will prioritise **global health** initiatives, including **pandemic preparedness and vaccine distribution**.

Expected Outcomes from the summit

G7 and wars in Ukraine and Gaza

- The G7 nations have already **imposed on Russia the biggest package of sanctions** ever imposed on a large economy.
- They have **blocked the country from international commerce** and the global financial system.
- G7 and EU nations have also **frozen about $325bn (£254bn) of Russian financial assets**

which were held in their territories, such as the foreign currency reserves of Russia's central bank.
- The G7 nations are now working on a scheme to take the interest those assets have earned and pass it to Ukraine in the form of a loan. **This could amount to $50bn**.

G7 and developing nations

- The relationship with developing nations and emerging economies will be central" to the G7 summit, and that it "will **work to build a co-operation model based on mutually beneficial partnerships**".
- It has **invited** leaders from **12 developing countries** in Africa, South America and the Indo-Pacific region.
- Under the the **Mattei Plan**, Italy will give grants and loans **worth 5.5bn euros (£4.6bn)** to several African countries, to help develop their economies.
- The scheme would also position Italy as an energy hub, building gas and **hydrogen pipelines** between Africa and Europe.

G7 and security and AI risks

- The G7 adopted an **anti-coercion pact**, designed to stop countries **such as China and Russia using their economic strength** to impose their will on others.
- In December 2023, Italy **pulled out of the Belt and Road Initiative**.
- The US has called the initiative "**debt-trap diplomacy**" on **China's part**.
- The safety of AI was raised at the 2023 summit in Japan and resulted in the **Hiroshima AI Process**, intended to promote "**safe, secure, and trustworthy AI worldwide**".
- The G7 summit may look at drawing up further international regulations for **AI safety, building on the AI Act adopted by the EU and the US president's executive order on AI.**

Past decisions have had global effects and its relevance today

Relevance today

- According to the think tank Bruegel ('The G7 is dead, long live the G7') **declined from roughly 50% in the 1970s to around 30% in 2018**.
- In comparison, the **G20,** which was established in response to the **2008 financial crisis**, is seen as a more inclusive forum.
- An analysis argued that the G20's creation proved the G7's **inability to handle-modern day crises**. But due to its size, the **G20** was "**too big and heterogeneous to make decisions when not mired in deep crisis**".
- There are also concerns about the **G7's ability to achieve cooperation within the group**. Example: Then US President Donald Trump was often at odds with other G7 leaders and at the **2019 summit**, he skipped a meeting on climate issues.

Past decisions have had global effects

- The G7 played a crucial role in setting up **a global fund to fight malaria and Aids in 2002.**
- Ahead of the **2021 G7 summit** in the UK, the group's finance ministers agreed to make **multinational companies pay more tax**.

Way forward

- Experts proposed a reconfigured G7+, which would include a common euro-zone representative and make space for China, India, and Brazil, thereby better reflecting the current global economic landscape in terms of both GDP and population.

2.8 INDIA-MIDDLE EAST-EUROPE ECONOMIC CORRIDOR

Context

- The Group of Seven (G7) industrialised nations have committed to promoting concrete infrastructure initiatives such as the India-Middle East-Europe Economic Corridor (IMEC) in the G7 Summit Communique issued at the end of the three-day G7 Summit.

Introduction

- The India-Middle East-Europe Economic Corridor (IMEC) is a connectivity project that seeks to develop a seamless infrastructure of ports, railways, roads, sea lines and pipelines to enhance trade among India, the Arabian Peninsula, the Mediterranean region and Europe

Launched

- On 10 September 2023 the Memorandum of Understanding (MoU) was signed during the 2023 G20 New Delhi summit by the governments of India, United States, United Arab Emirates, Saudi Arabia, France, Germany, Italy, Jordan and the European Union.

Structure:

- **East corridor**: **eastern leg** that would take container traffic from India to the UAE on India's west coast, joining the corridor's land route. The goods would move by rail from the UAE to Israel's Haifa port on the Mediterranean coast after transiting through Saudi Arabia and Jordan.
- **Northern corridor**: The **western leg of** the corridor would put the containers back on ships in Haifa and take them to European ports across the European Union, France, Italy, and Germany for onward transmission by European rail networks to their final destinations.
- The IMEC corridor will also include an electricity cable, a hydrogen pipeline and a high-speed data cable.

Objective

- To create a comprehensive transportation network, comprising rail, road, and sea routes.
- It aims to enhance transportation efficiency, reduce costs, increase economic unity, generate employment, and lower Greenhouse Gas (GHG) emissions.

Significance

- Makes trade between India and **Europe 40% faster**.
- Offers an alternative to the **Chabahar route** for the **International North-South Transit Corridor (INSTC).**
- Strengthens India's strategic partnerships with the **US, Saudi Arabia, UAE**.
- Accelerates progress on **Sustainable Development Goals (SDGs) globally**.
- Boosts trade and investment **opportunities, creating jobs and growth.**
- Facilitates export of **clean hydrogen** from India to Europe, reducing emissions.

Strategic and Diplomatic Impact:

- **Counters China's Belt and Road Initiative (BRI)** concerns about debt traps and environmental impacts.

Challenges

- **Financial and Coordination:** Requires significant investments and coordination among governments, private sector, multilateral institutions, and civil society.
- **Security and Political Risks:** Faces security risks and political uncertainties in some regions, such as West Asia and Afghanistan.
- **Regulatory and Logistical Issues:** Must deal with legal and regulatory hurdles, harmonize standards across countries and regions. Overcome geographical and logistical constraints to ensure efficient transport and communication networks.
- **Environmental and Social Concerns:** Address environmental and social impacts of infrastructure projects, ensure compliance with ESG norms.
- **Sustainability and Geopolitical Tensions:** Ensure long-term sustainability and resilience. Address potential conflicts or rivalries with other initiatives or actors, such as the exclusion of Turkey.

Conclusion

- IMEC offering incredible potential for regional and global growth as a catalyst for collective growth, global cooperation, and connectivity.

2.9 TIBET CHINA RELATIONS

Context

- In June 2024, the US Congress passed the Resolve Tibet Act, calling for a peaceful resolution of the dispute over the status of the Himalayan state, which Beijing refers to as Xizang. US President Joe Biden has to sign the bill to make it an Act.

History of the dispute over Tibet

Chinese Invasion and Seventeen Point Agreement

- The 13th Dalai Lama, Thubten Gyatso, announced de facto Tibetan independence in early 1913 and functioned as an autonomous region until 1950.
- In 1951, the Dalai Lama's representatives forcefully signed a **seventeen-point agreement** that granted China sovereignty over Tibet for the first time. it also assured **non-interference in domestic administration, Tibetan culture, and religion** But the Chinese began violating it.
- Chinese claim **this document is proof of Chinese sovereignty** over Tibet.

National uprising and the Dalai Lama's exile

- In March 1959 revolt erupted, first in Lhasa. fears of arrest **Dalai Lama fled Lhasa**, never to return, as the city was taken by the Chinese.
- **Since 1959**, China's hold over Tibet has been absolute.
- The people of Tibet have been fighting for full autonomy since 1959. Since then, the current Dalai Lama has been running a **government-in-exile, which China does not recognise**.

Recent Developments in Tibet

- China said it would talk **only with the representatives of the Dalai Lama** and **not the officials of the Tibetan government in exile based in India**
- China has been building infrastructure in Tibet, such as **border defense villages, dams, an all-weather oil pipeline, and internet connectivity projects.**
- China is **trying to control the selection of the next Dalai Lama**

India's position on Tibet

- In 1959, India **granted asylum to Dalai Lama** after a failed uprising.
- **Since 2003**, Government of India recognizes Tibet Autonomous Region as part of the People's Republic of China following the signing of the **Declaration on Principles for Relations and Comprehensive Cooperation between India and China**.

Tibet Act

- The Resolve Tibet Act is a bipartisan bill to enhance US support for Tibet and **promote dialogue between the People's Republic of China and the Dalai Lama without preconditions.**
- The US will send more funds to **non-governmental organisations in Tibet to promote "sustainable economic development, cultural preservation, and education".**

Delegation of U.S. lawmakers met the exiled Tibetan spiritual leader

- A delegation of U.S. lawmakers met the exiled Tibetan spiritual leader the Dalai Lama in India's northern town of **Dharamsala**.
- The meeting annoyed China, which urged the United States to "**fully recognise the anti-China and separatist nature of the Dalai clique**" and **refrain from "any form of contact with it**".

Conclusion

- Unless a resolution with the Dalai Lama is reached or China unilaterally returns to an ethnically conciliatory internal approach, the future for a predominantly Tibetan Tibet is not good.

2.10 INDUS WATER TREATY

Context

- Pakistan delegation in Jammu along with neutral experts to inspect two power projects.

Introduction

- A Pakistani delegation arrived as part of Neutral Expert proceedings to inspect two hydroelectric power projects in Jammu and Kashmir under the Indus Water Treaty. This is the **first visit by a Pakistani delegation** to Jammu and Kashmir in more than five years under the dispute settlement mechanism of the **1960 Treaty**.

Genesis of the treaty

- After Partition, the head works of the projects remained in India while the canals lay in Pakistan.
- The Inter Dominion Accord that kicked in from May 1948 called for India to supply Indus waters to Pakistan in lieu of annual payment, but it didn't take off.
- In 1951, both countries sought **World Bank** funding for irrigation projects on the riparian system.
- The Bank mediated an accord that took nine years to finalise.
- On September **19, 1960, India and Pakistan signed the Indus Waters Treaty** on sharing of the waters.

The sharing agreement

- **Three Western rivers of the Indus basin — Indus, Chenab, and Jhelum** — have been allocated to Pakistan for **unrestricted use,** except for certain categories of use by India.
- India can use the water of these rivers for specific **agri-uses, and for 'run of the river' hydropower projects. 'Run of the river' projects don't need live storage of water.**
- Pakistan is accorded the right to object if projects don't meet treaty specifications, and **India must share information** on projects, including changes from the original design, based on which Pakistan can flag issues within three months.
- The **three eastern rivers**, **Beas, Ravi and Sutlej,** have been allocated to India for unrestricted use. Per the treaty, an 80% share of Indus basin waters (about 135 million acre feet, or maf) is with Pakistan and 33 maf is with India.

Permanent Indus Commission

- IWT required India and Pakistan to set up a Permanent Indus Commission. The Commission is constituted by the permanent commissioners appointed by the two countries.
- It must meet annually (the last meeting was in May 2022).

Three levels of dispute resolution

- The first is the **permanent commission**. The dispute can be taken up parallelly at the government level.
- If no solution emerges, the matter can be escalated to the World Bank for the appointment of a **'Neutral Expert' (NE).**
- If the NE's decision is not to the satisfaction of either party can take the **arbitration route.**

The recent developments

- Pakistan delegation inspected the **Pakal Dul and Lower Kalnai hydroelectric** power projects under the provisions of the IWT for the last time in January 2019, before the ties between the two countries froze following the revocation of the special status of Jammu and Kashmir.
- Pakistan's initial request to the **World Bank in 2016,** concerning its objections to the design features of the two hydroelectric power projects, sought a settlement through a **'Neutral Expert**.' However,

Pakistan later withdrew this request and sought adjudication through a **Court of Arbitration**. India, on the other hand, insisted that the issue should be resolved solely through **'Neutral Expert'** proceedings.

- After failed negotiations, the World Bank appointed a **Neutral Expert** and the chair of the **Court of Arbitration in October 2022**. Issuing a notice for modifying the Treaty, India warned that "such parallel consideration of the same issues is not covered under any provision of the IWT".
- In July 2023, the Court of Arbitration ruled that it was "**competent to consider and determine the disputes set forth by Pakistan's request for arbitration".**
- Pakistan joined the second meeting of the parties held by **Neutral Expert in Vienna** in **September 2023** which discussed matters related to the organisation of the site visit.

Way Ahead

- The treaty in its present form **mentions a non-tiered dispute resolution mechanism** which may be modified to be more efficient and time-saving.
- There also lies a possibility for spelling out the **jurisdiction of the International Court of Justice**, which is not currently provided **for in the treaty**, could be negotiated and used as a dispute resolution mechanism.
- It would be in everyone's best interest to **re-examine the treaty and incorporate measures** for the sharing of hydroelectric power, especially in light of the growing significance of renewable energy sources.

2.11 SHORT ARTICLES

European Parliament

Context:

- Election to European Parliament held on June 6.

European Parliament

- **Introduction:** The European Parliament is the EU's **law-making body**. It is **directly elected by EU voters every 5 years.**
- **Role**: Directly-elected EU body with legislative, supervisory, and budgetary responsibilities
- **Members**: 720 MEPs (Members of the European Parliament)
- **President**: Roberta Metsola
- **Established in**: 1952 as Common Assembly of the European Coal and Steel Community, 1962 as European Parliament, first direct elections in 1979
- **Location**: Strasbourg (France), Brussels (Belgium), Luxembourg

What does the Parliament do?

The Parliament has 3 main roles:

Legislative

- Passing EU laws, together with the Council of the EU, based on European Commission proposals
- Deciding on international agreements
- Deciding on enlargements
- Reviewing the Commission's work programme and asking it to propose legislation

Supervisory

- Democratic scrutiny of all EU institutions
- Electing the Commission President and approving the Commission as a body. Possibility of voting a motion of censure, obliging the Commission to resign
- Granting discharge, i.e. approving the way EU budgets have been spent
- Examining citizens' **petitions** and setting up **inquiries**
- Discussing monetary policy with the European Central Bank
- Questioning Commission and Council
- Election observations

Budgetary

- Establishing the EU budget, together with the Council

- Approving the EU's long-term budget, the "Multiannual Financial Framework"

Composition

- The number of MEPs for each country is roughly **proportionate to its population**, but this is by degressive proportionality: no country can have fewer than 6 or more than 96 MEPs and the total number **cannot exceed 750 (plus the President).** MEPs are grouped by political affiliation, not by nationality.

How does the Parliament work?

Parliament's work comprises two main stages:

- **Committees -** to prepare legislation. The Parliament numbers **20** committees and three subcommittees.
- **Plenary sessions** – to pass legislation. This is when all the MEPs gather in the chamber to give a final vote on the proposed legislation and the proposed amendments.

Significance of Maldives' President's India Visit

Context

- President Muizzu attended the oath-taking ceremony of Indian Prime Minister Narendra Modi and held several high-level meetings during his two-day stay.

Evolution of India and Maldives Relations

- Independence of Maldives **in 1965** and India was one of the first countries to recognize the Maldives as an independent nation.
- **Maritime Boundary Agreement in 1979** define the maritime boundaries between the two countries.
- The relationship faced challenges in **1988** when a **coup attempt in the Maldives** led to the intervention of Indian forces in **Operation Cactus.** This event **temporarily strained diplomatic relations** but was later resolved.
- In 2008, Mohamed Nasheed became the President the relationship improved, focusing on **economic cooperation, trade, and people-to-people ties.**
- **In 2013** The relationship **faced challenges** during the presidency of Abdulla Yameen policies are **tilt towards China.**
- In 2018 the **election of Ibrahim Mohamed Solih** as the President of the Maldives in 2018 marked a **shift in bilateral relations by** reaffirmed their commitment to democratic values, and India extended financial assistance for various developmental projects.

Significance of Maldives for India:

- Maldives' proximity to the west coast of India.
- Situated along **crucial maritime trade routes** between the Gulf of Aden and the Strait of Malacca, the **Maldives acts as a "toll gate" for nearly half of India's external trade and 80% of its energy imports.**
- The Maldives is strategically located in the Indian Ocean.
- Opportunity for India to counterbalance China's growing influence in the Indian Ocean.
- India is one of the biggest investors and **tourism markets for the Maldives**.
- They have a '**Comprehensive Action Plan for Defence'** and **joint military exercise Ekuverin**.

Significance of India for Maldives:

- India supplies Maldives with its **essentials commodities**: rice, spices, fruits, vegetables, poultry, medicines and life-saving drugs.
- Maldivian students come to Indian higher educational institutions.
- **Rs 49 crore was India's exports to Maldives.** India emerged as Maldives' second largest trade partner in 2022.
- **First to help in natural disaster** as tsunami struck the islands in 2004, India was the first to send in help.
- **2014 Male had a drinking water crisis** and India overnight airlifted drinking water to the islands.
- **During the Covid-19 pandemic**, India sent essential medicines, masks, gloves, PPE kits and vaccines for the island country.

Recent issues and Challanges in India-Maldives Relations

- Maldives' new President has formally **requested India to withdraw military personnel from the islands** under "India Out" campaign.

- The Maldives did not participate in **NSA-level Colombo Security Conclave** along with India, Sri Lanka and Mauritius.
- The Maldives has decided **not to renew the hydrography cooperation agreement** with India after its expiry in June, 2024.
- Maldives is crucial to China's **"String of Pearls" strategy**, with major investments and **Belt and Road participation**.

Conclusion

- President Muizzu's recent visit to India suggests a renewed effort to improve bilateral relations. The discussions and agreements reached during his visit are expected to pave the way for increased cooperation and mutual prosperity for both nations.

2.12 SNIPPETS

Topics	Details
Cohabitation	• A situation where the President and the PM belong to different political parties • PM may choose his cabinet colleagues. None of the members of the Govt. can be a part of the legislature • The President is elected for a fixed term. Initially, the term was 9 years, reduced to 7 years and at present is 5 years.
Official Creditors Committee	• OCC is a group formed to represent the collective interests of creditors during the **debt restructuring or bankruptcy process of a debtor**, typically a corporation or sovereign entity. • The OCC is often appointed in **formal insolvency proceedings**, such as those under the **jurisdiction of bankruptcy courts**, to ensure that the creditors' interests are protected and that the restructuring plan is fair and equitable.
Space MAITRI	• NSIL, a Government of India company under the Department of Space and the commercial arm of the Indian Space Research Organisation (ISRO), is set to launch Space Machines Company's second Optimus spacecraft, the largest Australian-designed and built spacecraft to date • **Launch Date**: Scheduled for 2026 • **Launch Vehicle**: NSIL's Small Satellite Launch Vehicle (SSLV)
International Criminal Court	• It was created by the 1998 Rome Statute of the International Criminal Court and began functioning on **1 July 2002** . HQ-Hague, Netherlands. • It mandate investigates and, where warranted, tries individuals charged with the gravest crimes of concern to the international community. • **123 member nations**.
Project Nimbus	• Project Nimbus is an initiative by the **Israeli government** to establish comprehensive public cloud services for its government ministries and related bodies. • Announced in April 2021, it involves a partnership with **Google and Amazon**, who jointly won the bid to deliver these services. • The primary goal is to ensure **data sovereignty and prevent the leakage** of **sensitive information outside Israel's borders**.
Inclusion of new sports in Olympics	• India's bid to hold the **2036 Olympics** in Ahmedabad, India demand inclusion of yoga, Twenty20 cricket, kabaddi, chess, squash, and kho kho. • The **2024 Olympic Games will take place in Paris, from July 26 to August 11**. This year's Games will see the debut of **breaking** (or breakdancing) as an

	Olympic sport. Surfing, skateboarding, and sports climbing had debuted in the **Tokyo Games, held in 2021**.
World Refugee Day 2024	• World Refugee Day in 2024 **celebrated on June 20.** • World Refugee Day 2024 **official theme is "Everyone is Welcome."** • The **significance** of World Refugee Day is to highlight the hardships and challenges faced by Refugees all across the globe, and suggest measures to solve them. The day is observed to appreciate the resilience, courage and strength of refugees to build a bright future.
International Yoga Celebration	• 10th International Day of Yoga (IDY) celebrated on 21st June 2024. • The event aims to bring together thousands of participants carrying message to promote global health and wellness through the practice of yoga. • A theme for this day is announced every year — this year's theme is **"Yoga for Self and Society".**
International Sugar Organisation (ISO)	• India chaired the 64th International Sugar Council (ISO) . • The **International Sugar Organization** is an intergovernmental organization, based in **London** which was established under **international sugar agreement of 1968**
Global Initiative on Digital Health(GIDH)	• GIDH was launched as a **"key deliverable"** of India's G20 Presidency during the Health Ministers' meeting in Gujarat. • It became part of the **New Delhi declaration** and India promised to make a $10-million contribution to it as a seed fund
Laws on mercenaries in war zones	• The distinction between **conventional combatants and mercenaries is a fundamental cornerstone of international humanitarian law (IHL)**. • A combatant is typically a **member of the armed forces** of a party to the conflict, whereas a mercenary is recruited from a **third-party state** unrelated to the conflict. • **Article 47 of Additional Protocol I to the Geneva Conventions (API)** envisages six cumulative conditions for a person to qualify as a mercenary.
Antarctic Parliament	• India hosted the 46th Antarctic Treaty Consultative Meeting (ATCM) in Kochi. • India, as a **Consultative Treaty Party since 1983**, has been regularly sending scientific expeditions to Antarctica. • India operates **Maitri and Bharati research bases**, both in summer and winter months. • In the **Kochi meet**, India announced its decision to **build a successor to the 35-year-old Maitri station.**
Nuclear weapons race	• China is rapidly increasing its nuclear arsenal, now boasting 500 warheads, triple that of India. • **Russia and the USA collectively** possess nearly **90% of the world's** nuclear weapons. • India's nuclear arsenal has seen a slight expansion, growing from 164 warheads in **January 2023 to 172 warheads by January 2024**, placing it 6th among the world's nuclear-armed states.
International Organization for Migration (IOM)	• According to IOM At least 49 migrants died and 140 others were missing after their boat capsized off the coast of Yemen. • In 2023, IOM's **Displacement Tracking Matrix (DTM)** observed more than 97,200 migrant arrivals to Yemen. • IOM, Established in 1951, is leading **intergovernmental** organization in field of

	migration. Headquartered at **Geneva (Switzerland)** and consists of 175 member states **(including India).**
G7	• The **G7 (Group of Seven) is an organisation of the world's seven largest so-called "advanced" economies**. • They are **Canada, France, Germany, Italy, Japan, the UK and the United States.** • While it **lacks a permanent administrative** structure, the G7 **rotates its presidency annually** and the presidency serves as a temporary secretariat.
Gulf Cooperation Council	• The United States officials met Saudi-led Gulf Cooperation Council in Riyadh. They announced a new of defense working groups to be based in Saudi Arabia to **'advance US-GCC cooperation and multilateral [missile] integration against shared air and maritime threats'**. • Gulf Cooperation Council is a regional, intergovernmental, political, and economic union comprising **Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates.** • HQ-Riyadh, Saudi Arabia.
U.S.-India initiative on Critical and Emerging Technology (iCET)	• National Security Advisor Ajit Doval chaired the second meeting of the **U.S.-India initiative on Critical and Emerging Technology (iCET)** with his United States counterpart Jake Sullivan in New Delhi. • iCET, is a **collaborative framework established** by the United States and India to enhance **cooperation in developing fields of technology**.

2.13 ADDITIONAL TOPICS FOR READING

TOPIC NAME	UPLOADED ON IAS GYAN WEBSITE ON:
India Russia Logistic Agreement	24th June, 2024
India-Bangladesh Relation	22nd June, 2024
Russia-North Korea pact	22nd June, 2024
Ukraine meet statement	17 Jun 2024
Indo-Pacific Economic Framework for Prosperity (IPEF) Ministerial meeting	7 June 2024
India's Foreign Policy Modi 3.0	17 Jun 2024

3. ECONOMY

3.1 'BURP TAX' AND METHANE EMISSION FROM LIVESTOCK

Context

- New Zealand announced the scrapping of the 'burp tax' — a scheme to tax greenhouse gas emissions from livestock. The tax was introduced in October 2022.

'Burp Tax'

- **Primary Aim:** Curtail methane emissions from ruminant species.
- **Ruminants:** Hoofed grazing or browsing herbivores that chew cud, including cows, sheep, goats, and buffaloes. Their digestive system has four compartments, including the rumen, which ferments food and generates methane.
- **Methane Emission**: A potent greenhouse gas **responsible for 30% of warming since preindustrial times**, second only to carbon dioxide. Ruminant animals release methane mainly through burping.
- **New Zealand's Livestock:** Approximately 10 million cattle and 25 million sheep, contributing nearly half of the country's greenhouse gas emissions.
- **Previous Government Initiative:** The Labour Party-led government decided to impose a tax on livestock to address these emissions.

Reasons for Removal of the 'Burp Tax'

Protests by Farmers

- Farmers argued that the scheme, along with other agricultural emission regulations, would severely impact their livelihood.

New Government's Stance

- The new centre-right coalition in power decided to scrap the tax.
- The government plans to explore other ways of reducing methane emissions.

Sources of Methane (UNEP Data)

- **Agriculture**: Leading contributor to atmospheric methane.
  - Manure and gastroenteric releases from livestock.
  - Rice paddies: Flooded fields promote methane-emitting microbes, contributing to 8% of human-linked emissions.

Characteristics of Methane

- **Short-lived GHG:** Atmospheric lifetime of around a decade.
- **Potency:** Over 25 times more effective than carbon dioxide at trapping heat.

Concerns Associated with Methane

- **Health Impact**: Primary contributor to ground-level ozone, causing 1 million premature deaths annually.
- **Global Warming**: 80 times more potent than carbon dioxide over 20 years; responsible for 30% of global warming since pre-industrial times.
- **Increase:** Methane levels are rising faster than ever, with significant increases noted during the 2020 pandemic lockdowns.

Methane Emission from Livestock

- The livestock sector significantly contributes to methane emissions, primarily through enteric fermentation and manure management.
- Livestock emissions account for approximately 32% of human-caused methane emissions (UNEP Data).
- Global demand for animal protein is expected to increase by up to 70% by 2050 due to population growth, economic development, and urban migration.
- Methane is a potent greenhouse gas with significant global warming potential.

FAO's Global Conference and Findings

- FAO's ***first 'Global Conference on Sustainable Livestock Transformation'*** (September 25-27, 2023).
- **IPCC Report**: Methane emissions **contribute about 0.5°C to global warming**, making reduction vital to the Paris Agreement goals.

Managing Enteric Methane Emissions

- **Emission Sources**: All livestock emit methane, with ruminants (cows, sheep) being the largest contributors. **Promising Reduction Methods**: Synthetic inhibitors, Seaweed, Essential oils, Tannins.

Methane from Manure

- **Reduction Methods**: Anaerobic digestion followed by biogas collection, Storing manure in gas-tight structures. Developing tailored manure-management practices.

Food Waste and Methane

- **Contribution of Food Waste**: Significant source of greenhouse gas emissions from livestock and rice systems. Reducing and managing food waste is essential for a circular bioeconomy.

Methane Sinks

- **Atmospheric and Soil Methane Sinks**: **Upland soil:** Consumes 6% of total methane, **Treed cropland:** Higher sink capacity due to greater methane uptake, **Forests and grazing lands**: Significant soil sinks, **Land degradation reduces sink capacity**; restoration increases it slowly.

Grazing Management

- **Mitigation Strategies**: Improved forage quality and healthy soils enhance methane sequestration. Adaptive multi-paddock grazing shows higher sink capacity compared to continuous grazing.

Managing Methane with Genetic Engineering

- **Genetic Engineering**: Offers a promising methane mitigation strategy. Research focuses on identifying low-methane-producing lineages while retaining important traits. Improved animal health and reproductive performance can also reduce emissions.

Mitigation Strategies for Methane Emissions

- **FAO's Four Strategies:**

1. Animal Breeding and Management
2. Feed Management, Diet Formulation, and Precision Feeding
3. Forages
4. Rumen Manipulation

- **Feed Improvement:**
  - Enhancing feed efficiency to reduce methane emission intensity.
  - Methods: Increase nutrient density, alter rumen microbial composition, enhance feed management, selective breeding.

Challenges and Global Engagement

- **Low and Middle-Income Countries:** Challenges in setting ambitious national methane reduction targets.
- **Global Policy Engagement:** Essential for effective methane emission reductions.

Way Ahead

Importance of Collaboration

- **Synergies:** Between livestock stakeholders, governments, research institutes, the private sector, and producer organizations.
- **FAO's Role:** Technical support for integrating methane mitigation measures into national strategies, investments, and policies.

Importance of a Holistic Approach

- **Approach**: Crucial for reducing overall climate impacts.
  - Separate long-lived (e.g., carbon dioxide) and short-lived (e.g., methane) greenhouse gas emissions in targets.
  - Substantial methane reductions can lower global temperatures and contribute to the Paris Agreement goals.

Farmer Involvement in Methane Reduction

- **Strategies:**
  - Providing more nutritious feed to increase productivity.
  - Experimenting with alternative feed types to reduce methane production.
  - Efficient manure management practices.
  - Alternate wetting and drying approaches for paddy rice.

Impact of Reducing Methane

- **Climate Change:** Methane reduction has a near-term impact on climate change mitigation.
- **Potential:** Human-caused methane emissions could be reduced by 45% within the decade, averting nearly 0.3°C of global warming by 2045.

Conclusion

- Mitigation strategies for methane are crucial and need immediate research and implementation.
- **Global Cooperation:** Essential for the successful adoption of methane mitigation strategies on a global scale. **Holistic and Collaborative Effort:** Involvement of all stakeholders, including public servants, is necessary to secure funding and ensure successful adoption of strategies.

3.2 FOREIGN INVESTMENT & INDIAN ECONOMIC GOALS

Context

- **Foreign Investments:** Crucial for India's target of becoming a $5 trillion economy by the financial year 2025-26.
- **Challenges:** Attracting these investments requires removing bottlenecks faced by Indian companies receiving foreign funds and by foreign investors betting on India's growth.

Background: Foreign Exchange Management (Non-Debt Instruments) Rules, 2019

- On April 27, 2020, the Ministry of Finance amended the Foreign Exchange Management (Non-debt Instruments) Rules, 2019 (FEMA NDI Rules), with changes effective immediately.

Acquisition of Securities in a Rights Issue by Way of Renouncement

Rule 7:

- For unlisted Indian companies, the rights issue to foreign residents **must be at least the price offered to Indian residents.**
- For listed companies, the **price is determined by the company, not adhering to general pricing guidelines.**

Rule 7A:

- Introduced to apply pricing guidelines to shares acquired by foreign residents that were originally offered to Indian residents and **subsequently renounced**.

Single Brand Retail Trading (SBRT)

- **Investment Limits:** Foreign investment up to **100% under the automatic route.**
- **Sourcing Norms:**
  - **For investments beyond 51%, 30% of goods must be sourced from India**, calculated as an average over five years from the start of the SBRT business.
  - The exemption for entities with 'state-of-the-art' technology is clarified **to apply for three years from the earlier of opening the first store or starting online retail.**

Insurance Intermediaries

- **FDI Policy Changes:** Approved 100% FDI under the automatic route, effective from April 27, 2020.

Conditions for Divestment by Foreign Portfolio Investors (FPIs)

Divestment Rules:

- If FPIs exceed prescribed investment limits, they must divest or have their entire investment classified as FDI. Rules are subject to further conditions by SEBI and RBI.

Key Amendments to FEMA NDI Rules, 2019 (January 24, 2024)

Introduction of "International Exchange"

- **Definition:** Stock exchanges in permissible jurisdictions listed in Schedule XI of the Rules.

Expansion of "Listed Indian Company"

- **Previous Definition:** An Indian company with equity or debt instruments listed on a recognized stock exchange in India.
- **New Definition:** Now includes Indian companies listed on International Exchanges, broadening foreign investment opportunities.

New Provisions for Investment by Permissible Holders

- **Chapter X:** Allows permissible holders to invest in Indian companies listed on International Exchanges under the Direct Listing of Equity Shares scheme (Schedule IX).

Direct Listing of Equity Shares on International Exchanges

- **Chapter XI:** Sets conditions for Indian public companies to issue equity shares on international exchanges.
  - **Listing Requirements:** Shares must be listed on specified International Exchanges.
  - **Compliance:** Must adhere to sectoral caps and prohibited activities.

- **Equity Shares:** Must be dematerialized and rank pari-passu with shares listed on Indian exchanges.

Definition of Permissible Holder

- **Permissible Holder:** Includes holders of equity shares listed on an International Exchange.
- **Approval Requirement:** Holders from countries sharing land borders with India must obtain Central Government approval to hold shares in public Indian companies.

Compliance Obligations for Indian Companies

- **Regulatory Compliance:** Companies listing shares on international exchanges must adhere to:
  - Securities Contracts (Regulation) Act, 1956
  - Securities and Exchange Board of India Act, 1992
  - Depositories Act, 1996
  - Foreign Exchange Management Act, 1999
  - Prevention of Money-laundering Act, 2002
  - Companies Act, 2013
- **Equity Issuance Laws:** Must comply with existing laws and the new scheme's requirements.

Pricing of Issued Equity Shares

- **Minimum Price:** Equity shares on international exchanges must be priced at least as high as those issued to domestic investors under applicable laws.

Amendment Conundrum

- **PN3 Requirement:** Investments from entities or beneficial owners in countries sharing land borders with India require prior government approval to prevent opportunistic takeovers during crises like the COVID-19 pandemic.
- **Issues:**
  - **Undefined 'Beneficial Owner':** Lack of clear definition causing reliance on thresholds from other laws.
  - **RBI's Conservative Stance:** Impacting downstream investments by Foreign Owned or Controlled Companies (FOCCs).
  - **Approval Process:** Slow and high rejection rates, with significant pending proposals.

Issues and Solutions

Indemnity Challenge

- **Current Practice:** Indian companies require foreign investors to provide indemnities for PN3 compliance.
- **Solution:** Amend PN3 to clearly define 'beneficial owners' with specific thresholds and control tests.

Defining 'Beneficial Owners'

- **Ownership Threshold:** Clear thresholds (10%-25%) based on sector sensitivity.
- **Control-Conferring Rights:** Define rights that confer control, excluding investor protection rights.

Consultation Mechanism

- **Ambiguity Resolution:** Introduce a time-bound consultation mechanism with regulatory authorities for clarity on control clauses.

Conclusion

- **Goal:** Attract necessary foreign investments to achieve the $5 trillion economy target.
- **Required Actions:** Clarify 'beneficial owners' definition, establish a consultation mechanism, reduce compliance burdens for Indian companies.
- **Global Cooperation:** Essential for adopting effective methane mitigation strategies and achieving climate targets.

3.3 INDIA'S EXTERNAL DEBT

Context

- India's External Debt, as of March 2024, has been a critical focus in economic analysis, reflecting significant developments amidst global financial conditions.

External debt

- External debt **refers to funds borrowed from foreign sources, typically in foreign currencies, which must be repaid according to the terms agreed upon.**
- This borrowing encompasses loans from international financial institutions, foreign governments, and commercial banks, often tied to specific projects or sectors.

Overview of India's External Debt

- **Total Debt**: As of March 2024, India's external debt **stood at $663.8 billion**, reflecting a $39.7 billion increase from the previous year.
- **Debt to GDP Ratio**: Despite the increase, India's debt to GDP ratio improved to 18.7%, indicating relative stability in managing external debt compared to economic output.
- **Sectoral Composition**: Government debt **accounted for 4.2% of GDP**, while non-government debt comprised 14.5%, showcasing varying levels of sectoral exposure.
- **Currency Composition**: Predominantly **US dollar-denominated (48%),** with Indian rupee, yen, SDR, and euro comprising the remainder, reflecting diverse currency risk management.

Effects of External Debts

- **Economic Vulnerability**: Nations heavily reliant on external debt face **heightened economic risks** due to their dependence on foreign capital, making them susceptible to financial instability.
- **Impact of Economic Shocks**: Economic downturns can exacerbate debt challenges, especially if revenue sources like exports or tourism decline, affecting the **ability to meet debt obligations.**
- **Interest Rate Risks:** Changes in global interest rates **can escalate debt servicing costs,** posing challenges in managing debt effectively.

Exchange Rate Volatility

- **Foreign Currency Borrowing**: Borrowing in foreign currencies exposes countries to exchange rate risks.
- **Increased Debt Servicing Costs**: Currency depreciation relative to borrowed currencies can increase repayment costs, straining financial resources.

Significance of External Debts

- **Infrastructure Investment**: External debts **fund critical infrastructure project**s, fostering economic growth through improved productivity and connectivity.
- **Budget Deficit Coverage:** Governments use external borrowing to **cover budget shortfalls**, ensuring essential public services are sustained.

Limitations of External Debts

- **Financial Burden**: Excessive external debts strain government finances, diverting resources from vital sectors like healthcare and education.
- **Vulnerability to Economic Shocks**: Economic downturns impact debt servicing capacity, exacerbated by interest rate fluctuations and currency depreciation.

3.4 RECOMMENDATIONS OF 53RD GST COUNCIL MEETING

Context

- Union Finance Minister Nirmala Sitharaman chaired the 53rd GST Council meeting in New Delhi.
- The GST Council made the following recommendations relating to changes in GST tax rates, measures for facilitation of trade and measures for streamlining compliances in GST.

Changes in GST Tax Rates:

I. Recommendations relating to GST rates on Goods

A. Changes in GST rates of goods

1. A uniform rate of 5% IGST will apply to imports of 'Parts, components, testing equipment, tools and tool-kits of aircrafts, irrespective of their HS classification to provide a fillip to MRO activities subject to specified conditions.
2. All milk cans (of steel, iron and aluminium) irrespective of their use will attract 12% GST.
3. GST rate on 'carton, boxes and cases of both corrugated and non-corrugated paper or paper-board' (HS 4819 10; 4819 20) to be reduced from 18% to 12%.
4. All solar cookers whether single or dual energy source, will attract 12% GST.
5. To amend existing entry covering Poultry keeping Machinery attracting 12% GST to specifically incorporate "parts of Poultry keeping Machinery" and to regularise past practice on 'as is where is' basis in view of genuine interpretational issues.
6. To clarify that all types of sprinklers including fire water sprinklers will attract 12% GST and to regularise the past practice on 'as is where is' basis in view of genuine interpretational issues.
7. To extend IGST exemption on imports of specified items for defence forces for a further period of five years till 30th June, 2029.
8. To extend IGST exemption on imports of research equipment/buoys imported under the Research Moored Array for African-Asian-Australian Monsoon Analysis and Prediction (RAMA) programme subject to specified conditions.
9. To exempt Compensation Cess on the imports in SEZ by SEZ Unit/developers for authorised operations w.e.f. 01.07.2017.

Other Miscellaneous Changes

10. To exempt Compensation cess on supply of aerated beverages and energy drinks to authorised customers by Unit Run Canteens under Ministry of Defence.
11. To provide Adhoc IGST exemption on imports of technical documentation for AK-203 rifle kits imported for Indian Defence forces.

II. Recommendations relating to GST rates on services

1. To exempt the services provided by Indian Railways to general public, namely, sale of platform tickets, facility of retiring rooms/waiting rooms, cloak room services and battery-operated car services and to also exempt the Intra-Railway transactions. The issue for the past period will be regularized from 20.10.2023 to the date of issue of exemption notification in this regard.
2. To exempt GST on the services provided by Special Purpose Vehicles (SPV) to Indian Railway by way of allowing Indian Railway to use infrastructure built & owned by SPV during the concession period and maintenance services supplied by Indian Railways to SPV. The issue for the past will be regularized on 'as is where is' basis for the period from 01.07.2017 till the date of issue of exemption notification in this regard.
3. To create a separate entry in notification No. 12/2017- CTR 28.06.2017 under heading 9963 to exempt accommodation services having value of supply of accommodation up to Rs. 20,000/- per month per person subject to the condition that the accommodation service is supplied for a minimum continuous

period of 90 days. To extend similar benefit for past cases.

Other changes relating to Services

4. Co-insurance premium apportioned by lead insurer to the co-insurer for the supply of insurance service by lead and co-insurer to the insured in coinsurance agreements, may be declared as no supply under Schedule III of the CGST Act, 2017 and past cases may be regularized on 'as is where is' basis.
5. Transaction of ceding commission/re-insurance commission between insurer and re-insurer may be declared as no supply under Schedule III of CGST Act, 2017 and past cases may be regularized on 'as is where is' basis.
6. GST liability on reinsurance services of specified insurance schemes covered by Sr. Nos. 35 & 36 of notification No. 12/2017-CT (Rate) dated 28.06.2017 may be regularized on 'as is where is' basis for the period from 01.07.2017 to 24.01.2018.
7. GST liability on reinsurance services of the insurance schemes for which total premium is paid by the Government that are covered under Sr. No. 40 of notification No. 12/2017-CTR dated 28.06.2017 may be regularized on 'as is where is' basis for the period from 01.07.2017 to 26.07.2018.
8. To issue clarification that retrocession is 're-insurance of re-insurance' and therefore, eligible for the exemption under Sl. No. 36A of the notification No. 12/2017-CTR dated 28.06.2017.
9. To issue clarification that statutory collections made by Real Estate Regulatory Authority (RERA) are exempt from GST as they fall within the scope of entry 4 of No.12/2017-CTR dated 28.06.2017.
10. To issue clarification that further sharing of the incentive by acquiring bank with other stakeholders, where the sharing of such incentive is clearly defined under Incentive scheme for promotion of RuPay Debit Cards and low value BHIM-UPI transactions and is decided in the proportion and manner by NPCI in consultation with the participating banks is not taxable.

B. Measures for facilitation of trade

1. **Insertion of Section 128A in CGST Act, to provide for conditional waiver of interest or penalty or both, relating to demands raised under Section 73, for FY 2017-18 to FY 2019-20 :** Considering the difficulties faced by the taxpayers, during the initial years of implementation of GST, the GST Council recommended, waiving interest and penalties for demand notices issued under Section 73 of the CGST Act for the fiscal years 2017-18, 2018-19 and 2019-20, in cases where the taxpayer pays the full amount of tax demanded in the notice upto **31.03.2025.** The waiver does not cover demand of erroneous refunds. To implement this, the GST Council has recommended insertion of Section 128A in CGST Act, 2017.

2. **Reduction of Government Litigation by Fixing monetary limits for filing appeals under GST:** The Council recommended to prescribe monetary limits, subject to certain exclusions, for filing of appeals in GST by the department before GST Appellate Tribunal, High Court, and Supreme Court, to reduce government litigation. The following monetary limits have been recommended by the Council:
   GSTAT: Rs. 20 lakhs
   High Court: Rs. 1 crore
   Supreme Court: Rs. 2 crores

3. **Amendment in Section 107 and Section 112 of CGST Act for reducing the amount of pre-deposit required to be paid for filing of appeals under GST:** The GST Council recommended reducing the amount of pre-deposit for filing of appeals under GST to ease cash flow and working capital blockage for the taxpayers. The maximum amount for filing appeal with the appellate authority has been reduced from Rs. 25 crores CGST and Rs. 25 crores SGST to Rs. 20 crores CGST and Rs. 20 crores SGST. Further, the amount of pre-deposit for filing appeal with the Appellate Tribunal has been reduced from 20% with a maximum amount of Rs. 50 crores

CGST and Rs. 50 crores SGST to 10 % with a maximum of Rs. 20 crores CGST and Rs. 20 crores SGST.

4. **Applicability of Goods and Services Tax on Extra Neutral Alcohol (ENA) Taxation of ENA under GST:** The GST Council, in its 52nd meeting, had recommended to amend GST Law to explicitly exclude rectified spirit/Extra Neutral Alcohol (ENA) from the scope of GST when supplied for manufacturing alcoholic liquors for human consumption. The GST Council now recommended amendment in sub-section (1) of Section 9 of the CGST Act, 2017 for not levying GST on Extra Neutral Alcohol used for manufacture of alcoholic liquor for human consumption.

5. **Reduction in rate of TCS to be collected by the ECOs for supplies being made through them:** Electronic Commerce Operators (ECOs) are required to collect Tax Collected at Source (TCS) on net taxable supplies under Section 52(1) of the CGST Act. The GST Council has recommended to reduce the TCS rate from present 1% (0.5% CGST + 0.5% SGST/ UTGST, or 1% IGST) to 0.5 % (0.25% CGST + 0.25% SGST/UTGST, or 0.5% IGST), to ease the financial burden on the suppliers making supplies through such ECOs.

6. **Time for filing appeals in GST Appellate Tribunal:** The GST Council recommended amending Section 112 of the CGST Act, 2017 to allow the three-month period for filing appeals before the Appellate Tribunal to start from a date to be notified by the Government in respect of appeal/ revision orders passed before the date of said notification. This will give sufficient time to the taxpayers to file appeal before the Appellate Tribunal in the pending cases.

7. **Relaxation in condition of section 16(4) of the CGST Act:**
   (a) **In respect of initial years of implementation of GST, i.e., financial years 2017-18, 2018-19, 2019-20 and 2020-21:**
   The GST Council recommended that the time limit to avail input tax credit in respect of any invoice or debit note under Section 16(4) of CGST Act, through any return in FORM GSTR 3B filed upto 30.11.2021 for the financial years 2017-18, 2018-19, 2019-20 and 2020-21, may be deemed to be 30.11.2021. For the same, requisite amendment in section 16(4) of CGST Act, retrospectively, w.e.f. 01.07.2017, has been recommended by the Council.

   (b) **with respect to cases where returns have been filed after revocation:**
   The GST Council recommended retrospective amendment in Section 16(4) of CGST Act, to be made effective from July 1st, 2017, to conditionally relax the provisions of section 16(4) of CGST Act in cases where returns for the period from the date of cancellation of registration/ effective date of cancellation of registration till the date of revocation of cancellation of the registration, are filed by the registered person within thirty days of the order of revocation.

8. **Change in due date for filing of return in FORM GSTR-4 for composition taxpayers from 30th April to 30th June:** The GST Council recommended an amendment in clause (ii) of sub-rule (1) of Rule 62 of CGST Rules, 2017 and **FORM GSTR-4** to extend the due date for filing of return in **FORM GSTR-4** for composition taxpayers from 30th April to 30th June following the end of the financial year. This will apply for returns for the financial year 2024-25 onwards. The same would give more time to the taxpayers who opt to pay tax under composition levy to furnish the said return.

9. **Amendment of Rule 88B of CGST Rules, 2017 in respect of interest under Section 50 of CGST Act on delayed filing of returns, in cases where the credit is available in**

Electronic Cash Ledger (ECL) on the due date of filing the said return: The GST Council recommended amendment in rule 88B of CGST Rules to provide that an amount, which is available in the Electronic Cash Ledger on the due date of filing of return in **FORM GSTR-3B**, and is debited while filing the said return, shall not be included while calculating interest under section 50 of the CGST Act in respect of delayed filing of the said return.

10. **Insertion of Section 11A in CGST Act for granting power not to recover duties not levied or short-levied as a result of general practice under GST Acts:** The GST Council recommended inserting a new Section 11A in CGST Act to give powers to the Government, on the recommendations of the Council, to allow regularization of non-levy or short levy of GST, where tax was being short paid or not paid due to common trade practices.

11. **Refund of additional Integrated Tax (IGST) paid on account of upward revision in price of the goods subsequent to export:** The GST Council recommended to prescribe a mechanism for claiming refund of additional IGST paid on account of upward revision in price of the goods subsequent to their export. This will facilitate a large number of taxpayers, who are required to pay additional IGST on account of upward revision in price of the goods subsequent to export, in claiming refund of such additional IGST.

12. **Clarification regarding valuation of supply of import of services by a related person where recipient is eligible to full input tax credit:** The Council recommended to clarify that in cases where the foreign affiliate is providing certain services to the related domestic entity, for which full input tax credit is available to the said related domestic entity, the value of such supply of services declared in the invoice by the said related domestic entity may be deemed as open market value in terms of second proviso to rule 28(1) of CGST Rules. Further, in cases where full input tax credit is available to the recipient, if the invoice is not issued by the related domestic entity with respect to any service provided by the foreign affiliate to it, the value of such services may be deemed to be declared as Nil, and may be deemed as open market value in terms of second proviso to rule 28(1) of CGST Rules.

13. **Clarification regarding availability of Input Tax Credit (ITC) on ducts and manholes used in the network of Optical Fiber Cables (OFCs):** The Council recommended to clarify that input tax credit is not restricted in respect of ducts and manhole used in network of optical fiber cables (OFCs), under clause (c) or under clause (d) of sub-section (5) of section 17 of CGST Act.

14. **Clarification on the place of supply applicable for custodial services provided by banks:** The Council recommended to clarify that place of supply of Custodial services supplied by Indian Banks to Foreign Portfolio Investors is determinable as per Section 13(2) of the IGST Act, 2017.

15. **Clarification on valuation of corporate guarantee provided between related persons after insertion of Rule 28(2) of CGST Rules, 2017:** GST Council recommended amendment of rule 28(2) of CGST Rules retrospectively with effect from 26.10.2023 and issuance of a circular to clarify various issues regarding valuation of services of providing corporate guarantees between related parties. It is *inter alia* being clarified that valuation under rule 28(2) of CGST Rules would not be applicable in case of export of such services and also where the recipient is eligible for full input tax credit.

16. **Clarification regarding applicability of provisions of Section 16 (4) of CGST Act, 2017, in respect of invoices issued by the recipient under Reverse Charge Mechanism (RCM):** The Council recommended to clarify that in cases of supplies received from

unregistered suppliers, where tax has to be paid by the recipient under reverse charge mechanism (RCM) and invoice is to be issued by the recipient only, the relevant financial year for calculation of time limit for availment of input tax credit under the provisions of section 16(4) of CGST Act is the financial year in which the invoice has been issued by the recipient.

17. Clarification on following issues to provide clarity to trade and tax officers and to reduce litigation:

a) Clarification on taxability of re-imbursement of securities/shares as ESOP/ESPP/RSU provided by a company to its employees
b) Clarification on requirement of reversal of input tax credit in respect of amount of premium in Life Insurance services, which is not included in the taxable value as per Rule 32(4) of CGST Rules.
c) Clarification on taxability of wreck and salvage values in motor insurance claims
d) Clarification in respect of Warranty/ Extended Warranty provided by Manufacturers to the end customers
e) Clarification regarding availability of input tax credit on repair expenses incurred by the insurance companies in case of reimbursement mode of settlement of motor vehicle insurance claims.
f) Clarification on taxability of loans granted between related person or between group companies.
g) Clarification on time of supply on Annuity Payments under HAM Projects.
h) Clarification regarding time of supply in respect of allotment of Spectrum to Telecom companies in cases where payment of licence fee and Spectrum usage charges is to be made in instalments.
i) Clarification relating to place of supply of goods supplied to unregistered persons, where delivery address is different from the billing address
j) Clarification on mechanism for providing evidence by the suppliers for compliance of the conditions of Section 15(3)(b)(ii) of CGST Act, 2017 in respect of post-sale discounts, to the effect that input tax credit has been reversed by the recipient on the said amount.
k) Clarifications on various issues pertaining to special procedure for the manufacturers of the specified commodities, like pan masala, tobacco etc.

18. The Council recommended amendment in section 140(7) of CGST Act retrospectively w.e.f. 01.07.2017 to provide for transitional credit in respect of invoices pertaining to services provided before appointed date, and where invoices were received by Input Service Distributor (ISD) before the appointed date.

19. The Council recommended providing a new optional facility by way of **FORM GSTR-1A** to facilitate the taxpayers to amend the details in **FORM GSTR-1** for a tax period and/ or to declare additional details, if any, before filing of return in **FORM GSTR-3B** for the said tax period. This will facilitate taxpayer to add any particulars of supply of the current tax period missed out in reporting in **FORM GSTR-1** of the said tax period or to amend any particulars already declared in **FORM GSTR-1** of the current tax period (including those declared in IFF, for the first and second months of a quarter, if any, for quarterly taxpayers), to ensure that correct liability is auto-populated in **FORM GSTR-3B**.

20. The Council recommended that filing of annual return in **FORM GSTR-9/9A** for the FY 2023-24 may be exempted for taxpayers having aggregate annual turnover upto two crore rupees.

21. Amendment was recommended to be made in section 122(1B) of CGST Act retrospectively w.e.f. 01.10.2023, so as to clarify that the said

penal provision is applicable only for those e-commerce operators, who are required to collect tax under section 52 of CGST Act, and not for other e-commerce operators.

22. The Council recommended amendment in rule 142 of CGST Rules and issuance of a circular to prescribe a mechanism for adjustment of an amount paid in respect of a demand through **FORM GST DRC-03** against the amount to be paid as pre-deposit for filing appeal.

Other measures pertaining to Law and Procedures

23. Rolling out of bio-metric based Aadhaar authentication on All-India basis: The GST Council recommended to roll-out the biometric-based Aadhaar authentication of registration applicants on pan-India basis in a phased manner. This will strengthen the registration process in GST and will help in combating fraudulent input tax credit (ITC) claims made through fake invoices.

24. Amendments in Section 73 and Section 74 of CGST Act, 2017 and insertion of a new Section 74A in CGST Act, to provide for common time limit for issuance of demand notices and orders irrespective of whether case involves fraud, suppression, willful misstatement etc., or not: Presently, there is a different time limit for issuing demand notices and demand orders, in cases where charges of fraud, suppression, willful misstatement etc., are not involved, and in cases where those charges are involved. In order to simplify the implementation of those provisions, the GST Council recommended to provide for a common time limit for issuance of demand notices and orders in respect of demands for FY 2024-25 onwards, in cases involving charges of fraud or willful misstatement and not involving the charges of fraud or willful misstatement etc. Also, the time limit for the taxpayers to avail the benefit of reduced penalty, by paying the tax demanded along with interest, has been recommended to be increased from 30 days to 60 days.

25. The Council recommended amendment in section 171 and section 109 of CGST Act, 2017 to provide a sunset clause for anti-profiteering under GST and to provide for handling of anti-profiteering cases by Principal bench of GST Appellate Tribunal (GSTAT). Council has also recommended the sun-set date of **01.04.2025** for receipt of any new application regarding anti-profiteering.

26. Amendment in Section 16 of IGST Act and section 54 of CGST Act to curtail refund of IGST in cases where export duty is payable: The Council recommended amendments in section 16 of IGST Act and section 54 of CGST Act to provide that the refund in respect of goods, which are subjected to export duty, is restricted, irrespective of whether the said goods are exported without payment of taxes or with payment of taxes, and such restrictions should also be applicable, if such goods are supplied to a SEZ developer or a SEZ unit for authorized operations.

27. The threshold for reporting of B2C inter-State supplies invoice-wise in Table 5 of **FORM GSTR-1** was recommended to be reduced from Rs 2.5 Lakh to Rs 1 Lakh.

28. The Council recommended that return in **FORM GSTR-7**, to be filed by the registered persons who are required to deduct tax at source under section 51 of CGST Act, is to be filed every month irrespective of whether any tax has been deducted during the said month or not. It has also been recommended that no late fee may be payable for delayed filing of Nil **FORM GSTR-7** return. Further, it has been recommended that invoice-wise details may be required to be furnished in the said **FORM GSTR-7** return.

3.5 SHORT ARTICLES

Hawkish Economic Policy

Context

- **US Presidential Election:** As the election approaches in November 2024, the Federal Reserve (the US central bank) has indicated it will not quickly reduce interest rates.
- **Global Impact:** This decision affects President Joe Biden's re-election prospects and has significant implications for global economies, particularly emerging markets like India.

Impact of US Federal Reserve's Actions

- **Global Influence:** The US economy and the dollar are critical to global markets. The Federal Reserve's decisions are closely monitored worldwide.
- **Currency Strength:** Higher US interest rates strengthen the dollar, prompting investors to withdraw funds from emerging markets and invest in the US.
- **Historical Impact:** Previous hints of interest rate hikes, like the 2013 Taper Tantrum, caused significant capital outflows from emerging economies, including India.

US vs India: Central Bank Mechanisms

- **US Federal Reserve:**
  - **Federal Funds Rate (FFR):** Targeted for interbank lending rates.
  - **Monetary Adjustments:** Influences the FFR by adjusting the money supply.
  - **Current Stance:** Fed chair Jay Powell emphasized not lowering the 5.5% target range until inflation nears the 2% goal.
- **Reserve Bank of India (RBI):**
  - **Repo Rate:** Adjusts the rate at which it lends to banks.
  - **Inflation Target:** Aims for 4% inflation, compared to the Fed's 2%.
  - **Policy Approach:** Both central banks are cautious to avoid reversing policies prematurely and increasing inflation.

Resilience of India's Economy

- **Independence:** India has grown more resilient to the Fed's actions, with the RBI independently adjusting rates.
- **Interest Rate Differential:** Despite resilience, the Fed's cautious stance influences the RBI to maintain higher domestic rates to prevent a widening rate gap.

Further Reading

- For more details, refer to articles on US Fed rate hikes:
  - IAS Gyan Article 1
  - IAS Gyan Article 2

General Anti-Avoidance Rule (GAAR)

Context

- The Telangana High Court recently issued a ruling concerning the invocation of the General Anti-avoidance Rule (GAAR) by the revenue department against a taxpayer.

General Anti-Avoidance Rule (GAAR)

- The General Anti-Avoidance Rule (GAAR) is an anti-tax avoidance measure

introduced in India to curb tax evasion and prevent revenue loss.

- It has been in **effect since April 1, 2017, under the Income Tax Act, 1961.**

Key Points

- **Purpose:** GAAR targets aggressive tax planning strategies that aim to reduce tax liabilities in ways that, while technically legal, lack genuine commercial substance.
- **Trigger:** GAAR is invoked when transactions are declared as Impermissible Avoidance Arrangements (IAAs).

Impermissible Avoidance Arrangement (IAA)

An arrangement qualifies as an IAA if it:

1. **Seeks Tax Benefits:** The primary objective is to gain tax advantages.
2. **Non-Arm's Length Dealings:** Involves unusual rights or obligations not typical of standard transactions.
3. **Abuses Tax Laws:** Misuses provisions of the Income Tax Act.
4. **Lacks Commercial Substance:** Has no genuine commercial purpose or is carried out via unconventional means.

Implementation and Process

- **Revenue Department Role:** The revenue department is responsible for identifying and declaring IAAs.
- **Taxpayer Rights:** Taxpayers can contest the IAA classification.
- **Procedure:** Under Section 144BA, the process for declaring an arrangement as an IAA involves a formal procedure.

Application Scenarios

- **Tax Mitigation:** Setting up businesses in underdeveloped areas for legitimate tax benefits usually doesn't trigger GAAR.
- **Lack of Substance:** Transactions without commercial substance, aimed at exploiting tax exemptions, likely invoke GAAR.
- **Jurisdiction Manipulation:** Manipulating jurisdiction solely for tax avoidance is likely to attract GAAR scrutiny.
- **Artificial Subsidiaries:** Creating subsidiaries for tax avoidance without genuine business purposes triggers GAAR.

Criticism and Debate

- **Harshness and Misuse:** Critics argue that GAAR can be harsh and may penalize honest taxpayers.
- **Implementation Challenges:** Concerns exist about GAAR's complexity and the risk of it being misapplied.
- **Ongoing Discussion:** Debates continue on refining GAAR to ensure it effectively targets tax evasion without unfairly burdening taxpayers.

Buffer Stock Policy and its Impact on Inflation

Context

- Inflation rates vary significantly among food categories, particularly cereals and pulses, due to buffer stock interventions. This analysis examines the impact of buffer stocks, focusing on wheat and chana, on inflation dynamics in recent years.

Background

- In May 2024, inflation rates **were 8.69% for cereals and 17.14% for pulses,** reflecting the impact of buffer stock policies on market stability.
- The Food Corporation of India (FCI) sold a record 100.88 lakh tonnes of wheat in fiscal year 2023-24, including processed flour under the 'Bharat Atta' brand.
    - This reduced wheat inflation from a peak of **25.37% in February 2023 to 6.53% by May 2024**.
    - Despite challenges like poor crops, FCI's buffer maintenance effectively stabilized wheat prices.
- National Agricultural Cooperative Marketing Federation of India (NAFED) procured 25.56

lakh tonnes and 23.53 lakh tonnes of chana in the crop years 2021-22 and 2022-23 respectively.
    - NAFED used minimum support prices (MSP) **to prevent pulse price surges amid adverse weather conditions.**
    - Strategic sales of chana through e-auctions and branded 'Bharat Dal' **stabilized retail prices despite open market rates exceeding MSP significantly.**

Rationale for Expanded Buffer Policies:

- **Food Price Volatility:** Climate change exacerbates inherent volatility, necessitating robust buffer stock policies to stabilize prices and ensure food security during shortages.
- **Diversification and Expansion:** Beyond rice, wheat, and select pulses, expanding to include oilseeds, staple vegetables, and dairy products like skimmed milk powder (SMP) can mitigate price pressures. Processing perishables into value-added forms for institutional buyers further enhances resilience.
- **Cost-Benefit Analysis:** While buffer stocks involve fiscal costs, they crucially mitigate severe economic impacts of food inflation. Offloading stocks at market-based prices during inflationary periods ensures fiscal sustainability.

Conclusion:

- Buffer stocking is vital for stabilizing food prices amid climate-driven volatility.
- The success with wheat and chana underscores the need to expand and diversify buffer stocks, safeguarding consumers from price shocks and promoting agricultural sustainability in unpredictable climates.

READ ABOUT NAFED: *https://www.iasgyan.in/daily-current-affairs/talks-with-farmers-on-crop-diversification-proposal#:~:text=NAFED%20was%20established%20on%20the,Farmers%20Welfare%2C%20Government%20of%20India.*

READ ABOUT FOOD CORPORATION OF INDIA: *https://www.iasgyan.in/daily-current-affairs/food-corporation-of-india-fci-11*

Rooftop Solar Potential

Context:

- Rooftop solar (RTS) is poised to revolutionize India's energy landscape, offering a sustainable, decentralized, and affordable solution to meet the country's increasing electricity demands.
- As of March 31, 2024, India's installed RTS **capacity reached 11.87 GW, with an annual growth of 2.99 GW, the highest reported in a single year.**
- To sustain this momentum and meet future energy needs, India must intensify efforts to expand its RTS potential.

Key Points:

- **RTS Programme Overview:** Initiated under the Jawaharlal Nehru National Solar Mission, India aimed to achieve 20 GW of solar energy production by 2022, later revised to 100 GW by 2022, with RTS accounting for 40 GW. Ongoing initiatives like **SUPRABHA and SRISTI** support aggressive solar energy goals.
- **New Solar Power Rules:** Recent regulatory changes aim to accelerate solar energy production, supporting India's target of **installing 500 GW of renewable energy capacity by 2030**, contributing to broader net-zero targets by 2070.
- **State Performance and Challenges:** States like **Gujarat, Maharashtra, and Rajasthan lead in RTS adoption,** while bureaucratic delays and inadequate infrastructure challenge RTS deployment in states like Uttar Pradesh, Bihar, and Jharkhand.
- **Pradhan Mantri Surya Ghar: Muft Bijli Yojana:** This flagship scheme aims to equip **1 crore households with RTS systems, providing up to 300 units of free electricity monthly,** with a capacity addition target of 20 GW and a significant financial outlay of Rs 75,021 crore.
- **Streamlining Approvals:** The Indian government is simplifying regulatory clearances and promoting ease of business to reduce administrative barriers and accelerate RTS installations nationwide.

READ ABOUT ROOFTOP SOLAR: ***https://www.iasgyan.in/daily-current-affairs/pradhan-mantri-suryodaya-yojana#:~:text=Launched%20in%202014%2C%20the%20Rooftop,installed%20capacity%20by%20March%202026.***
https://www.iasgyan.in/daily-current-affairs/rooftop-solar-programme

RBI's Revised Priority Sector Guidelines

Context:

- In a move aimed at fostering inclusive growth and equitable access to credit across India, the **Reserve Bank of India (RBI)** has recently revised its **priority sector lending guidelines**.
- These revisions are designed to encourage banks to focus more on **economically disadvantaged districts** and **smaller borrowers**, addressing disparities in **credit availability** and **average loan sizes**.

Key Points:

- **Priority Sector Definition:** It includes sectors vital for the country's development, such as **agriculture**, **micro, small and medium enterprises (MSMEs)**, **export credit**, **education**, **housing**, **social infrastructure**, **renewable energy**, and **others**, as identified by the Government and RBI.
- **PSL Targets:** Domestic **scheduled commercial banks (SCBs)** and **foreign banks (20 branches and above)** must allocate **40%** of **Adjusted Net Bank Credit (ANBC)** or **Credit Equivalent Amount of Off-Balance Sheet Exposure (CEOBE)**, whichever is higher, to **priority sectors**. **Regional rural banks (RRBs)** and **small finance banks (SFBs)** have a higher target of **75%** of **ANBC** or **CEOBE**.
- **Methods to Meet PSL Obligations:** Banks can fulfill their **PSL targets** through **direct lending**, offering specialized **financial products**, and investing in eligible instruments like **bonds** issued by entities engaged in **priority sector activities**.
- **Consequences of Non-Compliance:** Banks failing to meet **PSL targets** are required to deposit the shortfall into specified funds and face **regulatory oversight** and potential **penalties**.

Key Changes:

- The revised guidelines emphasize lending to **economically disadvantaged districts** with lower average loan sizes, incentivizing increased **credit flow** to stimulate local economies. Starting FY 2025, **RBI** adjusts **weightage** for loans based on **district-specific credit availability metrics** to promote balanced regional development.

Low Loan Availability Districts (< Rs 9,000 per person):

- **Higher weightage of 125%** for loans in districts where average loan availability is below Rs 9,000 per person.
- **Incentivizes banks** to channel more resources into underserved areas.
- Aimed at **uplifting local economies** and **empowering small businesses and individuals**.

High Loan Availability Districts (> Rs 42,000 per person):

- **Reduced loan weightage to 90%** in districts with average loan availability exceeding Rs 42,000 per person.
- **Discourages excessive concentration** of credit in well-serviced regions.
- Promotes **more balanced distribution** of financial resources across different districts.

Framework for Other Districts:

- **Standard weightage level of 100%** for districts within average ranges of credit availability and loan sizes.
- **Flexibility** for outlier districts with **unusually low or high loan metrics** to adapt based on local economic realities.
- Ensures **tailored responses** to diverse economic conditions across districts
- **RBI's Strategic Framework: RBI** ranks districts by **per capita credit flow** to prioritize **incentives** for underserved districts and introduce measures discouraging excessive **credit concentration** in well-serviced areas. These measures aim to enhance **financial resilience** and **sustainable credit practices** across the banking sector.
- **Industry Response:** Recent reports indicate proactive responses from banks, including

expansions into new **credit products** and ambitious targets for **priority sector lending** in FY25, signaling the sector's readiness to comply with and benefit from these **regulatory changes**.

Power Market

Context

- To address the unusually high-power demand during a scorching summer, the government has taken a significant step by permitting the trading of surplus electricity generated from **"linkage coal"** in the country's **power markets**. This decision comes as a strategic response to ensure adequate power supply amidst soaring temperatures, where traditional methods may fall short.

Coal Linkages and Power Purchase Agreements (PPAs)

- **Coal Linkages**: Typically established by the government, coal linkages tie thermal units to long-term **PPAs** with distribution companies (**discoms**). **PPAs**: These agreements, spanning around 25 years, commit generators to supply power at fixed rates, posing challenges in adapting to dynamic market conditions.

Emergence of Power Markets

- **Flexibility Over PPAs**: Power markets offer a flexible, transparent alternative to **PPAs**, enabling generators to respond swiftly to demand fluctuations. **Market-Driven Pricing**: Surplus power can be traded independently of **PPAs** at market-determined prices, optimizing revenue for generators.

Functioning of Power Markets

- **Market Dynamics**: Buyers and sellers participate in bidding and offering electricity, with the **market clearing price** determined by demand and supply equilibrium.
- **Market Categories**: **Spot markets** facilitate immediate trades, while **contract markets** enable longer-term transactions such as day-ahead and term-ahead markets.
- **Role of RECs**: **Renewable Energy Certificates (RECs)** allow utilities to fulfil renewable purchase obligations, contributing to the green energy ecosystem.

Power Exchanges in India

- **Establishment and Regulation**: Power exchanges operate under the framework established by the **Electricity Act of 2003**, regulated by **CERC**.
- **Market Dominance**: **Indian Energy Exchange Ltd (IEX)** holds a significant market share, followed by **Power Exchange India Limited (PXIL)** and **Hindustan Power Exchange Ltd (HPX)**.

Growth and Importance of Power Exchanges

- **Trading Volume**: **IEX** traded about 110 billion units (BU) of electricity in FY 2023-24, representing a substantial portion of India's total power demand.
- **Regulatory Support**: Recent amendments aim to encourage participation in power exchanges, recognizing their growing significance in India's energy market.

Future Developments

- **Market Coupling**: Proposed to enhance price discovery and stability by matching bids across exchanges.
- **Capacity Markets**: Aimed at incentivizing investment in generation capacity for long-term grid reliability, aligning India's market practices with international standards.
- This strategic move by the government not only addresses immediate energy needs but also sets the stage for a more resilient and adaptable **energy infrastructure** in the face of future challenges.

World Investment Report 2024

Context

- The World Investment Report 2024 indicates **that the value of international project finance deals in African nations plummeted by 50 per cent to $64 billion in 2023, following a 20 per cent decrease in 2022.**

India's Performance

- In 2023, **India** saw a notable decline in **Foreign Direct Investment (FDI)**, recording

$28 billion compared to **$49 billion** in 2022, as reported by **UNCTAD**.

- This decrease led to India's global FDI ranking dropping from **8th** in 2022 to **15th** in 2023. Despite this decline, India maintained its attractiveness for FDI in **greenfield projects** and **international project finance deals**, remaining among the **top five countries** globally.
- Specifically, India ranked **fourth** in FDI announcements for greenfield projects and retained the **second position** worldwide for international project deals.
- On the other hand, India's **FDI outflows** saw a shift, ranking **20th** globally in 2023, down from **23rd** in the previous year, reflecting investments made by Indian companies outside the country. According to UNCTAD's **World Investment Report**, India secured the **15th position** among the top FDI recipient countries globally, with **$28 billion** in FDI inflows.

UNCTAD

- **UNCTAD**, established in 1964, operates as the **United Nations Conference on Trade and Development**, headquartered in **Geneva, Switzerland**.
- It plays a pivotal role in promoting **trade, investment, and development** in developing countries.
- UNCTAD releases comprehensive reports such as the **World Investment Report** and the **Trade and Development Report** to facilitate informed decision-making in global trade and development policies.
- These reports provide valuable insights into trends, challenges, and opportunities in global **investment flows**, aiding policymakers and stakeholders in understanding and navigating the complexities of international **trade and investment** landscapes.

'Fast Track Immigration Trusted Traveller Programme'

In News

- Union Home Minister Amit Shah inaugurated the **'Fast Track Immigration Trusted Traveller Programme' (FTI-TTP)** at Indira Gandhi International (IGI) Airport, aimed at revolutionizing travel for **Indian nationals** and **Overseas Citizen of India (OCI)** cardholders.

Details

- This initiative promises a faster, easier, and more secure travel experience, marking a significant step towards modernizing India's immigration system.
- The FTI-TTP aims to streamline the immigration process by reducing waiting times at counters for pre-verified individuals, ensuring enhanced travel convenience.

Key Points:

- **Objective**: Enhance efficiency and security for pre-verified Indian nationals and OCI cardholders.
- **Eligibility**: Open to those with a clean record and accurate information submission.
- **Application Process**: Online submission via designated portal, biometric submission required.
- **Biometric Registration**: Done at specified international airports or FRRO offices.
- **Membership Validity**: Up to five years or passport validity.
- **Passport Requirement**: Minimum six months validity.
- **Information Verification**: Mandatory residential address and accuracy in data.
- **Document Submission**: Includes passport photograph, scanned documents, proof of address.
- **Processing Fees**: Rs 2,000 for adults, Rs 1,000 for minors, and $100 for OCI cardholders.

The FTI-TTP aims to modernize India's immigration infrastructure, aligning it with global standards and ensuring a seamless travel experience for its beneficiaries.

Pradhan Mantri Awas Yojna

Context:

- Prime Minister Narendra Modi visited Solapur, Maharashtra, to dedicate homes constructed under the **Pradhan Mantri Awas Yojana-Urban Scheme (PMAY-Urban)** to over

15,000 beneficiaries, including diverse occupational groups such as power loom workers, rag pickers, vendors, handloom workers, and bidi industry workers.

PM Awas Yojana (PMAY):

- Launched in 2015 by Prime Minister Narendra Modi, implemented by the Ministry of Housing and Urban Affairs (MoHUA).
- Has four components: **In-situ Slum Redevelopment (ISSR)**, **Affordable Housing in Partnership (AHP)**, **Credit Linked Subsidy Scheme (CLSS)**, and **Beneficiary Led Construction (BLC)**.

Significance:

- Provides dignified living conditions with pucca houses and basic amenities.
- Empowers women through homeownership.
- Promotes social inclusion and cohesion.
- Stimulates the housing sector and creates employment.
- Supports Sustainable Development Goals (SDGs), particularly SDG 11.

Current Status of PMAY:

- **Over 2.95 crore houses** sanctioned under both PMAY (Urban) and PMAY (Gramin), nearly 80% of the initial target for 2024.
- Deadline for PMAY (Urban) extended to December 31, 2024.
- **CLSS** remains key, with over **1.18 crore houses** sanctioned.
- Emphasis on technology for transparency and efficiency.

Challenges:

- Land availability and affordability.
- Delay in approvals and clearances.
- Capacity and coordination issues among stakeholders.
- Awareness and demand challenges.
- Quality, durability, and maintenance concerns.

Way Forward:

- Enhance land availability through pooling and banking.
- Simplify approval processes with online platforms.
- Strengthen capacity building and monitoring.
- Increase awareness through media campaigns.
- Improve house quality through standardization.
- Promote convergence with other urban development schemes.

Conclusion:

- PMAY has achieved significant milestones but faces challenges that require proactive solutions. Collaboration between the Government of India, states/UTs, and partners is crucial for effective implementation and achieving desired outcomes.

PM AWAS YOJANA: *https://www.iasgyan.in/daily-current-affairs/pm-awas-yojana-32*

3.6 SNIPPETS

Topics	Details
Inclusion of Indian Government Bonds in JP Morgan's Emerging Markets Indices	From June 28, 2024, **Indian Government Bonds (IGBs)** will gradually be incorporated into **JP Morgan's emerging markets bond indices**, completing the process by March 31, 2025. This move is anticipated to bring sizable **capital inflows** to India, estimated between **$20-25 billion**. **JP Morgan**, a leading global financial services firm, is spearheading this inclusion, enhancing India's presence in the **JPMorgan Government Bond Index-Emerging Markets index suite** and associated benchmarks **attracting substantial foreign investment, supporting external finances, and potentially lowering funding costs.**
Holdcos	Amidst current market challenges, SEBI's recent announcement of a special call auction session has sparked a significant rally in Investment Holding

	Companies (IHCs), also known as Holdcos. A **Holdco** (holding company) **controls or influences other firms by acquiring sufficient stock.** It earns through dividends from controlled firms and is used to limit liability. These firms play a critical role **by holding assets and securities of other listed companies within their group.** Notably, companies like Bombay Burmah Trading Corporation and Kalyani Investment Company saw their shares surge, **driven by their historically undervalued prices compared to their actual book values.** This move by SEBI aims to enhance price **discovery transparency, offering potential for unlocking value in Holdco shares**, although analysts remain cautiously optimistic due to lingering concerns over tax implications and regulatory factors affecting Holdco valuations in India's market landscape.
e-Samridhi Portal	In a significant move to bolster agricultural sustainability and ensure fair prices for **pulses** like **tur, urad, and masur**, Union Minister of **Agriculture & Farmers' Welfare** and **Rural Development** Shri Shivraj Singh Chouhan reaffirmed the government's commitment to **Minimum Support Prices (MSP)**. Central to this initiative is the **e-Samridhi Portal**, launched by **NAFED** and **NCCF**, which aims to streamline **procurement processes** and facilitate **direct bank transfers** for registered **farmers**. By enabling farmers to register directly or through **cooperative societies** and **FPOs**, the portal enhances **operational efficiency** and ensures **food security** by reducing reliance on imports. This digital platform not only connects farmers with **procurement agencies** but also lays the groundwork for a modern **agricultural revolution**, emphasizing the pivotal role of **pulses** and **oilseeds** in India's agricultural landscape alongside traditional crops like **wheat** and **rice**.
Augmentation of Minimum Support Prices (MSP)	The Union Cabinet approved **augmentation of Minimum Support Prices (MSP)** for all mandated Kharif Crops for Marketing Season 2024-25, aiming to ensure fair prices and boost agricultural production. Significant increases in MSP have been recommended for **oilseeds** and **pulses**, including crops like nigerseed, sesamum, and tur/arhar, aligning with the directive to fix MSP at least 1.5 times the All-India weighted average cost of production. This move not only supports farmers' income by offering remunerative prices but also promotes crop diversity, reflecting a broader strategy for agricultural sustainability and rural prosperity.

3.7 ADDITIONAL TOPICS FOR READING

- Strategic Interventions for Green Hydrogen Transition (SIGHT) programme
- Enforcement of Telecommunications Act, 2023
- India's Port Development: Achieving Global Recognition
- India's Ranking in the Global Energy Transition Index
- Angel Tax, India's startup ecosystem
- OFFSHORE WIND ENERGY IN INDIA
- India's Port Development: Achieving Global Recognition
- Great Nicobar Project

4. DEFENSE & SECURITY

4.1 BLUEPRINT FOR WARFARE IN CYBERSPACE

Context

- The CDS, General Anil Chauhan, released India's first joint doctrine for cyberspace operations, highlighting the significance and complexity of cyberspace in modern warfare.

Details

Cyber Warfare

- **Definition:** Cyber warfare refers to the use of cyber capabilities by state or non-state actors to disrupt, destroy, or manipulate computer systems, networks, and information infrastructure with the intention of causing harm, exerting influence, or achieving strategic objectives.

Types of Cyber Warfare

- **Cyber Espionage :** Cyber espionage involves unauthorized access to computer systems or networks to gather sensitive information. It is often conducted covertly to obtain strategic, political, or economic intelligence.
- **Cyber Sabotage :** Cyber sabotage aims to disrupt or disable critical infrastructure, services, or operations through cyber attacks. This can include damaging or manipulating systems to cause physical or economic harm.
- **Cyber Terrorism :** Cyber terrorism uses cyber attacks to instill fear, cause disruption, or coerce governments or societies for ideological, political, or religious reasons. It can involve spreading propaganda, launching denial-of-service attacks, or targeting critical services.

Challenges in Cyber Security

- **Limited Investment:** Insufficient funding for advanced cybersecurity technologies and infrastructure upgrades.
- **Legacy Systems:** Dependence on outdated IT systems vulnerable to modern cyber threats.
- **Skill Shortage: Shortfall of skilled cybersecurity professionals capable of managing complex cyber threats.**
- **Training and Development: Need for continuous education and skill enhancement to keep pace with evolving cybersecurity landscape.**
- **Complexity:** Challenges in navigating diverse cybersecurity regulations and standards across sectors.
- **Legal Ambiguities:** Unclear laws and jurisdictional issues impacting enforcement against cyber crimes.
- **Security Integration:** Ensuring robust security measures in the design and deployment of IoT, AI, and cloud computing technologies.
- **Cyber Warfare:** State-sponsored attacks and geopolitical tensions influencing national cyber security strategies.

Indian Initiatives for Cyber Security:

National Cyber security Policy

- **Framework:** The National Cyber security Policy provides a comprehensive strategy for creating a secure cyber ecosystem.
- **Objectives:** It aims to protect information, infrastructure, and other critical assets from cyber threats.
- **Implementation:** Guidelines for enhancing cyber resilience across government, private sectors, and academia

Indian Computer Emergency Response Team (CERT-In)

- **Role:** CERT-In serves as the national agency for incident response, vulnerability handling, and cyber security management.
- **Functions:** It provides early warning and response to cyber incidents, coordinates with stakeholders, and promotes cyber security awareness.
- **Impact:** Facilitates timely mitigation of cyber threats and strengthens incident response capabilities nationwide.

Cyber Surakshit Bharat

- **Objective:** Launched under the Ministry of Electronics and Information Technology (MeitY), Cyber Surakshit Bharat aims to raise awareness about cyber threats and promote cybersecurity hygiene.
- **Initiatives:** Includes workshops, training programs, and campaigns to educate citizens, businesses, and government officials on cyber safety practices.
- **Collaboration:** Partnerships with industry stakeholders and academia to enhance cybersecurity readiness.

National Cyber Coordination Centre (NCCC)

- **Role:** NCCC serves as a centralized agency for real-time monitoring, threat assessment, and coordination of cyber incidents.
- **Functions:** Enhances situational awareness, supports decision-making during cyber crises, and facilitates information sharing among stakeholders.
- **Integration:** Coordinates with CERT-In and other agencies to strengthen national cyber defense mechanisms.

Cyber Swachhta Kendra (Botnet Cleaning and Malware Analysis Centre)

- **Purpose:** Operated by CERT-In, Cyber Swachhta Kendra aims to provide free tools for malware analysis and help secure systems and devices from botnet infections.
- **Activities:** Offers malware detection and removal tools, promotes best practices for cyber hygiene, and supports cyber threat intelligence sharing.
- **Impact:** Mitigates risks associated with malware and botnet attacks, contributing to overall cybersecurity resilience.

Significance of the Joint Doctrine

- Guidance for Commanders
  - **Strategic Direction:** Provides essential guidance to commanders navigating the complexities of conducting cyberspace operations.
  - **Decision Support:** Helps in making informed decisions to safeguard national interests in the digital domain.
- Enhancing Jointness and Integration
  - **Collaborative Efforts:** Facilitates jointness and integration among the Army, IAF, and Navy in cyber defense strategies.
  - **Operational Cohesion:** Strengthens coordinated efforts to achieve unified objectives in cyberspace operations.
- Advancing Ongoing Processes
  - **Progression:** Marks a significant step forward in advancing India's capabilities and readiness in cyberspace operations.
  - **Continuous Improvement:** Supports ongoing efforts to evolve and adapt to emerging cyber threats and technological advancements.

Conclusion

- The Joint Doctrine for cyberspace operations provides strategic guidance, enhances military integration, and advances India's cyber capabilities, ensuring commanders make informed decisions and fostering continuous improvement to address evolving cyber threats.

4.2 SHORT ARTICLES

iDEX

Context

- The Ministry of Defence signed the 350th contract under the Innovations for Defence Excellence (iDEX) initiative with SpacePixxel Technologies Pvt Ltd.

Details

Introduction

- It is a flagship scheme of the Ministry of Defence, Government of India.
- It was launched in 2018 to foster innovation in the Defence and Aerospace sectors.

Objective

- to cultivate an innovation ecosystem by collaborating with startups, innovators, MSMEs, incubators, and academia.
- Provide financial support to nearly 300 startups, MSMEs, individual innovators, and about 20 partner incubators through the Defence Innovation Organisation (DIO).

Support and Engagement

- Offers grants and support for R&D projects with significant potential for future adoption in Indian defence and aerospace.
- Engaged with over 400 startups and MSMEs.
- Recognized as a game-changer in the defence ecosystem.
- Received the Prime Minister's Award for Innovation in the defence sector.

Funding and Management

- Funded and managed by the Defence Innovation Organisation (DIO), a "not for profit" company under Section 8 of the Companies Act 2013.
- DIO formed by two Defence Public Sector Undertakings (DPSUs) – Hindustan Aeronautics Limited (HAL) and Bharat Electronics Limited (BEL).
- iDEX functions as the executive arm of DIO, carrying out necessary activities with DIO providing high-level policy guidance.

Budgetary Support

- Approved central sector scheme with budgetary support of Rs 498.78 crore from 2021-22 to 2025-26.
- Rs 45 crore released for the financial year 2021-2022.

Promoting Innovation

- Aims to promote innovation and indigenization in the aerospace and defence sectors at the startup level.
- Encourages a culture of technology co-creation and co-innovation.
- Empowers startups to be part of the defence and aerospace ecosystem.

Government Support

- Provides substantial grants and easier access to test facilities and infrastructure.
- Facilitates co-creation, co-innovation, and procurement processes.
- Creates a conducive environment for startups to innovate and grow in the defence and aerospace sectors.

Liquid IED

Context

- Jammu and Kashmir Police recovered hidden liquid IEDs in Pulwama.
- This is posing a new challenge for security forces amid recent attacks in the Jammu region.

Details

Introduction

- Improvised Explosive Devices (IEDs) are unconventional homemade explosives.
- IEDs vary in shape, size, and triggering methods.
- IEDs are used by a wide range of individuals and groups, including criminals, vandals, terrorists, suicide bombers, and insurgents.

Characteristics of IEDs

- Unconventional Weapons : IEDs are homemade explosives, which can be designed in various forms and triggered through different mechanisms. These weapons are highly adaptable and can be customized to fit specific attack scenarios.
- **Diverse Forms:** The forms of IEDs can range from small pipe bombs to complex devices capable of causing mass destruction. They can be:
  - Carried, placed, or thrown by a person
  - Delivered in a package
  - Concealed on the roadside
  - Carried or delivered in a vehicle
- **Term Origin:** The term IED became widely recognized during the Iraq War, which began in 2003.

Components of an IED

- **Initiating Mechanism:** An IED includes a detonator to trigger the explosion.
- **Explosive Charge:** The main explosive material within the device.
- **Casing/Projectiles**: A container for the explosives, often filled with objects such as nails or ball bearings to create lethal fragments upon detonation.

Materials Used in IEDs:

- IEDs can be made from a wide range of materials, including:
  - Artillery rounds
  - Mortar rounds
  - Aerial bombs
  - Fertilizers (such as ammonium nitrate)
  - TNT
  - Other commercial explosives

Security Concerns:

- There is significant concern regarding explosives created from liquid components.
- These can be transported in a stable form and mixed at the site of the attack.
- This concern led to the U.S. Department of Homeland Security restricting the amount of liquids passengers can carry on commercial aircraft since 2006.

TAPAS

Context

- The Indian Air Force (IAF) has made a notable proposal to the central government to bolster its native unmanned surveillance capabilities by acquiring 10 TAPAS drones.

Details of TAPAS Drones

Introduction

- The Tactical Airborne Platform for Aerial Surveillance Beyond Horizon-201, or Tapas BH-201, is a medium-altitude, long-endurance (MALE) drone

Developed by

- DRDO's Aeronautical Development Establishment (ADE)

Manufacturing Collaboration

- Bharat Electronics Limited and Hindustan Aeronautics Limited collaborate in manufacturing these drones

Key Features and Capabilities

- **Operational Specifications**: Operates at an **altitude of 30,000 feet for up to 24 hours.**
- **Payload and Range**: Payload capacity of **up to 350 kg and a range of 250 km.**
- **Technological Advancements**:
  - Advanced aerodynamics and digital flight controls.
  - Equipped with medium and long-range electro-optic payloads and synthetic aperture radar for all-weather, day-night operations.

Multiple roles of TAPAS drone:

- **Surveillance and Reconnaissance**: Provides real-time intelligence gathering over vast areas, enhancing situational awareness.
- **Target Acquisition**: Helps in identifying and marking targets for precision strikes, improving operational effectiveness.
- **Communication Relay**: Acts as a communication hub, facilitating seamless connectivity between ground forces and command centers.
- **Battlefield Monitoring**: Monitors troop movements and activities in remote or hostile environments, ensuring operational security.
- **Search and Rescue**: Assists in locating and rescuing personnel in distress, especially in inaccessible or hazardous terrain.
- **Border Patrol**: Conducts continuous surveillance along borders, enhancing border security and monitoring activities.

4.3 SNIPPETS

Topics	Details
JIMEX24	• **The eighth edition** of the India-Japan Maritime Exercise (JIMEX 24) has begun at **Yokosuka, Japan.** The exercise includes both harbour and sea phases • **Indian Navy's Participation:** Indigenous Stealth Frigate INS Shivalik • **Japan's Participation:** Guided Missile Destroyer JS Yugiri • **Inception:** 2012 • **Editions:** JIMEX 2024 marks the eighth edition of this bilateral maritime exercise.
Tarang Shakti	• India to host its first multinational air exercise Tarang Shakti. It will be held in

	August, and is likely to see the **participation of ten countries.**
	• **Two-phase Exercise:**
	  ○ **Phase 1**: Southern India (First two weeks of August)
	  ○ **Phase 2**: Western Sector (End of August to mid-September)
	• **Strategic Significance:**
	  ○ **Showcase of Capabilities:** Demonstrates India's advanced air power projection capabilities and strengthens its strategic partnerships.
	  ○ **Global Stage:** Highlights India's commitment to fostering international military cooperation and enhancing regional stability.

Red Flag 2024	• An Indian Air Force (IAF) contingent has arrived at the **Eielson Air Force Base in Alaska** to participate in the prestigious multi-national exercise, Red Flag 24.
	• Red Flag is **a two-week advanced aerial combat training exercise.**
	• It aims to integrate aircrew in a multinational environment
	• India has sent eight Rafale fighter jets to the exercise
	• Participants in RED FLAG-Alaska are divided into
	  ○ "Red" defensive forces
	  ○ "Blue" offensive forces
	  ○ "White" forces serving as a neutral controlling agency.
	• The defensive forces include ground-control intercept and surface air defense units to replicate potential threats from hostile nations.
	• They employ defensive counter-air tactics underground-control intercept guidance.

Ex- HOPEX	• The Indian Air Force (IAF) has deployed its Rafale fighters, C-17 Globemaster and IL-78 tankers jets to Egypt for the Ex-HOPEX exercise • This weeklong exercise marks **the fourth joint exercise** between the IAF and the Egyptian Air Force (EAF). **Historical Context** • **Non-Aligned Movement:** India and Egypt were founding members, indicating a history of cooperation in multilateral fora. • **75th Anniversary:** In 2022, India and Egypt celebrated 75 years of diplomatic relations, underscoring their enduring partnership.

IRIS T Missile	• The IRIS-T programme is the combined initiative of **Germany, Greece, Norway, Italy, Spain and Sweden .** It is a short-range, highly maneuverable, all-aspect missile.
	• **Diehl Defence** is the main contractor.
	• **Performance and Capabilities**
	  ○ Short-range, highly maneuverable, all-aspect missile.
	  ○ Equipped with roll-pitch imaging and a wide-angle infrared seeker.
	  ○ Fast target acquisition and full hemisphere engagement, can be employed as **fire-and-forget.**
	  ○ **Maximum range:** Approximately 25 km.
	  ○ **Maximum speed:** Mach 3.

AIR LORA	• The Long-Range Artillery (LORA) ballistic missile, designed and developed **by Israel Aerospace Industries (IAI)** • Israel Aerospace Industries introduced **a new air-launched version** of its Lora ballistic missile. • Its Supersonic Speed ensures rapid delivery and reduces the time available for

	enemy countermeasures.
	• **Performance and Capabilities**
	  ○ **Long-Range Precision:** Capable of striking targets from a significant distance, extending the operational range of fighter aircraft.
	  ○ **High Accuracy:** Achieves **less than 10-meter Circular Error Probable (CEP),** ensuring precision strikes.
	  ○ **Autonomous Operation:** Features **simple fire-and-forget functionality** for ease of use.
	  ○ **Target Flexibility**: Can **adapt to changing target locations** during the mission flight.

Nagastra	• It is India's first indigenous man-portable suicide drones • It is developed by **Economics Explosives Ltd (EEL),** a subsidiary of Solar Industries Nagpur, in collaboration with **Bangalore's Z-Motion** • It flies at altitudes up to **4,500 meters**. • It has a maximum range of **30 kilometers** in autonomous mode (15 kilometers when operated remotely). • It features a **'Kamikaze mode'** for targeted destruction • It is Capable of carrying **a 1-kilogram warhead.**

INS Sunayna	• INS Sunayna is a Saryu class Offshore Patrol Vessel (OPV).
	• It was commissioned at **Kochi in 2013.**
	• INS Sunayna is based under the Southern Naval Command.
	• It was constructed by Goa Shipyard Limited.
	• It can achieve speeds of up to **25 knots.**
	• The warship is equipped with **an automatic power management system.**
	• The ship is designed to meet the increasing ocean surveillance and patrolling requirements of the Indian Navy.
	• **Other ships in the Saryu class include:**
	  ○ INS Sumitra.
	  ○ INS Sumedha

Fire Dragon 480	• The Fire Dragon 480 is a long-range rocket developed by China's Norinco Group. • It is designed primarily for export. • Adopted by the People's Liberation Army (PLA) in 2019, this tactical ballistic missile offers advanced capabilities and precision. • **Type**: Tactical ballistic missile • **Diameter**: 750 mm • **Precision Guidance**: Equipped with sensors for accurate targeting of moving objects • **Warhead Weight**: Over 400 kg • **Impact Velocity**: Exceeds 500 meters (1,640 feet) per second • **Destructive Power**: Capable of destroying a 10,000-ton cruiser with two hits.
Stryker Armoured Combat Vehicles	• The Stryker is a family of **eight-wheel-drive armoured infantry combat vehicles (ICVs)** • It is jointly developed by **General Dynamics Land Systems (GDLS) Canada and the General Dynamics Land Systems Division** in the United States • India and the US are close to finalizing an agreement to co-produce the latest generation of Stryker armored infantry combat vehicles (ICVs).

	• **Design and Armament**
	  ○ **Hull and Armor**: The Stryker's hull is constructed from high-hardness steel with an additional layer of ceramic tile armor for enhanced protection.
	  ○ **Crew and Infantry Capacity**: It is operated by a two-person crew and can carry a nine-man infantry squad.
	  ○ **Range and Speed**: The vehicle has a range of 483 kilometers and can reach a top speed of around 100 km/h.
	Armament: Equipped with a 30 mm cannon and a 105 mm mobile gun.

Javelin Missile	• The FGM-148 Javelin is a **man-portable, fire-and-forget anti-tank guided missile** (ATGM) system.
	• Developed by the Javelin Joint Venture, a partnership between **Raytheon and Lockheed Martin.**
	• **Warhead:** 4kg tandem-charge, high-explosive anti-tank (HEAT)
	• **Maximum Range:** 2,500 meters
	• India and the US are discussing co-producing American Javelin missiles in India to meet Indian military needs.
	• **Deployment**
	  ○ Shoulder-fired by a single operator.
	  ○ Can be mounted on wheeled or tracked vehicles and unmanned ground vehicles.
	  ○ Expected to remain in inventory until at least 2050.

Kalibr Cruise Missile	• It is a Russian family of the ship-, submarine-, surface- and air-launched cruise missiles that can engage hostile warships and land targets.
	• **Range:** 200-2,500 kilometres based on its type
	• **Payload:** 450 kg warhead, capable of high explosive or potentially nuclear capabilities
	• **Variants:** Includes SS-N-27 (Sizzler) anti-ship cruise missile and 91R anti-submarine missile, sharing common vertical launch system (VLS) tubes.
	• **Capabilities:**
	  ○ Provides significant offensive capabilities across various naval platforms
	  ○ It enhancing Russia's deterrence and strike capabilities against adversaries

SM-6 Missile	• It is developed by Raytheon Company of the USA, the SM-6 missile is unique in its ability to perform three primary roles: anti-air warfare, anti-surface warfare, and ballistic missile defense or sea-based terminal missions. • It **has a published surface-to-air range of 240 km**, with estimated ranges reaching up to **463 km.** • It offers **increased flexibility for navies operating within limited ship space.** • It contributes to the enhanced offensive capabilities of surface forces for the U.S. and its allies. • Recently its **air-launched variant is integrated into US Navy F/A-18 Super Hornet** • It Employs **semi-active homing and active homing guidance** for accurate target engagement.

5. ENVIRONMENT & ECOLOGY

5.1 INDIA'S TRANSITION TO CLEAN ENERGY

Context

- India is balancing its reliance on fossil fuels with the **urgent need** to shift to renewable energy.
- The current decision-making in **energy policy is fragmented**, necessitating integration to effectively manage **international geopolitical tensions** and technological advancements.

Introduction

- The transition to clean energy is critical for addressing global climate change, ensuring energy security, and fostering sustainable economic growth. For India, this transition is essential to reduce its dependence on fossil fuels, enhance energy security, and meet its commitment to net-zero carbon emissions by 2070.

Goals of India's Energy Transition

- **Sustainability:** Achieving **net-zero carbon emissions by 2070** and reducing carbon intensity.
- **Energy Security**: Reducing **import dependency** and diversifying energy sources.
- **Economic Growth**: Supporting economic development through sustainable and efficient energy use.

Historical Reliance on Fossil Fuels

- Historically, India has **heavily depended on fossil fuels** for its energy needs.
- Significant progress has been made in renewable energy, with **ambitious targets for expanding solar, wind**, and other non-fossil fuel energy sources.

Details

Key Points

- **Dual-Pronged Energy Policy:**
  - **Fossil Fuels:** Managing import dependency, diversifying import sources, strategic reserves, domestic exploration, demand conservation, efficiency, and environmental protection.
  - **Renewable Energy:** Commitment to net-zero carbon emissions by 2070, reducing carbon intensity, and achieving **500 GW of non-fossil fuel electricity generation by 2030**.
- **Ministry Roles and Integration:**
  - **Fossil Fuels:** Handled by the **Ministry of Petroleum** and the **Ministry of Coal**.
  - **Renewables:** Managed by the Ministries of **Renewables**, **Power**, **Heavy Industry**, **Mines and Minerals**, **IT**, and **Environment**.
  - **Need for Integrated Policy:** Address the **compartmentalized structure** for cohesive energy policy formulation and implementation.
- **Geopolitical Context and Supply Chain Resilience:**
  - **Global Competition: US, its allies vs. China and Russia**, impacting green transition.
  - **China's Monopoly:** Dominance in materials essential for green energy and low-cost technology.
  - **Strategic Measures:** Duties on Chinese imports, PLI scheme, and potential development of a strategic frame similar to the US Chips and Science Act.
- **Strategic Framework for Convergence and Sustainability:**
  - **Hydrocarbon PSEs and Energy Companies:** Prevent duplicity of effort and resources.
  - **Supply Chain Volatility:** Addressing future requirements of copper, lithium, nickel, and cobalt as warned by IEA.

- **National Security and Green Technology**: Balancing competitiveness of clean energy and mitigating security risks.
- **Private Capital and Green Investment**: Incentivizing private investment, stepping up public investment, and creating a roadmap for the transition.

- **Policy Recommendations:**
  - **Energy Strategy Document**: Prepare a document titled "Energy strategy: Towards convergence, security, and sustainability" addressing the above issues.
  - **Public and Private Sector Synergy**: Identify sectors for special incentives and increase public investment to attract private capital.
- **Addressing Global and Domestic Challenges:**
  - **Infrastructure Bottlenecks**: India's aging power grid struggles to transmit intermittent **renewable energy sources like solar and wind**. Upgradation and expansion are needed.
- Example: **Integrating renewable energy sources** into the National Grid for efficient power distribution
  - **Financial Constraints**: Large-scale renewable projects require significant upfront investment. Government subsidies and innovative financing mechanisms are crucial.
- Example: Securing loans with favourable terms for setting up solar parks.
  - **Policy Incoherence: Lack of coordination between ministries** (Power, Finance, Environment) can hinder clean energy initiatives. Streamlined policy frameworks are essential.
- Example: Ensuring consistency between renewable energy targets and environmental regulations.
  - **Storage Limitations**: **Storing** excess renewable energy is a challenge. Developing cost-effective energy storage solutions is critical.
- Example: Investing in research and development of **battery storage technology**.
  - **Skilling the Workforce**: The clean energy sector requires a skilled workforce. Upskilling existing workers and training new entrants are necessary.
- Example: Introducing certificate courses for technicians specializing in solar panel maintenance.
- **Examples of Successful Energy Transition Strategies:**
  - **Germany**: **Energiewende policy** focusing on **renewable energy expansion** and energy efficiency.
  - **Denmark**: High integration of wind energy and a strong regulatory framework supporting clean energy.
  - **China**: Massive investments in renewable energy **infrastructure** and manufacturing capabilities.

Renewable Energy in India

Ambitious Targets:

- India has set a target to achieve 175 GW of renewable energy capacity by 2022 and **450 GW by 2030**. The focus is on **solar, wind, biomass, and small hydro power**.

Policy Support:

- Government initiatives such as the **National Solar Mission**, incentives for **solar rooftop installations**, and **wind power** auctions have significantly boosted renewable energy capacity.

Net Zero Carbon Emissions

Long-term Commitment:

- India has committed to achieving net **zero carbon emissions by 2070**, aligning with global efforts to limit global warming to below 2°C and pursue efforts **to limit the increase to 1.5°C**.

Conclusion

- To achieve its clean energy transition goals, India must adopt a **cohesive and integrated approach**. This includes **streamlining policy formulation and implementation**, addressing infrastructure and financial challenges and learning from successful international strategies. By doing so, India can ensure energy security, foster sustainable economic growth and contribute significantly to global climate change mitigation efforts.

5.2 'AIR OF THE ANTHROPOCENE' INITIATIVE

Context

- The 'Air of the Anthropocene' initiative is an international project that combines art and technology to visualize and communicate the health risks of air pollution. This initiative focuses on **India, Ethiopia** and **the U.K.**, **promoting public awareness** and fostering discussions on air quality.

Introduction

- Air pollution is a critical global issue, significantly impacting **humanhealth** and the **environment**. It contributes to respiratory and cardiovascular diseases, environmental degradation, and **climate change**, posing major challenges to public health, sustainable development, and economic stability worldwide.

Significance of Air Pollution as a Global Issue

- Air pollution is a critical global issue, affecting millions of people and contributing to severe health problems and environmental degradation. Understanding and addressing air pollution is essential for ensuring **public health, sustainable development and climate resilience.**

Initiative Details

Key Points

Project Scope

- Utilized **digital light painting** to represent air pollution levels in cities and rural areas in India, Ethiopia, and the U.K.

Key Findings

- Cities like **Delhi** exhibited significantly higher **PM2.5 pollution** compared to rural areas. PM2.5 refers to fine particulate matter with a diameter of less than 2.5 micrometres, known for causing severe health problems.

Health Impact

- Linked air pollution to serious health issues such as **heart disease, stroke and various cancers**. Emphasized the chronic and acute impacts on public health.

Research Published

- Findings were published in **Nature Communications Earth & Environment.**

Visual Method

- Used an **LED light array** that changed intensity based on real-time PM2.5 readings to create visualizations.

Global Perspective

- Showed how air pollution varies across contexts, with factors like biomass stoves in **Ethiopia** contributing to the problem.

Exhibitions

- **Light painting visualizations** were displayed in locations like **Los Angeles, Belfast and Birmingham** to raise awareness.

Dimension

Public Health

- Understanding the health impacts of air pollution is crucial for framing effective public health policies.

Environmental Policies

- Insights from such studies can inform environmental regulations and pollution control measures.

International Cooperation

- The project exemplifies international collaboration in addressing global challenges like air pollution.

Technological Integration

- Demonstrates the innovative use of technology in environmental science and public awareness campaigns.

Challenges with Respect to Particulate Matter and Wider Impacts of Air Pollution

- **Health Impacts:**
  - Air pollution, particularly PM2.5, causes severe health issues, including **respiratory diseases, cardiovascular diseases and various cancers**.
- **Environmental Degradation:**
  - Pollutants harm ecosystems, reduce agricultural productivity, and contribute to **climate change**.
- **Economic Costs:**
  - Air pollution leads to significant healthcare costs and **productivity losses**.

Potential Policy Measures

- **Stricter Emission Standards:**
  - Implement stringent regulations to control emissions from industrial and vehicular sources.
- **Promotion of Clean Energy:**
  - Encourage the use of renewable energy sources to reduce reliance on fossil fuels.
- **Public Awareness Campaigns:**
  - Increase awareness about the dangers of air pollution and promote sustainable practices among the public.
- **International Collaboration:**
  - Strengthen global partnerships to share knowledge, technology, and resources in combating air pollution.

Conclusion

- The 'Air of the Anthropocene' initiative underscores the importance of addressing air pollution through integrated policy measures and international cooperation. By combining **art, technology and scientific research**, this project highlights the urgent need to combat air pollution for a **healthier** and more **sustainable future**.

5.3 1.5 DEGREE CELSIUS THRESHOLD

Context

- May 2024 was the warmest May on record, continuing a **12-month streak** of record-breaking temperatures, with an **average global temperature 1.5°C above** the 1850-1900 pre-industrial average.

Introduction

- The 1.5 degree Celsius warming target aims to limit global temperature rise and mitigate severe climate change impacts through international agreements and stringent emission controls.

Background of 1.5 Degrees Celsius Warming Target

- The Paris Agreement, signed by 195 countries in 2015, aims to limit global temperature rise to "well below 2 degrees Celsius" and pursue efforts to keep it to 1.5 degrees Celsius above pre-industrial levels.

- The baseline for pre-industrial levels is generally considered as the years 1850-1900 due to reliable historical data.
- The 1.5 degree Celsius target is set to avoid extreme and irreversible impacts of climate change.

Consequences

- Increase in frequency, intensity, and/or amount of heavy precipitation in many regions.
- More intense and frequent droughts in some regions.
- Warmer oceans leading to stronger hurricanes and rapid sea ice melt, contributing to sea level rise.
- Intensified wildfires and prolonged fire seasons.
- Acceleration of climate tipping points causing irreversible damage to natural systems.

Impacts at Global level

- Severe heatwaves, such as those experienced in India, with temperatures nearing 50 degrees Celsius.
- Mass coral bleaching events harming ocean life and dependent human communities.
- Increased risk of crossing climate tipping points, including melting ice sheets and ocean temperature changes.

Impact in India

- Increased intensity and duration of heatwaves causing health crises and fatalities.
- Greater frequency of extreme weather events like floods and droughts affecting agriculture and livelihoods.
- Coastal regions facing higher risks of sea level rise and associated displacement.

Way Forward

- Immediate and radical reduction of greenhouse gas emissions.
- Transition away from fossil fuels like coal, oil, and gas to renewable energy sources.
- Implementation of robust climate policies and international cooperation to meet emission targets.
- Promotion of sustainable practices in agriculture, industry, and urban development.
- Strengthening of climate resilience and adaptation measures, particularly for vulnerable regions and communities.

About Copernicus Climate Change Service (C3S)

C3S

- C3S provides detailed information on **past**, **present**, and **future climate changes**.

Data Sources

- Utilizes **satellite data** and ground-based observations.

Tracking Trends

- Publishes regular reports **on temperature anomalies** and other climate indicators.

Empowering Action

- Offers tools for **climate adaptation** and **mitigation planning**.

Global Collaboration

- Works with European and global partners for **comprehensive climate monitoring**.

About World Meteorological Organization (WMO)

Establishment

- Founded in 1950, a specialized agency of the **United Nations**.

Core Focus

- Promotes international cooperation in **meteorology, climatology, hydrology,** and **related fields**.

Information Dissemination

- Publishes annual State of the **Global Climate reports** and updates on extreme weather events.

Early Warning Systems

- Provides climate predictions and warnings about climate-related risks.

Global Initiatives

- Leads global initiatives on climate monitoring and disaster risk reduction, including the **Global Framework for Climate Services** (GFCS)

Conclusion

- Staying within the 1.5 degree Celsius limit requires urgent, collective action to curb

emissions and mitigate climate change impacts, ensuring a sustainable future for all.

5.4 RAISING AMBITION, ACCELERATING ACTION

Context

- NDCs are pivotal in global climate efforts, detailing each country's plan to reduce emissions and adapt to climate impacts.
- The **Paris Agreement** mandates regular updates and transparency in these commitments to **collectively combat** climate change.

Introduction

- The **UN Environment Programme** (UNEP) report, *Raising ambition, accelerating action: Towards enhanced Nationally Determined Contributions for forests*, identifies significant deficiencies in current **Nationally Determined Contributions (NDCs)** regarding forest protection, management, and restoration under the **Paris Agreement**. NDCs represent countries' commitments to **mitigate emissions** and **adapt to climate change**, updated every five years since 2020.

Details

Key Findings

- **Deforestation Emissions:**
  - Emissions from deforestation increased since the **Glasgow Leaders' Declaration in 2021**, with significant contributions from **Latin America** and **the Caribbean**, except for **Brazil**.
- **NDC Targets:**
  - **Only 8 out of the 20 countries** with the **most tropical deforestation have set targets** to reduce tree cover loss in their NDCs.
- **Country Commitments:**
  - **Mexico** aims for net zero deforestation by 2030, **Bolivia** targets an 80% reduction, and **Côte d'Ivoire** aims for a 70% reduction by 2030.
- **Emission Figures:**
  - An average of 5.6 billion tonnes of CO2 equivalent was emitted from **tropical deforestation** annually between 2019 and 2023.
- **Forest Carbon Prices:**
  - The report recommends increasing **forest carbon prices** to $30-50 per tonne of **CO2 emissions** in the carbon market.
- **Role of Indigenous Communities:**
  - **Participation** of **local and indigenous communities** is crucial for effective forest protection.

International Agreements:

- REDD+ mechanism under UNFCCC aims to reduce emissions from **deforestation** and **forest degradation**.
- The **New York Declaration** on Forests aimed to **halve** deforestation by 2020.
- The Glasgow Leaders' Declaration targets halting and **reversing forest loss by 2030.**
- The **Bonn Challenge** seeks to restore 150 million hectares of degraded land by 2020 and 350 million hectares by 2030.

Recommendations:

- NDC targets should prioritize inclusivity, considering **Indigenous Peoples'** and **local communities' perspectives**.
- Emphasis should be on **preserving primary forests** rather than replacing them with planted forests.
- Strengthening and aligning forest-related measures in NDCs and national policies is crucial.
- **International cooperation** is essential to achieve global forest conservation goals.
- Increasing forest carbon prices in **carbon markets** can incentivize conservation efforts.

Way Forward

- The report urges countries, especially those with significant forest cover, to enhance their NDCs with concrete and measurable forest-related targets for **COP30** in **Brazil**, aiming **towards 2035**.

- It highlights the importance of robust enforcement of existing laws and the active **involvement of local communities** and **Indigenous Peoples in forest protection efforts**.

Conclusion

- The UNEP report underscores critical gaps in NDCs regarding forest protection and restoration, urging enhanced targets and international collaboration. Effective enforcement, community involvement, and increased carbon pricing are essential for achieving global deforestation goals under the Paris Agreement.

5.5 PM 2.5 POLLUTION

Context

- PM2.5 pollution, poses severe health risks globally. This pollution is exacerbated by climate patterns like El Niño and the Indian Ocean Dipole, necessitating integrated mitigation strategies.

Introduction

- PM2.5 pollution consists of tiny particles that can penetrate deep into the lungs, causing significant health issues such as respiratory and cardiovascular diseases. The impact of PM2.5 is further influenced by climate variability, making its mitigation a critical environmental and public health concern.

PM2.5 and Health Impact

- PM2.5 refers to particulate matter with a diameter of 2.5 micrometres or less.
- **Health Risks:**
  - Penetrates deep into the respiratory system.
  - Causes respiratory and cardiovascular diseases.
  - Leads to premature deaths, particularly among vulnerable populations.

Geographical Disparity in Air-Pollution Related Issues

- Higher PM2.5 levels in densely populated areas like urban and industrial regions.
- Significant impact can be seen in countries like China and India.
- Urbanization and Industrialization are the major contributors to increased pollution levels.

Indian Scenario

- Major cities like Delhi frequently reports higher PM2.5 levels.
- High PM2.5 impact as it increases respiratory illnesses and cardiovascular diseases.
- According to the Global Burden of Disease report, air pollution is a leading cause of premature deaths in India.

Role of Climate Variability Phenomena

- **El Niño:**
  - Warming of surface waters in the central and eastern tropical Pacific Ocean.
  - Alters global weather patterns, affecting precipitation and wind patterns, thereby influencing regional air quality.
- **Indian Ocean Dipole (IOD):**
  - Differences in sea surface temperatures between the western and eastern Indian Ocean.
  - Affects monsoon dynamics and regional rainfall patterns, impacting air quality.
- **North Atlantic Oscillation (NAO):**
  - Fluctuations in atmospheric pressure differences at sea level between the Icelandic Low and the Azores High.
  - Influences weather in Europe, North America, and North Africa, indirectly affecting global climate and potentially influencing air quality.

Effects of Climate Change on Human Health

- Increased Frequency of Extreme Weather Events leads to higher pollution levels.

- It has impact on agriculture and water resources at it affects food security and clean water availability.
- Extreme heatwaves can cause increase in heat-related illnesses and deaths.

Related Efforts Globally and in India

- **Global Efforts:**
  - International Cooperation & agreements to address transboundary air pollution.
  - Environmental policies & stricter regulations on industries and promotion of clean technologies.
- **Efforts in India:**
  - Implementation of systems to track pollution levels such as Air Quality Monitoring Systems.
  - Running public awareness campaigns and providing education on the health risks of air pollution.
  - Promotion of green spaces and reduction of vehicular emissions in other words Sustainable Urban Planning.

Conclusion

- Mitigating PM2.5 pollution requires robust environmental policies, interdisciplinary approaches, and international cooperation to protect public health and mitigate climate impacts. Understanding and addressing the interplay between air pollution and climate variability is essential for effective management and policy formulation.

5.6 BONN TALKS

Context

- The recent Bonn climate meeting failed to define a new climate finance goal, leaving crucial issues unresolved for COP29 in Baku.
- Developing countries require significant climate finance to mitigate and adapt to climate change, with the current $100 billion target deemed insufficient.

New Collective Quantified Goal (NCQG)

- **Purpose:** Establish a new climate finance goal above the current $100 billion annually.
- **Necessity:** Needed to address the increasing financial requirements for climate action in developing countries post-2025.
- **Process:** Developed through international negotiations, with input papers leading to a formal draft for COP29.
- **Challenges:** Defining contributions, monitoring financial flows, and ensuring accountability among developed countries.
- **Expectations:** Developing countries demand trillions of dollars annually to effectively mitigate and adapt to climate change impacts.

Details

Key Points

- **Search for a New NCQG**
  - A new climate finance goal above $100 billion per year is required by the end of 2024.
  - The Bonn talks resulted in an “input paper” listing various countries' demands.
  - Money is central to climate action, required for mitigation, adaptation, and data collection.
  - The NCQG must address the growing financial needs of developing countries.
  - Finalizing the NCQG is crucial for COP29's success in Baku.
- **The Adequate Amount**
  - Developing countries need trillions of dollars annually to combat climate change.
  - A UNFCCC assessment estimates $6 trillion needed by 2030 for promised climate actions.
  - The global clean energy transition requires $4.3 trillion annually till 2030.
  - India proposed that developed countries should provide at least $1 trillion annually after 2025.
  - Arab and African countries have proposed targets of $1.1 trillion and $1.3 trillion respectively.
- **Debate Over Contribution**

- Annexure 2 of the UNFCCC lists 25 countries and the European Economic Community responsible for climate finance.
- Developed countries argue for shared responsibility due to evolving economic statuses of countries.
- China, the second-largest economy, resists additional climate finance responsibilities.
- Developed countries acknowledge that the new target must exceed $100 billion annually.
- Financial contributions must address equitable responsibility and current economic capacities.

Importance of COP29

- Location: Baku, Azerbaijan, in November 2024.
- Significance: Pivotal for finalizing the NCQG, impacting future climate finance commitments.
- Focus: Defining a new, adequate climate finance goal and addressing related challenges.

About UNFCCC

- **Global Climate Framework**
  - An international treaty aimed at addressing climate change and its impacts.
- **Establishment**
  - Adopted in 1992, it provides the foundation for global cooperation on climate action, facilitating negotiations and agreements among nations.
- **Key Functions**
  - Facilitates annual conferences (COPs) to review and advance climate goals.
- **Supports scientific research and data sharing.**
  - Oversees the implementation of international climate agreements.
- **Principles**
  - Guided by principles of equity, common but differentiated responsibilities, and the precautionary approach.
  - Seeks to achieve sustainable development while combating climate change.
- **Membership**
  - Nearly universal membership, with 197 parties (196 countries and the European Union) committed to addressing climate change.

Recent Developments

- The Bonn climate meeting failed to make significant progress on defining a new climate finance goal.
- By the end of 2024, countries are required to finalize a new monetary target, exceeding the current $100 billion per year, that developed nations must mobilize to support developing countries in combating climate change.

Financial Requirements

- **For Implementing Climate Commitments**
  - Developing countries now need trillions of dollars annually for climate action, not just billions.
  - A UNFCCC assessment last year estimated that these countries require about $6 trillion by 2030 to implement their climate commitments.
- **For Adaptation**
  - These countries need between $215 billion and $387 billion annually.
  - The global transition to clean energy demands approximately $4.3 trillion annually until 2030 and about $5 trillion annually until 2050 to achieve net-zero emissions.
- **Demand by Various Countries**
  - India proposed that developed countries should commit to providing at least $1 trillion annually after 2025.
  - Arab countries suggested a minimum of $1.1 trillion.
  - African countries demanded $1.3 trillion.
  - Developed countries have not made any public offers, merely acknowledging that the new target must exceed the current $100 billion per year.

Debate Over Contribution

- **Annexure 2 Countries of the UNFCCC**
  - Under the UNFCCC and the Paris Agreement, only the 25 countries listed in Annexure 2 of the UNFCCC, along with the European Economic Community, are

obligated to provide climate finance to developing nations.

- **Responsibilities Being Shifted to Other Countries**
  - The Annexure 2 countries have been attempting to shift some of the responsibility to other nations, arguing that many countries are now economically stronger than they were in the early 1990s when the list was created.
  - Countries like China, the world's second-largest economy, oil-rich Gulf states, and South Korea are not part of Annexure 2.

Outcome of Bonn Summit

- Despite expectations that the Bonn talks would provide at least some indicative numbers to be refined before COP29 in November in Baku, Azerbaijan, this did not materialize.
- The outcome was a 35-page, 428-paragraph input paper outlining the wish lists of various countries, covering not only the amount of climate finance but also related issues such as:
  - Contributors: Identifying which countries should contribute to the climate finance pool.
  - Allocation: Determining what the funds should be spent on, including specific projects and initiatives.
  - Monitoring: Establishing mechanisms for tracking and managing the flow of finance.

Conclusion

- The input paper is anticipated to evolve into a formal negotiating draft, which will be the basis for discussions and potential agreements at COP29. The finalization of the NCQG is crucial for addressing the growing financial needs for climate action, particularly in developing countries.

5.7 WORLD CROCODILE DAY

Context

- Crocodile Conservation Efforts was initiated in 1975 in Bhitarkanika National Park, Odisha, aimed at reviving the saltwater crocodile population through habitat protection and captive breeding.

Initiative Details

Wildlife Conservation:

- Bhitarkanika National Park has a successful crocodile conservation project running since 1975.
- The Wildlife Protection Act, passed in 1972, is a key law to protect endangered animals like crocodiles.
- Sometimes, crocodiles and people come into conflict. This can cause problems for both communities.
- Places like Bhitarkanika are special because of their unique ecosystems. Protecting these areas helps animals like saltwater crocodiles survive.
- Conservation efforts use methods like raising baby crocodiles in captivity and protecting their natural habitat.

Human-Crocodile Conflict:

- More saltwater crocodiles means more danger for people. There have been more attacks lately, causing injuries and even deaths.
- This is a big problem for people who live near the water, like fishermen and farmers. They're scared and can't do their jobs as easily.
- To try and keep people safe, they're building fences along the rivers and warning villagers to be careful.
- But this whole situation is causing tension. People who live there are unhappy with how the government is handling it, and it's even affecting local politics.

About Bhitarkanika National Park

Location

- Kendrapara district, Odisha.

Designation

- National park since 1998, Ramsar site since 2002.

Ecosystem

- Second largest mangrove ecosystem in India, network of creeks and canals.

Conservation Efforts

- Successful Crocodile Conservation Project initiated in 1975.

Wildlife

- Largest congregation of saltwater crocodiles, along with species like Indian python, king cobra, black ibis, and darters.

About Crocodiles in India

Species:

Saltwater Crocodile (Crocodylusporosus)

- **About Crocodile:** Largest living reptile
- **Habitat:** Bhitarkanika, Sundarbans, Andaman and Nicobar Islands
- **IUCN Status:** Least Concern
- **Protection Status (WPA):** Schedule I

Mugger Crocodile (Crocodylus palustris)

- **About Crocodile:** Broad snouts, dig burrows for nesting
- **Habitat:** 15 Indian states including Ganga River drainage
- **IUCN Status:** Vulnerable
- **Protection Status (WPA):** Schedule I

Gharial (Gavialis gangeticus)

- **About Crocodile:** Long, narrow snout with a bulbous knob, Primarily eats fish
- **Habitat:** Freshwater rivers: Chambal, Girwa, Ghagra, Son, and Gandak
- **IUCN Status:** Critically Endangered
- **Protection Status (WPA):** Schedule I

Challenges related to Conservation of Crocodiles in India

- **Habitat Destruction**: Ongoing deforestation, wetland conversion, and urbanization lead to loss of crucial habitats.
- **Illegal Poaching:** Poaching for crocodile skin and body parts remains a significant threat.
- **Human-Wildlife Conflict**: Increasing human-crocodile encounters result in fatalities and injuries, causing tension in local communities.
- **Pollution:** Industrial discharge, agricultural runoff, and plastic waste pollute water bodies, affecting crocodile habitats.
- **Climate Change:** Rising temperatures and altered precipitation patterns affect the ecosystems crocodiles rely on.
- **Limited Awareness:** Lack of public awareness and education on the importance of crocodiles and their conservation.
- **Inadequate Funding:** Insufficient financial resources hamper effective conservation efforts and habitat management.

- **Weak Law Enforcement**: Inconsistent enforcement of wildlife protection laws undermines conservation efforts.

Measures related to Conservation of Crocodiles in India

- **Habitat Protection**: Establishing and maintaining protected areas such as national parks and wildlife sanctuaries.
- **Captive Breeding Programs**: Enhancing population numbers through scientifically managed breeding and release programs.
- **Community Engagement**: Involving local communities in conservation efforts through education and livelihood programs.
- **Anti-Poaching Initiatives**: Strengthening anti-poaching patrols and imposing stringent penalties for illegal hunting.
- **Pollution Control**: Implementing measures to reduce industrial and agricultural pollution affecting water bodies.
- **Scientific Research**: Conducting regular research and monitoring to inform conservation strategies and policies.
- **Conflict Mitigation**: Developing and implementing strategies to reduce human-crocodile conflicts, such as safe water access points.
- **Legislative Support:** Strengthening the legal framework and ensuring robust implementation of wildlife protection laws.

International Cooperation

- **Global Conservation Networks:** Collaborating with international organizations like the IUCN and WWF for research and conservation strategies.
- **CITES Compliance:** Adhering to the Convention on International Trade in Endangered Species of Wild Fauna and Flora to control illegal trade.
- **Transboundary Conservation Programs**: Engaging in joint conservation initiatives with neighbouring countries sharing crocodile habitats.
- **Technical and Financial Assistance:** Securing support from international bodies for habitat restoration, captive breeding, and public awareness campaigns.
- **Research Collaboration:** Partnering with global research institutions to study crocodile behaviour, genetics, and ecology.

Way Forward

- **Integrated Conservation Plans:** Developing comprehensive plans that integrate habitat protection, community involvement, and scientific research.
- **Sustainable Funding:** Securing long-term funding through government budgets, international grants, and public-private partnerships.
- **Enhanced Public Awareness:** Running widespread awareness campaigns to educate the public about crocodile conservation.
- **Capacity Building:** Training local communities and wildlife officials in conservation practices and conflict resolution.
- **Climate Resilience:** Incorporating climate adaptation strategies into conservation plans to ensure ecosystem stability.
- **Policy Advocacy:** Advocating for stronger policies and international agreements to support crocodile conservation.
- **Regular Monitoring:** Establishing continuous monitoring systems to track crocodile populations and habitat health.

- **Collaborative Governance:** Encouraging cooperation among government agencies, NGOs, local communities, and international bodies for effective conservation management.

Conclusion

- Crocodile conservation in Bhitarkanika has been a significant success, but addressing human-crocodile conflicts remains crucial to ensure safety and harmony between wildlife and local communities.

5.8 WORLD DAY TO COMBAT DESERTIFICATION AND DROUGHT 2024

Context

- UNCCD's World Day to Combat Desertification and Drought raises awareness annually on June 17.
- The 30th anniversary of the UNCCD underscores the global commitment to sustainable land stewardship.

Introduction

- The United Nations Convention to Combat Desertification (UNCCD) emphasizes sustainable land management to combat desertification and drought globally, culminating in the upcoming COP16 in Riyadh, Saudi Arabia.

Details

Key Points

- Importance of Sustainable Land Management: Crucial for biodiversity conservation, climate change mitigation, and ensuring food security.
- Impact of Land Degradation: Affects nearly half the global population, with severe consequences for marginalized communities like indigenous groups, rural households, and smallholder farmers.
- India's Efforts: Measures to combat land degradation include the Bonn Challenge pledge and various national initiatives.

About Land Degradation:

- **Land Degradation:**
  - According to the United Nations Convention to Combat Desertification (UNCCD), land degradation refers to the reduction or loss of the biological or economic productivity and complexity of land areas in arid, semi-arid, and dry sub-humid regions.
- **Land Degradation Challenges in India:**
  - Extent: Approximately 97.84 million hectares affected by desertification and land degradation.
  - Causes: Soil erosion, deforestation, unsustainable agricultural practices, and urbanization.
  - Impact: Threatens food security, exacerbates water scarcity, and reduces biodiversity.
- **Measures Taken by India:**
  - Desertification and Land Degradation Atlas: Published by the Space Applications Centre (SAC) to monitor and visualize degraded land.
  - Bonn Challenge Pledge: India committed to restoring 26 million hectares of degraded land by 2030.
  - Coastal Rehabilitation: Tamil Nadu's bio-shield initiative to protect coastal habitats and mitigate land degradation.
  - South-South Cooperation: Collaboration through the Centre of Excellence at the Indian Council for Forestry Research and Education (ICFRE) to promote sustainable land management practices.
  - National Policies: Policies like the National Action Plan on Climate Change and Sustainable Development Goals (SDGs) addressing land degradation.
- **Recommendations from Reports and Committees:**
  - National Green Tribunal (NGT) recommendations: Strengthening enforcement of environmental laws to prevent land degradation.
  - NITI Aayog reports: Emphasize integrated water resource management and afforestation to combat desertification.

- Scientific Committees: Advocating for technology-driven solutions and community participation in sustainable land use practices.

About UNCCD

Established

- 1994

Legally Binding Agreement

- UNCCD is the **only international agreement linking environment, development and sustainable land management** (arid, semi-arid, dryland focus).

Combating Desertification & Drought

- Focuses on **desertification, land degradation and drought**, especially in severely affected countries (Africa).

Supporting SDGs

- Aims to achieve goals of the **2030 Agenda**, particularly **SDG 15 (Life on Land)**.

Land Degradation Neutrality (LDN)

- Pushes for **restoration** of 1.5 billion hectares of degraded land by 2030 (SDG target).

Conference of Parties (COP)

- Bi-annual decision-making body for **UNCCD policy** and progress review.

Conclusion

- India's efforts to mitigate land degradation are critical in achieving global environmental sustainability goals. Enhanced cooperation, technological innovation, and community involvement are essential for effective land management and biodiversity conservation.

5.9 COMPRESSED BIOGAS

Context

- **Uttar Pradesh** can **generate 24% of India's compressed biogas (CBG)**which is crucial for the country's renewable energy goals.

Details

About *Biogas*

- Biogas is produced from **organic waste** and offers an eco-friendly alternative to fossil fuels, aligning with sustainable development goals.
- **Compressed biogas (CBG)** can enhance **waste management practices**, turning agricultural residues and organic waste into valuable energy resources.
- Reports like the CSE highlight the potential of biogas in **reducing dependence on imported fuels**, contributing to energy security and environmental sustainability.

CNG:

- **Compressed Natural Gas (CNG)** is a cleaner alternative to other fossil fuels, reducing greenhouse gas emissions and urban air pollution.
- CNG is currently imported, and increasing domestic production of CBG can decrease reliance on imports, aligning with energy self-sufficiency goals.
- **Integration of CNG and CBG** in transportation can be a significant step towards achieving India's targets under the National Policy on Biofuels.

CSE:

- The **Centre for Science and Environment (CSE)** is a key think tank providing research and policy recommendations on environmental issues, including renewable energy.
- CSE's reports and symposia, such as the one in **Muzaffarnagar**, play a crucial role in highlighting challenges and opportunities in the CBG sector.
- CSE's advocacy for **better waste management and clean energy solutions** supports India's sustainable development and environmental policies.

India's Energy Demand:

- India's growing energy demand requires a diversified energy mix, including renewable sources like **CBG**, to ensure energy security and sustainability.
- Policies like the **National Action Plan on Climate Change** emphasize the importance of

renewable energy in meeting India's energy needs.

- The **Sustainable Alternative Towards Affordable Transportation (SATAT) scheme** aims to promote CBG production, contributing to India's energy diversification and sustainability goals.

UPNEDA:

- The Uttar Pradesh New and Renewable Energy Development Agency (UPNEDA) is instrumental in **implementing the state's bioenergy policy** and **promoting renewable energy projects**.
- UPNEDA's initiatives include providing subsidies, land for lease, and other incentives to boost CBG production in the state.
- UPNEDA's efforts to involve farmers and local stakeholders in bioenergy projects ensure community participation and shared benefits, supporting rural development and energy access.

Conclusion

- Overcoming challenges such as limited bio-slurry offtake, partial gas offtake by oil and gas companies, and financing difficulties is essential for Uttar Pradesh's CBG sector growth. Strategic initiatives by organizations like UPNEDA and CSE can unlock UP's vast CBG potential, aligning with India's renewable energy goals, promoting sustainable development, and ensuring energy security and environmental sustainability.

5.10 SHORT ARTICLES

60th Meeting of The Subsidiary Bodies (SB60)

Context

- The 60th Meeting of the Subsidiary Bodies (SB60) sets the stage for COP29, focusing on new climate finance goals and commitments from developed nations. This mid-year climate conference, scheduled to take place in Bonn, Germany, is crucial for addressing global climate challenges.

Details

- **New Climate Finance Goals (NCQG) at COP29:** Central focus on developed countries' financial commitments to developing nations, aiming for new climate finance targets.
- **OECD Report:** Developed countries mobilized over $100 billion in 2022, largely through loans, underscoring financial challenges.
- **Challenges for Developing Countries:** High capital costs, debt burdens, and uneven fund distribution hinder effective climate action.
- **Carbon Market Mechanisms:** Discussions on emission avoidance and authorisation under Paris Agreement's Articles 6.2 and 6.4.
- **Mitigation and Global Stocktake (GST):** Annual GST at SB60 reviews Paris goals; Mitigation Work Programme (MWP) scales urban mitigation, emphasizes non-debt finance and technology transfer.

About SB60

- **Climatic Conference:** It is the mid-year climatic conference scheduled to take place in Bonn Germany.
- **Preparation for COP29:** SB60 lays the groundwork for COP29, addressing critical issues like the **Global Stocktake and carbon markets**.
- **Global Stocktake Dialogue:** The first annual dialogue at SB60 assesses Paris Agreement progress and informs **Nationally Determined Contributions (NDCs)**.
- **Mitigation Focus:** Emphasizes scaling up **urban mitigation efforts**, discussing support mechanisms and non-debt finance.

About UNFCCC

- **Establishment and Purpose:** **Formed in 1992** to stabilize greenhouse gas concentrations, preventing dangerous climate change.

- **Structure and Membership:** Near-universal membership with 198 parties, including **COP, Subsidiary Bodies**, and a Secretariat.
- **Key Agreements:** Oversees Kyoto Protocol and Paris Agreement**, focusing on binding emissions targets** and **global warming** limits.

Centre for Science and Environment (CSE)

Centre for Science and Environment (CSE)	
Established	1980
Mission	Promote sustainable development and environmental governance in India.
Key Activities	Policy advocacy, research, and capacity building on climate change, air pollution, and water management.

Environmental Performance Index

Context

- **2024 Environmental Performance Index** ranks Estonia first, highlighting global challenges in emissions reduction, with **India ranking 176th**.

Details

- **About EPI**
  - The Environmental Performance Index (**EPI**) is a comprehensive framework that assesses the environmental performance of countries around the world. It provides a data-driven summary of the state of **sustainability** and **environmental health**.
- **Published By**
  - The EPI is developed and published by **Yale University and Columbia University** in collaboration with the **World Economic Forum**.
- **Significance of EPI**
  - The EPI ranks countries based on their environmental performance, helping policymakers, researchers, and the public understand how well nations are protecting the environment. It highlights leaders and laggards in environmental performance, offering insights into best practices and areas needing improvement.
- **Framework**
  - The EPI framework includes various indicators and metrics, categorized into key areas:
    1. **Climate and Energy**: Greenhouse gas emissions, renewable energy use, and energy efficiency.
    2. **Air Quality**: Concentrations of fine particulate matter, nitrogen dioxide, and sulphur dioxide.
    3. **Water and Sanitation**: Access to safe drinking water and sanitation, and water quality.
    4. **Biodiversity and Habitat**: Protection of terrestrial and marine areas, and species protection.
    5. **Ecosystem Services**: Forest cover, fish stocks, and grassland loss.
- Each indicator is assessed and scored, culminating in an overall EPI score and ranking for each country.

EPI Indicators	Metrics	Assessment
Climate and Energy	GHG emissions, renewable energy	Measures efforts to mitigate climate change
Air Quality	PM2.5, NO2, SO2 levels	Assesses impact on human health
Water and Sanitation	Access to safe water, sanitation	Evaluates public health and infrastructure
Biodiversity	Protected areas, species protection	Assesses conservation efforts and habitat quality
Ecosystem Services	Forest cover, fish stocks, grassland loss	Measures natural resource management and sustainability

- **India's Performance**

- India ranks 176th in the 2024 EPI, indicating significant challenges in its environmental sustainability and emissions reduction efforts. Key areas for improvement include:
  1. **Greenhouse Gas Emissions**: High levels of emissions, particularly from the energy and transportation sectors.
  2. **Air Quality**: Poor air quality with high concentrations of harmful pollutants.
  3. **Water and Sanitation**: Inadequate access to clean water and sanitation facilities in many regions.
  4. **Biodiversity and Habitat**: Insufficient protection of terrestrial and marine areas, leading to habitat loss and species decline.

Nagi & Nakti

Context

- The **Nagi and Nakti Bird Sanctuaries** in **Bihar's Jamui district** have been designated as Ramsar sites, marking a significant milestone in India's conservation efforts under the **Ramsar Convention**. This recognition underscores the importance of conserving wetlands, which are crucial for biodiversity.

Details

- **Location:** Nagi and Nakti Bird Sanctuaries are situated in the Jamui district of Bihar, within the Jhajjar forest range.
- **Designation:** These sanctuaries have been designated as **Important Bird and Biodiversity Areas (IBA)** by **BirdLife International**.
- **Biodiversity:** The sanctuaries provide habitat for over 150 bird species, including several endangered species. They are particularly crucial for migratory birds, serving as a vital stopover during the winter months.
- **Human-Made Sanctuaries**: Both sanctuaries were created through the construction of the Nakti Dam, transforming the area into a haven for wildlife.
- **Conservation Impact:** The Ramsar designation supports sustainable wetland management and enhances biodiversity protection efforts in India.
- **Importance of Nagi and Nakti Sanctuaries**
  - **Ecological Significance**: These sanctuaries play a vital role in the local ecosystem, supporting diverse flora and fauna.
  - **Birdlife:** They are home to various bird species, making them important sites for birdwatching and research.
  - **Conservation Efforts**: The Ramsar designation helps in promoting regional conservation activities, increasing awareness, and securing funding for ongoing and future projects.
- **About the Ramsar Convention**
  - **International Treaty**: Established in 1971, the Ramsar Convention aims to conserve important wetlands worldwide.
  - **India's Participation**: India actively designates significant wetlands as Ramsar sites to enhance conservation efforts. With the inclusion of Nagi and Nakti, India now has 82 Ramsar sites.

Kunwar Lake

- Bihar's **first Ramsar site**, designated in 2020.
- Supports a diverse range of bird species.
- Significant for **migratory birds** and aquatic life conservation.
- Boosted regional conservation activities and awareness.

The Bombay Natural History Society (BNHS)

- Established in 1883, **BNHS is a leading Indian conservation organization**.
- Engages in research, education, and policy advocacy for natural heritage protection.

- Members like Arvind Mishra contribute to significant conservation efforts, including Ramsar site recognitions.

Catla

Context

- The **UN FAO's The State of World Fisheries and Aquaculture 2024 report** reveals significant trends in global fisheries and aquaculture, emphasizing the rise of aquaculture over wild capture, impacting species diversity and regional production patterns.

Key findings

- Catla is the **eighth most produced aquatic species in the world**, with over 4 million tonnes harvested in 2022.
- It is **native to the river systems of northern India**, the Indus plain, and parts of **Pakistan, Bangladesh, Nepal, and Myanmar**.
- Catla has been introduced to almost all rivers, reservoirs, and tanks across India.
- Initially **farmed in ponds of eastern Indian states**, Catla spread **throughout India** in the latter half of the 20th century.
- Catla, along with **Rohu** and **Mrigal**, is among the most farmed fish in India's inland fisheries.
- **Whiteleg shrimp** was the top aquatic species produced in 2022, with 6.8 million tonnes.
- There have been significant changes in the types of species harvested over the years, with notable regional differences.
- Until the late 1970s, finfish made up about 90% of total aquatic animal production, compared to 75% in 2022.
- **In 2022**, aquaculture **production exceeded capture fisheries production for the first time**, leading to more Catla production.
- **Eight of the top ten aquatic species** produced in 2022 were mainly **from aquaculture**, including Catla.

The State of World Fisheries and Aquaculture 2024 report

Published by	Food and Agriculture Organization (**FAO**) of the United Nations
Focus	Comprehensive analysis of **global fisheries** and **aquaculture trends**
Content	• Updated data on production, consumption, trade of fish and fish products • Employment statistics in fisheries and aquaculture • Index on the sustainability of fish stocks • Case studies for successful "Blue Transformation" practices • Analysis of **El Niño's impact on fisheries** and **aquaculture** • Future projections for fisheries and aquaculture production (until 2032)
Additional Feature	"**Blue Transformation in Action**" - a roadmap for sustainable practices in fisheries and aquaculture

Binsar Wildlife Sanctuary

Context

- A severe forest fire in Binsar Wildlife Sanctuary resulted in the deaths of four Uttarakhand forest department staffers and injuries to four others, highlighting forest fire risks.

Details

Key points:

- A forest fire led to the deaths of four forest department staffers and injuries to four others.
- Uttarakhand reported 1,213 forest fire incidents since November 1, compared to 663 incidents the previous year.
- Fires have damaged 1,653 hectares of forest land across Garhwal, Kumaon, and wildlife administrative regions.

- The Indian Air Force deployed an MI17 helicopter to control the wildfire in Binsar Wildlife Sanctuary.

Binsar Wildlife Sanctuary:

- **Location and Area:** Situated in the Almora district of Uttarakhand, spanning approximately 45.59 square kilometers.
- **Biodiversity:** Rich in oak, rhododendron forests, leopards, Himalayan goral, and over 200 bird species.
- **Historical Significance:** Former summer capital of the Chand Dynasty; named after the 16th-century Bineshwar Mahadev temple dedicated to Lord Shiva.
- **Flora and Fauna:** Dense oak and rhododendron forests, chir pine forests at lower altitudes, over 200 bird species, and animals like leopards, ghorals, and Himalayan black bears.
- **Established:** The sanctuary was established in 1988 to conserve the region's rich biodiversity.

Global Environment Facility (GEF)

Context

- The Global Environment Facility (GEF) approved $736.4 million for global environmental protection initiatives during its council meeting in Washington, D.C., starting June 17, 2024.

Details

Key points:

- Multilateral Environmental Conventions: GEF's role in supporting key conventions like the Stockholm and Minamata Conventions.
- Global Environmental Projects: Significance of international cooperation in tackling climate change, biodiversity loss, and pollution.
- Funding Mechanisms: Insights into the allocation of funds and the impact of GEF-supported initiatives.
- Environmental Governance: Policies and programs adopted by the GEF Council.
- Biodiversity Targets: GEF's contribution to global biodiversity targets under the Kunming-Montreal Global Biodiversity Framework.

Global Environment Facility (GEF):

- Establishment: Founded in 1991, restructured post-1992 Rio Earth Summit.
- Objective: Grants and blended finance for projects addressing biodiversity loss, climate change, pollution, and land and ocean health.
- Funding: Over $1 billion annually, with $22 billion in grants to date. The World Bank acts as the GEF Trustee.
- Replenishment: $5.33 billion pledged for 2022-2026.
- Member Countries: 184 member countries, including India.
- Main Governing Bodies:
  - Assembly: Includes all 184 member countries, meets every 3-4 years at the ministerial level.
  - Council: Main governing body with 32 members (14 from developed countries, 16 from developing countries, and 2 from economies in transition). Meets biannually.
  - Secretariat: Based in Washington, D.C., supervises project implementation and policy adherence.
  - STAP (Scientific and Technical Advisory Panel): Offers scientific advice on policies, strategies, and projects.
  - GEF IEO (Independent Evaluation Office): Assesses GEF's impact and effectiveness.
- Operational Agencies: 18 agencies, including UNDP, UNEP, and the World Bank.
- Financial Mechanism for:
  - Convention on Biological Diversity (CBD)
  - United Nations Framework Convention on Climate Change (UNFCCC)
  - United Nations Convention to Combat Desertification (UNCCD)
  - Stockholm Convention on Persistent Organic Pollutants
  - Minamata Convention on Mercury
- Focus Areas: Biodiversity, Climate Change (Mitigation & Adaptation), Chemicals & Waste, International Waters, Land Degradation, Sustainable Forest Management.

- Additional Initiatives: Circular Economy, Capacity Development, Debt-for-Nature Swaps, Gender Equality, Indigenous Peoples.

Pantanal Wetland

Context

- Brazil's Pantanal wetlands face severe wildfires due to dry conditions, threatening biodiversity and communities in Mato Grosso do Sul state.

Details

- Wildfires in Pantanal devastate biodiversity, destroying habitats crucial for numerous plant and animal species.
- Climate change exacerbates wildfires by creating hotter, drier conditions, increasing frequency and intensity.
- Current conservation policies struggle to contain wildfires due to inadequate resources and strategies.

Pantanal Wetlands

- **Geography:** Located in Brazil, straddling Bolivia and Paraguay, covering 140,000 to 195,000 sq km. Formed as a structural basin during Andes' uplift.
- **Biodiversity:** Rich in flora and fauna with over 4,700 species including jaguars, giant otters, and hyacinth macaws. Home to 10 million caimans.
- **Environmental Issues:** Faces threats from deforestation, agricultural expansion, severe wildfires exacerbated by climate change, and pollution.
- **Conservation Efforts:** UNESCO World Heritage Site status for a portion. Challenges include insufficient protected areas and extensive private land use.

Blue Planet Prize

Context

- The **Blue Planet Prize** is an annual award by Japan's Asahi Glass Foundation recognizing significant scientific contributions to **solving global environmental issues**.
- The 2024 recipients are IPBES, noted for their authoritative work on **biodiversity** and **ecosystem services**, and Robert Costanza, for his foundational work in ecological economics.

Details

Key Points

About IPBES:

Established

- 2012

Purpose

- Strengthen the science-policy interface for biodiversity and ecosystem services.

Role

- Leading global authority on the state of knowledge and science regarding biodiversity, ecosystem services, and nature's contributions to people.

Impact

- Facilitates better science-informed policy and action, influences multilateral processes such as the Sustainable Development Goals (SDGs) and the Convention on Biological Diversity (CBD).

Achievements and Contributions:

- **Assessment Reports**: IPBES reports are critical in shaping international efforts towards biodiversity conservation and sustainable development.
- **Corporate Impact**: Businesses use IPBES findings to shape corporate sustainability strategies and Environmental, Social, and Governance (ESG) activities.

Importance of the Blue Planet Prize:

- **Recognition:** Highlights significant contributions to solving environmental issues.
- **Incentive:** Encourages further research and application of scientific knowledge to address global environmental challenges.
- **Awareness:** Raises global awareness about the importance of biodiversity and sustainable practices.

Glacial Algae

Context

- Glacier algae, particularly **Ancylonemanordenskiöldii,** have evolved **unique adaptations to survive** and thrive in extreme glacial environments, significantly influencing glacier melt rates.

- The study of **glacier algae** challenges traditional evolutionary concepts by demonstrating evolution through reduced complexity and provides insights into ancient environmental adaptations.

Details

Key Points

Glacier Algae and Their Environment

Species Studied

- Ancylonemanordenskiöldii

Habitat

- Glaciers, extreme environments with high UV exposure and low temperatures.

Adaptation Mechanisms

- **Pigmentation:** The purple pigment purpurogallin acts as a sunscreen, protecting algae from UV and visible light.
- **Genetic Adaptations:** Increased tolerance to UV and visible light, improved light perception, and efficient repair mechanisms for sun damage.
- **Evolutionary Insights:**
  - **Time Frame:** Glacier algae evolved around 520-455 million years ago, after the Cryogenian period.
  - **Evolutionary Adaptation:** Algae became simpler over time, losing multicellularity and genetic diversity linked to complex forms, an example of evolution through reduced complexity.
  - **Environmental Influence:** Adaptations likely driven by more recent glacial periods rather than the Cryogenian.
- **Impact on Glacial Ecosystems:**
  - **Melt Acceleration:** Algal blooms darken ice surfaces, increasing absorption of sunlight and accelerating melt rates.
  - **Example:** In 2016, algal growth on the Greenland ice sheet contributed to significant runoff, affecting global sea levels.
- **Significance for Climate Change:**
  - **Current Relevance:** Understanding algae's adaptations helps predict the future of Earth's icy environments amidst changing climates.
  - **Broader Implications:** Offers a model for studying other organisms in extreme environments and their evolutionary responses to environmental pressures.

Bio Bitumen

Context

- The Central Road Research Institute (**CRRI**) focuses on research and development in road and runway infrastructure and promotes the use of **bio-bitumen as a sustainable** alternative to traditional bitumen.
- Bio-bitumen, derived from organic materials through pyrolysis, offers environmental, economic, and import-reduction benefits, addressing India's growing demand for bitumen in road construction.

Details

Key Points

- **Bio-bitumen:**
  - **Definition**: A sustainable, petroleum-free alternative to traditional bitumen, also known as bio-asphalt.
  - **Sources**: Manufactured from organic materials such as bio-char, bio-oil, and lignins derived from plant cell walls.
  - **Production Process**: Produced through pyrolysis, which involves heating waste materials to around 500°C without oxygen.
- **Benefits of Bio-bitumen:**
  - **Reduced Imports**: Decreases dependency on imported bitumen, leading to savings on foreign exchange.
  - **Environmental Impact**: Utilizes organic waste materials, addressing issues like stubble burning and promoting sustainability.
  - **Economic Benefits**: Substantial savings on foreign exchange and promotion of renewable resources.
  - **Promotion of Bio-economy**: Encourages the use of sustainable resources in construction, boosting the bio-economy.
- **Bitumen:**
  - **Definition**: A black substance derived primarily from crude oil, composed of complex hydrocarbons and elements like calcium, iron, sulphur, and oxygen.

- **Properties:** Renowned for waterproofing and adhesive properties, making it vital for construction.

- **India's Current Situation – Bitumen:**
  - **Demand Growth**: Increased road construction activities have significantly raised bitumen consumption.
  - **Import Dependency**: India imports approximately half of its annual bitumen requirement.
  - **Statistics:** In 2023-24, India imported 3.21 million tonnes and produced 5.24 million tonnes of bitumen locally.

U.N.'s Annual Sustainable Development Report

Context

- The **UN's Sustainable Development Report** indicates that **no SDGs are on track to be met by 2030**, with most showing limited or reversed progress.
- Major contributing factors include **funding shortfalls, geopolitical tensions** and **the impacts of the COVID-19 pandemic**.

Details

Key Findings

- **No Sustainable Development Goals (SDGs)** are on track to be **met by 2030**, with most showing limited or reversed progress.
- Persistent challenges remain in **poverty eradication**, **hunger reduction**, **sustainable city development** and **biodiversity protection**.
- The **COVID-19 pandemic** has **significantly set back global health**, **economy** and **social systems**, hindering SDG progress.
- Chronic **lack of funding** for **sustainable development initiatives** is a major barrier, especially in developing countries.
- **Military conflicts** and **political instability** disrupt cooperation and progress on SDGs.
- **Better access to international finance**, **supportive credit rating systems** and a **revamp of the UN system** are **essential**.
- **Finland, Sweden** and **Denmark lead** in **SDG performance**, while the poorest countries lag significantly, requiring targeted support and interventions.

State of Global Air (SoGA) Report

Context

- The **State of Global Air (SoGA) report by the Health Effects Institute and UNICEF** reveals that **air pollution** is the **second leading global risk factor for death**, causing 8.1 million deaths in 2021.
- The report underscores the significant health impacts of air pollution, particularly on children under five, and emphasizes the need for urgent measures to improve air quality and public health.

Details

Key Points

- **Air pollution** is now the **second leading risk factor for death globally**, following high blood pressure, as per the latest State of Global Air report.
- The report highlights that PM2.5 air pollution, from sources like **fossil fuels** and **biomass burning**, contributed to 7.8 million deaths in 2021.
- Children under five years old are particularly vulnerable, with 700,000 deaths linked to air pollution in 2021, making it the second leading risk factor for this age group after malnutrition.
- Household air pollution, mainly from cooking with polluting fuels, accounted for 500,000 of these child deaths, predominantly in **Africa and Asia**.
- Long-term exposure to ozone contributed to 489,518 deaths globally in 2021, with significant impacts on respiratory health, including 14,000 ozone-related COPD deaths in the United States.
- The **Global Burden of Disease study**, a key data source for the **SoGA report**, provides comprehensive estimates of **health impacts from various risk factors across 204 countries** and territories.
- The report emphasizes that nearly every person on earth breathes **unhealthy levels of air pollution daily**, indicating a widespread global health challenge.
- Despite the grim statistics, progress has been made since 2000, with a 53% reduction in

child deaths linked to air pollution due to improved access to clean energy and healthcare.

State of Global Air (SoGA) Report:

- The **State of Global Air (SoGA) report** by the **Health Effects Institute** and **UNICEF** provides a detailed analysis of air pollution's **health impacts**, drawing data from the **Global Burden of Disease study**.
- The report emphasizes the severe health consequences of pollutants like PM2.5, ozone, and NO2, highlighting their role in **noncommunicable diseases** such as heart disease, stroke, and asthma.
- The SoGA report's findings stress the **importance of policy interventions to improve air quality, reduce emissions from fossil fuels and biomass**, and protect vulnerable populations, aligning with the goals of sustainable development and public health improvement.

Gas Flaring

Context

- **Gas flaring by oil and gas producers increased by 7% in 2022**, reversing the reductions achieved between 2021 and 2022 and adding 23 million tons of carbon dioxide equivalent emissions.
- The World Bank emphasizes urgent action is needed to achieve the goal of zero routine flaring by 2030, as global efforts have not been sustainable.

Details

Key points	Details
Definition of Gas Flaring	The burning of natural gas associated with oil extraction, often due to a lack of infrastructure to utilize it.
Report Released By	World Bank's Global Gas Flaring Tracker Report
Key Findings / Data / Stats	• Gas flaring rose to 148 billion cubic meters in 2022, the highest since 2019 • Additional 23 million tons of CO2 equivalent emissions in 2022 • 5% increase in gas flared per barrel of oil produced
Major Contributors	• Russia, Iran, Iraq, US, Venezuela, Algeria, Libya, Nigeria, Mexico (75% of global flaring, 46% of oil output)
Impacts	• Significant climate concern due to methane's high warming potential • Oil and gas sector contributes about 20% of human-made methane emissions • Half of these emissions come from developing nations
Significance	• Methane has over 80 times the warming power of CO2 in the first 20 years in the atmosphere
Measures	• World Bank calls for urgent action to achieve zero routine flaring by 2030 • 2030 Zero Routine Flaring Initiative aims to eliminate routine gas flaring within six years • Promotes sustainable development and mitigates climate change through targeted international cooperation

Barda Sanctuary

Context

- The **Gujarat Forest Department is translocating spotted deer and sambar from Gir Forest to Barda Wildlife Sanctuary** to enhance the **prey base for Asiatic lions** and support their long-term conservation.
- Barda Wildlife Sanctuary is **a potential habitat for Asiatic lions** due to its ecological conditions and vegetation, making it a suitable site for lion relocation and natural dispersal.

Details

Barda Wildlife Sanctuary:

- **Location and Area:** Barda Wildlife Sanctuary spans 192.31 sq. km and is located about 100 km from Gir Forest in Gujarat's Saurashtra region.
- **Ecological Significance:** The sanctuary's ecoclimatic conditions and vegetation composition are similar to Gir Forest, making it a suitable habitat for Asiatic lions.
- **Biodiversity:** Barda hosts species like blue bulls, wild boars, peafowls, and now translocated spotted deer and sambar to support the lion population.
- **Historical Context:** Barda was known for its Asiatic lion population until 1879, highlighting its potential for successful lion recolonization and long-term conservation.
- **Conservation Efforts:** The Gujarat Forest Department's initiatives, including the establishment of an Asiatic lion gene pool centre, aim to enhance wildlife conservation and biodiversity in Barda.
- **Challenges and Solutions:** Addressing the low prey base and ensuring sustainable prey populations are crucial for the sanctuary's success in supporting relocated lions.

About Asiatic Lion:

Feature	Description
Habitat	Primarily Gir Forest National Park and surrounding areas in Gujarat, India. Once widespread across West Asia and the Middle East.
Physical Characteristics	Smaller than African lions. Males have a sparse mane, visible ears, and a fold of skin along the belly.
Threats	Habitat loss, human-wildlife conflict, poaching.
Conservation Efforts	Asiatic Lion Reintroduction Project aims to establish a second population.
Significance	Flagship species of India.

5.11 SNIPPETS

Topics	Details
Paraparatrechina Neela	• A new blue ant species, **Paraparatrechinaneela**, was discovered in **Siang Valley, Arunachal Pradesh**. • First new species of Paraparatrechina in 121 years since the description of the only previously known species, P. aseta (Forel, 1902), in the Indian subcontinent. • The new ant species has a **metallic-blue body**, large eyes, and a sub-triangular head, making it a rare find among ants. • Paraparatrechina ants are small, 1-2 mm long, in the subfamily Formicinae. • Found in Afrotropical, Australasian, **Indomalayan**, **Oceanian**, and **Palearctic** regions. • Thrive in **tropical environments**, from rainforests to forest clearings. • Habitats range from leaf litter to high canopy levels. • The genus includes 38 valid species and four valid subspecies. • **Indomalayan region** hosts 14 known species of Paraparatrechina. • Paraparatrechinaaseta was the **sole species in the Indian subcontinent**. • Blue color in insects results from **photonic nanostructures**, **not pigments**. • **Blue coloration** independently evolved in various insect groups.
Forest Eagle Owl (Bubo Nipalensis)	• **Forest Eagle Owl (Bubo nipalensis)** breeding recorded in **Pench Tiger Reserve, Maharashtra**. • **Bird watchers and Special Tiger Protection Force (STPF)** crucial in the discovery. • Found in **dense, moist deciduous forests near Surewani village**.

	• Researchers recorded their low-frequency calls using Raven Pro software. • **Nocturnal birds**, active during the night. • Considered part of a super species, allopatric in distribution. • Habitats include **wet temperate** and **riparian forests**. • Conservation status requires attention due to habitat specificity and potential threats.
Parengyodontium Album	• **Parengyodontium album** is a marine fungus specializing in polyethylene plastic degradation. • Discovered residing among marine microbes on oceanic plastic litter in **North Pacific Ocean pollution** hotspots. • Requires prior **UV exposure** for effective **polyethylene breakdown**. • The **fungus degrades polyethylene** at a rate of approximately 0.05% per day. • Ongoing research targets discovery of other plastic-degrading organisms in deeper ocean layers. • Significance lies in managing **marine plastic pollution** and advancing environmental conservation efforts.
Thismia Malayana	• Thismiamalayana, a **distinctive plant species** found in the rainforests of Peninsular Malaysia. • **Survives in low-light rainforest** understories through mycoheterotrophy. • It is known for its unique characteristic of **not performing photosynthesis, relying instead on mycorrhizal symbiosis**. • Emphasizes the biodiversity significance of rainforests, advocating for conservation efforts. • It is classified as **Vulnerable** as per IUCN Red List.
Musankwa Sanyatiensis	• Discovery of a **new dinosaur species**, **Sanyativenatorsanyensis**, near Lake Kariba in Zimbabwe, named after the **Sanyati River**. • Analysis indicates it belonged to the **plant-eating sauropodomorph** group and likely inhabited swampy environments. • **Significance of Discovery:** • It enhances the sparse representation of **African dinosaurs**, urging further research in underexplored regions. • The discovery helps understand **Late Triassic Sauropodomorpha diversity**, providing evolutionary insights into prehistoric ecosystems. • It **highlights Zimbabwe's potential for significant paleontological discoveries**, emphasizing its ecological and scientific importance. • Late Triassic-Early Jurassic sediments are crucial for studying global prehistoric biodiversity changes.
Przewalski Horses	• Przewalski horses, an **endangered** wild horse species, are being reintroduced into their native Kazakh steppe after a long absence, as part of a project led by Prague and Berlin zoos. • This project aims to bolster the population of Przewalski horses, showcasing Kazakhstan's commitment to wildlife **conservation**, which has **also benefited other endangered species** like the **Saiga antelope**. • The reintroduction of Przewalski horses to Kazakhstan is part of **broader global efforts** to preserve endangered species and maintain ecological balance, demonstrating international cooperation in conservation. • **Przewalski Horses:** Endangered wild horse species **reintroduced** into Kazakhstan.

	• **Native Habitat:** Kazakh steppe, suited to harsh winters and scarce food conditions. • **Conservation Project:** Led by **Prague** and **Berlin zoos**, involving 40 horses over five years. • **Current Populations:** 2,000 globally, found in **China, Mongolia, France, Russia,** and **the Chernobyl** exclusion zone. • **Saiga Antelope:** Another endangered species in Kazakhstan, with population growth due to conservation efforts.
Myricaria Genus	• A study by Kyoto University revealed that **snow leopards**, traditionally considered carnivorous, consume plants, particularly from the **Myricaria genus**, indicating dietary flexibility. • This discovery could influence conservation strategies and captive care. • Researchers used metabarcoding analysis to identify plant and **prey DNA** in faecal samples collected from the **Sarychat-Ertash Reserve** in **Kyrgyzstan's Tien-Shan Mountains**, uncovering significant plant consumption by **snow leopards**. • Snow leopards inhabit **high-altitude regions** above the tree line in Central and South Asia, particularly the **Himalayas, Karakoram, Pamirs** and **Tien Shan**. • In India, they are found in the **Trans-Himalayan region** at elevations between 3,000 to 4,500 meters. • Understanding snow leopards' plant consumption can inform better conservation strategies, enhance captive care, and ensure more effective habitat management. • Initiatives like the "**Project Snow Leopard**" (2009) and the **Global Snow Leopard and Ecosystem Protection Program** (GSLEP) focus on conservation through community participation, scientific research, and transboundary cooperation, aiming to secure 20 snow leopard landscapes by 2020.
4-Horned Antelope	• In recent developments at **Veerangana Durgavati Tiger Reserve** in **Madhya Pradesh**, the sighting of the rare **four-horned antelope** marks its first recorded presence in the region, showcasing its adaptability to dry environments. • The reserve also recorded sightings of barking deer, highlighting its diverse wildlife. • Additionally, the successful adaptation of two tigers translocated from **Bandhavgarh Tiger Reserve** has bolstered Veerangana Durgavati's tiger population, which now stands at 18, including cubs. This success underscores effective conservation efforts in the area. • The four-horned antelope, predominantly found in India and Nepal and classified as **'Vulnerable'** on the IUCN Red List due to its estimated population of 10,000, features distinctive four horns on males. • Formerly known as **Nauradehi Sanctuary**, **Veerangana Durgavati Tiger Reserve** is becoming renowned for its biodiversity, evident from recent wildlife sightings and conservation achievements. • Madhya Pradesh's tiger reserves, including **Pench, Bandhavgarh**, **Kanha**, and **Sanjay Tiger Reserves**, are pivotal in conserving diverse flora and fauna, including iconic species like tigers, leopards, and numerous bird species.
Atlantic Bluefin Tuna	• **Atlantic bluefin tuna**, historically abundant in **Irish waters**, face threats from **overfishing** and climate change-induced habitat shifts, impacting **marine biodiversity** and **coastal economies**. • Warming seas are causing tuna to migrate north, impacting marine ecosystems

	and coastal communities. • Trinity College Dublin and Irish Marine Institute tracked tuna migration using satellite tags. • Some tuna travelled to the **Mid-Atlantic** and **Mediterranean**, with several returning to Ireland the following year. • Improved management has led to the reappearance of **bluefins** in Irish waters, but climate change poses ongoing risks. • Ongoing studies aim to understand changes in marine ecosystems to help Ireland adapt to climate change.
Haliskia Peterseni	• A new **pterosaur species**, Haliskiapeterseni, was discovered in **Australia**. • It's the most complete pterosaur fossil found in Australia, with 22 percent of it recovered. • Pterosaurs lived from the Late Triassic to the end of the **Cretaceous period**. • Anhanguerian pterosaurs were found worldwide, showing they lived in diverse environments. • The discovery was made by researchers from Curtin University, including Kevin Petersen and PhD student Adele Pentland.
Micro Algae	• CSIR-IICT scientists highlight **Chlorella Growth Factor (CGF)** as a protein-rich ingredient for sustainable food and feed applications. • CGF, derived from microalgae, is a promising alternative protein source for human and animal diets. • CGF is **rich in essential amino acids**, surpassing the protein quality of commercially available soy meal. • Microalgae cultivation for CGF does not compete with traditional crops for space and resources, supporting sustainable food systems. • CGF offers health benefits by promoting overall health, immunity, and well-being, with higher protein quality metrics compared to soy meal.
Bioluminescent Mushroom	• **Filoboletusmanipularis**, a bioluminescent mushroom species, was recently discovered in **Kasaragod's Ranipuram forest** during a micro-fungal survey. • These mushrooms **emit green light** through a biochemical process involving **luciferin** and **luciferase enzymes**. • Due to **potential toxins**, Filoboletusmanipularis mushrooms are **not suitable for consumption**. • **Ranipuram forest in Kasaragod, Kerala**, characterized by its **tropical and humid conditions**, provides an ideal habitat for various fungi, including bioluminescent species.
Ophichthussuryai	• **OphichthusSuryai**, a new species of snake eel, was discovered in the **Subarnarekha** and **Bahuda rivers**, highlighting Odisha's rich estuarine biodiversity. • The species was identified using DNA analysis and morphological studies at the **ZSI laboratory**. • The research on OphichthusSuryai, published in the **Bulletin of Marine Science**. • The species is named in **honour** of **Surya Kumar Mohanty**, recognizing his contributions to **Odisha's fishery department**.
Indiconema	• Indiconema, a newly discovered genus of diatom, **found in the Eastern** and **Western Ghats of India**. • Diatoms play a crucial role in **global oxygen production** and **aquatic ecosystem**

	health. • Indiconema shows **unique valve features** and shares a close relation with the **Afrocymbella genus of East Africa**.
Caecilian	• **Kaziranga National Park**, renowned for its biodiversity, recently documented the striped **caecilian**. • Caecilians are limbless, elongated amphibians with **segmented, shiny skin, short sensory tentacles and a hard, thick skull for burrowing**. • They **range in size from less than three inches** to nearly five feet and are typically found in various shades of gray, brown, black, orange, or yellow. • Inhabiting **moist tropical and subtropical regions.** • **Herpetofauna conservation focuses on reptiles** and **amphibians**, important for pest control and as ecological indicators, with recent surveys and training aimed at enhancing identification and conservation efforts.
Iberian Lynx	• The **Iberian Lynx's population** has **increased** from 62 mature individuals in 2001 to over 2,000 in 2022 due to conservation efforts. • The IUCN status of the species improved from **'Endangered' to 'Vulnerable'** as of June 20. • Key conservation efforts include increasing the **abundance of prey** (European rabbit), habitat restoration, reducing human-caused deaths, and enhancing genetic diversity through translocations and breeding programs. • The current habitat is Mediterranean scrub and forest in **Spain and Portugal**. • The success of conservation efforts is attributed to collaboration between public bodies, scientific institutions, NGOs, private companies, community members, and support from the **EU LIFE project.**
Mugger And Turtle	• The fire at **Pariej lake, Kheda district**, resulted in the death of a **mugger crocodile** and **turtles**, both listed under **Schedule I** of the **Wild Life (Protection) Act, 1972**. • **Increase** in **mugger crocodile population** highlights the region's importance. • **Lack of communication** between departments led to the incident. • **Gujarat wildlife policies** aim to protect **crocodile habitats**. ◦ Past actions like **removing muggers from Narmada Dam raise concerns**.
Encephalartos Woodii	• **Encephalartos woodii**, discovered by botanist John Medley Wood in **1895**, is a critically endangered species with only male clones existing. • **Only male clones exist**, as the last wild specimen was removed in 1916. • Cycads reproduce with cones, but **all E. woodii are male**, preventing natural reproduction. • Efforts are underway **to find a female in South Africa using drones and AI**. • Cycads are **highly endangered due to slow growth**, **habitat loss** and **poaching**. • Finding a female is crucial for sexual reproduction and saving the species.

Russell Viper	• **Rise in snake bites**, especially by **Russell's vipers**, prompts health centres to stock anti-venom.
	• **Key Concern:** 7,000 deaths annually due to snake bites.
	• **Russell's Viper:**
	  ◦ Re-emerged and spread across **Bangladesh**.
	  ◦ Found near homes and farms, preying on rodents.
	  ◦ **Highly venomous**, requiring rapid anti-venom treatment.
	• **Cause:** Environmental changes impacting wildlife distribution.
	• **Global Context:** Snake bites are a neglected tropical disease, a WHO priority.

Didymocarpus Janakiae	• **Didymocarpusjanakiae** is a new plant species **discovered** in **Arunachal Pradesh**, specifically in the **sub-tropical forests** of the **West Kameng district**. • It is named in honour of **Dr. EK Janaki Ammal**, a pioneering Indian botanist and the **first Indian woman** to earn a doctorate in botany in the United States. • This species has a very limited population, with **fewer than 20 individuals** found, making it **critically endangered (IUCN status)**. • The plant's habitat is **under threat fromrapid development**, such as road construction, highlighting the urgent need for conservation.
Indian Painted Frog	• Rare sighting of Indian Painted Frog, Kaloula pulchra, in Telangana. • Typically found in Sri Lanka, Bangladesh, and western India. • Spotted at Kawal Tiger Reserve, highlighting biodiversity. • **Indian Painted Frog** belongs to the **Microhylidae family**. • Frog's striking appearance includes smooth brown shades with orange or yellow patches. • **Nocturnal species**, diet consists mainly of insects.
Mainland Serow	• The **mainland serow (Capricornissumatraensis thar)** was recorded at 96 meters above sea level in **Raimona National Park, Assam**. • The discovery highlights the park's role in preserving biodiversity and addressing **habitat fragmentation** and **poaching** issues. • The species is typically **found at altitudes between 200-3,000 meters**, according to the **IUCN**. • The discovery was published in the **Journal of Threatened Taxa** by a team of scientists, including those from Aaranyak and Assam University. • Raimona National Park was **declared a national park** on June 8, **2021**, covering an area of 422 sq. km.
Steriphopus Wangala	• New ground-dwelling spider highlights biodiversity in **Meghalaya**, **particularly Garo Hills**. • Human activities like **Jhum cultivation** and **road construction** threaten these species. • Naming the spider "**Steriphopuswangala**" integrates local culture (**Wangala Festival**) with conservation. • This spider (**reddish-brown, powerful legs**) lives near human settlements in **West Garo Hills**.

5.12 ADDITIONAL TOPICS FOR READING

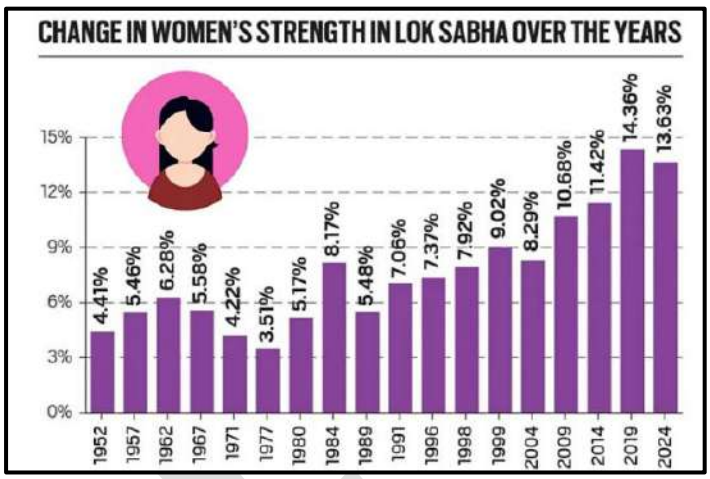
Topics	Uploaded on IAS GYAN website on
Gandhi Sagar Wildlife Sanctuary	17th June
World Environment Day	5th June
Unesco's State Of Ocean Report	7th June
Delhi Water Crisis	8th June
Marsupials	8th June
High Seas Biodiversity Treaty	10th June
Bonn Climate Change Conference	10th June
Singapore's Nanyang Technology University (Ntu) Study	11th June

On Air Pollution	
No2 Emissions	13th June
Sea Cucumber	13th June
Camelids	14th June
Hydrochlorofluorocarbons	15th June
Climate Change And Spread Of Dengue	17th June
Eco Levy	19th June
Elephants Have Names For Each Other	19th June
U.N.'S Annual Sustainable Development Report	21st June
Avocados	21st June
Dendrophthoe Longensis & Petrocosmea Arunachalense	25th June
Bannerghatta	28th June
Borneo Elephants	29th June
Rhisotope Project	29th June

6. SOCIAL ISSUES

6.1 ENHANCING WOMEN'S POLITICAL REPRESENTATION IN INDIA

Context



- India elected **74 women MPs to Lok Sabha in 2024.**
- Represents a progression from 1952, but still below the proposed 33% quota.
- Slow and irregular increase in women's representation.
- India lags behind other nations.

2024 Elections: Candidates' Composition

- Out of 8,360 candidates, **only around 10% were women.**
- Improvement from 1957's **3% but underscores gender disparity.**
- BJP and Congress fielded higher female candidates.

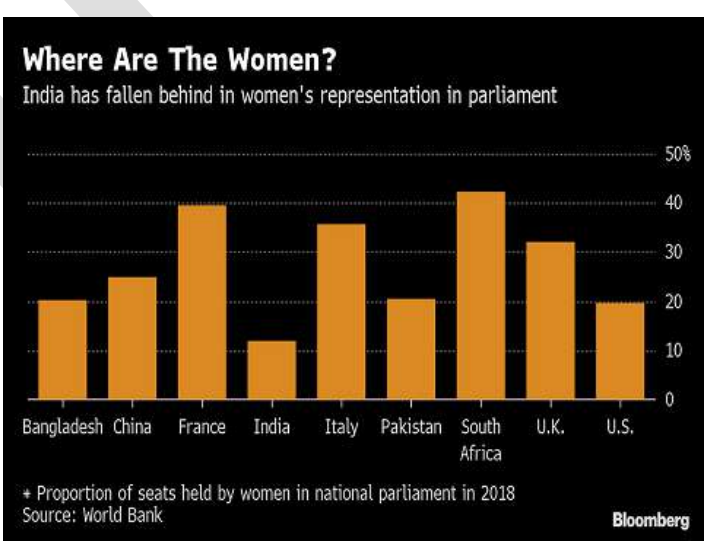
Successes in Women's Participation in Local Politics

Third Tier of Government:

- India's local government includes municipalities in urban areas and Panchayati Raj Institutions (PRIs) in rural regions.

73rd and 74th Amendments (1992):

- Aimed to improve local-level planning, implementation, and monitoring.
- Introduced reservation of **one-third seats in local body elections for women.**
- Significant increase in participation, **reduced proxy representation.**
- 20 of India's 28 states have increased the reservation to 50 percent.



Challenges

- Societal biases, male-dominated party structures, familial responsibilities, financial constraints.
- Institutional barriers like **centralized party ticket distribution, dynastic politics.**

The Case for Institutional Reforms

- Amend Representation of People Act, 1950, to **mandate one-third tickets for women.**
- **Revive Women's Reservation Bill 2008** for one-third seats in parliament and state assemblies.

Challenges to Reforms

- **Political consensus** hurdles amidst opposition within parties.

- Ensuring equitable distribution of reserved tickets among diverse backgrounds.

Way Ahead

- **Boosting Participation:** Women's political engagement rises with improved education and financial autonomy.
- **Transforming Institutions and Society:** Reforms needed to empower women politically.
- **Women's Groups Vital:** Sustained action by women's organizations and political networks crucial for women's political visibility.
- **Building Inclusive Democracy:** Higher female representation vital for a truly inclusive democracy in India.

READ ABOUT :Women's Reservation Act, 2023:*https://www.iasgyan.in/daily-current-affairs/womens-reservation-42#:~:text=The%20Women's%20Reservation%20Bill%2C%20with,crucial%20for%20its%20successful%20implementation*.

6.2 MARRIAGE EQUALITY BILL

Context

- The Thai Senate recently passed the Marriage Equality Bill, marking a significant shift in Thailand's marriage laws.

Key Provisions

- Replaces **gender-specific terms with gender-neutral language** (e.g., "spouse" instead of "husband" or "wife").
- **Grants equal rights to same-sex couples in adoption**, inheritance, and tax benefits.
- Ensures **legal parity with heterosexual couples** in cases of legal incapacitation.

Positive Societal Reception

- Received bipartisan support, reflecting societal acceptance.
- Polls show high tolerance and support for LGBTQ+ rights in Thailand.

Global Context

- Contrasts with **Asia's mixed progress on LGBTQ+ rights.**
- Highlights disparities with countries like Taiwan and Nepal, where marriage equality is legal.

Global Status of Same-Sex Marriage

- **Legalized in 36 countries globally**, predominantly in Europe, the Americas, and Oceania.

Indian Context

- **Section 377 of IPC decriminalized by the Supreme Court**, but same-sex marriage remains unrecognized.
- Calls for **legislative action under the Special Marriage Act** to recognize same-sex marriages.

Supreme Court and LGBTQ+ Rights

- Upheld constitutional rights and struck down Section 377, affirming equality and personal liberty.
- Emphasized human rights over social and religious morality.The right to marry is a fundamental right **under Article 21.**

Arguments in Favor of Same Sex Marriage

- Affirms equality and fundamental rights for all **individuals under Articles 14 (equality before law), 15 (prohibition of discrimination), and 21 (right to life and personal liberty) of the Indian Constitution.**
- Recognizes diversity in relationships and promotes social acceptance.
- Aligns with constitutional principles of **non-discrimination and personal liberty.**
- Supports stable family units and provides legal protections for children.

Arguments against Same Sex Marriage

- Challenges traditional notions of marriage and societal norms.
- Raises concerns about religious and cultural values.
- Potential implications for broader social changes, such as acceptance of polygamy.

Way Forward

- Advocate for legislative reforms to ensure full marriage rights for same-sex couples.
- Promote education on gender and sexuality to foster social acceptance.
- Uphold equality before the law for all sexual orientations and identities in India.

6.3 WORLD INEQUALITY LAB: CASTE'S ROLE IN INDIA'S INEQUALITY DEBATE

Context

- A recent working paper from the World Inequality Lab has reignited discussion on India's widening wealth gap and highlighted persistent caste-based inequalities, shaping the country's socioeconomic landscape.

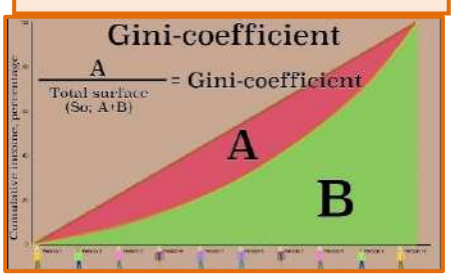
Key Points

Economic Inequality Overview:

- Emphasizes that economic disparity in India transcends mere rich-poor dichotomy, with caste-based inequalities as integral components.
- Utilizes metrics like the Gini coefficient and consumption shares for analysis.

Gini Index

The **Gini Index**, developed by Italian statistician Corrado Gini in 1912, measures a nation's **level of income inequality** by evaluating the distribution of income or wealth across its population. It ranges from **0** (perfect equality) to **1** (perfect inequality), highlighting disparities where high-income individuals receive a larger share of total income.



Population and Consumption Share:

- **Scheduled Tribes (ST):** Constitute 9% of the population but account for only 7% of consumption.
- **Scheduled Castes (SC):**Represent 20% of the population with a consumption share of 16%.
- **Other Backward Classes (OBC):** Make up 43% of the population and have a consumption share of 41%.
- **General Category:** Comprising 28% of the population, they hold 36% of consumption, indicating significant economic advantage.

Gini Coefficient Analysis:

- **Overall Reduction:** Decreased from 0.359 in 2017-18 to 0.309 in 2022-23, signaling a reduction in income inequality by 0.050 points.
- **Changes Within Social Groups:** STs, SCs, and OBCs saw varying reductions, reflecting improved consumption equity.
- **Consumption Trends:** Marginal decreases for STs, SCs, and OBCs in the bottom 20% decile, while the General category experienced a pronounced decline.
- **Top 20% Decile:** All groups saw increased consumption, with a notable surge among the wealthiest in the General category.

Persistent Disparities

- STs and SCs continue to **face pronounced economic gaps despite some improvements**.

- Significant consumption disparities persist, particularly among higher-caste elites in the General category.

Efforts and Challenges

- Government policies like reservations and direct benefit transfers aim to alleviate disparities.
- Despite progress, substantial challenges remain in achieving equitable economic growth and social harmony.

Recommendations

- Focus on **enhancing income generation and consumption capabilities** for marginalized communities.
- **Sustained monitoring and targeted interventions** are crucial for achieving lasting economic equity.

Conclusion

- India's efforts to reduce poverty are commendable, **yet entrenched caste-based economic disparities** remain a critical challenge.
- **Effective policy interventions and continued efforts** are essential to promote **inclusive growth and bridge socioeconomic divides.**

World Inequality Lab (WIL)
The WIL is a global research center dedicated to studying and addressing inequality through extensive data collection, research publications, and global dissemination efforts. Maintaining the World Inequality Database, WIL focuses on income, wealth, gender, and environmental disparities, with research spanning historical trends, global wealth distribution, and societal impacts of inequality.

6.4 GENDER GAP REPORT

Context

- The World Economic Forum **released the 18th edition of its annual Global Gender Gap Report for 2024.**

Global Gender Gap Report 2024 Highlights

India's Ranking:

- **Overall**: Ranked 129th out of 146 countries, slightly lower than the previous year.
- **South Asia**: Third-lowest among South Asian economies.

Comparison with Neighbors:

- **Better Performers**: Bangladesh, Nepal, Sri Lanka, and Bhutan outperformed India.

Political Empowerment:

- **Ranking**: 65th
- **Significance**: Reflects some progress in women's political representation, though overall improvement is needed.

India's Rankings in Key Categories

- **Economic Participation and Opportunity**: Ranked 142nd
  - Indicates significant gender disparities in economic involvement.
- **Health and Survival**: Ranked 142nd
  - Reflects critical issues in health equity and survival rates.
- **Educational Attainment**: Ranked 112th
  - Shows progress in educational access, but substantial gaps in literacy rates and outcomes remain.

Areas of Gender Gap Improvement for India

Economic Participation:

- **Peak Parity Goal**: To achieve 46% economic parity, a 6.2 percentage point improvement is needed.
- **Key Indicators for Improvement**:
  - **Estimated Earned Income**: Needs a 28.6% improvement.
  - **Legislative, Senior Officials, and Management Roles**: Requires a 14.4% increase.

- **Labour-Force Participation Rate**: A 45.9% increase is needed.
- **Professional and Technical Workers**: Should improve by 49.4%.

Political Empowerment Scores

- **Head-of-State Indicator**: Top 10 globally with a 40.7% score.
- **Ministerial Positions**: 6.9% held by women.
- **Parliament Representation**: Women hold 17.2% of seats, below global averages.

Educational Attainment

- **Enrolment Levels**: High in primary, secondary, and tertiary education, but modest increases in women's educational attainment.
- **Literacy Gap**: 17.2 percentage point gap between men and women, contributing to a rank of 124th in this category.

Global Trends and Insights

- **Gender Gap Closure**: 68.5% of the global gender gap has been closed, indicating progress but highlighting the need for further efforts.
- **Europe**: Leads in gender equality with the least disparity across parameters.
- **Latin America and the Caribbean**:
  - **Economic Parity**: Highest score to date at 65.7%.
  - **Political Empowerment**: Second-highest regional score at 34%.

Recommendations for Improvement

1. **Focus on Political Participation**: Enhancing women's participation in political processes to address large existing gaps.
2. **Labour-Force Participation**: Encouraging post-pandemic recovery of women's labour-force participation rates to 65.7% globally.
3. **Educational and Economic Opportunities**: Improving access to education and economic opportunities for women to reduce the gender gap and achieve long-term parity.

6.5 SHORT ARTICLES

Nata Pratha

Context

- The National Human Rights Commission of India issued notices to the Union Ministry of Women and Child Development and state governments of Rajasthan, Madhya Pradesh, Uttar Pradesh, and Gujarat regarding the alarming practice of 'Nata Pratha.'

'Nata Pratha'

- 'Nata Pratha' is a harmful tradition **formalized through stamp papers, perpetuating illegal and unethical acts under economic and social pressures.**
- This tradition, **involving the sale or marriage of underage girls, persists in certain communities within these states.**

Consequences

- The practice violates fundamental human rights, subjecting girls to physical, emotional, and psychological harm, denying them education and personal growth, and perpetuating poverty and gender inequality.

NHRC's Call

- The NHRC vehemently condemns 'Nata Pratha' and **urges immediate eradication, emphasizing the need for robust measures to safeguard the rights of affected individuals.**

NHRC's Recommendations

1. **Legal Action**:
   - Against the father for selling his daughter.
   - Against police personnel for inaction.

2. **Legislative Measures**: State Government urged to enact laws against 'Nata Pratha'.

Further Enquiries and Findings

1. **Special Rapporteur's Role**:
   - Detailed enquiry into the sale of girls.
   - Suggested a **multifaceted strategy** to address the issue.
2. **Research Division's Suggestions**:
   - Enactment of laws against 'Nata Pratha'.
   - Prosecution under human trafficking and **POCSO Act.**
   - Establishment of **village-level boards** to register cases.
   - **Awareness building, education, and employment opportunities** for girls and women.

National Human Rights Commission of India

The National Human Rights Commission of India (NHRC) is a **statutory body established on October 12, 1993,**under the Protection of Human Rights Ordinance of September 28, 1993, later reinforced by the Protection of Human Rights Act, 1993 (PHRA). Endowed with the responsibility of safeguarding and promoting human rights as defined by the act, the NHRC is entrusted with ensuring the life, liberty, equality, and dignity of individuals, as guaranteed by the Constitution and international covenants. Among its key functions are proactively or reactively investigating human rights violations, recommending measures for their effective implementation, studying factors inhibiting human rights enjoyment, and proposing remedial actions. The NHRC also conducts research in human rights, inspects prison conditions, conducts human rights education, and supports NGOs working voluntarily in this field. The NHRC is **composed of a chairperson and five members, excluding ex-officio members**. The chairperson must have served as Chief Justice of India or a Judge of the Supreme Court. Additionally, **one member each must have been a Judge of the Supreme Court and a Chief Justice of a High Court**. Among the three remaining members, **at least one must be a woman with expertise in human rights matters**. Ex-officio members include chairpersons from various national commissions, and appointment of sitting Judges of the Supreme Court or Chief Justices of High Courts requires consultation with the Chief Justice of India.

Sadfishing

In News:

- Sadfishing, coined by **journalist Rebecca Reid in 2019**, explores the phenomenon of exaggerated emotional claims online for sympathy and attention. It critiques the ethical boundaries of personal disclosure in digital spaces, notably among celebrities and influencers.

Key Points:

- **Origins and Influential Events:** Rebecca Reid introduced "sadfishing" in 2019, highlighting instances like Kendall Jenner's acne posts, sparking debates on authenticity versus strategic promotion.
- **Celebrity Exploitation and Public Perception**: Instances of celebrities leveraging personal struggles for publicity underscore the blurred lines between genuine expression and marketing, prompting calls for transparency.
- **Research and Insights:** Studies link sadfishing to coping mechanisms and mental health conditions, stressing the importance of distinguishing genuine distress from attention-seeking behavior.
- **Implications for Mental Health:** Sadfishing raises concerns about its impact on mental well-being, advocating for empathy and responsible social media use to foster genuine connections.

ULLAS – Nav Bharat SaakshartaKaryakram

Context:

- Ladakh has been declared as a fully functional literacy unit under ULLAS of Nav Bharat SaakshartaKaryakram, with a literacy rate surpassing 97%.

ULLAS and Nav Bharat SakshartaKaryakramme

- ***Introduction***: Launched by the GOI**for FYs 2022-2027**, replacing Adult Education, this **centrally sponsored scheme** aims to address literacy needs under the ULLAS initiative aligned with the National Education Policy 2020.
- ***ULLAS Initiative***: ULLAS (Understanding Lifelong Learning for All in Society), **part of the New India Literacy Programme (NILP) from 2022-2027,** aligns with the National Education Policy 2020. It aims to integrate adults aged 15 and above into mainstream society through education, enhancing national contribution. Focused on creating **a learning ecosystem for adults aged 15** and above, emphasizing foundational literacy, critical life skills, vocational development, basic education equivalency, and lifelong learning.
- ***Scheme Implementation:*** Utilizes volunteer efforts via the ULLAS Mobile App, supported by face-to-face workshops and digital resources, targeting non-literates across all states and UTs.
- ***Objectives and Targets***: Aims to **educate 5 crore learners over 5 years**, integrating technological tools and community engagement strategies to monitor and assess outcomes effectively.
- ***Salient Features***: Prioritizes **the 15-35 age group and marginalized cohorts**, integrates Information and Communication Technology for efficiency, utilizes Performance Grading Indices, and engages PRIs, ASHA workers, and volunteers for widespread participation.

7. SCIENCE & TECHNOLOGY AND HEALTH

7.1 BIODIESEL

Context

- The recent development of a superhydrophobic catalyst by a global team of scientists promises to revolutionize biodiesel production, significantly reducing costs and enhancing efficiency.
- The development involved scientists from Assam, Odisha, China, and the United Kingdom, highlighting international collaboration in advancing sustainable energy technologies.

Details

About the Catalyst

- **Superhydrophobic Nature:** The catalyst is designed to be superhydrophobic, mimicking natural surfaces like lotus leaves. This property is crucial as it prevents water from interfering with the catalytic process, ensuring the catalyst's active sites remain effective over multiple uses.
- **Cost Reduction:** Current biodiesel production costs approximately $1.2 per liter in India. The new catalyst is expected to slash this cost to about 37 cents per liter, making biodiesel much more competitive with conventional diesel fuels.
- **Efficiency and Reusability:** The robustness of the catalyst allows for repeated use, enhancing overall efficiency. This reusability feature contributes to cost-effectiveness and sustainability in biodiesel production.
- **Derived from Biomass:** The catalyst is derived from biomass, specifically cellulose. This source material is ecologically benign, abundant, and affordable, aligning well with sustainable practices in energy production.

Biodiesel

- Biodiesel is a renewable, clean-burning alternative fuel derived from natural fats or vegetable oils.
- It can be used as a substitute for or blended with conventional diesel fuel derived from petroleum.
- Biodiesel can be produced from a variety of feedstocks, including: Vegetable oils (soybean, canola, palm, etc.), Animal fats (tallow, lard, etc.) and Recycled cooking oils.
- The most common method to produce biodiesel is transesterification.

Advantages of Biodiesel

- **Renewable Resource:** Biodiesel is produced from renewable biomass sources.
- **Reduced Greenhouse Gas Emissions:** It typically produces lower levels of greenhouse gas emissions compared to petroleum diesel.
- **Biodegradability:** Biodiesel degrades faster than petroleum diesel, reducing environmental impact in case of spills.
- **Compatibility:** It can be used in existing diesel engines with little or no modification.

Disadvantages of Biodiesel

- **Feedstock Availability:** Depending on the feedstock, there may be competition with food production or land use.
- **Cold Weather Performance:** Biodiesel can gel in cold temperatures, affecting engine performance.
- **Storage Stability:** Biodiesel has poorer oxidative stability compared to petroleum diesel, requiring careful storage and handling.

Biodiesel Initiatives by the Government of India

- **National Policy on Biofuels (2018):** This overarching policy sets a target of 5% blending of biodiesel in diesel by 2030. It outlines various measures to achieve this, including:
  - **Feedstock diversification:** Encouraging the use of non-edible oilseeds, used cooking oil (UCO), and short gestation crops for biodiesel production, reducing reliance on imported palm oil.
  - **Production incentives:** Providing financial assistance for setting up biodiesel production units, particularly those utilizing UCO.
  - **Pricing mechanisms:** Offering higher purchase prices for biodiesel compared to traditional first-generation (1G) biofuels to incentivize production.
- **Biodiesel Purchase Policy (2006):** This policy mandates Oil Marketing Companies (OMCs) to purchase a specific quantity of biodiesel for blending purposes.
- **Direct Sale of Biodiesel (2015):** This initiative allows bulk consumers like railways and state transport corporations to directly buy biodiesel (B100) for blending with regular diesel. Subsequently, in 2017, this permission was extended to all consumers.
- **Repurpose Used Cooking Oil (RUCO) Program:** This program promotes the collection and conversion of UCO into biodiesel, tackling waste management and promoting a sustainable feedstock source.
- **Pradhan Mantri JI-VAN Yojana (2019):** This scheme aims to create an ecosystem for establishing commercial 2G ethanol projects, fostering research and development in advanced biofuel production technologies.

Biodiesel Classification in India

Based on Feedstock:

- **1G (First Generation) Biodiesel:** Produced from edible vegetable oils like palm oil, soybean oil, or jatropha oil. While readily available, these sources raise concerns about "food vs. fuel" competition and land-use change.
- **2G (Second Generation) Biodiesel:** Derived from non-food sources like used cooking oil (UCO), waste animal fats, and non-edible oilseeds like Jatropha curcas (non-fruiting variety). This category is considered more sustainable as it doesn't compete with food production.
  - **Used Cooking Oil (UCO) Biodiesel:** A primary focus area due to its abundance and potential to address waste management issues. The government actively promotes UCO collection and conversion programs.
- **3G (Third Generation) Biodiesel:** Under development, this category explores potential feedstocks like algae oil, which offers high yields and doesn't require dedicated land use. However, commercially viable production technologies are still being researched.

Based on Blending Ratio:

- **B100:** Pure biodiesel, rarely used directly due to its higher viscosity compared to diesel.
- **BXX:** Biodiesel blended with fossil diesel, with "XX" representing the percentage of biodiesel (e.g., B20 is 20% biodiesel and 80% diesel). The current target in India is to achieve 5% blending (B5) by 2030.

Based on Production Standards:

- **Biodiesel conforming to Bureau of Indian Standards (BIS) specifications:** This ensures quality and compatibility with existing engines.

7.2 MOND THEORY

Context

- The debate over dark matter and its main rival theory, Modified Newtonian Dynamics (MOND), has been a significant focus in astrophysics.
- Recent findings from the Cassini mission have brought more challenges to MOND, potentially undermining its viability.

Details

Background

- Galaxies rotate much faster than Newton's laws of gravity predict when considering only visible matter.
- This discrepancy led to the proposal of dark matter, an unseen substance providing the necessary gravitational pull.
- However, the inability to directly detect dark matter has led to alternative theories like MOND, which suggests modifications to Newton's laws in regions of low acceleration, like the outskirts of galaxies.

Key Findings from Cassini

- The Cassini mission orbited Saturn from 2004 until its deliberate plunge into Saturn in 2017.
- One of its scientific objectives was to test gravitational theories within the solar system, offering insights into MOND.
    - **MOND's Predictions**: MOND predicts deviations from Newtonian gravity at low accelerations, which should be observable within the solar system, particularly in the orbits of distant planets like Saturn.
    - **Cassini's Observations**: By precisely timing radio signals between Earth and Cassini, scientists measured Saturn's orbit with high accuracy. The data showed no deviations from Newtonian predictions, providing no support for MOND.
    - **Statistical Analysis**: The likelihood of MOND matching Cassini's data, even after adjusting for uncertainties and galaxy mass calculations, was extraordinarily low (comparable to a coin landing heads up 59 times in a row).

Implications for Dark Matter

- Despite MOND's shortcomings, the dark matter model is not without its challenges.
- It struggles with certain aspects of cosmology, such as the universe's expansion rate and the formation of large-scale structures.
- However, dark matter remains the prevailing theory due to its broad applicability across different scales.

Modified Newtonian Dynamics (MOND) Theory

- Modified Newtonian Dynamics (MOND) is an alternative hypothesis to dark matter.
- **Origin:** Proposed by Israeli physicist Mordehai Milgrom in 1983.
- **Purpose:** To address the discrepancy between the observed rotational speeds of stars in galaxies and the predictions made by Newton's laws of motion and universal gravitation without invoking dark matter.

The Problem with Newtonian Dynamics

- **Galactic Rotation Curves**: Observations show that stars in the outer regions of spiral galaxies rotate at similar speeds as those near the center, contradicting the expected decrease in rotational speed with distance from the galactic center based on Newtonian dynamics.
- **Dark Matter Hypothesis**: The conventional solution posits the existence of an unseen mass (dark matter) that exerts additional gravitational force, thus flattening the rotation curves.

Basic Principles of MOND

- **Modification of Newton's Second Law**: MOND suggests a modification at low accelerations rather than introducing additional unseen mass.
    - **Newtonian Regime**: At high accelerations, the standard Newtonian dynamics hold true.
    - **MOND Regime**: At accelerations below a certain threshold approximately 1.2×10 – 10 m/s 21.2× 10−10m/s2), the effective gravitational force deviates from Newton's inverse-square law.
- **MOND Acceleration Parameter (a_0):** The critical acceleration scale where Newtonian dynamics break down and MOND becomes significant.

7.3 CASIMIR EFFECT

Context

- Scientists at the Chinese Academy of Sciences have successfully manipulated the Casimir effect, switching it from attractive to repulsive forces using a ferrofluid as an intermediate medium.

Details

Recent Breakthrough

- **Ferrofluids:** These are liquids that become strongly magnetized in the presence of a magnetic field.
- By applying magnetic fields, researchers controlled the dielectric permittivities and magnetic permeabilities of the ferrofluids, thus tuning the Casimir force.
- The experiment involved manipulating the Casimir effect between a gold sphere and a silicon dioxide substrate, demonstrating reversible transitions from attraction to repulsion.

Implications for Nanotechnology

- **Actuators and Sensors**: Improved control over small-scale forces can enhance the performance of nano-actuators and sensors.
- **Quantum Computing**: Casimir force manipulation could be beneficial in the development of quantum computing components, where precise control of quantum states is crucial.
- **Medical Nanodevices**: In biomedical applications, controlling the Casimir effect could lead to more effective drug delivery systems and diagnostic tools.

About the Casimir effect

- The Casimir effect is a quantum phenomenon where two uncharged, parallel, closely spaced plates attract or repel each other due to quantum vacuum fluctuations.
- This effect has been a subject of interest since its prediction by Hendrik Casimir in 1948 and its first measurement by Steve Lamoreaux in 1997.

Theoretical Background

- **Quantum Vacuum Fluctuations**
    - In quantum field theory, even the vacuum state is not empty but filled with fluctuating electromagnetic fields. These fluctuations arise due to the Heisenberg uncertainty principle.
    - Virtual particles continuously appear and disappear in the vacuum, contributing to the zero-point energy of the system.
- **Casimir's Prediction**
    - Hendrik Casimir predicted that two uncharged, parallel, perfectly conducting plates placed very close to each other would experience an attractive force.
    - This force arises due to the restriction of allowed electromagnetic modes between the plates, leading to a difference in vacuum energy compared to outside the plates.
- **Lifshitz Theory**
    - Generalizes the Casimir effect to real materials with finite conductivity and finite temperature.
    - The Lifshitz formula accounts for dielectric properties and thermal fluctuations.

Implications and Theoretical Extensions

- **Quantum Field Theory and Condensed Matter Physics**
  - The Casimir effect provides insight into the properties of quantum vacuum and the role of boundary conditions in quantum field theory.
  - It has implications for the study of confined systems and surface interactions in condensed matter physics.
- **Cosmology and Dark Energy**
  - Some theories propose that the Casimir effect could contribute to the cosmological constant and dark energy, although this remains a speculative area of research.

Applications

- **Nanotechnology and Microelectromechanical Systems (MEMS)**
  - The Casimir effect plays a significant role at the nanoscale, affecting the design and operation of MEMS and NEMS (nanoelectromechanical systems).
  - It can cause stiction (static friction) in closely spaced components, which is a challenge in device engineering.
- **Novel Materials and Metamaterials**
  - Researchers are exploring materials with tailored electromagnetic properties to control and manipulate Casimir forces.
  - Metamaterials with negative refractive indices can potentially lead to repulsive Casimir forces.
- **Fundamental Physics Experiments**
  - Precision measurements of the Casimir effect are used to test theories beyond the Standard Model of particle physics, such as extra dimensions and modifications to gravity.

7.4 AMENDMENTS TO INTERNATIONAL HEALTH REGULATIONS

Context

- On June 3, 2024, the 77th World Health Assembly made historic strides by adopting significant amendments to the International Health Regulations (IHR).
- These amendments aim to enhance global preparedness and response to future pandemics, emphasizing improved access to medical products and financing.

Details

Key Amendments and Decisions

- **Definition of Pandemic Emergency**: The IHR now includes a precise definition of a "pandemic emergency," facilitating more effective international collaboration in responding to events that are nearing or have already become pandemics.
- **Improved Access and Financing**: Member countries pledged to ensure better access to medical products and financing, reinforcing health systems to protect against future outbreaks.
- **Strengthening National Capacities**: Enhancements are aimed at improving countries' abilities to detect and respond to outbreaks. This includes better disease surveillance, information sharing, and national response plans.

Significance of the Amendments

- **Global Coordination**: The amendments are designed to improve global coordination on disease surveillance, information sharing, and response efforts.
- **Equity and Collective Preparedness**: The changes are underpinned by a commitment to equity and the recognition that health threats transcend national borders, making preparedness a collective responsibility.
- **States Parties Committee**: This new committee will facilitate the effective implementation of the amended regulations, ensuring better coordination both within and between countries.

- **National IHR Authorities**: These authorities are created to enhance the coordination of regulation implementation, ensuring that all nations have the resources and plans needed to effectively respond to health threats.

Future Directions

- **Pandemic Agreement**: Member countries will continue working on the proposed Pandemic Agreement, focusing on improving international coordination, collaboration, and equity in pandemic preparedness and response.
- **Intergovernmental Negotiating Body**: Established in December 2021, its mandate has been extended to finalize the Pandemic Agreement by the World Health Assembly in 2025, or earlier if possible, at a special session in 2024.

International Health Regulations (IHR)

- The International Health Regulations (IHR) are a legally binding framework established by the World Health Organization (WHO) to ensure global public health security.
- **Objective**: To prevent, protect against, control, and provide a public health response to the international spread of disease.

Historical Background

- **Origins**: The first IHR were adopted in 1969, focusing on six diseases: cholera, plague, yellow fever, smallpox, relapsing fever, and typhus.
- **Revisions**: The IHR were revised in 2005 to address a broader range of public health threats, including emerging diseases and other health events of international concern.

Key Components of IHR (2005)

- **Core Capacities**:
  - **Surveillance**: Countries must develop and maintain capabilities to detect, assess, report, and respond to public health events.
  - **Response**: Establishment of national public health emergency response plans and coordination mechanisms.
- **Notification and Reporting**:
  - **Timely Reporting**: Countries must report public health emergencies of international concern (PHEIC) to the WHO within 24 hours.
  - **Information Sharing**: Continuous exchange of information with the WHO regarding public health risks and response measures.
- **Public Health Measures**:
  - **Containment**: Implementation of measures to prevent the spread of disease at points of entry, including airports, ports, and ground crossings.
  - **Quarantine and Isolation**: Enforcing isolation and quarantine when necessary to contain infectious diseases.
- **International Collaboration**:
  - **Coordination**: Working with the WHO and other countries to manage health risks and share best practices.
  - **Technical Support**: Receiving assistance from the WHO for capacity building and emergency response.

7.5 VIRUS LIKE PARTICLES

Context

- Scientists at the Institute of Advanced Virology (IAV) in Thiruvananthapuram have developed a novel technique for generating non-infectious Nipah virus-like particles (VLPs).
- This breakthrough enables crucial tests for vaccine and therapeutic development to be conducted in biosafety level-2 (BSL-2) labs, a significant improvement from the previous requirement of biosafety level-4 (BSL-4) labs.

Details

Virus-Like Particles (VLPs)

- Virus-like particles (VLPs) are molecular structures that resemble viruses but lack viral genetic material. This makes them non-infectious while retaining the ability to induce strong immune responses.
- **Structure**: VLPs typically consist of viral proteins that self-assemble into structures mimicking the morphology of actual viruses. They can be spherical, icosahedral, or filamentous in shape.

Composition and Formation

- **Proteins**: VLPs are composed mainly of viral capsid or envelope proteins. These proteins have the inherent ability to self-assemble into particles.
- **Expression Systems**: VLPs are produced using various expression systems, including:
  - **Bacterial Systems**: Often used for simple and cost-effective production.
  - **Yeast Systems**: Provide post-translational modifications.
  - **Insect Cell Systems**: Using baculovirus vectors for high-yield production.
  - **Mammalian Cell Systems**: Offer complex post-translational modifications and proper protein folding.
  - **Plant Systems**: Emerging as cost-effective and scalable platforms.

Applications of VLPs

- **Vaccines**:
  - **Prophylactic Vaccines**: VLPs can present viral antigens in their native conformation, making them effective for vaccine development. Examples include vaccines for HPV (Human Papillomavirus) and HBV (Hepatitis B Virus).
  - **Therapeutic Vaccines**: VLPs are being explored for cancer immunotherapy and chronic infections.
- **Diagnostic Tools**: VLPs can be used as antigens in diagnostic assays to detect antibodies against specific viruses.
- **Nanotechnology and Drug Delivery**: VLPs can be engineered to carry therapeutic agents or to serve as scaffolds in nanotechnology applications.

Advantages of VLPs

- **Safety**: As they lack genetic material, VLPs cannot replicate, ensuring safety.
- **Immunogenicity**: VLPs can elicit strong immune responses due to their size and repetitive surface structures.
- **Versatility**: Can be engineered to display epitopes from various pathogens.

Challenges and Limitations

- **Production and Purification**: The yield and purity of VLPs can vary depending on the expression system and production conditions.
- **Stability**: Maintaining the stability of VLPs during production, storage, and transport can be challenging.
- **Cost**: The cost of production, especially in mammalian systems, can be high.

Case Studies

- **HPV Vaccines**: The development of VLP-based vaccines like Gardasil and Cervarix has significantly reduced the incidence of HPV-related diseases.
- **HBV Vaccines**: VLP-based Hepatitis B vaccines have been instrumental in reducing global HBV infections.
- **Emerging Infections**: Research is ongoing for VLP-based vaccines for Zika, Chikungunya, and other emerging viral threats.

7.6 RABIES

Context

- In a significant public health development, the government of Jammu and Kashmir has declared human rabies a notifiable disease under the Epidemic Diseases Act of 1897.
- This decision **mandates the immediate reporting of all suspected, probable, and confirmed cases of human rabies by both government and private health facilities, including medical colleges, to the respective Chief Medical Officer and the State Nodal Officer of the National Rabies Control Program (NRCP).**

Details

- **Disease Background:**
  - Rabies is an acute viral infection affecting all warm-blooded animals, including humans. It is primarily transmitted through animal bites and has an extremely high fatality rate.
  - **Global and National Context:** India accounts for 59.9% of rabies deaths in Asia and 35% of global rabies deaths. However, rabies is entirely preventable with timely and appropriate Post-Exposure Prophylaxis (PEP).
- **Importance of Notification:**
  - **Surveillance and Reporting:** Establishing a robust surveillance and disease reporting system is crucial to determine the exact magnitude of rabies.
  - **WHO Goal:** The notification aligns with the World Health Organization's goal of zero deaths due to human rabies by 2023.
- **Mandate for Reporting:**
  - **Health Facilities' Obligation:** All government and private health facilities, including medical colleges, are required to report any suspected, probable, and confirmed cases of human rabies.
  - **Reporting Format:** Cases must be reported using the prescribed formats appended as Annexure-1 and Annexure-2 to the notification.
- **Legal Framework:**
  - **Epidemic Diseases Act of 1897:** The notification exercises powers conferred by Section 2 of this Act, officially declaring human rabies a notifiable disease in Jammu and Kashmir.

EPIDEMIC DISEASES ACT, 1897

The **Epidemic Diseases Act of 1897** is a piece of legislation enacted to provide for the better prevention of the spread of dangerous epidemic diseases. Here is a structured breakdown of its provisions and background:

Purpose and Scope

- **Aim:** To prevent the spread of dangerous epidemic diseases through temporary provisions or regulations.
- **Extent:** The Act applies to the whole of India.

Sections of the Act

Section 1: Title and Extent

- **Title:** The Act is officially known as the Epidemic Diseases Act, 1897.
- **Extent:** It extends to the entire country of India.

Section 2: Powers to Take Special Measures

- **State Government Powers:** Empowers state governments to take special measures and formulate regulations to contain the outbreak of epidemic diseases.
  - **Examples of Measures:**
    - Inspection of persons traveling by railway or otherwise.
    - Segregation in hospitals or temporary accommodations of persons suspected to be infected.
    - **Section 2A:** Grants the central government the authority to take steps to prevent the spread of an epidemic.
  - **Implementation:** Health is a state subject, but by invoking Section 2, advisories and directions of the Ministry of Health & Family Welfare become enforceable.
  - **Inspection and Detention:** Allows the government to inspect any ship arriving or leaving any port and detain any person intending to sail or arriving in the country.

Section 3: Penalty for Disobedience

- **Penalties:** Disobedience of any regulation or order made under the Act is punishable under Section 188 of the Indian Penal Code (IPC).
  - **Section 188 IPC:**
    - **General Penalty:** Simple imprisonment for up to one month, or a fine up to two hundred rupees, or both.
    - **If Disobedience Causes Danger:** Imprisonment for up to six months, or a fine up to one thousand rupees, or both.

Section 4: Legal Protection to Implementing Officers

- **Protection:** Provides legal protection to officers acting under the Act, ensuring they are not subject to legal proceedings for actions taken in good faith to implement the Act's provisions.

Section 188 of the Indian Penal Code

- **Description:** Deals with disobedience to an order duly promulgated by a public servant.
- **Punishments:**
  - **General:** Simple imprisonment for up to one month or a fine up to two hundred rupees, or both.
  - **If Disobedience Causes Danger:** Imprisonment for up to six months or a fine up to one thousand rupees, or both.

Background

- The Epidemic Diseases Bill was introduced on January 28, 1897, during an outbreak of the bubonic plague in Mumbai.
- **Reason:** Existing laws were insufficient to handle issues like overcrowded houses, neglected latrines, accumulations of filth, insanitary cowsheds and stables, and the disposal of house refuse.
- **Powers:** The Bill called for special powers for provincial governments and local bodies to check passengers off trains and sea routes, among other measures.

7.7 CELLULAR ORIGAMI IN PROTISTS

Context

- Cellular origami, a concept inspired by traditional paper folding, explores how cells and biological structures can fold and unfold with remarkable precision.
- Stanford University researchers have discovered a groundbreaking example of this phenomenon in the protist *Lacrymariaolor*, a single-celled organism known for its extraordinary ability to extend and retract its "neck."

Details

Cellular Origami

- **Biological Folding:** In cellular origami, folding refers to the way biomolecules and cells self-

organize into functional three-dimensional structures. This process is fundamental to the formation and function of various biological entities.

- **Self-Assembly:** A process where molecules spontaneously form organized structures without external guidance. This is crucial in the formation of complex biological architectures.

Applications of Cellular Origami

Protein Folding

- **Mechanisms:** Understanding how proteins fold into their functional shapes is vital for insights into their functions and roles in diseases. Misfolded proteins are associated with conditions like Alzheimer's and Parkinson's diseases.
- **Chaperone Proteins:** Assist in the proper folding of other proteins, ensuring they achieve their correct conformations.

Tissue Engineering

- **Scaffold Design:** Creating 3D scaffolds that mimic the extracellular matrix can guide the growth and organization of cells into functional tissues.
- **Regenerative Medicine:** Using cellular origami principles to develop tissues and organs for transplantation, enhancing the body's ability to heal and regenerate.

Drug Delivery

- **Nanocarriers:** Designing foldable nanoparticles that can encapsulate drugs and release them at targeted sites within the body, improving the efficacy and reducing side effects of treatments.
- **Responsive Materials:** Developing materials that change shape or function in response to environmental stimuli (e.g., pH, temperature) to deliver therapeutics precisely where needed.

Synthetic Biology

- **DNA Origami:** Using the principles of origami to fold DNA into specific shapes and structures that can perform particular functions, such as molecular machines or sensors.
- **Artificial Cells:** Creating synthetic cells with programmable folding properties to mimic natural cell functions or perform novel tasks.

Protists

- **Protists** are a diverse group of eukaryotic microorganisms, primarily unicellular, that do not fit into the other traditional kingdoms of animals, plants, or fungi.
- They are often considered the "catch-all" category of life forms, exhibiting a wide range of characteristics and ecological roles.

Characteristics of Protists

- **Eukaryotic Cells:** Protists have cells with a true nucleus and membrane-bound organelles.
- **Diversity in Form:** They can be unicellular, multicellular, or colonial. Some protists, like algae, resemble plants, while others, like protozoa, exhibit animal-like behaviors.
- **Motility:** Many protists are motile and can move using cilia, flagella, or pseudopodia.
- **Reproduction:** Protists reproduce through various methods, including asexual reproduction (binary fission, budding) and sexual reproduction (conjugation, fusion of gametes).

Classification of Protists

- Protists are classified into several groups based on their similarities and differences.
- The classification is often fluid and has undergone significant changes with advances in molecular biology.

Protozoa

- **Amoeboids:** Move and ingest food using pseudopodia. Example: Amoeba.
- **Flagellates:** Use one or more flagella for movement. Example: Trypanosoma.
- **Ciliates:** Covered with cilia for movement and feeding. Example: Paramecium.
- **Sporozoans:** Parasitic and often have complex life cycles involving multiple hosts. Example: Plasmodium.

Algae

- **Green Algae (Chlorophyta):** Photosynthetic, contain chlorophyll a and b. Example: Chlamydomonas.
- **Brown Algae (Phaeophyceae):** Mostly marine, large multicellular forms. Example: Kelp.
- **Red Algae (Rhodophyta):** Mostly marine, contain phycobiliproteins. Example: Porphyra.
- **Diatoms (Bacillariophyta):** Have silica cell walls, major component of phytoplankton. Example: Navicula.

Slime Molds and Water Molds

- **Slime Molds:** Resemble fungi in appearance and life cycle but are motile. Example: Physarum.
- **Water Molds:** Resemble fungi, live in water or moist environments. Example: Phytophthora.

Ecological and Economic Importance of Protists

- **Primary Producers:** Algae are crucial primary producers in aquatic ecosystems, forming the base of the food web.
- **Decomposers:** Slime molds and some protozoa play a role in decomposing organic matter.
- **Pathogens:** Some protists cause diseases in humans, animals, and plants. Example: Plasmodium causes malaria, and Phytophthora infestans causes potato blight.
- **Industrial Use:** Algae are used in biofuel production, food additives, and cosmetics.

Protists in Research and Biotechnology

- **Model Organisms:** Some protists, like Chlamydomonas and Tetrahymena, are used as model organisms in scientific research due to their simple structure and ease of manipulation.
- **Genetic Studies:** Protists have been instrumental in understanding basic biological processes such as cell division, motility, and signaling.

7.8 WHY IS CHINA PROBING THE FAR SIDE OF THE MOON?

Context

- China's space exploration efforts have reached a significant milestone with the Chang'e 6 mission, which brought back lunar samples from the moon's far side.
- This mission is a part of China's ambitious Chang'e program, named after the moon goddess in Chinese mythology, and represents a significant step in understanding the moon's geology and the formation of planetary bodies.

Details

Chang'e 6 Mission Details

- **Launch and Lunar Orbit**:
  - Launched on May 3 and entered lunar orbit on May 8.
  - The lander complex separated from the orbiter on May 30 and descended into a large crater named Apollo on June 1.
- **Sample Collection**:
  - A drill and scoop were used to extract about 2 kg of lunar soil.
  - Samples were transferred to an ascender which took off on June 4 and handed over the samples to the orbiter.
- **Return Journey**: The sample-bearing returned to Earth on June 25, 2024.

The Chang'e Missions: A Timeline

- **Chang'e 1 (2007)**:Launched by the Chinese National Space Administration (CNSA) as part of the Chinese Lunar Exploration Programme (CLEP).Created a detailed map of the moon's surface.
- **Chang'e 2**:Equipped with a better camera for enhanced imaging.
- **Chang'e 3 (2013)**:Successfully landed a rover on the moon, marking the beginning of phase II missions.

- **Chang'e 4 (2019)**:Achieved the first landing on the moon's far side.
- **Chang'e 5 (2020)**:Collected and returned lunar soil samples from the moon's near side.Introduced a complex mission structure involving a lander, an ascender, an orbiter, and a returner.
- **Chang'e 6 (2023)**:Currently in progress, aiming to replicate the success of Chang'e 5 but from the moon's far side.

The Far Side of the Moon

- **Tidally Locked**: The moon is tidally locked with Earth, meaning the same side always faces our planet.
- **Terrain**: The far side is rockier with fewer smooth plains compared to the near side.
- **Communication Challenges**: Direct communication with a spacecraft on the far side is impossible without a relay satellite due to the lack of line of sight.

Broader Implications

- **Telescope Installation**:
  - The far side is considered ideal for installing large telescopes due to the lack of Earth's interference.
  - ISRO and the Raman Research Institute in Bengaluru are working on such a device, PRATUSH.
- **China's Growing Space Ambitions**:
  - The Chang'e missions demonstrate China's expanding capabilities and ambitions in space exploration.
  - Successful missions bolster China's position in the global space race and pave the way for future lunar and interplanetary missions.
- **International Collaboration and Data Sharing**:
  - While CNSA has been relatively reserved in sharing mission updates, international scientific collaborations depend on data access.
  - The extent of data sharing and collaboration with foreign research groups remains to be seen.

Must read article:
Change 6

7.9 H5N2 BIRD FLU

Context

- The World Health Organization (WHO) has confirmed the first human death from the H5N2 strain of bird flu, raising significant concerns among experts.
- The victim, a 59-year-old man from Mexico, had no known exposure to poultry or other animals, which suggests a potential shift in the virus's transmission dynamics.

Details

Understanding Avian Influenza

- **Definition**: Avian influenza, or bird flu, is a viral infection primarily affecting birds. Certain subtypes can infect humans, causing severe respiratory illnesses.
- **Notable Subtypes**: H5N1, H7N9, and now H5N2.
- **Symptoms in Humans**: Fever, cough, sore throat, muscle aches, and severe respiratory distress in advanced cases.

Why Experts Are Alarmed?

- **Transmission Concerns**:
  - **Lack of Exposure**: The victim's lack of exposure to infected animals raises the possibility of new transmission pathways.
  - **Potential Shift**: Suggests the virus may have adapted to infect humans more efficiently.
- **Public Health Implications**:
  - **Zoonotic Nature**: Avian influenza is a zoonotic disease, meaning it can spread from animals to humans.
  - **Global Risks**: The interconnected nature of global poultry trade and international

travel could facilitate the rapid spread of the virus.

- **Historical Context**:
  - **Previous Human Infections**: Notable instances include the H5N1 subtype causing human fatalities since 1997.
  - **Current Concern**: Each new case, especially without direct animal contact, highlights the need for ongoing vigilance.

H5N2 Bird Flu

- H5N2 is a subtype of the Influenza A virus that primarily affects birds but can also pose risks to humans and other animals.

Virology

- **Classification**:
  - **Virus Type:** Influenza A
  - **Subtype**: H5N2
  - **Genome:** Single-stranded RNA virus
- **Structure**:
  - **Hemagglutinin (H):** H5 type, responsible for virus entry into host cells.
  - **Neuraminidase (N):** N2 type, facilitates virus release from host cells.
- **Mutation and Reassortment**: High mutation rates and genetic re-assortment with other influenza viruses can lead to new variants, complicating control measures.

Transmission

- **Primary Hosts**:
  - **Wild Birds:** Natural reservoir, often asymptomatic carriers.
  - **Domestic Poultry:** Highly susceptible, can suffer severe outbreaks.
- **Transmission Methods**:
  - **Direct Contact:** Infected birds shed the virus through saliva, nasal secretions, and feces.
  - **Indirect Contact**: Contaminated surfaces, water, and feed.

Symptoms and Effects

- **In Birds**:
  - **Respiratory Symptoms**: Coughing, sneezing, nasal discharge.
  - **Gastrointestinal Symptoms**: Diarrhea.
  - **Neurological Symptoms**: Tremors, incoordination.
  - **General Symptoms**: Lethargy, decreased egg production, sudden death in severe cases.
- **In Humans**:
  - **Mild Cases:** Conjunctivitis, mild flu-like symptoms.
  - **Severe Cases**: Pneumonia, acute respiratory distress syndrome (ARDS), and potentially death.

Outbreaks

- **2014-2015**: Major outbreak in North America, leading to the culling of millions of poultry.
- **2021-2022**: Outbreaks in various regions, including Europe and Asia, prompting widespread control measures.

7.10 QUANTUM INTERNET

Context

- Researchers from Imperial College London, the University of Southampton, and the Universities of Stuttgart and Wurzburg in Germany have **successfully transmitted, stored, and retrieved quantum data through standard fiber optic cables for the first time.**
- This breakthrough **brings us closer to the realization of a practical quantum internet**, addressing key challenges in quantum data transmission.

Details

Quantum Data Transmission Challenges

- **Stability**: Quantum information is inherently unstable over long distances, with qubits (quantum bits) easily lost or fragmented during transmission.
- **Repeaters**: In classical networks, repeaters amplify signals across the network. For quantum networks, similar devices are needed to store and retransmit quantum states, ensuring signal fidelity over long distances.

Quantum Internet

- The quantum internet is a revolutionary concept that aims to leverage the principles of quantum mechanics to enhance communication capabilities beyond the scope of classical internet technologies.
- By utilizing quantum phenomena such as entanglement and superposition, the quantum internet promises unprecedented security and computational power.

Core Concepts in Quantum Internet

Quantum Mechanics Fundamentals

- **Quantum Bits (Qubits)**: The basic unit of quantum information, analogous to classical bits, but can represent both 0 and 1 simultaneously due to superposition.
- **Entanglement**: A phenomenon where qubits become interconnected such that the state of one instantaneously influences the state of another, regardless of distance.
- **Superposition**: The ability of qubits to be in multiple states at once, enabling parallelism in quantum computations.

Quantum Communication Principles

- **Quantum Key Distribution (QKD)**: A method of secure communication that uses quantum mechanics to distribute encryption keys, ensuring secure data transfer.
- **Quantum Teleportation**: The transfer of quantum states from one location to another without moving the physical particles, facilitated by entanglement.
- **Quantum Repeaters**: Devices that extend the range of quantum communication by mitigating loss and errors through entanglement swapping and purification.

Architecture of the Quantum Internet

Quantum Network Infrastructure

- **Quantum Nodes**: Points in the network that perform quantum operations and house qubits.
- **Quantum Channels**: Pathways through which quantum information is transmitted, typically using photons over optical fibers or free space.
- **Entanglement Distribution**: The process of creating and distributing entangled qubits across the network to enable quantum communication.

Layered Model

- **Physical Layer**: Deals with the transmission of qubits through quantum channels, managing issues like decoherence and noise.
- **Link Layer**: Ensures reliable point-to-point quantum communication, handling error correction and entanglement swapping.
- **Network Layer**: Manages routing of quantum information across multiple nodes, optimizing the use of quantum resources.
- **Application Layer**: Supports end-user applications such as secure communication, quantum computing access, and distributed quantum sensing.

Applications of the Quantum Internet

- **Unbreakable Encryption**: Utilizing QKD, the quantum internet can provide encryption methods that are theoretically immune to any computational attack.
- **Authentication**: Quantum techniques can ensure the authenticity of communication parties, preventing impersonation and fraud.
- **Distributed Quantum Computing**: Allows users to access quantum computers remotely, leveraging the quantum internet to perform complex computations that classical computers cannot handle.
- **Enhanced Measurement Precision**: Quantum sensors can achieve higher precision in measurements of physical quantities like time, magnetic fields, and gravitational waves, facilitated by the quantum internet.

Challenges

- **Decoherence**: The loss of quantum information due to interaction with the environment, which poses a significant challenge for maintaining quantum states over long distances.
- **Error Correction**: Developing robust quantum error correction techniques to protect

quantum information from noise and operational errors.
- **Scalability**: Building scalable quantum networks that can support a large number of users and nodes.
- **Standardization**: Creating standardized protocols and interfaces to ensure interoperability between different quantum technologies and platforms.
- **Accessibility**: Ensuring that the benefits of the quantum internet are widely accessible and do not exacerbate digital divides.

7.11 LARGE ACTION MODELS

Context

- Large Action Models (LAMs) are revolutionizing how enterprises operate by autonomously handling complex tasks that traditionally required human intervention.
- **These advanced AI models understand natural language commands, interpret user intent from multimodal inputs (speech, video, text), and execute actions autonomously.**

Details

Enterprises Embracing LAMs

- **U.S. Insurance Firms**: Automating claims processing, significantly reducing labor costs.
- **European Airlines**: Enhancing customer interactions from booking to loyalty programs.
- **Asian Retailers**: Boosting sales conversions by 25% with personalized recommendations powered by LAMs.

Example Implementations

- **Vacation Planning**: End-to-end management, including bookings and itineraries.
- **Job Application Automation**: Streamlining the job search and application process.
- **Investment Portfolio Optimization**: Personalized financial management and advisory.
- **Social Media Content Creation**: Customizing content to user preferences for better engagement.

Large Action Models (LAMs)

- Large Action Models (LAMs) represent a significant advancement in the field of artificial intelligence.
- Unlike traditional AI models that primarily focus on understanding or generating text, LAMs combine language comprehension with logical reasoning and autonomous action execution.
- This makes them particularly powerful for a wide range of applications.

What are Large Action Models (LAMs)?

- LAMs are advanced AI models designed to understand and execute complex tasks based on user instructions communicated in natural language.
- **Functionality**: They combine language understanding with logic and reasoning, enabling them to perform a variety of tasks autonomously.
- **Learning Mechanism**: LAMs learn from massive datasets of user actions and information, which they utilize for strategic planning and real-time decision-making.

Key Features of LAMs

- **Complex Task Execution**:
  - LAMs can handle intricate tasks such as end-to-end vacation planning, job application automation, investment portfolio optimization, and personalized social media content creation.
  - They continuously learn and adapt to user preferences to improve their efficiency and effectiveness.
- **Advanced Machine Learning Techniques**:
  - **Deep Learning**: Utilizes neural networks to process and learn from vast amounts of data.
  - **Reinforcement Learning**: Enables LAMs to learn from interactions with their environment, improving their decision-making over time.

- **Real-Time Decision Making**:
  - By analyzing past and present actions, LAMs can predict future outcomes, aiding in strategic planning and real-time decisions in complex environments.
- **Wide Range of Applications**:
  - **Personal Assistants**: Enhancing user experience by performing various personal and professional tasks.
  - **Autonomous Vehicles and Robotics**: Improving navigation, task execution, and interaction with the environment.
  - **Healthcare**: Assisting in diagnosis, treatment planning, and patient care.
  - **Financial Modelling**: Optimizing investment strategies and risk management.

Comparison with Large Language Models (LLMs)

- **Large Language Models (LLMs)**:
  - AI programs that can recognize and generate text, understand context, and perform language-related tasks.
  - **Training**: LLMs are trained on extensive datasets using deep learning to understand the relationship between characters, words, and sentences.
  - **Capabilities**: They can generate coherent and contextually relevant responses, translate languages, summarize texts, answer questions, and assist in creative writing or code generation.
- **Key Differences**:
  - **Scope of Functionality**: While LLMs focus on language understanding and generation, LAMs extend these capabilities to include logical reasoning and autonomous task execution.
  - **Action Orientation**: LAMs are designed to perform actions based on understanding, making them suitable for more complex and dynamic environments.

7.12 SHORT ARTICLES

Recombinant Proteins

Context

- Researchers at the Indian Institute of Science (IISc), Bengaluru, have developed **an innovative method for the mass production of recombinant proteins, presenting a safer and more efficient alternative to existing techniques**.
- This advancement addresses the hazards associated with methanol usage in recombinant protein production, proposing the use of monosodium glutamate (MSG) instead.

Traditional Method: Methanol-Induced Production

Recombinant Proteins:

- Recombinant proteins are produced by genetically modifying bacterial, viral, or mammalian cells.
- **Applications:** These proteins are crucial for various medical applications, including vaccine antigens, insulin, and monoclonal antibodies.
- **Yeast (Pichia pastoris / Komagataellaphaffii) :** The most widely used organism for this production.

Methanol-Induced Process:

- **Promoter Activation:** The yeast contains a unique promoter (AOX promoter) that is activated by methanol, which codes for the enzyme alcohol oxidase (AOX).
- **Process:**
  - The gene coding for the desired protein is inserted next to the AOX promoter in the yeast genome.
  - Yeast cells are grown using glycerol or glucose.
  - Methanol is added to activate the AOX promoter, inducing protein production.

Challenges with Methanol:

- **Safety Risks:** Methanol is highly flammable and hazardous.
- **Oxidative Stress:** Methanol metabolism produces hydrogen peroxide, which can damage yeast cells and recombinant proteins.

Novel Method: MSG-Induced Production

Monosodium Glutamate (MSG) as an Alternative:

- **Discovery:** MSG, a USFDA-approved food additive, can activate a different promoter in the yeast genome.
- **Promoter:** This promoter codes for the enzyme phosphoenolpyruvate carboxykinase (PEPCK).
- **Process:**
  - The MSG activates the PEPCK promoter, leading to protein production similar to that induced by methanol.
- **Advantages:**
  - **Safety:** MSG is non-flammable and safer to handle than methanol.
  - **Efficiency:** The process eliminates the oxidative stress caused by methanol.

Applications

- **Biotech Industries:** The novel expression system can be utilized for the mass production of valuable proteins.
- **Products:** Includes milk and egg proteins, baby food supplements, nutraceuticals, and therapeutic molecules.
- **Scalability:** The method has the potential for widespread adoption in industrial settings due to its safety and efficiency.
- **Innovation:** Represents a significant advancement in biotechnological processes, offering a more sustainable and safer approach to recombinant protein production.

Cryonics

Context

- Australian Cryonics firm freezes first client in hopes of bringing him back to life in future.

Details

- **Cryonics** is the **practice of preserving individuals at extremely low temperatures with the hope that future medical advancements can restore them to life and health.**
- It involves cooling legally dead bodies to liquid nitrogen temperatures to halt physical decay.

Key Concepts and Principles

- **Legal Death:** Cryonics can only be initiated after a person is declared legally dead, meaning their heart has stopped beating and there is no neurological activity.
- **Cryopreservation Process:**
  - **Stabilization:** Begins immediately after legal death to maintain tissue viability.
  - **Cooling:** The body is gradually cooled to just above freezing to prevent ice formation.
  - **Cryoprotectant Perfusion:** Blood is replaced with cryoprotectants to prevent ice crystal formation.
  - **Vitrification:** The body is cooled to -196°C in liquid nitrogen, turning biological tissues into a glass-like state without forming ice crystals.

Technical Aspects of Cryonics

- **Cryoprotectants:** Chemicals like glycerol and ethylene glycol used to protect biological tissues from ice damage during cooling.
- **Vitrification:** A process that cools the body so quickly that ice crystals do not form, avoiding cell and tissue damage.
- **Cooling Rates:** Controlled cooling rates are crucial to avoid thermal stress and damage.
- **Storage:** Long-term storage in liquid nitrogen at -196°C in specially designed cryostats.

Ethical Considerations

- **Consent:** Individuals must provide informed consent prior to death for cryonic preservation.
- **Ethical Debates:** Concerns about identity and continuity, the potential for future resuscitation, and resource allocation.

Craters on Mars

Context

- The Physical Research Laboratory (PRL) in Ahmedabad has made a significant discovery by identifying three new craters on the surface of Mars, located in the Tharsis volcanic region.
- This region is known for its volcanic activity and is a prominent feature on the Martian landscape.

Details

- A computer-generated view of Mars depicting the boundary between darkness and daylight (known as the terminator) helps to visualize the location and context of these newly discovered craters.

Details of the Craters

- **Lal Crater**
  - **Named After**: Devendra Lal, a notable Indian geophysicist and former Director of PRL.
  - **Dimensions**: 65 km in diameter.
  - **Coordinates**: Centered at -20.98° latitude and 209.34° longitude.
  - **Scientific Significance**: The Lal crater is particularly notable because its entire area is covered with lava. Additionally, geophysical evidence suggests the presence of a 45-meter thick sedimentary deposit beneath the surface, indicating that water once transported significant amounts of sediment into this crater. This discovery supports the theory that Mars was once a wet planet with flowing water.
- **Mursan Crater**
  - **Named After**: The town of Mursan in Uttar Pradesh, India.
  - **Dimensions**: 10 km in diameter.
  - **Location**: Superimposed on the eastern rim of the Lal crater.
  - **Geological Context**: The relationship of the Mursan crater with the Lal crater helps scientists understand the sequence of impacts and geological processes in the region.
- **Hilsa Crater**
  - **Named After**: The town of Hilsa in Bihar, India.
  - **Dimensions**: 10 km in diameter.
  - **Location**: Superimposed on the western rim of the Lal crater.
  - **Geological Context**: Similar to the Mursan crater, its position provides insights into the impact history and the geological evolution of the Tharsis region.

HIV Vaccine

Context

- Recent studies from the Scripps Research Institute and MIT present two nanoparticle-based vaccine candidates, N332-GT5 and eOD-GT8, aimed at eliciting broadly neutralizing antibodies (bNAbs) against HIV.

Details

Historical Context

- Over four decades since the first reported cases of AIDS, the scientific community continues its relentless pursuit of an effective HIV vaccine.
- In 1981, Dr. Michael Gottlieb's seminal paper reported the first cases of acquired immunodeficiency syndrome (AIDS), marking the beginning of a global health crisis.
- Unlike many infectious diseases that humanity has managed to control through vaccination, HIV has remained a formidable challenge.

Challenges in HIV Vaccine Development

- **High Mutation Rate**:
  - HIV's replication process is highly error-prone, leading to numerous variants within a single patient.
  - This genetic variability complicates the development of a universally effective vaccine.
- **Immune System Evasion**:
  - HIV evolves rapidly, outpacing the immune system's ability to produce effective antibodies.
  - The virus's ability to mutate faster than the immune system can respond makes traditional vaccination strategies ineffective.

Immune Response Mechanisms

- **Role of B-cells**:
  - B-cells produce antibodies that target specific viral proteins.
  - When a B-cell encounters a matching protein fragment, it refines its antibodies to bind more effectively to the virus, neutralizing it.
- **Broadly Neutralizing Antibodies (bNAbs)**:

- A small subset of HIV-infected individuals naturally produce bNAbs that target conserved regions of the virus.
- These antibodies can neutralize a wide range of HIV strains but typically take years to develop.

National Health Exchange

Context

- The National Health Claim Exchange (NHCX) is a new digital platform launched by the Health Ministry in collaboration with the Insurance Regulatory and Development Authority of India (IRDAI).

Details

How NHCX Works

The NHCX will function as a centralized gateway for the exchange of claims-related information among various stakeholders in the healthcare ecosystem. Its key features include:

- **Seamless Interoperability**: Facilitates the efficient processing of health claims, enhancing transparency and efficiency.
- **Centralized Hub**: Acts as a unified portal for all health claims, reducing administrative burdens on hospitals which currently deal with multiple portals for different insurers.
- **Streamlined Processes**: Encourages the digitization of health transactions, providing financial incentives under the Digital Health Incentive Scheme (DHIS).

Adoption and Incentives

- The National Health Authority has announced financial incentives to encourage the adoption of digital health transactions.
- From January 2023, hospitals receive ₹500 per claim or 10% of the claim amount, whichever is lower, for transactions conducted through the NHCX.
- This is expected to promote widespread use of the platform and digitization of patient health records.

Child Nutrition Report 2024

Context

- A recent UNICEF report has revealed alarming statistics about severe food poverty among children under age 5 worldwide.

Details

- The report indicates that 27% of young children, or approximately 181 million, are experiencing severe food poverty, defined by consuming no more than two of the eight recognized food groups per day.
- This condition puts these children at high risk of life-threatening malnutrition, including wasting, the most severe form.

Key Findings

- **Global Distribution**:
  - **South Asia and Sub-Saharan Africa**: Over two-thirds of children in severe food poverty reside in these regions.
  - **High-Impact Countries**: 20 countries account for 65% of these children.
- **Statistics**:
  - **Wasting and Mortality**: Severely malnourished children are 12 times more likely to die than their well-nourished peers.
  - **Gaza**: Severe food poverty is notably high due to ongoing conflict, with 90% of children living in such conditions between December 2023 and April 2024.
- **Progress and Efforts**:
  - **West and Central Africa**: Severe food poverty has decreased from 42% in 2012 to 32% in 2022 due to government investments in child nutrition and feeding counseling.
  - **Middle- and Upper-Income Households**: Surprisingly, nearly half (97 million) of the affected children live in relatively affluent households.

Recommendations

UNICEF urges a comprehensive and coordinated response involving:

- **Governments**: Increased investments in child nutrition programs and policies.

- **Humanitarian Organizations**: Enhanced support and intervention in regions most affected by severe food poverty.
- **Food Industry**: Collaboration to ensure affordable and accessible nutritious food.
- **Media**: Raising awareness about the severity of child food poverty and promoting actionable solutions.

Skin Bank

Context

- The Indian Army has recently established a skin bank facility to aid in the treatment of severe burn injuries and other skin-related conditions.
- This facility, a first-of-its-kind within the Armed Forces Medical Services, will serve military personnel and their families, providing a critical resource for skin grafting procedures.

Details

What is a Skin Bank?

- A skin bank is a facility where donated skin from deceased individuals is collected, processed, and stored for future use in medical treatments, primarily for burn victims.
- The skin can be preserved for up to 5 years under controlled conditions.

Key Features of the Indian Army's Skin Bank

- **Centralised Hub**: The facility acts as a centralised hub for the collection, processing, storage, and distribution of skin grafts.
- **Specialised Staff**: Staffed with trained medical professionals, including plastic surgeons, tissue engineers, and specialised technicians.
- **Storage Conditions**: Skin is preserved in an 85% glycerol solution at temperatures between 4-5 degrees Celsius.

Skin Donation Process

- **Eligibility**: Any individual over the age of 18, except those with conditions like AIDS, Hepatitis B & C, STDs, skin cancer, active skin diseases, and septicemia, can donate skin.
- **Collection**: Skin must be donated within 6 hours of death.
- **Processing**: The donated skin is tested for infections (HIV, viral markers, Hepatitis), processed, and preserved.
- **Storage**: Processed skin can be stored for up to 5 years.

Importance of Skin Grafting

- Skin grafting is a surgical procedure where a piece of healthy skin is transplanted to an area where the skin is damaged or missing.
- This procedure significantly improves survival rates and healing times for burn victims and can reduce hospital stays and treatment costs.

Types of Skin Grafts

Autografts

- **Description**: Skin taken from the patient's own body.
- **Advantages**: Reduced risk of rejection and infection.
- **Disadvantages**: Requires a donor site, which creates another wound.

Allografts

- **Description**: Skin taken from another human donor, usually a cadaver.
- **Advantages**: No need for an additional wound on the patient.
- **Disadvantages**: Higher risk of rejection and infection, temporary solution as the body eventually rejects it.

Xenografts

- **Description**: Skin taken from a different species, usually pigs.
- **Advantages**: Readily available and no additional wound on the patient.
- **Disadvantages**: Temporary solution, higher risk of infection and rejection.

Synthetic Grafts

- **Description**: Man-made materials used to cover the wound.
- **Advantages**: No risk of disease transmission, customizable to the patient's needs.
- **Disadvantages**: May not integrate as well as natural skin, potential for long-term complications.

Swom Sattelite

Context

- On a significant collaborative mission, the French-Chinese Space Variable Objects Monitor (SVOM) satellite was successfully launched by a Long March 2-C rocket from the Xichang Satellite Launch Center in southwestern China.
- This satellite aims to delve into the universe's most powerful explosions, known as gamma-ray bursts (GRBs), providing crucial data on the cosmos's history and evolution.

Details

- **Orbit**: The SVOM satellite will orbit at an altitude of 625 kilometers above Earth.

Mission Objectives

- The primary mission of the 930-kilogram SVOM satellite, equipped with instruments from both France and China, is to detect and study gamma-ray bursts.
- These bursts are incredibly bright cosmic events caused by massive star explosions or compact star mergers.
- They emit energy comparable to over a billion billion suns, carrying significant information about the cosmic environments they traverse.
- This data is vital for understanding galaxy formation and the transformation of gas clouds over time.
- **Historical Insight**: Observing gamma-ray bursts allows scientists to look back in time, as the light from these objects takes millions to billions of years to reach Earth.
- **Mystery Unraveling**: SVOM aims to uncover several mysteries associated with GRBs, including detecting the most distant and earliest bursts in the universe's history.

Scientific Collaboration

- This project marks a notable cooperation between the French and Chinese space agencies, highlighting international scientific collaboration despite limited space partnerships due to US restrictions on technology transfer.
- China and France previously launched the CFOSAT oceanographic satellite in 2018, and European nations have participated in China's Chang'e lunar exploration missions.

Gamma-Ray Bursts (GRBs)

- Gamma-ray bursts (GRBs) are the most powerful explosions observed in the universe, emitting enormous amounts of energy in the form of gamma rays.
- These brief yet intense events originate from catastrophic cosmic events, such as the collapse of massive stars or the mergers of neutron stars.
- **Discovery**: GRBs were first discovered in the late 1960s by the Vela satellites, which were initially designed to detect nuclear explosions. Instead, they detected bursts of gamma radiation from space.
- **Observation**: GRBs are detected by space-based observatories equipped with gamma-ray detectors. Notable missions include NASA's Swift and Fermi Gamma-ray Space Telescopes.

Rare Sensory Hearing Loss

Context

- Bollywood playback singer Alka Yagnik has been diagnosed with a rare form of sensory hearing loss due to a viral attack.
- She has emphasized the importance of protecting one's hearing from loud music and excessive use of headphones.

Details

- Sensorineural hearing loss (SNHL) is a type of hearing loss caused by damage to the inner ear or the nerve pathways that transmit sound from the ear to the brain.

Causes

- **Congenital Factors**: Genetic factors or complications during pregnancy or childbirth.
- **Noise Exposure**: Prolonged exposure to loud noises can damage the hair cells in the inner ear, leading to noise-induced hearing loss.
- **Ageing**: Natural ageing processes can damage or destroy hair cells in the inner ear.
- **Infections and Diseases**: Conditions such as meningitis, mumps, measles, and autoimmune diseases like Meniere's disease.

- **Trauma**: Head injuries or inner ear trauma.
- **Ototoxic Medications**: Certain antibiotics and chemotherapy drugs.

Mechanism of SNHL

Inner Ear Structure

- **Cochlea**: A spiral-shaped organ within the inner ear containing tiny hairs called stereocilia.
- **Function**: Stereocilia convert vibrations from sound waves into neural signals that the auditory nerve transmits to the brain.

Damage Mechanism

- **Noise Exposure**: Sounds louder than 85 decibels can damage the stereocilia. Damage may not be apparent until 30-50% of these hairs are affected.
- **Viral Infections**: Can cause SNHL through direct cochlear invasion, immune-mediated damage, or disrupted blood supply to the inner ear.

Symptoms of SNHL

- **Difficulty Understanding Speech**: Struggling to comprehend spoken words, especially in noisy environments.
- **Muffled or Distorted Sounds**: Sounds may appear unclear or fuzzy.
- **Tinnitus**: Ringing, buzzing, or hissing sounds in the ears.
- **Difficulty Hearing High-Pitched Sounds**: Trouble perceiving higher frequencies.
- **Balance Issues**: Possible balance and coordination problems.

Treatment for SNHL

- **Medications**: To address underlying conditions contributing to SNHL.
- **Cochlear Implants**: Devices that can bypass damaged parts of the ear and directly stimulate the auditory nerve.
- **Hearing Aids**: Amplify sound to assist those with hearing loss.

Plutonium Isotope Fission

Context

- Researchers have reported groundbreaking results in the study of plutonium-240 (Pu-240) fission.
- This marks the **first attempt to measure the prompt fission neutron spectrum** (PFNS) of induced fission in Pu-240 with neutrons of energy greater than 0.85 MeV.
- The findings reveal significant deviations from model predictions, impacting reactor design, radiation shielding, and nuclear medicine.

Details

- A part of the fission energy carried away by neutrons is called the prompt fission neutron spectrum.
- 'Prompt' stands for neutrons Pu-240 might emit right after it has captured a neutron with the energy to destabilise it
- Pu-240 undergoes spontaneous fission, and emits alpha particles.
- The isotope is considered a contaminant of weapons-grade plutonium, where its composition by weight is restricted to under 7%

Experimental Setup

- **Location**: Los Alamos Neutron Science Centre (LANSCE)
- **Setup**: A tungsten disc bombarded by proton pulses produces neutrons (0.01-800 MeV).
- **Detector**: Liquid scintillators arranged around a 20-milligram, 99.875% pure Pu-240 sample detect the emitted neutrons and other fission products.
- **Neutron Energy**: 1-20 MeV
- **Data Extraction**: Careful subtraction of contributions from spontaneous fission and alpha particles to isolate PFNS data.

Findings

- **PFNS Differences**: Observed PFNS deviated notably from model predictions.
- **Second-Chance Fission**: Higher-than-expected rates of second-chance fission in Pu-240, indicating a nucleus becomes fissionable after losing a neutron.
- **Third-Chance Fission**: Signs of a smaller contribution from third-chance fission, though difficult to observe directly.

Relevance to Nuclear Technology and Research

Reactor Design and Safety

- **Plutonium Utilization**: Information crucial for reactors using MOX fuel and fast breeder reactors.

- **PFBR**: Prototype Fast Breeder Reactor at Madras Atomic Power Station, India, using plutonium from CANDU spent fuel.

Radiation Shielding

- Improved PFNS data enhances accuracy in designing radiation shielding.

Nuclear Medicine

- More precise neutron emission data aids in calculating radiation doses for medical applications.

Regulatory T Cells

Context

- Researchers at Cambridge University have uncovered a groundbreaking property of Regulatory T cells (Tregs), which could revolutionize treatments for a variety of diseases, particularly inflammatory conditions and organ transplants.

Details

Key Discovery

- **Unified Movement:** Contrary to the previous belief that Tregs exist as multiple specialized populations, the study found that these cells move uniformly throughout the body.
- **Tissue Repair:** Tregs seek out and repair damaged tissues, functioning as a 'Unified Repair Army'.

Impact on Inflammatory Diseases

- **Current Challenges:** Anti-inflammatory drugs available today target the entire body, which can lead to broad immune-suppression and unwanted side effects.
- **Targeted Therapy:** The discovery could lead to the development of drugs that specifically target areas needing repair, increasing efficacy and reducing side effects.
- **Precision Medicine:** Such targeted treatments could revolutionize the management of inflammatory diseases by focusing on localized tissue repair.

Implications for Organ Transplants

- **Current Challenges:** Organ transplant recipients must take lifelong immunosuppressants to prevent organ rejection, making them prone to infections.
- **New Therapeutic Approach:** The research suggests designing drugs that selectively suppress the immune response against the transplanted organ while allowing the rest of the immune system to function normally. This approach could enable transplant patients to lead healthier and more normal lives by minimizing the risk of infections.

Regulatory T Cells (Tregs)

- Regulatory T cells (Tregs) are a specialized subset of T cells that play a critical role in maintaining immune homeostasis, preventing autoimmune diseases, and modulating immune responses.
- Tregs primarily develop in the thymus (thymic Tregs or tTregs) and can also be induced in the periphery from conventional T cells (peripheral Tregs or pTregs).

7.13 SNIPPETS

Topics	Details
JADES-GS-z14-0	• NASA's James Webb Space Telescope (JWST) has discovered the earliest-known galaxy, JADES-GS-z14-0. • This galaxy, observed by the JWST Advanced Deep Extragalactic Survey (JADES) program, formed approximately 290 million years after the Big Bang. • The JADES team also identified another early galaxy, JADES-GS-z14-1, which formed about 303 million years after the Big Bang, with a mass of 100 million solar masses and forming about two new stars per year.
PraVaHa Software	• ISRO has developed a sophisticated Computational Fluid Dynamics (CFD)

	software named Parallel RANS Solver for Aerospace Vehicle Aero-thermo-dynamic Analysis, abbreviated as PraVaHa. • This software is pivotal for the aerodynamic and aerothermal analysis of aerospace vehicles.
Phenome India Project	• Council of Scientific and Industrial Research (CSIR) announced the successful conclusion of the first phase of its groundbreaking longitudinal health monitoring project, the 'Phenome India-CSIR Health Cohort Knowledgebase' (PI-CheCK). • To mark this significant milestone, CSIR organized a special event, 'Phenome India Unboxing 1.0', at the National Institute of Oceanography.
Enterobacter Bugandensis	• A collaborative study by scientists from the Indian Institute of Technology Madras (IIT-M) and NASA's Jet Propulsion Laboratory (JPL) has unveiled significant findings regarding a multi-drug-resistant pathogen, **Enterobacter bugandensis**, aboard the International Space Station (ISS). • **Enterobacter bugandensis** is a multi-drug-resistant bacterium known for causing hospital-acquired infections. • It belongs to the ESKAPE group of pathogens, which are notorious for their ability to evade antibiotic treatments and contribute to significant morbidity and mortality in healthcare settings.
Donanemab	• Donanemab, a new therapy for Alzheimer's disease developed by drug maker Eli Lilly, has received unanimous support from independent scientists advising the United States Food and Drug Administration (USFDA), bringing it a step closer to clinical use. • **Prevalence**: Alzheimer's is one of the most common forms of dementia, with an estimated 5.3 million people affected in India. This number is expected to rise to 14 million by 2050.
Biopharmaceutical Alliance	• On June 6, 2024, South Korea, India, the United States, Japan, and the European Union (EU) announced the formation of the Biopharmaceutical Alliance. • This coalition was created in response to the critical drug supply shortages experienced during the Covid-19 pandemic and aims to establish a resilient supply chain within the biopharmaceutical sector.
International Year Of Quantum Science And Technology	• In a landmark announcement, the United Nations has designated 2025 as the 'International Year of Quantum Science and Technology'. • This global initiative aims to raise public awareness about the significant advancements and potential applications of quantum science.
Kavli Prize	• The winners of the 2024 Kavli Prize (not to be confused with the Kavli Medal) were announced. Eight winners were awarded for their contributions to astrophysics, neuroscience, and nanoscience. • Named after Norwegian-American businessman and philanthropist Fred Kavli, the prize mirrors the Nobel Prize in its intent to honor groundbreaking scientific achievements.
Double Sun Halo	• A rare celestial phenomenon known as a "double sun halo" was recently witnessed in the skies over Leh, Ladakh. • A double sun halo is a variation of the more common 22-degree halo. It consists of two halos: • **Inner Halo**: A bright ring with a radius of approximately 22 degrees from

	the sun. • **Outer Halo**: A larger ring with a radius of around 46 degrees from the sun's center.
Streptococcal Toxic Shock Syndrome	• Streptococcal Toxic Shock Syndrome (STSS), commonly referred to as "flesh-eating bacteria," is a severe and rapidly progressing bacterial infection caused by certain strains of Group A Streptococcus (GAS). • Recently, Japan has seen a significant rise in STSS cases, highlighting the urgency of understanding its spread and prevention measures. • This bacterium typically resides in the throat and on the skin. It can cause various infections, ranging from mild conditions like strep throat to severe diseases like STSS.
'5g Intelligent Village' And 'Quantum Encryption Algorithm'	• In a significant move to promote innovation and technological advancement in the telecommunications sector, the Department of Telecommunications (DoT) has announced two major calls for proposals. • These initiatives are part of the Jai Anusandhan program aimed at fostering innovative start-ups, establishing a robust ecosystem for research and entrepreneurship, and achieving inclusive digital growth across India.
Sleeping Sickness	• In a landmark achievement, **Chad has become the first country in 2024 and the 51st globally to eliminate a neglected tropical disease (NTD) — the gambiense form of human African trypanosomiasis (HAT), also known as sleeping sickness.** • Sleeping sickness, or African Trypanosomiasis, is a parasitic disease caused by protozoa of the genus *Trypanosoma*.
***Klebsiella Pneumoniae* Bacteria**	• Researchers at Columbia University have found that K. pneumoniae bacteria, when infected by bacteriophages, use reverse transcriptase to create a specific protein named Neo. • This protein can halt bacterial cell replication, effectively stopping the infection.

7.14 ADDITIONAL TOPICS FOR READING

TOPICS	UPLOADED ON IAS GYAN WEBSITE ON
Dietary Habits And Nutritional Challenges In India	3rd June 2024
Draft Resolution To Improve Organ Transplantation Availability	3rd June 2024
Artificial Intelligence And Anti-Microbial Resistance	7th June 2024
Starship	12th June 2024
Atomic Clocks	12th June 2024
CRISPR/Cas9 Used To Alter Photosynthesis	13th June 2024
Digital Firewall	17th June 2024
Sickle Cell Anemia	20th June 2024
Rising Cholera Cases	24th June2024
Methanol and Spurious Liquor	24th June 2024
Multi-omics	27th June 2024

8. CULTURE & HISTORY

8.1 BIRSA MUNDA

Context

- 124th death anniversary of revolutionary tribal leader Birsa Munda.

Birsa Munda

Early Life and Background

- **Birth and Community:** Born on November 15, 1875, in present-day Jharkhand, **Birsa Munda hailed from the Munda tribe in the Chotanagpur region.**

Aspect	Description
Traditional Land System	The Munda tribe adhered to the "khuntkatti" system, characterized by customary land rights without landlords.
Impact of Colonial Policies	
Permanent Settlement Act (1793)	Introduced the zamindari system, displacing traditional land ownership and creating landlords (dikus) and tenant farmers (ryots).
Forced Labor and Exploitation	Tribals endured forced labor (begar system) and exploitation by moneylenders, with their clan councils replaced by colonial courts.
Famine and Starvation	The community endured severe famines in 1896-97 and 1899-1900, resulting in widespread starvation.

Birsa Munda's Transformation and LeadershipEducation and Early Influence

- **Primary Education:** Initially attending a German Mission school after briefly converting to Christianity, Birsa received primary education under Jaipal Nag.
- **Disillusionment:** British rule and missionary activities **fostered cynicism among many tribals**, including Birsa, towards foreign presence.

Rise as a Tribal Leader

- **Sardari Agitation:** Between 1886 and 1890, **Birsa was influenced by the peaceful Sardari agitation**, led by the Oraon and Munda tribes, against British rule.
- **Anti-Colonial Movement:** By 1890, **Birsa was deeply involved in anti-missionary and anti-colonial movements.**

Religious and Social Reforms

- **Formation of Birsait Sect:** Birsa founded the Birsait faith, **advocating against superstition, begging, and animal sacrifice, and promoting the worship of one God.**
- **God-like Status:** Revered as 'Bhagwan' (God) and 'Dharti ka Abba' (Father of the Earth) by his followers.

The Ulgulan Movement Launch and Activities

- **Start of Ulgulan Movement (1899):** Birsa Munda **initiated the Ulgulan (The Great Tumult) movement,** employing guerrilla warfare to resist British authority.
- **Call for Birsa Raj:** He urged tribals to reject colonial laws and rent payments, advocating for the establishment of Birsa Raj.

British Repression and Birsa's Death

- **Arrest and Death:** Birsa was arrested by British police on March 3, 1900, and later died in Ranchi Jail on June 9, 1900, at the age of 25, reportedly due to illness.

Legacy and Impact Legal and Social Reforms

- **Abolition of Begar System:** The movement contributed to the **government's abolition of the forced labor system.**
- **Tenancy Acts:** The **Tenancy Act of 1903 recognized the khuntkhatti system**, while the Chotanagpur Tenancy Act of 1908 prohibited the transfer of tribal land to non-tribals.

Continuing Influence

- **Tribute by Government:** Jharkhand's government continues to honor Birsa Munda's legacy, striving to uplift tribal and native communities in line with his ideals.
- **Janjatiya Gaurav Divas:** is a name given on 15 November 2021 by the Union Cabinet of the Government of India, in its meeting held on 10 November 2021, to remember the contribution of tribal freedom fighters, as part of the year-long celebration of the 75th anniversary of Indian independence. November 15 is the birthday of the great tribal warrior Birsa Munda.
- **PM- Jan Man Mission:**GOI, in the Budget Speech for 2023-24, announced that a Pradhan Mantri Janjati Adivasi Nyaya Maha AbhiyaN (PM-JANMAN) will be launched to enhance the socio-economic conditions of Particularly Vulnerable Tribal Groups.
- The **Birsa Munda Park** was opened in November 2009 and has since contributed immensely to the growth of the region.

Birsa Munda remains an emblem of resistance, revered among tribal communities for safeguarding their land rights and cultural heritage.

8.2 NALANDA UNIVERSITY

Context

- Prime Minister, Shri Narendra Modi visited the Ruins of Nalanda in Bihar.

Nalanda University

- The original Nalanda University is considered **amongst the first residential universities in the world.**
- The ruins of Nalanda were **declared a UNESCO World Heritage Site in 2016.**

Overview of Nalanda

- Located **near Rajagriha (modern-day Rajgir),** southeast of Pataliputra (Patna).
- Operated from **427 CE until the 13th century**.
- Played a vital role in arts and **academics during the "Golden Age of India."**

Historical Significance and Patronage

- Established **during the Gupta Empire era**. Thrived under the Pala Empire.
- Patronized by various Indian and Javanese patrons.

Academic Excellence and Curriculum

- Faculty included **scholars of Mahayana Buddhism.**
- Curriculum included **Buddhist philosophies, Vedas, grammar, medicine, etc.**
- Renowned library facilitated transmission of **Sanskrit texts to East Asia**

Early History (1200 BCE–300 CE)

- Settlement evidence from 1200 BCE.
- Mentioned in early Buddhist and Jaina texts.
- Emperor Ashoka established a vihara there.

Notable Visitors

- **Faxian (399–412 CE):** Visited India but did not mention Nalanda.
- **Xuanzang (630–643 CE):** Spent two years studying at Nalanda.
- **Yijing (673–700 CE):** Described daily life at Nalanda.

Pala Dynasty (750–1200 CE)

- Pala rulers patronized Nalanda.
- Shift towards Vajrayana Buddhism.

Destruction and Legacy

- Likely destroyed during Turko-Afghan conquest.
- Continued activity into the late 13th century.

Names of Historical Figures associated with Nalanda:

- Mahavira, Gautama Buddha, Shariputra, Aryadeva, Asanga, Atisha, Buddhaguhya, Chandrakirti, Chandragomin, Dharmakirti, Dharmapala, Dhyānabhadra, Dignaga, Kamalaśīla, Maitripada, Nagarjuna, Naropa, Śāntarakṣita, Shantideva, Shilabhadra, Śubhakarasiṃha, Subhūticandra, Vajrabodhi, Vasubandhu, Xuanzang, Yijing.
- These figures contributed significantly to the **intellectual and spiritual legacy of Nalanda, shaping Buddhist thought and practice over centuries.**

Modern Status and Recognition

- UNESCO World Heritage Site.
- Recognized as an **"Institute of National Importance" in India.**

Significance of Nalanda University

Symbol of India's Educational Heritage

- Represents India's rich educational legacy and historical significance.
- Stands as a beacon of learning that transcends borders and embraces diversity.

Epicenter of India's Educational Identity

- Historically drew students from diverse backgrounds seeking knowledge and enlightenment.
- Epitomized India's inclusive approach to education and cultural exchange.

Global Cultural and Educational Renaissance

- Reflects the heritage and cultural exchanges among Asian countries.
- Symbolizes India's renaissance in education and global influence.

Revival in a Globalized World

- Holds significance in today's borderless pursuit of knowledge.
- Aims to revive India's role as a leader in global education and intellectual exchange.

Contribution to Global Education

- Revitalization contributes to global dialogue and exchange of ideas.
- Promotes India's vision as a prominent center of education and knowledge.

Initiatives and Collaborations

- Common Archival Resources Centre and cultural exchange programs foster collaboration.
- Preserves and promotes shared heritage and traditions of India and Southeast Asia.

Regional Cooperation and Partnership

- Establishes ASEAN-India University network for mutual learning and development.
- Catalyst for regional cooperation and cultural understanding.

Commitment to Innovation and Global Cooperation

- Embraces diversity and shapes the future of education and global cooperation.
- Contributes to the vision of an Asian century characterized by progress and shared prosperity.

Nalanda University continues to inspire as a symbol of India's commitment to knowledge, innovation, and cultural exchange, contributing to global education and cooperation in the 21st century.

8.3 SHORT ARTICLES

Six-Day War

Details

- The **Six-Day War** of June 1967, a watershed moment in Middle Eastern history, saw **Israel** swiftly gain control over the **Sinai Peninsula**, **Gaza**, the **Golan Heights**, the **West Bank**, and **East Jerusalem** following

a pre-emptive strike triggered by **Egypt's** blockade of the **Straits of Tiran**. This victory solidified Israel's **geopolitical dominance**, triggering the rise of **Palestinian nationalism** and the establishment of the **PLO**. The **Yom Kippur War** in October 1973, fought primarily in the **Sinai Peninsula** and **Golan Heights**, aimed to reclaim these territories occupied since 1967, underscoring ongoing regional tensions and shaping subsequent conflicts in the **Middle East**.

Note: The **Yom Kippur War**, also known as the October War, erupted from October 6 to 25, 1973, led by **Egypt** and **Syria**. Arab states aimed to reclaim territories occupied by **Israel** since 1967, notably seeking control of the eastern bank of the **Suez Canal** for Egypt. Focused on the **Sinai Peninsula** and **Golan Heights**, the conflict underscored the region's persistent tensions and efforts to overturn Israel's post-Six-Day War territorial gains.

Satnamis

Context

- Members of the Satnami religious sect express outrage over the desecration of the Jaitkham shrine near Giraud village, a site of significant religious importance as the birthplace of Guru Ghasidas.

Who are the Satnamis?

- Predominantly a Scheduled Caste community in Chhattisgarh and parts of Madhya Pradesh.
- **Teachings:** Rooted in **Guru Ghasidas' teachings**, emphasizing the worship of a **formless Absolute and rejecting idolatry and caste hierarchies.**

Historical Context:

- **Early Origins:** Founded in **Narnaul, Haryana**, in the 17th century **under the influence of Kabir.**
- **Revolt Against Aurangzeb:** In 1672, Satnamis rebelled against Aurangzeb's tax impositions, showing resilience despite severe reprisals.
- **Revival Under Ghasidas:** Experienced resurgence in the 18th century in Chhattisgarh under Guru Ghasidas.

The Satnampanth:

- **Founding Figures:Bir Bhan, influenced by Saint Ravidas**, established the sect in Narnaul. Jagjivan Das, the second significant figure, met Emperor Akbar.
- **Establishment:** Officially founded on April 21, 1657, named after the deity Satnam.

Satnami Revolt 1672:

- **Context:** Triggered by resentment against Aurangzeb's Islamic policies.
- **Impact:** Despite limited resources, Satnamis fiercely resisted Mughal forces, symbolizing defiance against religious persecution.

Revival and Legacy:

- **First Revival:** In 1714 with the emergence of the Satnami Sadh community in Uttar Pradesh.
- **Second Revival:** Led by Jagjivan Das and later by Ghasidas, who founded the Chhattisgarh-based Satnami sect in the 1780s.

Contemporary Influence:

- **Religious Doctrine:** Ghasidas' teachings, preserved in the Nirvan Gyan scripture, shape Satnami beliefs.
- **Modern Dynamics:** Emphasizes monotheistic worship, dietary restrictions, and social equality. Satnamis wield significant political influence, especially in Chhattisgarh.

Guru Ghasidas: Pioneer of Satnam Dharma

- **Early Life:** Born on December 18, 1756, he became a prominent **Satnami Saint and Scholar in Chhattisgarh.**
- **Teachings:** Preached Satnam and egalitarianism, **symbolized by the Jai Stambh.**
- **Social Reformer:** Confronted caste injustices and traveled extensively to address societal challenges.

- **Legacy:** Established the Satnami community in Chhattisgarh, promoting truth and equality. His son, Guru Balakdas, continued his teachings.

8.4 SNIPPETS

Topics	Details
Sarod	• **Sarod maestro Pandit Rajeev Taranath** passed away, leaving behind a legacy deeply intertwined with the **sarod**, a revered instrument in Hindustani music. Crafted from materials like **coconut shell**, **tun wood**, **drone**, **shikri**, and **ivory**, the sarod evolved from the Afghan rubāb and gained prominence in 19th-century India. Influenced by Bharata's Natya Shastra, an ancient text dating back to around 200 BCE, it shares features with the ancient Chitra veena. Known for its distinctive **meend** (glissandi), the sarod features a resonator with a stretched goatskin membrane and a horn bridge for its strings. Traditionally strung with 17 to 25 strings of gut or silk, modern versions often use steel or bronze. Renowned players like Ustad Amjad Ali Khan and Buddhadev Das Gupta have further elevated its status in classical music.
Advent of Horse-Based Transportation	• A recent study published in the **Nature Journal** illuminates the profound impact of **horse domestication** on human history. Genomic analysis has uncovered **dual domestication events** occurring independently in **Central Asia** and the **Russian steppes**. The first event, attributed to the **Botai culture** 5,500 years ago in Central Asia, focused on using horses for **meat** and **milk**, rather than mobility. Subsequently, a second domestication took place in the western Russian steppes around 4,700 years ago, marking a pivotal shift towards **horse-based mobility** by 4,200 years ago. This transformation is underscored by evidence of **selective breeding** for docility, highlighting how these early cultures shaped the genetic and cultural trajectory of human-horse relationships.
Operation Blue Star	• The 40th anniversary of **Operation Blue Star** recalls a pivotal chapter in Indian history, executed by the **Indian Armed Forces** from June 1 to 10, 1984. Against the backdrop of the **Khalistan movement** stemming from Sikh discontent post-Partition, Punjab's division and administrative grievances fueled aspirations for a separate Sikh state. Amidst escalating tensions, **Jarnail Singh Bhindranwale** emerged as a prominent advocate, his radical stance escalating violence and resistance. The military intervention aimed at removing him from the **Golden Temple complex** initially sought dialogue but escalated to the use of heavy weaponry, resulting in significant civilian casualties and controversy. The aftermath, including the assassination of Prime Minister Indira Gandhi and anti-Sikh riots, underscored the challenges of addressing cultural and religious grievances through military means, emphasizing the imperative of cultural sensitivity in handling such complex situations.
Mohineshwar Shivalaya	• The Maharani Temple in Gulmarg, succumbed to flames overnight, leaving behind only ashes. • Originally known as **Mohineshwar Shivalaya or Rani Temple** it was built **in 1915 by Mohini Bai Sisodhia**, **wife of the last ruler of Jammu and Kashmir, Maharaja Hari Singh**. Mohini Bai Sisodhia, daughter of Maharaja Mohandev of Dharampur,

	built it as a place **of worship for Lord Shiva, serving as a spiritual retreat for her during her time in Gulmarg.**
Juneteenth	• Juneteenth, on June 19th, **celebrates the abolition of slavery in the US.**Lincoln's Emancipation Proclamation in 1863 started it, and Granger's General Order No. 3 in 1865 ended it in Texas, making Juneteenth a symbol of freedom.
Ghodbunder Fort	• Conservation efforts at Ghodbunder Fort, Thane, Maharashtra, have revealed a hidden chamber-like structure beneath its inner layers. **Built by the Portuguese in the early 16th century**, the fort served as a strategic trading post named for its horse-trading origins. **Captured by the Marathas in 1737**, it later became a British administrative center. The ongoing renovation, managed by the **Archaeological Survey of India since 2014**, aims to restore its historical significance.
Mudgal Fort	• Nestled in **Karnataka's Raichur district**, Mudgal Fort has garnered attention for its rich historical legacy. Over a millennium old, it has witnessed the **rule of dynasties like the Chalukyas, Rashtrakutas, and Vijayanagara Empire.** During the Bahmani Sultanate's era, it served as a strategic bastion, **witnessing clashes between the Vijayanagara Empire and the Adil Shahi Sultanate. Today**, efforts to preserve its architectural marvels and artifacts aim to promote heritage tourism and celebrate its cultural resilience in the region's tumultuous past.
Dodol	• Recently, the Goa government applied for a **Geographical Indication (GI) tag for Dodol**, **a classic Goan sweet.** Made with rice flour, coconut milk, and black palm jaggery, Dodol has a firm, jelly-like texture and deep brown color. It holds cultural significance, traditionally prepared during Christmas by Goan Christian households. Believed to have **arrived during Portuguese rule in the 17th century**, Dodol is also popular in Southeast Asia. A GI tag would protect its authenticity, promote cultural heritage, and potentially boost local and international markets, safeguarding its legacy for future generations.
Kozhikode: UNESCO's First 'City of Literature' in India	• UNESCO officially declared **Kozhikode in Kerala as India's first 'City of Literature'**. This recognition highlights Kozhikode's rich literary heritage and vibrant cultural landscape. The city has made diverse contributions to **literature, cinema, music, and media.** Notable writers, including **Jnanpith awardees**, underscore Kozhikode's literary prowess. Writer M.T. Vasudevan Nair received the Kozhikode Corporation's diamond jubilee award for his literary contributions. The **Anakkulam Cultural Centre was designated as the 'City of Literature center'**, solidifying Kozhikode's status as a literary hub.
Srinagar's Bid for World Craft City Status	• The **World Crafts Council International (WCCI) i**s considering Srinagar for nomination as **India's World Craft City (WCC) this year**. A WCCI inspection team is currently evaluating craft clusters and artisan practices in Srinagar, focusing on preserving crafts like **Pashmina shawls and papier mâché.** Anticipated benefits include **new market opportunities and global visibility.** • The World Crafts Council AISBL (WCC-AISBL), **established in 1964**, is a non-profit, non-governmental organization **registered in Belgium**. It aims to promote crafts persons worldwide by fostering economic development through craft-related activities, organizing workshops, conferences, and exhibitions, and providing support and advice. **Affiliated with UNESCO**, the WCC is organized into five regions: Africa, Asia Pacific, Europe, Latin America, and North America. **Founded by Kamaladevi Chattopadhay and Aileen Osborn Webb**, the WCC **convenes every four years,** with regional meetings held annually.

Renaming of Jyotirmath and Kosiyakutoli	• The Uttarakhand government's proposal to rename Joshimath tehsil to Jyotirmath and Kosiyakutoli tehsil to Pargana Shri Kainchi Dham tehsil has been approved by the Centre. This aims to enhance the cultural and religious significance of these areas, boosting religious tourism in Uttarakhand. Jyotirmath, **established by Adi Shankaracharya**, symbolizes spiritual knowledge and **Advaita Vedanta philosophy**. Kosiyakutoli's transformation to Pargana Shri Kainchi Dham **aligns it with Neem Karoli Baba's Kainchi Dham Ashram,** honoring his spiritual legacy and **promoting regional recognition and tourism**. Neem Karoli Baba's teachings, which influenced notable figures like Steve Jobs and Ram Dass, have garnered global interest in the ashram and its cultural significance.
Smritivan Earthquake Memorial and Museum: Honored in Prix Versailles Museums 2024	• Smritivan Earthquake Memorial and Museum's recent **inclusion in the prestigious Prix Versailles Museums 2024** marks a significant accolade in architectural excellence and commemoration. **World Selection for the Prix Versailles Museums 2024, - an architectural competition by UNESCO** recognizes outstanding design in commercial establishments worldwide. **Conceptualized in 2004 by the Gujarat State Disaster Management Authority and inaugurated in 2022, Smritivan** spans 470 acres, featuring 13,000 memorial trees, scenic pathways, and a 1 MW solar plant. Its 11,500 sq. meter museum intricately covers geological history, disaster risks, and the resilience of communities, offering visitors a 5D simulator and a reflective memorial space. Smritivan stands not only as a **tribute to the 2001 Gujarat earthquake victims** but also as a **testament to architectural innovation and the enduring spirit of remembrance and preparedness.**

9. GEOGRAPHY AND DISASTER MANAGEMENT

9.1 NOTIFIED DISASTERS

Context

- The inclusion of heatwaves as a notified disaster under the Disaster Management Act (DM Act) in India has been a subject of ongoing debate and discussion.

Details

- **Heatwaves are prolonged periods of excessively hot weather, often accompanied by high humidity**. They pose significant risks to health, infrastructure, the economy, and the environment. The **debate around their inclusion, as notified disasters under the Disaster Management Act (DM Act) of 2005, reflects the evolving understanding of their impacts and the changing climate.**

Notified Disasters under the DM Act

- The **DM Act currently recognizes 12 categories of disasters**: cyclone, drought, earthquake, fire, flood, tsunami, hailstorm, landslide, avalanche, cloudburst, pest attack, and frost and cold waves.
- **Financial assistance for these disasters is provided through the SDRF and the National Disaster Response Fund (NDRF),** enabling states to address immediate relief needs and access additional support for severe disasters.

Reasons for Including Heatwaves as Notified Disasters under the Disaster Management Act

Increased Frequency and Severity

- **Climate Change Impact:** Climate change has led to more frequent and severe heatwaves, which now occur with greater intensity and duration.
- **Trend Analysis:** Historical data shows a clear trend of increasing temperatures and more extreme heat events across India.

Public Health Crisis

- **High Mortality and Morbidity:** Heatwaves cause a significant number of deaths and illnesses, particularly affecting vulnerable populations such as the elderly, children, and those with pre-existing health conditions.
- **Heat-Related Illnesses:** Conditions such as heatstroke, dehydration, and exacerbation of cardiovascular and respiratory diseases are directly linked to extreme heat.

Economic Impact

- **Productivity Loss:** High temperatures reduce worker productivity, particularly in outdoor occupations like agriculture and construction, leading to economic losses.
- **Healthcare Costs:** The burden on healthcare systems increases due to the treatment of heat-related illnesses.

Environmental and Infrastructure Damage

- **Urban Heat Islands:** Cities experience higher temperatures due to concrete surfaces and limited vegetation, exacerbating the effects of heat waves.
- **Infrastructure Strain:** Prolonged heatwaves can lead to power outages, water shortages, and damage to infrastructure such as roads and buildings.

Enhanced Preparedness and Response

- **Systematic Planning**: Official recognition would lead to the development of comprehensive heat action plans, ensuring better preparedness and coordinated response efforts.
- **Resource Allocation**: States and local governments would have access to dedicated funds for implementing mitigation and adaptation measures.

Financial Support and Compensation

- **Relief Funds**: Inclusion would allow access to national and state disaster response funds (NDRF and SDRF), providing financial assistance for relief and rehabilitation.
- **Compensation for Losses**: Affected individuals and families would receive compensation for heatwave-related deaths and damages, helping to alleviate financial burdens.

Policy and Governance

- **Clear Guidelines**: Recognizing heat waves as disasters would establish clear guidelines and protocols for action, improving governance and accountability.
- **Inter-Governmental Coordination**: It would facilitate better coordination between central, state, and local authorities in managing heatwave impacts.

International Precedents

- **Global Practices**: Several countries already recognize heatwaves as significant disasters and have implemented successful management strategies, providing models for India to follow.

Public Awareness and Education

- **Increased Awareness**: Official recognition would lead to greater public awareness about the dangers of heatwaves and the importance of preventive measures.
- **Community Engagement**: Enhanced efforts to educate communities about heatwave risks and protective actions could save lives.

Concern and Challenges

- **Historical Context:** When the DM Act was enacted in 2005, heatwaves were seen as regular seasonal phenomena rather than catastrophic events. They were not considered to meet the criteria of disasters that overwhelmed community coping capacities.
- **Definition of Disaster:** The DM Act defines a disaster as an event causing substantial loss of life, property, or environmental damage, beyond the coping capacity of the community. Historically, heat waves did not meet this threshold, as their impacts were not perceived as catastrophic compared to other natural disasters.
- **Financial Implications:** Recognizing heat waves as notified disasters would impose significant financial responsibilities on the government, including compensation for heatwave-related deaths. The standard compensation of Rs 4 lakh per deceased person could become a major financial burden given the potential scale of heatwave impacts.
- **Attribution Challenges:** Unlike more clearly defined disasters,

Recent Developments

- State Actions: Some states have independently notified heatwaves as local disasters under the DM Act, utilizing up to 10% of their SDRF for heat-related impacts. States like Haryana, Uttar Pradesh, Odisha, and Kerala have adopted this approach, reflecting a growing recognition of heatwave severity.
- Finance Commission Recommendations: The 15th Finance Commission did not support including heatwaves as a national notified disaster, emphasizing the sufficiency of the current list of disasters. It recommended enhancing state flexibility to use SDRF funds for local disasters, including heatwaves.
- Public Health Concerns: The increasing frequency and severity of heatwaves due to climate change highlight the need to treat heatwaves as a significant public health challenge. Systematic response strategies and enhanced resource allocation are crucial for effective management.

heat-related deaths are often due to exacerbations of pre-existing conditions. This complicates the process of attributing deaths directly to heatwaves, making it challenging to determine eligibility for compensation.

- **Existing Response Mechanisms:** State governments currently use their funds to implement Heat Action Plans (HAPs) and manage heat wave impacts through local disaster provisions within the State Disaster Response Fund (SDRF). This has been an effective, if not ideal, response mechanism without requiring central notification.

Conclusion

- The ongoing debate over including heatwaves as notified disasters under the DM Act reflects the need to adapt disaster management policies to evolving climate realities. While there are financial and implementation challenges, the increasing public health risks and severity of heat waves necessitate a reconsideration of their status. Including heatwaves as notified disasters could facilitate better resource allocation, systematic response strategies, and financial assistance for affected regions, aligning disaster management efforts with current and future climate challenges.

9.2 SHORT ARTICLES

Stromatolites

Context

- The discovery of living stromatolites on Sheybarah Island in Saudi Arabia is a significant advancement in our understanding of Earth's ancient history and life evolution.

What are Stromatolites?

- **Stromatolites are layered structures formed by the growth of cyanobacteria (formerly known as blue-green algae) and other microorganisms**. These organisms trap and bind sedimentary grains, forming layered structures over time.
- They can take various forms including flat, domed, or columnar shapes and are characterized by alternating light and dark layers visible in cross-sections.

Stromatolites, once abundant globally, are now rare in Australia's Shark Bay and the Bahamas' Exuma Islands due to unique environmental conditions such as high salinity, low nutrient levels, and limited predator grazing pressure, which support their growth.

Significance of Stromatolites

- **Earliest Evidence of Life:** Stromatolites are one of the earliest forms of life on Earth, dating back over 3.5 billion years. They are preserved in ancient rock formations, providing direct evidence of early microbial communities and their activities.
- **Environmental Indicators:** The growth and distribution of stromatolites reflect specific environmental conditions. They grow in shallow, nutrient-poor waters where sediment accumulation and microbial growth can occur undisturbed.
- **Contribution to Atmospheric Oxygen:** Stromatolites played a pivotal

role in the Great Oxygenation Event, which occurred approximately 2.3 billion years ago. Before this event, Earth's atmosphere was largely devoid of oxygen (anoxic).

Discovery on Sheybarah Island

- **Sheybarah Island, situated in the Red Sea**, was the site of a significant discovery where living stromatolites were found dating back 3.48 billion years. This discovery challenges previous assumptions that stromatolites only thrived in modern environments like Shark Bay and the Exuma Islands.
- Finding living stromatolites on Sheybarah Island suggests that these structures are more resilient and adaptable than previously thought.

Zircon

Context

- The study published in Nature Geoscience presents significant findings about Earth's early conditions and the potential for life to emerge much earlier than previously thought.

Details

- The study analyzed ancient rocks and minerals, particularly focusing on zircon crystals from the Jack Hills in Western Australia. These crystals can be up to 4.4 billion years old.
- **Zircon crystals are key to this study because they contain oxygen isotopes that are sensitive indicators of fluid-rock interactions.** By studying these isotopes, researchers could infer how early Earth's water cycle and geological processes evolved.

Key Highlights of the Study

- **Researchers found evidence suggesting that Earth had the necessary conditions for life, specifically fresh water and dry land, as early as 4 billion years ago.** This challenges previous assumptions that Earth was predominantly covered by oceans during its early stages.
- Fossil evidence indicates that interaction between freshwater and the emerging continental crust began around 3.5 billion years ago. This interaction is crucial as it likely facilitated the conditions conducive to life's emergence.

Zircon and Its Applications

- **Zircon is a nesosilicate mineral known for its robustness and resistance to chemical alteration.** It can exhibit various colours naturally, including colourless, yellow-golden, red, brown, blue, and green.
- **Zircon is primarily used in the ceramics industry, especially in tile production.** It is a raw material for producing fused and chemically derived zirconia, which finds applications in advanced ceramics like electro-ceramics and biocompatible devices.
- In the glass sector, **zircon serves as an X-ray absorber in cathode-ray tubes** and was previously used in older types of monitors.
- Beyond traditional applications, ongoing research explores zircon's potential in biomedical implants, advanced technical ceramics such as solid oxide fuel cells, and other high-tech industries.

> The findings suggest that **Earth had environments suitable for life within only 600 million years after its formation.** This timeline is significant as it raises questions about how quickly life could have emerged given the appropriate conditions.

Cold Lava

Context

- The recent volcanic eruption at Mount Kanlaon in the Philippines has heightened awareness of the dangers associated with volcanic activity, particularly cold lava flows, also known as lahars.

About Cold Lava

Characteristics

- **Despite being termed "cold" lava, lahars can remain internally hot due to ongoing chemical reactions within the volcanic material.** Externally, they behave like wet concrete, flowing downhill and engulfing

everything in their path. Key characteristics include:

- **High density:** The mixture's heavy nature contributes to its destructive potential.
- **Abrasion:** The material carried by lahars can grind and erode surfaces, adding to their destructive capability.

Formation and Composition

- **Cold lava, or lahar, forms when volcanic materials such as ash, sand, and pebbles mix with rainwater**. This mixture creates a dense, concrete-like slurry capable of flowing rapidly downhill.
- The primary components of lahars include:
  - **Volcanic ash:** Fine particles ejected during an eruption.
  - **Sand and pebbles:** Larger volcanic fragments.
  - **Water:** From rain, snowmelt, or other sources.

Destructive Potential

- Lahars are **extremely hazardous due to their ability to move swiftly and carry a substantial amount of debris**.
- Unlike traditional lava flows, which move slowly enough for people to evacuate, **lahars can travel at speeds of hundreds of kilometres per hour.** This rapid movement is driven by the high water content, which reduces friction and allows the lahar to flow quickly over long distances.

Volume and Spread

- **As lahars travel downhill, they can pick up additional debris, increasing their volume and destructive force.** The ability to gather more sediment and rubble as they move makes them particularly dangerous. This can lead to extensive damage to:
  - **Buildings:** Lahars can destroy homes and other structures in their path.
  - **Infrastructure:** Roads, bridges, and other critical infrastructure can be severely damaged or completely obliterated.
  - **Human life:** The speed and force of lahars pose a significant threat to people living in nearby communities.

Origin Without Eruption

- Lahars are **generally associated with volcanic eruptions, but they can also occur without**.
- Heavy rainfall or snowmelt can destabilize loose volcanic sediments, especially in areas lacking vegetation. This process can result in the formation of lahars, making them a hazard even in the absence of an active eruption.

Destructiveness

- Cold lava, or lahars, are considered more destructive and deadlier compared to regular lava flows due to several factors:
  - **Speed:** Lahars can travel much faster than traditional lava flows.
  - **Density:** The heavy, debris-laden slurry can cause more damage upon impact.
  - **Volume:** As lahars move, they gather more material, increasing their volume and destructive power.
  - **Unpredictability:** Lahars can occur suddenly, often triggered by weather events, making them less predictable and more difficult to prepare for.

Mongla Port

Context

- India's consideration of operating Mongla Port in Bangladesh and constructing a new terminal to counterbalance China's strategic presence in the region highlights the geopolitical and economic significance of this initiative.

Key Highlights

Strategic Location and Connectivity

- **Crucial Gateway for Maritime Trade**: The Port of Mongla serves as an essential maritime hub for Bangladesh, strategically located at the confluence of the Pasur and Mongla Rivers, near the Sundarbans mangrove forest. This positioning enhances its importance for regional trade and commerce.
- **Proximity to India's Northeastern States**: For India, Mongla Port provides a significant route for accessing its geographically isolated northeastern states like Assam, Tripura, and Meghalaya. Utilizing Mongla Port can reduce

transportation costs and distances for goods destined for these regions.

Economic and Trade Cooperation

- **India Ports Global Limited (IPGL)**: India's interest in operating Mongla Port through IPGL reflects the deepening economic ties between India and Bangladesh. This move highlights the potential for enhanced trade cooperation and infrastructure development, benefiting both nations.
- **Memorandum of Understanding (MoU) 2015**: The MoU signed between India and Bangladesh in 2015 for the use of Chattogram and Mongla ports signifies a commitment to improving connectivity and facilitating trade. This agreement aims to streamline the transit of goods from Mongla Port to India's northeastern states using multiple transportation modes, including waterways, roads, and railways.

Counterbalancing China's Presence

- **Geopolitical Considerations**: India's move to operate Mongla Port and develop a new terminal is strategically significant in counterbalancing China's growing influence in the region. China's involvement in regional infrastructure projects, including ports and railways, has raised concerns about its strategic intentions.
- **Strengthening Regional Influence**: By enhancing its presence and operational capabilities at Mongla Port, India aims to strengthen its influence in the Bay of Bengal region and ensure secure and efficient trade routes for its northeastern states.

Economic Benefits and Infrastructure Development

- **Enhanced Trade Routes**: Operating Mongla Port can lead to the development of more efficient trade routes, reducing logistical challenges and fostering economic growth in India's northeastern states. Improved connectivity can boost trade volumes and economic integration between India and Bangladesh.
- **Infrastructure Investments**: Constructing a new terminal at Mongla Port represents a significant infrastructure investment. This development can modernize port facilities, increase cargo handling capacities, and support regional economic development.

Regional Cooperation and Stability

- **Bilateral Relations**: Strengthening port operations and connectivity with Bangladesh reinforces the cooperative relationship between the two countries. Enhanced economic ties can contribute to regional stability and prosperity.
- **Shared Economic Growth**: Collaborative infrastructure projects can drive shared economic growth, benefiting both India and Bangladesh. This cooperation can create a more interconnected and economically vibrant South Asia.

Conclusion

- India's initiative to operate Mongla Port in Bangladesh and develop a new terminal reflects a strategic effort to enhance regional connectivity, economic cooperation, and counterbalance China's presence in the region. This move highlights the importance of Mongla Port in facilitating trade and economic integration between India and Bangladesh, while also serving broader geopolitical interests in South Asia.

Abyssal Plains

Context

- A recent deep-sea expedition has revealed insights into the diverse marine life of the Clarion Clipperton Zone, located between

Mexico and Hawaii at depths of 3,500 to 5,500 meters.

Key Discoveries

- **Transparent-Bodied Sea Cucumbers ('Unicumbers')**: These sea cucumbers have adapted to the nutrient-poor environment by developing a transparent body, allowing them to blend into their surroundings.
- **Pink Sea Pigs**: These slow-moving sea cucumbers have adapted to gather food using remodelled feet.
- **Cup-Shaped Glass Sponges**: Known for their long lifespan, some of these sponges can live up to 15,000 years.

Abyssal Plains

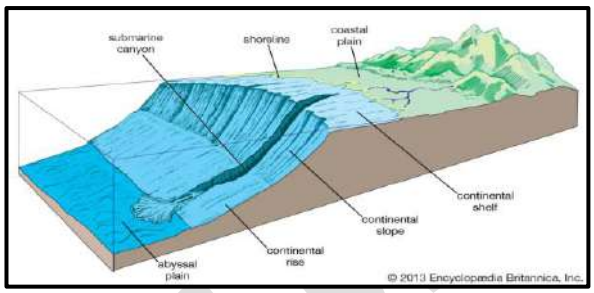
- Abyssal plains are extensive, flat regions on the deep ocean floor, situated between 3,000 and 6,000 meters below the surface. These plains lie between the foot of a continental rise and a mid-ocean ridge.

Formation and Composition

- **Plate Tectonics and Seafloor Spreading**: Abyssal plains are formed through the process of plate tectonics and seafloor spreading. Magma rises from the asthenosphere to create new oceanic crust at mid-ocean ridges.
- **Sedimentation**: As the new crust spreads, it becomes covered with fine-grained sediments, primarily clay and silt, deposited by turbidity currents that transport material from continental margins into deeper waters.

Characteristics

- **Metallic Nodules**: Abyssal plains are rich in metallic nodules containing manganese, iron, nickel, cobalt, and copper, along with elements like carbon, nitrogen, phosphorus, and silicon.
- **Extreme Conditions**: These regions are marked by darkness, high water pressure (up to 750 times atmospheric pressure), and low temperatures, making them inhospitable for many organisms.
- **Biodiversity**: Despite harsh conditions, abyssal plains are believed to harbour significant biodiversity, playing crucial roles in



ocean carbon cycling, the dissolution of calcium carbonate, and influencing atmospheric CO2 concentrations.

Ecological and Geological Importance

- **Carbon Cycling**: Abyssal plains contribute to the global carbon cycle by acting as major reservoirs of carbon, influencing the long-term sequestration of atmospheric CO2.
- **Calcium Carbonate Dissolution**: These regions are important for the dissolution of calcium carbonate, essential for maintaining the ocean's chemical balance.

Challenges and Exploration

- **Exploration Difficulties**: Abyssal plains were not recognized as distinct features until the late 1940s and their exploration was challenging due to extreme conditions such as darkness, high pressure, and oxygen scarcity.
- **Preservation and Study**: They are poorly preserved in the sedimentary record because they are often consumed by the subduction process over time. Systematic studies of these regions have been limited but are essential for understanding deep-sea ecosystems and geological processes.

Termite Mounds in Namaqualand

Context

- Discovery of the World's Oldest Termite Mounds in Namaqualand

Details

- The **termite mounds, known locally as "heuweltjies," are situated along the Buffels River in Namaqualand, South Africa.**

- Radiocarbon dating has revealed that these mounds range from 13,000 to 34,000 years old, making them the oldest inhabited termite mounds known globally.
- These mounds are actively maintained by the **southern harvester termite, Microhodotermes viator.**

Scientific Significance

- **Climate Records:** The mounds serve as a unique archive of past environmental conditions, particularly climate variations. Their formation period experienced significantly more rainfall than the present, indicating substantial climatic shifts over millennia.
- **Carbon Sequestration:**
  - **Organic Carbon:** Termites inject younger organic material deep into their nests, enhancing soil carbon storage.
  - **Inorganic Carbon:** Calcite and gypsum dissolve during high rainfall periods, contributing to long-term carbon storage through mineral weathering processes.
- **Environmental Impact:** Understanding these natural processes is crucial for developing strategies to mitigate climate change.

Namaqualand

- **Namaqualand is an arid region spanning parts of Namibia and South Africa**. It is known for its unique ecological and cultural characteristics.
- **Geographic Division:**
  - **Little Namaqualand:** Located in South Africa.
  - **Great Namaqualand:** Located in the Karas Region of Namibia, sparsely populated by the Namaqua, a Khoikhoi people traditionally inhabiting the area.
- **Goegap Nature Reserve:** Renowned for its proximity to the Atlantic Ocean, wildflowers, mineral wealth, and cultural history.
- **Namaqua National Park:** A biodiversity hotspot with the highest concentration of succulent plants.

Succulent Plants

- Succulents are plants with **thick, fleshy tissues that store water.**
- They are **native to deserts or semiarid regions** and are found in over 60 plant families, with Aizoaceae, Cactaceae, and Crassulaceae being dominant.
- **Many succulent plants have closed stomata during the day and open at night,** minimizing water loss during hot, dry days and allowing carbon dioxide uptake in the dark.
- **Venus's-flytrap, a well-known meat-eating plant**, is one of the best-known examples of a succulent plant.

Deep Sea Mission

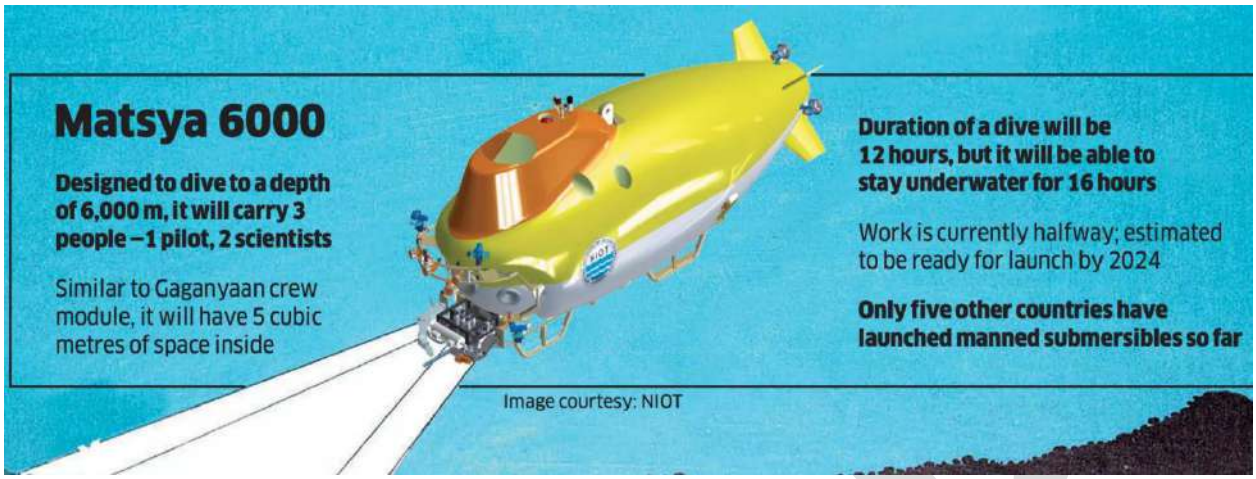
Context

- India is set to become the 6th country globally to have its own Deep Sea Mission.

Deep Sea Mission

- India's Deep Sea Mission, officially known as the Deep Ocean Mission (DOM), is an initiative **launched by the Ministry of Earth Sciences (MoES)** to explore and harness the largely untapped potential of the ocean depths.

- The National Institute of Ocean Technology (NIOT) created the **Matsyayaan 6000, a vessel capable of reaching depths of 6,000 meters as part of this mission.**



Objectives of the Deep Ocean Mission

- **Marine Biodiversity Study:** The mission aims to conduct comprehensive surveys to document and understand the diversity of marine species at various depths.
- **Flora and Fauna Exploration:** Deep-sea ecosystems, including habitats like hydrothermal vents, cold seeps, and abyssal plains, will be studied to identify new species and understand their ecological roles and adaptations.
- **Mineral Exploration:** Utilizing advanced deep-sea exploration technologies, the mission seeks to survey mineral-rich areas for potential extraction of resources like rare earth metals and polymetallic nodules.
- **Ocean Sciences Development:** Advanced understanding of oceanographic processes such as deep-sea currents, circulation patterns, and nutrient cycles.

Collaboration with Indian Space Research Organisation (ISRO)

- ISRO's expertise in remote sensing instruments, cameras, and payloads can enhance Deep Ocean imaging systems and sensors like Matsyayaan 6000.
- The advanced communication system developed by ISRO for space missions can improve communication reliability between deep-sea vessels and control centres, enabling real-time data transmission.
- ISRO's satellite navigation systems can enhance underwater navigation accuracy in deep environments where conventional GPS signals may be unreliable.
- The ability of ISRO to collect and process large amounts of data from space missions can be applied to deep ocean exploration, including environmental parameters and biological samples.
- Collaboration with ISRO allows for the transfer of knowledge on mission planning, operational procedures, and safety protocols, equipping offshore mission teams to handle complex tasks in extreme environments.
- ISRO scientists and engineers provide valuable insights into research methods for academic purposes, benefiting marine biologists, oceanographers, and geoscientists involved in ocean missions and enhancing scientific production and discoveries in academic programs.

Economic Impact

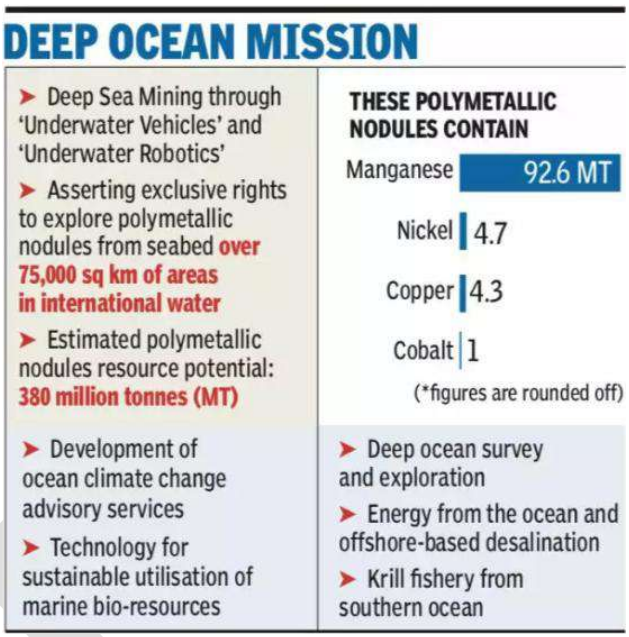
- **Commercial Exploitation:** Identification and extraction of valuable minerals and energy resources from the deep sea, contributing to economic growth. Reduces India's dependency on imported minerals and

boosts the country's blue economy sector, creating employment opportunities in marine engineering, robotics, and related industries.

- **Resource Management:** Development of sustainable mining practices and efficient resource utilization strategies. Balances economic benefits with environmental conservation to ensure the long-term viability of ocean resources.

Environmental Impact and Conservation

- **Preservation of Marine Biodiversity:** Implementation of conservation measures and marine protected areas to safeguard fragile deep-sea ecosystems. Scientifically informed approaches to mitigate environmental impacts of mining and other human activities.
- **Climate and Environmental Research:** Study of deep-sea environments to understand their role in climate change and explore carbon sequestration methods. Contributes to global efforts in climate science and environmental conservation.



Strategic Significance:

- **Technological Advancement:** Enhances India's technological capabilities in deep-sea exploration and marine sciences, reducing reliance on foreign technologies. Strengthens national security and scientific leadership in oceanographic research.
- **International Collaboration:** Collaborations with international partners for scientific research, data sharing, and policy development. Contributes to global governance frameworks for sustainable ocean resource management and conservation.

Conclusion

- India's Deep Ocean Mission is a multidimensional initiative aimed at unlocking the potential of the deep sea while ensuring sustainable development and environmental stewardship. Through cutting-edge technologies, scientific research, and international collaborations, the mission seeks to achieve significant advancements in marine sciences, economic growth, and environmental protection.

9.3 SNIPPETS

Topics	Details
Bayesian Convolutional Neural Network	• The Indian National Centre for Ocean Information Services (INCOIS) has developed a **forecasting tool called the Bayesian Convolutional Neural Network (BCNN) to predict El Niño and La Niña conditions up to 15 months in advance.** • It utilizes advanced technologies like Artificial Intelligence (AI), deep learning, and machine learning (ML) to enhance the accuracy and lead time of El Niño Southern Oscillation (ENSO) forecasts.
Hindu Kush-Himalaya	• The Indian Oceanographic and Meteorological Organization (ICIMOD) has reported that the **Hindu Kush Himalaya (HKH) have experienced below-average snow presence**. • The Hindu Kush is a vast mountain range spanning about 800 kilometres in Central and South Asia, west of the Himalayas.

	• It **starts in central and eastern Afghanistan, extending across – Bangladesh, Bhutan, China, India, Nepal, Myanmar and Pakistan.** • The **range merges with the Pamir Mountains** near the borders of China, Pakistan, and Afghanistan. • The **highest peak in the Hindu Kush is Tirich Mir**, in Pakistan.
Planet Nine	• Scientists are exploring the possibility of **Planet Nine, also known as Planet X, a hypothetical planet beyond Neptune and the Kuiper Belt in the outer solar system.** • Planet Nine is estimated to be about 5-10 times the mass of Earth and is located far beyond Pluto. • Its orbit is likely highly elliptical, taking thousands of years to complete. • Challenges in finding Planet Nine include its distance and dimness, sky surveys using telescopes like Pan-STARRS, and observational bias.
Summer Solstice	• The **summer solstice falls around June 21st in the Northern Hemisphere**, is an important astronomical event that signifies the longest day and shortest night of the year. • **It occurs when the Earth's axial tilt is most inclined towards the Sun, directly above the Tropic of Cancer** at approximately 23.5 degrees north latitude. • This results in the **Northern Hemisphere receiving the most sunlight during the year, while the Southern Hemisphere experiences its winter solstice with the shortest day and longest night.**
Garnet	• Garnet is a common mineral found in various colours, with **deep red being the most common.** • They **commonly form in metamorphic rocks** like schist, amphibolite, and eclogite, and in some igneous rocks like granites and peridotites. • It is **rare in beach sands** due to vulnerability to ocean waves and currents. • **Australia is a top garnet producer,** valued for its hardness and abrasive properties. • Garnets are used in various industries for blasting media, manufacturing, decorative arts, wall plasters, ceramics, and polishing applications on surfaces like glass and picture tubes.
World Hydrography Day	• The **International Hydrographic Organization (IHO) celebrated World Hydrographic Day on 21st June 2024.** • The IHO was established in 1921 to facilitate intergovernmental consultations on issues related to technical standards, safe navigation and protection of the marine environment. • The 2024 theme, **"Hydrographic Information – Improving Safety, Efficiency and Sustainability in Maritime Activities"**, focuses on the evolving role of hydrographic services in light of advances such as e-navigation, autonomous navigation and reduced emissions. • **Hydrographics are the scientific study of water bodies** and adjacent coastal areas and play a key role in maritime security, environmental management and economic development.
Chenab Bridge	• The **Chenab Rail Bridge, located between Bakkal and Kauri in Jammu and Kashmir**, is part of the Udhampur-Srinagar-Baramulla Rail Link (USBRL) project. • It is the **world's highest rail bridge**, standing 359 meters above the Chenab River, it is **made of special steel designed for blast-proof construction.** • The **Chenab River originates from the confluence of the Chandra and Bhaga**

	rivers, it flows through Jammu and enters Punjab, Pakistan, where it joins the Indus River. • The Indus Waters Treaty of 1960 allocates the Chenab's waters to Pakistan for irrigation and India for non-consumptive uses like power generation.
Pallikaranai Marshland	• The Pallikaranai Marshland **located south of Chennai, is a crucial freshwater and partly saline wetland.** • It is the **last natural wetland in the city and one of the few in South India.** • It is **recognized under the National Wetland Conservation and Management Programme and is a Ramsar site in India.** • It is **bordered by the Buckingham Canal on its eastern edge**. • The marshland spans 250 sq. km, including 65 wetlands, and **drains into the Bay of Bengal via Okkiyam Madavu and Kovalam Creek outlets.**
MAASAI	• The Maasai are a Nilotic ethnic group primarily **residing in northern, central, and southern Kenya, as well as northern Tanzania, near the African Great Lakes region.** • **They speak the Maa language**, which belongs to the Nilotic language family and is related to Dinka, Kalenjin, and Nuer languages. • **The laibon serves as the central figure in Maasai religious life**, functioning as a shamanistic healer, diviner, and political leader. • **Cattle are the foundation of Maasai life**, providing meat, milk, and occasionally blood, which are central to their diet. • **They wear shúkà, which are sheets wrapped around the body**. The colours and patterns can vary and often have cultural significance.
Onge Tribe	• The Onge tribe, **descendants of the Negrito group, reside in Little Andaman Island**. • They **lead a semi-nomadic lifestyle**, depending on the ocean and forest for survival. • Their **religious beliefs revolve around animism** and they hold high regard for the natural elements that support their livelihood. • The **Onge people intentionally chew bark to colour their teeth red**, as pearly white teeth symbolize death to them. • The **tribe faces fertility and population growth issues, with over 40% struggling to conceive.**
River Sunkoshi	• The **headwaters are located in the Zhangzangbo Glacier in Tibet** and flow eastward through a valley between the Mahabharat Range and the Himalayas. • Its tributaries, including Tamakosi, Likhu, Dudhkosi, Arun, Tamor, and Indravati, feed into the river. • **At Tribenighat, the Tamur and Arun rivers join the Sunkoshi to form the Kosi River,** which flows through the Chatra Gorge before entering the Gangetic Plain in India. • The **Sunkoshi River contributes 44% of the Saptakoshi's water flow**, with the Arun and Tamur rivers contributing 37% and 19% respectively.
Drakensberg Nature Reserve	• **South Africa has declared the Northern Drakensberg Nature Reserve**, a 6,500-hectare area in the Drakensberg Mountains. • The reserve is part of the **Great Escarpment, formed during the breakup of Gondwana.**

	• The **Drakensberg mountain range is home to the Orange River**, a vital water resource that sustains agricultural and industrial activities in South Africa. • The **Tugela Falls, the world's second-highest waterfall,** is within the Drakensberg range. • The Drakensberg is **famous for its extensive collection of San rock art**, with thousands of paintings found in numerous caves and overhanging sites.
Pampa Lake	• A 2,500-year-old rock shelter near Pampa Lake discovered ancient paintings of a humped bull facing off against a tiger. • The **Pamba River is the longest in Kerala,** after Periyar and Bharathappuzha. • The **Sabarimala Temple, dedicated to Lord Ayyappa**, is located on the river's banks. • The **river originates at Pulachimalai hill in the Peerumedu plateau** in the Western Ghats at an altitude of 1,650 metres. • The river flows through various districts before **emptying into the Vembanad Lake**.
T Coronae Borealis	• **Blaze Star, also known as T Coronae Borealis (T CrB),** is a dim star located 3,000 light-years away from our solar system. • **It's a rare recurrent nova, occurring once every 80 years**. The nova involves a binary star system with a white dwarf and a red giant. • **The event is expected to be visible to the naked eye for about a week,** with NASA predicting it to occur between now and September 2024. • Unlike supernovae, novae do not destroy the star system but allow it to reset and repeat the cycle.

9.4 ADDITIONAL TOPICS FOR READING

TOPIC NAME	UPLOADED ON IAS GYAN WEBSITE ON:
MULLAPERIYAR DAM ISSUE	3rd June, 2024
E-FLOWS MONITORING SYSTEM	19th June, 2024
PERSISTENT ORGANIC POLLUTANTS (POPs)	19th June, 2024
DEAD ZONE	20th June, 2024
LITHIUM MINING	29th June, 2024

10. PLACES IN NEWS

10.1 IN INDIA

VADHAVAN PORT PROJECT

Details

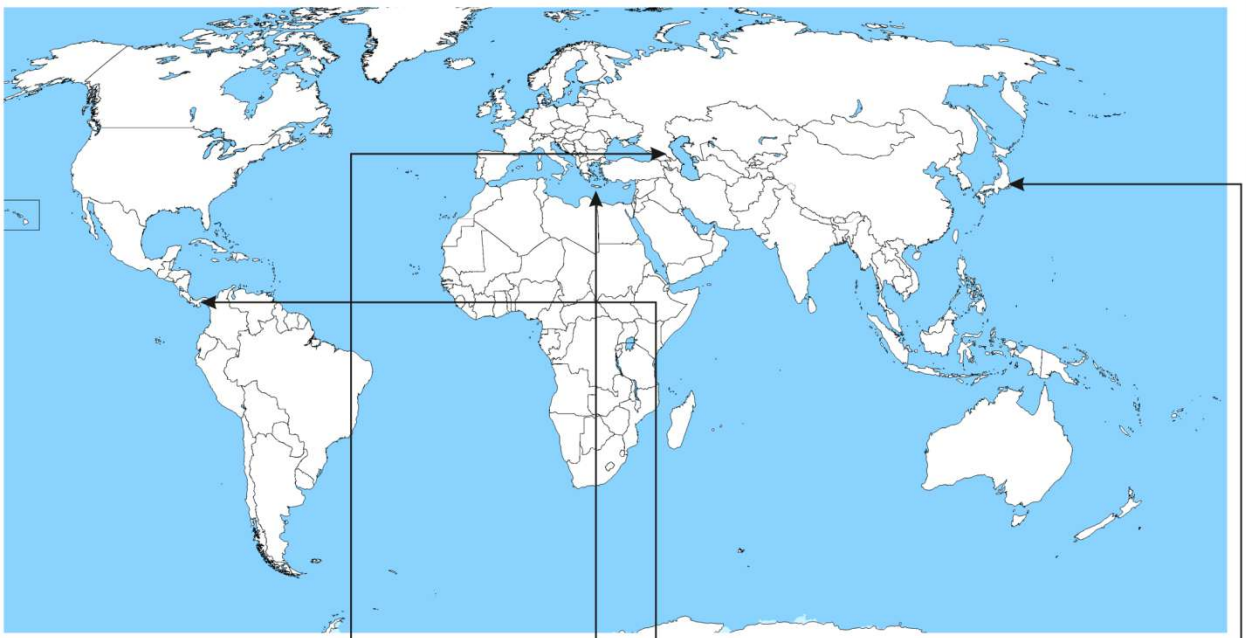
- The Union Cabinet approved the Rs 76,220 crore Vadhavan Port project in Maharashtra, featuring various terminals and linked to the Delhi-Mumbai Expressway.
- It will serve as a significant gateway for transportation corridors to improve the logistics sector under the Sagarmala initiative.

KGF

Details

- Kolar Gold Fields (KGF) in Karnataka has a history of gold mining dating back over a century.
- Operations ceased in 2001 due to economic reasons, but now there are plans to revive mining at KGF.
- The revival of gold mining at KGF will consider environmental and technological factors to mitigate any negative impacts on the environment and local communities.

10.2 IN WORLD



DAGESTAN

Details

- Dagestan is located in the southern tip of Russia, bordering the Caspian Sea to the east, Azerbaijan to the south, Georgia to the west, and Chechnya to the northwest.
- Dagestan is linguistically diverse and has 14 official languages.
- The cultural landscape is characterized by a mixture of traditions of different ethnic groups, including Avars, Dargins, Kumyks, Lezgins, and others.
- Dagestan has a unique political structure with a parliamentary system led by the People's Assembly.

CRETE ISLAND

Details

- Crete Island is the largest in Greece and the fifth largest in the Mediterranean Sea, situated in the Aegean Sea's southern part.
- It's surrounded by the Sea of Crete, the Libyan Sea, the Myrtoan Sea, and the Carpathian Sea.
- The Minoan Civilization, Europe's earliest advanced civilization, emerged on the island around 2700-1420 BCE.

PANAMA

Details

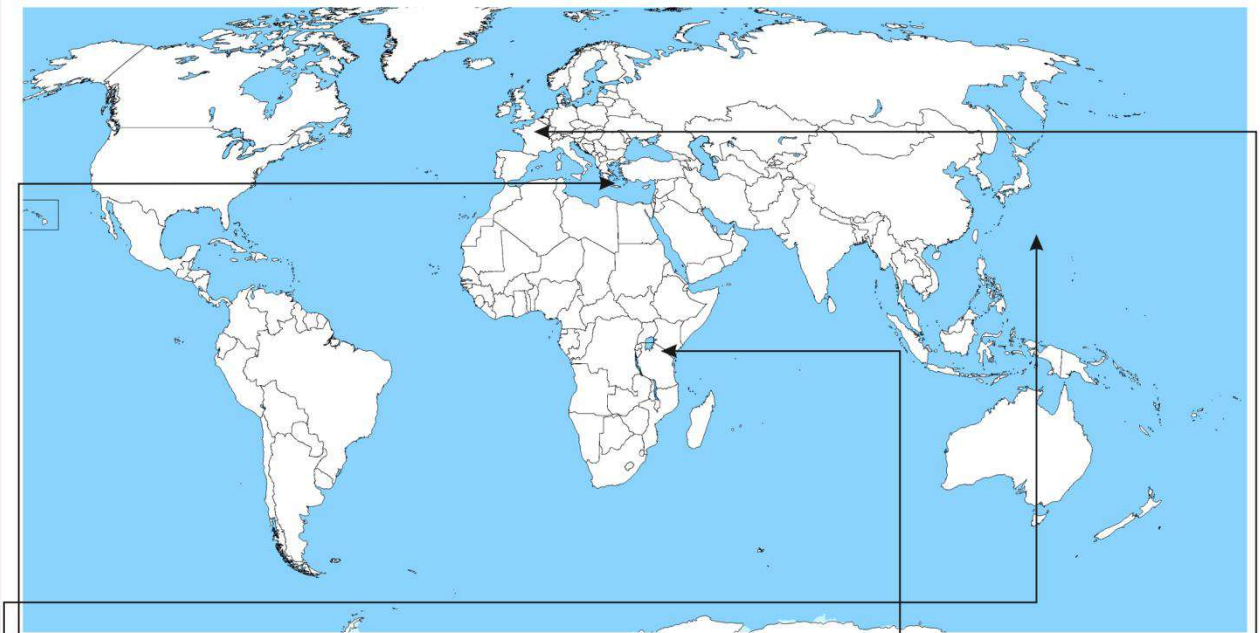
- Panama, located on the Isthmus of Panama, connects North and South America and is bordered by Costa Rica and Colombia.
- It is home to the largest rainforest in the Western Hemisphere outside the Amazon Basin.
- The famous Panama Canal, connecting the Atlantic and Pacific oceans, was constructed by the United States between 1904 and 1914, with ownership transferring to Panama in 1999.

MOUNT FUJI

Details

- Mount Fuji is the tallest mountain in Japan and an active volcano located on Honshu Island.
- It holds deep cultural and religious significance in Japan and is one of the "Three Holy Mountains" and a sacred site.
- It was designated as a World Heritage site by UNESCO in 2013, establishing it as an iconic symbol of Japan.

10.2 IN WORLD



DELOS ISLAND

Details

- Delos, a sanctuary of ancient Greek and Roman civilization, is at risk of submerging due to rising sea levels and climate change.
- It is located near Mykonos in Greece, is known for its historical significance in mythology, history, and archaeology.
- The island's 2,000-year-old buildings offer insights into Hellenistic and Roman life, including temples, marketplaces, and stone lions guarding sacred spaces.

SAIPAN

Details

- Saipan is in the Mariana Islands and part of the Northern Mariana Islands group, located in the northwestern Pacific Ocean.
- It is a self-governing commonwealth associated with the United States.
- Mount Takpochao is its highest point.

LAKE NATRON

Details

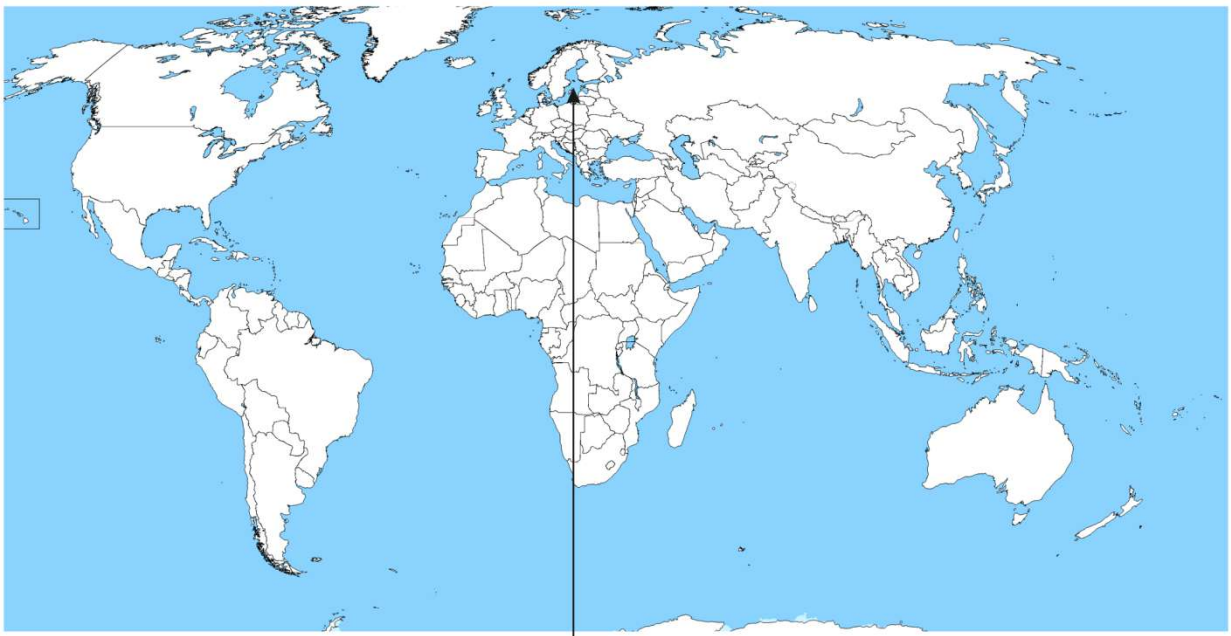
- Lake Natron is an alkaline lake in Tanzania known for its extreme conditions, high pH levels, and biodiversity.
- Fed by the Southern Ewaso Ng'irol River and mineral-rich hot springs, the lake's high evaporation rates lead to the accumulation of natron and trona, creating its alkaline properties.
- The lake's red colour is due to halophilic microorganisms like cyanobacteria, which attract Africa's lesser flamingos by providing their preferred food source, Spirulina algae.
- The area, despite being a Ramsar Site and home to endemic species, lacks formal protection.

SEINE RIVER

Details

- The Seine River is France's second-longest river after the Loire.
- Originating in Burgundy, it flows northwest towards Paris, joining the Marne River.
- It empties into the English Channel, separating northern France from southern England.

10.2 IN WORLD



BALTIC SEA

Details

- The Baltic Sea is a semi-enclosed inland sea in Northern Europe, separating the Scandinavian Peninsula from continental Europe.
- It is linked to the White Sea and the North Sea via canals, and to the Atlantic Ocean through the Danish Straits.
- The sea drains through the Danish straits and includes the Gulf of Bothnia, the Gulf of Finland, the Gulf of Riga, and the Bay of Gdańsk.
- It is the world's largest brackish inland water body with lower salinity levels than oceans due to freshwater inflow. Over 250 rivers empty into the sea, with the Neva being the largest.

11. GOVERNMENT SCHEMES

11.1 SHORT ARTICLES

E-Migrate

Context

- The Ministry of External Affairs (MEA) and the State Bank of India (SBI) have signed a Memorandum of Understanding (MoU) to provide additional digital payment services through SBIePay to users of the eMigrate portal.

Key Highlights of the MoU

Objective

- **Integration of SBIePay with eMigrate Portal:** The primary goal of the MoU is to integrate SBI's digital payment gateway, SBIePay, with the eMigrate portal. This integration is intended to provide a secure and efficient platform for making digital payments related to emigration processes.
- **Promotion of Safe and Legal Migration:** By facilitating transparent and seamless transactions for emigration-related fees, the MoU aims to promote safe and legal migration practices. This will help reduce fraud and enhance compliance with legal and regulatory requirements.

Benefits for Users

- **Indian Migrant Workers:**
  - Migrant workers will benefit from simplified payment options, including UPI (Unified Payments Interface), credit/debit cards, and NEFT (National Electronic Funds Transfer) through net banking of all Indian banks.
  - Importantly, these transactions will be conducted with zero transaction charges, reducing the financial burden on workers who are often in a vulnerable economic position.
- **Recruiting Agents:**
  - Recruiting agents will be able to handle payments related to recruitment processes more efficiently. The integrated platform will ensure compliance with legal and regulatory requirements, reducing administrative burdens and enhancing operational efficiency.
- **Other Users of eMigrate Portal:**
  - Foreign employers and insurance companies will benefit from a unified platform to manage payments related to their engagements with Indian migrant workers. This will streamline their operations and enhance transparency in financial transactions.

eMigrate Portal

- The **eMigrate portal was launched by the MEA to streamline the emigration process for Indian workers in Emigration Check Required (ECR) countries**. It aims to eliminate the need for physical paperwork and simplify the registration and application processes for emigration clearances.
- The **portal allows workers to register, apply for emigration clearances, and track their application status online**. Foreign employers and recruiters can also register on the portal to recruit Indian manpower or directly apply for permits.
- The portal provides transparency and easy tracking of the application status for both workers and employers, enhancing accountability and reducing instances of fraud and exploitation.

Conclusion

- The integration of SBIePay with the eMigrate portal represents a significant step forward in leveraging digital infrastructure to improve governance and service delivery in the emigration sector. This initiative is expected to enhance the efficiency, transparency, and convenience of the emigration process for all stakeholders involved.

Great Scheme

Context

- The Union Ministry of Textiles has approved startups in Technical Textiles to promote innovation and sustainability.

Key Initiatives and Developments

GREAT Scheme: Startups in Technical Textiles

- **Purpose:** The GREAT (Grant for Research and Entrepreneurship across Aspiring Innovators in Technical Textiles) scheme is designed to support young innovators, scientists, technologists, and startup ventures. The goal

is to develop commercial technologies and products within the technical textiles domain.

- **Funding:** Each approved startup under this scheme can receive up to INR 50 lakhs in funding support from the Government of India (GOI).
- **Focus Areas:** The startups are focusing on critical areas such as sustainability, composites, high-performance textiles, Meditech (medical textiles), and smart textiles.
- **Examples of Innovations:**
  - Development of braided composites for military applications.
  - Creation of surgical simulation models using composites.
  - Production of nano-fibre-infused textiles for energy generation and sensing.

Academic Integration and Infrastructure Development

- **Funding Allocation:** Approximately INR 6.4 crores has been allocated to IIT Guwahati under the National Technical Textiles Mission (NTTM) guidelines.
- **Objectives:** The funding is aimed at introducing new papers/subjects in technical textiles and upgrading laboratory infrastructure within the Civil Engineering Department.
- **Focus on Geotextiles:** The initiative particularly focuses on geotextiles, which are essential for the unique geographical and environmental conditions of the Northeast Region (NER). Geotextiles are used in construction projects for reinforcement, filtration, separation, and drainage.

Significance and Impact

- **Promoting Innovation:**
  - **Encouragement:** By supporting startups and academic institutions, the NTTM encourages innovation and entrepreneurship within the technical textiles sector.
  - **Advancement:** This support is crucial for advancing India's capabilities in manufacturing and technology-oriented sectors, ensuring the development of high-value, innovative products.
- **Sustainability and Self-Reliance:**
  - **Eco-friendly Textiles:** The initiatives under NTTM emphasize sustainability through the development of eco-friendly textiles.
  - **Self-Reliance:** Enhancing India's self-reliance in critical areas such as defence, healthcare, and infrastructure is a key objective, reducing dependence on imports and fostering domestic innovation.
- **Academic Empowerment:**
  - **Strengthening Research:** Funding for academic institutions like IIT Guwahati strengthens their research and educational capabilities.
  - **Regional Development:** By addressing local needs through specialized technical solutions, these institutions contribute significantly to regional development.

Way Forward

- **Expansion and Collaboration:**
  - **Continued Support:** Ongoing support for startups and academic institutions under NTTM is expected to drive further advancements in technical textiles.
  - **Collaborative Efforts:** Collaboration between industry, academia, and government bodies is crucial for scaling innovations and achieving broader socio-economic impacts.
- **Technology Adoption:**
  - **Smart Textiles:** Emphasis on smart textiles and advanced materials is likely to lead to the adoption of cutting-edge technologies in various sectors.
  - **Enhanced Performance:** These advancements will enhance product performance and efficiency, making India a competitive player in the global market.

Conclusion

- The Ministry of Textiles' initiatives under NTTM aim to promote innovation, sustainability, and academic empowerment in the technical textiles sector, aligning with India's goals of becoming a leader in high-value manufacturing and technology. By supporting startups, improving academic infrastructure, and promoting sustainable practices, the Ministry is driving advancements in technical textiles, boosting India's economy and global competitiveness.

11.2 ADDITIONAL TOPICS FOR READING

TOPIC NAME	UPLOADED ON IAS GYAN WEBSITE ON:
AGNIPATH SCHEME	11th June, 2024
DIGITAL HEALTH INCENTIVE SCHEME	20th June, 2024
JAL JEEVAN MISSION	29th June, 2024