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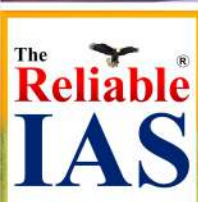
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FOR CIVIL SERVICES EXAM

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Major Dhyan Chand Khel Ratna Award for 2024

Relevance: Prelims

- The Indian government has announced the recipients of the prestigious Major Dhyan Chand Khel Ratna Award for 2024, honoring exceptional contributions to sports.



Awardees & Their Achievements

- Manu Bhaker (Shooting):** Manu Bhaker made history at the Paris 2024 Olympics by becoming the first Indian athlete post-Independence to win two medals in a single edition of the Games. Despite initial controversies regarding her nomination, Bhaker's outstanding performance has been rightfully recognized.
- Harmanpreet Singh (Hockey):** As the captain of the Indian men's hockey team, Harmanpreet Singh led the team to a second consecutive Olympic bronze medal in Paris. His leadership and skills have been instrumental in India's consistent performance on the international stage.
- Praveen Kumar (Para Athletics):** Praveen Kumar clinched gold at the Paris Paralympics in the men's high jump T64 category, setting a new Asian record. His achievement has significantly contributed to India's prominence in para-athletics.
- D Gukesh (Chess):** D Gukesh has emerged as a formidable force in the world of chess, achieving remarkable milestones and elevating India's status in the global chess community.

Controversy Surrounding Nominations

- Initially, there was controversy over Manu Bhaker's omission from the nomination list, despite her historic Olympic performance. Reports suggested discrepancies regarding her application, with some sources claiming she had applied, while others indicated she had not. The Sports Ministry faced criticism for this oversight and subsequently took corrective measures to include her among the awardees.

Significance of the Khel Ratna Award

- The Khel Ratna Award, officially known as the Major Dhyan Chand Khel Ratna Award, is India's highest sporting honour.
- It was instituted in 1991–1992 to recognise outstanding performance in sports. This prestigious award is given annually by the Ministry of Youth Affairs and Sports. It aims to honour athletes who have displayed exceptional skill, dedication, and achievement in their respective fields.
- The award highlights India's commitment to promoting sports and motivating athletes to achieve excellence. Winners receive a medallion, a certificate, and a cash prize of ₹25 lakh.



Kashmiri Papier-Mache

Relevance: GS I - Art & Culture

- **In News:** Artisans in Kashmir are crafting papier-mâché models of the dodo (*Raphus cucullatus*), a bird that went extinct 343 years ago. Over 50,000 colorful models have been exported to European markets, showcasing the revival of this craft with a unique ecological theme.



About Kashmiri Papier-Mâché:

Historical Significance

- ✓ Kashmiri Papier-mâché is a centuries-old handicraft from the Kashmir Valley.
- ✓ Introduced in the 14th century by Persian saint Mir Sayyid Ali Hamadani.
- ✓ Renowned for its intricate designs and the transformation of paper pulp into vibrant, decorated artifacts.

Key Features

- ✓ **Materials & Craftsmanship:** Created primarily from paper pulp, handcrafted by skilled artisans in Srinagar & other parts of the Kashmir Valley.
- ✓ **Product Range:** Includes vases, bowls, cups (with or without metal rims), boxes, trays, lamp bases, and now models of extinct birds like the dodo.
- ✓ **Design Aesthetics:** Showcases floral patterns, forest motifs, and cultural themes reflecting the heritage and ecology of Kashmir.
- ✓ **Global Reach:** Products enjoy high demand domestically and internationally, especially in Europe and Mauritius.

Legal and Cultural Recognition:

- **Geographical Indication (GI) Status:** Recognized under the GI Act, 1999, ensuring the authenticity and preservation of this traditional craft.
- **Official Registration:** Registered with the Controller General of Patents, Designs, and Trademarks, solidifying its cultural value.

The Dodo Connection:

- **Symbol of Revival**
 - ✓ Kashmir artisans have crafted over 50,000 papier-mâché dodo models for export to Europe and Mauritius, particularly for Christmas markets.
 - ✓ The dodo, extinct since 1681, holds special cultural significance as Mauritius's national emblem.
- **Global Appreciation**
 - ✓ These artistic renditions serve as a blend of heritage craft and environmental awareness, enhancing their cultural and commercial value.

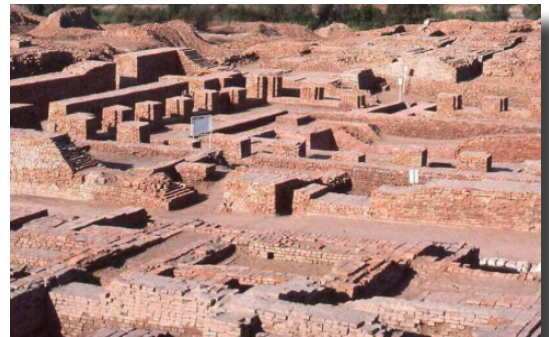
Conclusion:

- Kashmiri Papier-mâché continues to thrive as a symbol of India's rich cultural heritage, now extending its legacy to raise global awareness of extinct species through its innovative designs.

5,000-Year-Old Water Management Found at Rakhigarhi

Relevance: GS I - Ancient History

- **In News:** During an ongoing excavation at Rakhigarhi, archaeologists discovered an ancient water storage system estimated to be 3.5 to 4 feet deep, showcasing the advanced water management strategies of the Harappan Civilization. Additionally, a dried riverbed of the Chautang (Drishavati) River was identified.



Water Management Practices of the Harappan Civilization:

- **Elaborate Drainage Systems**
 - ✓ **Design:** Underground drains made with accurately placed bricks.
 - ✓ **Functionality:** Connected individual houses to wider public drains for efficient sewage disposal.
- **Small Bunds**
 - ✓ **Location:** Found in Lothal, Gujarat.
 - ✓ **Purpose:** Constructed to store rainwater for irrigation and drinking purposes.
- **Dockyard**
 - ✓ **Location:** Lothal, near the Sabarmati River.

- ✓ **Significance:** A meticulously lined structure with channels for water inflow and outflow, indicating maritime activity.
- **Channels and Reservoirs**
 - ✓ **Location:** Found in Dholavira, Gujarat.
 - ✓ **Construction:** Entirely built of stone to store fresh rainwater or divert water from nearby streams.
 - ✓ **Engineering Feat:** Demonstrates advanced hydraulic systems for water conservation, harvesting, and storage.
- **Tanks and Wells**
 - ✓ **Location:** Prominent in Mohenjodaro.
 - ✓ **Technique:** Rainwater was collected in tanks and distributed to household wells through a sophisticated drainage network.
- **The Great Bath**
 - ✓ **Location:** Mohenjodaro.
 - ✓ **Description:** A massive water tank with a brick floor, likely used for religious mass bathing. It is an outstanding example of early large-scale water structures.

Abot Rakhigarhi:

- **Location**
 - ✓ Situated in the Hisar district of Haryana, on the Ghaggar-Hakra river plain.
 - ✓ Recognized as one of the oldest and largest cities of the Harappan Civilization.
- **Key Findings**
 - ✓ Numerous archaeological mounds and skeletal remains, providing the only DNA evidence from the Harappan era.
 - ✓ Evidence of craft activities, residential buildings, streets, drainage systems, and burial sites.

Conclusion:

- Rakhigarhi continues to provide insights into the technological and cultural advancements of the Harappan Civilization, emphasizing their expertise in urban planning and resource management.



Judiciary Faces Over 5,600 Vacancies Across All Levels

Relevance: GS II - Governance

- **In News:** The Ministry of Law reports a shortage of over 5,600 judges across various courts, from the Supreme Court (SC) to district courts, highlighting a critical issue in India's judiciary system.



Current Status of Vacancies:

- **Supreme Court:** 2 vacancies.
- **High Courts:** 364 vacancies.
- **District Courts:** 5,245 vacancies.

Reasons for Judicial Vacancies:

- **Frequent Vacancies**
 - ✓ Result from retirements, resignations, deaths, and the elevation of judges.
 - ✓ Increase in the sanctioned strength of courts also contributes.
- **Time-Consuming Collegium System**
 - ✓ Requires collaboration between the Executive and Judiciary.
 - ✓ Appointments involve consultation and approvals from multiple authorities.
 - ✓ Governed by Articles 217 and 224 of the Constitution for High Court judges.
- **Delays in Lower Court Recruitment**
 - ✓ Lengthy examination processes for appointments.
 - ✓ Low pay scales and high workloads deter skilled professionals from joining the judiciary.

Impacts of Vacancies:

- **Justice Delayed**
 - ✓ **Pending cases:** Over 19,500 in the Supreme Court and 27 lakh in High Courts.
 - ✓ Other contributing factors include inadequate infrastructure, frequent adjournments, and lack of strict timelines.
- **Low Judge-to-Population Ratio**
 - ✓ Current ratio stands below 25 judges per million people, significantly



below the recommended 50 judges per million set by the All India Judges Association in 2002.

- ✓ High workloads increase stress on judicial officers, heightening the risk of errors.

Way Forward Key Recommendations by EAC-PM:

- **Revisiting NJAC Framework**
 - ✓ Revival of the National Judicial Appointments Commission (NJAC) could balance independence with accountability in judicial appointments.
- **All India Judicial Service (AIJS)**
 - ✓ A centralized recruitment mechanism for district and subordinate courts, akin to the civil services, can attract talent and standardize the selection process.
 - ✓ Article 312 of the Constitution supports the creation of All-India Services.
- **Additional Measures**
 - ✓ Streamlining the appointment process to ensure timeliness.
 - ✓ Conducting regular assessments of judicial strength.
 - ✓ Improving infrastructure & increasing salaries to attract skilled professionals.

Lok Sabha Seating Arrangement Finalized

Relevance: GS II - Polity

- **In News:** The seating arrangements for the 18th Lok Sabha have been finalized, reflecting the allocation of seats in the chamber in accordance with parliamentary rules.



About Seating Arrangement in Lok Sabha:

- The seating arrangement in the Lok Sabha chamber ensures systematic allocation of seats for Members of Parliament (MPs).
- It reflects the party's strength in the House and promotes organized conduct of proceedings.
- **Legal Framework Governing the Arrangement**
 - ✓ Rule 4 of the Rules of Procedure and Conduct of Business in Lok Sabha.
 - ✓ Direction 122(1)(a) under Directions by the Speaker outlines the framework for seat allocation.
- **Who Determines the Seating**
 - ✓ The Speaker of the Lok Sabha has the authority to decide and finalize the seating arrangement.

Procedure for Seat Allocation:

- **Proportionate Representation**
 - ✓ Seats are allocated in proportion to the strength of parties in the House.
 - ✓ The ruling party members sit on the right side of the Speaker.
 - ✓ The opposition parties occupy seats on the left side of the Speaker.
- **Special Provisions for Smaller Groups**
 - ✓ Smaller parties (with fewer than five members) and independent MPs are seated at the discretion of the Speaker.
- **Allocation Formula**
 - ✓ A specific formula is used to allot seats to parties with a strength of five or more members.
- **Finalization**
 - ✓ Parties submit recommendations for individual MP placements.
 - ✓ The Speaker finalizes the placements based on these recommendations.

Significance:

- Promotes orderly proceedings and efficient functioning of the Lok Sabha.
- Reflects parliamentary decorum by balancing party representation and adhering to established rules.
- Enables members to engage effectively in debates and discussions while maintaining party coherence.

Bharatiya Vayuyan Vidheyak 2024**Relevance: GS II - Governance**

- **In News:** The Bharatiya Vayuyan Vidheyak (BBV) 2024 replaces the Aircraft Act of 1934, marking a significant modernization of India's aviation regulatory framework. After passing the Lok Sabha and being approved by the Rajya Sabha in August 2024, this new legislation aims to facilitate ease of business in India's aviation industry.
 - ✓ The Aircraft Act of 1934, which had undergone 21 amendments over time, is now superseded by updated provisions designed to meet contemporary challenges and capitalize on emerging opportunities in aviation.
 - ✓ The new bill was introduced following recommendations from the International Civil Aviation Organization (ICAO) to amend the outdated law.



Key Features of the Bharatiya Vayuyan Vidheyak:

- **Creation of New Regulatory Bodies**
 - ✓ **Directorate General of Civil Aviation (DGCA):** Responsible for aviation regulations and safety management.
 - ✓ **Bureau of Civil Aviation Security (BCAS):** Focuses on overseeing aviation security measures.
 - ✓ **Aircraft Accidents Investigation Bureau (AAIB):** Dedicated to investigating aircraft accidents.
- **Government Oversight**
 - ✓ The central government will continue to have overall control over these authorities.
 - ✓ The government holds the power to issue directives and review the decisions of these bodies.
- **Appeals Process**
 - ✓ Appeals against decisions made by DGCA or BCAS can be directed to the central government, with no further avenues for appeal.
- **Aircraft Design Regulation**
 - ✓ The bill retains existing provisions that govern aircraft manufacturing, operation, and trade.
 - ✓ Additional powers are granted to regulate aircraft design, ensuring comprehensive oversight.
- **Rule-Making Authorities**
 - ✓ Existing rule-making powers are maintained, covering aircraft-related activities, licensing, inspections, and air transport services.
 - ✓ New rule-making authority has been added to regulate radio telephone operator certificates and licenses, in accordance with the International Telecommunication Convention.
- **Offences and Penalties**
 - ✓ The law specifies penalties for violations, including up to two years of imprisonment, a ₹1 crore fine, or both for offences such as:
 - Transporting prohibited items (e.g., explosives, arms).
 - Endangering public safety during flight.
 - Failing to comply with the directions of DGCA or BCAS.
 - ✓ **Stricter penalties:** For violations related to waste or slaughter near airports, penalties could include up to three years' imprisonment and a ₹1 crore fine.
 - ✓ The government may prescribe civil or criminal penalties for violations in areas such as aircraft activities, international conventions, and aircraft detentions.

- **Penalty Adjudication**

- ✓ Existing provisions for adjudicating penalties remain, with the central government appointing officers to impose penalties.
- ✓ A new multi-tier appeal mechanism allows decisions by the First Appellate Officer to be appealed to a Second Appellate Officer.

Criticisms of the Bharatiya Vayuyan Vidheyak:

- **Concerns About Regulatory Independence**

- ✓ Unlike independent regulators in sectors like telecom, insurance, and electricity, the DGCA is not autonomous from the central government, raising concerns about its effectiveness and impartiality.
- ✓ There is no clear definition of the qualifications, selection process, or tenure of the Director General, leading to potential transparency issues.
- ✓ The DGCA operates as a government department, unlike the independent bodies seen in other industries.

- **Limited Appeal Options**

- ✓ Critics argue that restricting appeals to the central government reduces the professional autonomy of regulatory bodies like the DGCA and BCAS.

- **Appointment of Arbitrator for Compensation Issues**

- ✓ The bill allows the government to appoint an arbitrator for resolving compensation disputes, which some argue violates the right to equality under Article 14 of the Indian Constitution, as previously ruled by the Supreme Court.

- **Discretionary Powers of the Government**

- ✓ The central government has significant discretion in specifying criminal penalties for certain violations, raising concerns about the separation of powers and the potential for executive overreach.

- **Concerns Over Inclusivity**

- ✓ The Hindi title of the bill has been criticized for being exclusionary, potentially alienating the non-Hindi-speaking majority, who account for 60% of the population.

Conclusion:

- The bill aims to streamline aviation regulation and improve the ease of doing business, it has faced criticism on issues such as regulatory independence, appeals mechanisms, and discretionary powers granted to the central government.
- Despite these concerns, the new law represents an important step towards aligning India's aviation laws with modern global standards and addressing the growing demands of the sector.



Railways (Amendment) Bill, 2024: A Leap Towards Revamping Indian Railways

Relevance : GS II - Governance

- **In News:** The Union Minister of Railways introduced the Railways (Amendment) Bill, 2024 in the Lok Sabha.
- The proposed legislation seeks to abolish the Indian Railway Board Act of 1905 and merge its provisions into the Railways Act of 1989, thereby granting legal authority to the Railway Board.



Key Features of the Bill:

- **Formation of the Railway Board**
 - ✓ A statutory Railway Board will be established, serving as the principal decision-making body for Indian Railways.
 - ✓ The Central Government will outline
 - The composition of the Board.
 - Eligibility criteria, expertise, & terms for the Chairman & other members.
 - The procedure for appointment to these roles.
- **Increased Autonomy for Zones**
 - ✓ Enhanced decision-making independence for railway zones to improve functionality and decentralize responsibilities.
- **Introduction of an Independent Regulator**
 - ✓ A dedicated regulatory body will supervise various aspects of Indian Railways, including:
 - Fare structures.
 - Safety protocols.
 - Involvement of private players.
- **Preservation of Current Organizational Framework**
 - ✓ The Bill does not propose alterations to the existing administrative setup of Indian Railways.

Anticipated Impacts of the Bill:

- **Strengthening the Role of the Railway Board**
 - ✓ Providing statutory authority will bolster the efficacy and autonomy of the

Railway Board, facilitating better management.

- **Faster Decision-Making Through Decentralization**
 - ✓ Delegating more power to railway zones will ensure quicker and localized resolutions.
- **Enhanced Governance and Accountability**
 - ✓ An independent regulator will establish a clear and accountable framework for policy enforcement, ensuring responsibility among stakeholders.
- **Boost to Private Sector Engagement**
 - ✓ Encouraging private sector involvement could result in:
 - Potential improvements in infrastructure and services.
 - Possible concerns such as increased travel costs and reduced government financial support.

Conclusion:

- The Railways (Amendment) Bill, 2024, represents a progressive step towards restructuring the administrative and operational fabric of Indian Railways. By empowering zones, ensuring transparent oversight, and fostering private sector participation, the Bill aligns with India's vision of modernizing its railway network and governance model.

National Panchayat Awards 2024

Relevance: GS II - Polity

- **In News:** The Ministry of Panchayati Raj has announced that seven Gram Panchayats from Tripura have been selected for the National Panchayat Awards (NPA) 2024.
 - ✓ The awards are presented annually on 24th April to honor the best-performing Panchayats under the Incentivization of Panchayats Scheme.
 - ✓ National Panchayati Raj Day is celebrated on the same day.



Objective of National Panchayat Awards:

- **Recognition of Excellence:**
 - ✓ Recognizes the exemplary work of Panchayats in enhancing the delivery of services and public goods.
- **Promoting SDGs:**
 - ✓ Evaluates Panchayat performance in achieving the Sustainable Development Goals (SDGs) aligned with the Localization of Sustainable Development

Goals (LSDGs) themes.

- **Fostering Competitive Spirit:**
 - ✓ Encourages competition among Panchayats to foster innovation and excellence.
- **Catalyzing LSDGs:**
 - ✓ Aligns with 9 LSDG themes encompassing the 17 SDGs, driving focused and localized development efforts.

Key Features of the National Panchayat Awards:

- **Administered By:** Ministry of Panchayati Raj.
- **Launched In:** The awards were instituted in 2022.
- **Awarding Authority:** Presented by the President of India.
- **Award Scope:** Recognizes Gram, Block, and District Panchayats based on their performance in the appraisal year 2022–2023.
- **Digital Incentives:** Award money is transferred digitally to winning Panchayats.
- **Women's Leadership:** 42% of award-winning Panchayats are led by women leaders, highlighting gender inclusivity.

National Panchayat Awards 2024:

- **Award Criteria**
- Panchayats are evaluated on 9 key LSDG themes, which include:
 1. Poverty-Free and Enhanced Livelihoods Panchayat.
 2. Healthy Panchayat.
 3. Child-Friendly Panchayat.
 4. Water-Sufficient Panchayat.
 5. Clean and Green Panchayat.
 6. Self-Sufficient Infrastructure in Panchayat.
 7. Socially Just and Socially Secured Panchayat.
 8. Panchayat with Good Governance.
 9. Women-Friendly Panchayat.
- Participation is mandatory for all Gram Panchayats under these themes.
- **Award Categories**
- The awards are conferred in seven categories, including:
 - ✓ Deen Dayal Upadhyay Panchayat Satat Vikas Puraskar (DDUPSVP).
 - ✓ Nanaji Deshmukh Sarvottam Panchayat Satat Vikas Puraskar (NDSPSVP).
 - ✓ Gram Urja Swaraj Vishesh Panchayat Puraskar.
 - ✓ Carbon Neutral Vishesh Panchayat Puraskar.



- ✓ Panchayat Kshamta Nirmaan Sarvottam Sansthan Puraskar.
- ✓ Best Participant (State/District).
- ✓ Nanaji Deshmukh Vishesh Puraskar.

Union Cabinet clears Bills for Simultaneous Elections

Relevance : GS II - Governance

- **In News:** The Union Cabinet has recently approved two key Bills aimed at facilitating simultaneous elections to the Lok Sabha and State Legislative Assemblies.



- ✓ **First Bill:** Seeks to amend the Constitution to enable simultaneous elections.
- ✓ **Second Bill:** Proposes amendments in laws governing Union Territories with Legislative Assemblies.
- This follows the recommendations of a high-level committee led by former President Shri Ram Nath Kovind, which outlined a roadmap for conducting simultaneous elections for Parliament, State Assemblies, and local bodies.

Understanding Simultaneous Elections:

- **Definition:** Simultaneous elections involve conducting elections for the Lok Sabha, all State Legislative Assemblies, and local bodies (Municipalities and Panchayats) at the same time.
- **Need for Simultaneous Elections**
 - ✓ **Governance Efficiency:** Frequent elections disrupt policy-making and development programs due to the imposition of the Model Code of Conduct (MCC).
 - ✓ **Cost Reduction:** Consolidating elections can significantly reduce the financial burden of conducting separate elections periodically.
 - ✓ **Optimal Resource Utilization:** Prevents prolonged diversion of security forces and electoral officials (e.g., teachers) from their primary duties.
 - ✓ **Enhanced Participation and Efficiency**
 - Encourages higher voter turnout.
 - Reduces legal and administrative burdens on courts and electoral bodies.
- **Challenges of Simultaneous Elections**
 - ✓ **Impact on Regional Parties:** May disadvantage regional parties by creating a centralized election narrative.

- ✓ **Reduced Accountability:** Public scrutiny of elected representatives may decrease as elections would be held only once every five years.
- ✓ **Logistical Hurdles:** Requires a massive number of Electronic Voting Machines (EVMs) and other resources.
- ✓ **Legal and Constitutional Hurdles:** Demands significant amendments to existing laws and constitutional provisions.

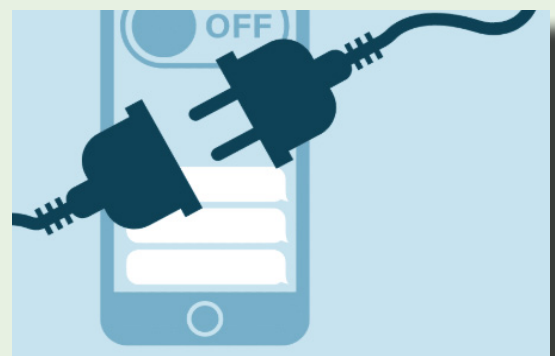
Recommendations by the High-Level Committee:

- **Constitutional Amendments**
 - ✓ Modify three articles and introduce 12 sub-clauses to the existing provisions.
 - ✓ Amend three laws related to Union Territories with legislative assemblies.
- **Unified Electoral Roll:** A single electoral roll to be prepared by the Election Commission of India (ECI) in collaboration with State Election Commissions by amending Article 325.
- **Municipal and Panchayat Elections:** To align these with parliamentary and Assembly elections, to be conducted within 100 days of the main polls.
- **Appointed Date for Lok Sabha:** The President will notify the date for the first sitting of the Lok Sabha post-elections, synchronizing its term with State Assemblies.
- **Fresh Elections in Special Cases:** In case of a hung Parliament or a no-confidence motion, fresh elections will be conducted only for the remaining term of the previous Lok Sabha.

Rising Calls for a 'Right to Disconnect' in India

Relevance: GS II - Polity

- **In News:** Recently, increasing calls for a legal framework ensuring the 'Right to Disconnect' have emerged in India, following the tragic death of a young female employee due to excessive work-related stress.



What is the 'Right to Disconnect'?

- The 'Right to Disconnect' ensures employees are not obligated to respond to work-related calls, emails, or messages beyond official working hours. Additionally, it protects them from facing disciplinary action for not doing so.

Need for the 'Right to Disconnect' in India:

- **Psycho-Social Impact:** Continuous connectivity weakens social bonds, fosters isolation, and heightens the risk of mental health challenges and physical

illnesses like cardiovascular diseases.

- **Impact on Women Professionals:** A recent study revealed that Indian women in professions such as IT, auditing, and media often work over 55 hours a week, amplifying work-life imbalance.
- **Other Challenges:** Prolonged screen exposure leads to sleep disturbances, insomnia, and declining productivity levels.

Status of the 'Right to Disconnect' in India:

- **Absence of Specific Legislation:** Currently, there are no laws in India explicitly recognizing employees' right to disconnect from work outside official hours.
- **Constitutional Provisions:**
 - ✓ **Article 38:** Directs the state to promote the welfare of its citizens.
 - ✓ **Article 39(e):** Mandates the state to ensure the strength and health of workers are not exploited.
- **Judicial Precedents:**
 - ✓ **Vishakha v. State of Rajasthan (1997):** Established the right to a safe working environment, particularly for women.
 - ✓ **Ravindra Kumar Dhariwal and Ors v. UoI (2021):** Emphasized the need to accommodate individuals with disabilities in workspaces.
- **Recent Legislative Initiative:** In 2018, a Private Member's Bill proposing the 'Right to Disconnect' was introduced in the Lok Sabha. The Bill sought to codify employees' right to disengage from work communications post-working hours.

Global Perspective on the 'Right to Disconnect':

- **France:** Recognized since 2001, the Labour Chamber of the French Supreme Court ruled that employees are not obligated to work from home or carry work materials after office hours.
- **Portugal:** Enacted a law making it illegal for employers to contact employees outside working hours, barring emergencies.
- **Spain:** Public workers and employees are granted the right to disconnect from electronic devices.
- **Australia:** Australian legislation ensures employees have the right to disengage from work communications outside official hours.

Conclusion:

- The growing calls for implementing the 'Right to Disconnect' in India highlight the urgent need for a legal framework that ensures employees' mental well-being and work-life balance. While global examples showcase effective models, India must tailor its approach, addressing the socio-economic realities of its workforce, fostering productivity, and safeguarding employee rights.

Supreme Court's Determination to Eliminate Manual Scavenging

Relevance: GS II - Governance

- **In News:** In its pivotal October 2023 ruling (Dr. Balram Singh v. Union of India), the Apex Court (SC) stressed the imperative to abolish manual scavenging and hazardous cleaning practices nationwide. Despite initiatives like the NAMASTE Program, the SC noted that no urban local body has successfully achieved this goal.



About Manual Scavenging:

Definition

- ✓ Manual scavenging refers to the practice of removing, transporting, or handling human excreta from unsanitary toilets, open drains, pits, or railway tracks.

Present Scenario

- ✓ As of 2021, India reported 58,098 manual scavengers, with 75% of them being women.
- ✓ Between 2018–2022, 339 fatalities occurred during sewer & septic tank cleaning.

Violation of Fundamental Rights

- This practice infringes on:
 - ✓ **Article 17:** Elimination of untouchability.
 - ✓ **Article 21:** Right to a life of dignity.

Supreme Court's Directives (2023):

- In the Dr. Balram Singh v. Union of India case, the SC issued significant instructions to strengthen safety measures and compensation frameworks:
 - ✓ **Enhanced Compensation for Deaths:** Raised to ₹30 lakhs for victims' families.
 - ✓ **Support for Disability:** ₹20 lakhs for permanent impairment; ₹10 lakhs for partial impairment.
 - ✓ **Rehabilitation Initiatives:** Scholarships and vocational training programs to aid the reintegration of affected individuals and their dependents.

Prohibition of Employment as Manual Scavengers & Their Rehabilitation Act, 2013:

- **Salient Provisions**

- ✓ **Ban on Manual Scavenging:** Categorically prohibits engaging individuals in such practices or supporting its continuation.
- ✓ **Elimination of Dry Latrines:** Mandates the replacement of dry toilets with sanitary systems employing modern technology.
- ✓ **Penalties for Non-compliance:** Violators face imprisonment up to 2 years, a fine up to ₹1 lakh, or both.
- ✓ **Rehabilitation Provisions:** Stipulates financial aid, housing, and alternative livelihood options for those engaged in manual scavenging.
- ✓ **Survey and Identification:** Obligates authorities to conduct nationwide surveys to document individuals involved in manual scavenging.
- ✓ **Oversight Mechanisms:** Establishes the National Commission for Safai Karamcharis and corresponding state-level bodies to oversee enforcement and rehabilitation efforts.

Challenges Hindering Eradication:

- **Weak Enforcement:** Insufficient monitoring and accountability by local authorities allow the practice to persist.
- **Cultural and Social Stigma:** Deep-seated caste-based discrimination hampers the societal reintegration of individuals transitioning to alternate livelihoods.
- **Insufficient Rehabilitation:**
 - ✓ Poor execution of welfare schemes leaves many without adequate support or resources.

Government Interventions to Combat Manual Scavenging:

- **Swachh Bharat Mission (2014):** Aims to enhance sanitation, eradicate open defecation, and replace dry latrines with modern systems.
- **National Safai Karamcharis Finance and Development Corporation (NSKFDC):** Provides financial support for skill enhancement, self-employment, and family welfare.
- **Skill Enhancement Programs:** Equips individuals with training for dignified, alternative occupations.
- **Self-Employment Assistance:** Offers financial aid to facilitate entrepreneurship and small-scale ventures.
- **NAMASTE Program (2023):** Focuses on mechanized cleaning of sewers and septic tanks, aiming to safeguard workers and modernize sanitation practices.

Way Forward:

- **Stringent Enforcement of Legislation:** Ensure the rigorous application of the 2013 Act with enhanced penalties and robust monitoring mechanisms.
- **Mechanization of Processes:** Promote the widespread adoption of mechanized tools for cleaning, minimizing the reliance on manual labor.

- **Comprehensive Rehabilitation Plans:** Implement holistic training, education, and financial aid programs to support alternative livelihood opportunities.
- **Addressing Societal Bias:** Launch awareness campaigns to combat caste-based prejudices and foster social inclusion.
- **Targeted Welfare Policies:** Design inclusive schemes focusing on education, healthcare, and housing for affected communities.

Conclusion:

- The Supreme Court's landmark directives and government-led initiatives, such as the NAMASTE Program, underscore the urgency of addressing this dehumanizing practice. However, achieving this goal requires legal enforcement, technological advancements, and comprehensive rehabilitation measures, along with sustained efforts to eliminate the entrenched social stigma associated with this practice.

Radhakrishnan Panel Recommends Overhaul of National Testing Agency

Relevance : GS II - Education Sector

- **In News:** The Radhakrishnan Committee, a seven-member panel, was constituted in June 2024 following reports of question paper leaks during the Common University Entrance Test for Undergraduate (CUET-UG) exams.



Challenges with Common Entrance Tests in India:

- **Question Paper Leaks and Marks Irregularities**
 - ✓ Instances such as the NEET UG 2024 paper leak and allegations of improper grace marks allocation.
- **Frequent Exam Cancellations and Technical Failures**
 - ✓ Exams disrupted due to systemic issues, including:
 - Malfunctioning biometric systems.
 - Server failures leading to cancellations (e.g., UGC NET June 2024).
- **Operational Transparency Concerns**
 - ✓ Delay in result announcements.
 - ✓ Variability in difficulty levels of question papers.
 - ✓ Lack of clarity in normalization processes.



Additional Challenges

- ✓ Political Interference in examinations.
- ✓ Cases of corruption in recruitment exams (e.g., Vyapam scam in Madhya Pradesh).

Recommendations by the Radhakrishnan Panel:

- **Strengthening Exam Authentication:** DigiExam Initiative: Modeled on DigiYatra, to ensure robust verification and curb impersonation.
- **Restructuring the National Testing Agency (NTA):** Refocus its mandate to exclusively conduct higher education entrance examinations.
- **Improved Coordination with Local Authorities:**
 - ✓ Link NTA with state and district authorities to:
 - Identify reliable testing centers.
 - Monitor suspicious individuals or activities.
- **Mobile Testing Centers:** Introduce mobile testing units for candidates from rural, remote, and sparsely populated areas.
- **Additional Measures**
 - ✓ Establish a dedicated grievance redressal cell.
 - ✓ Provide mental health support for students.
 - ✓ Strengthen test audit mechanisms to ensure fairness and accountability.

Existing Initiatives for Exam Reforms in India:

- **Public Examinations (Prevention of Unfair Means) Act:** Aims to deter malpractice in exams.
- **Biometric Verification:** Used for accurate candidate identification.
- **Real-Time Computer-Based Examinations:** Enhance efficiency and reduce manual errors.
- **Formation of National Testing Agency (NTA):** Centralized body for conducting national-level exams.

Conclusion:

- The panel's recommendations emphasize the need for stringent reforms in India's examination ecosystem. Addressing systemic flaws, enhancing transparency, and integrating technology will not only improve the credibility of entrance tests but also ensure fairness and equal opportunities for aspirants across the country.

Directives to Safeguard Sacred Groves

Relevance : GS II - Governance

- **In News:** The Supreme Court (SC) issued key directives regarding the identification and protection of sacred groves such as Orans in Rajasthan, based on the landmark T.N. Godavarman Judgment (1996).



Supreme Court's Key Directions & Suggestions:

- **Legal Protection Under Wildlife Protection Act, 1972**
 - ✓ Recommended granting protection to sacred groves through Section 36(c) (declaration of community reserves).
- **Adoption of the Piplantri Model**
 - ✓ Encouraged replicating the Piplantri village model from Rajasthan's Rajsamand district across the country.
 - ✓ **Piplantri Model Highlights**
 - A community-led conservation initiative where villagers plant 111 trees for every girl child born.
- **Comprehensive Policy by MoEFCC**
 - ✓ Directed the Ministry of Environment, Forest, and Climate Change (MoEFCC) to formulate an all-encompassing policy for the governance and management of sacred groves.
 - ✓ This includes conducting a nationwide survey to map sacred groves.
- **Empowering Local Communities**
 - ✓ Suggested empowering traditional communities as custodians of sacred groves under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.
- **Supervision by a Dedicated Committee**
 - ✓ Recommended the MoEFCC and Rajasthan's Forest Department constitute a supervisory committee to oversee the mapping and identification of sacred groves.

Sacred Groves: A Natural and Cultural Heritage:

- **What Are Sacred Groves?**
 - ✓ Sacred groves are patches of forest or tree clusters held in high cultural or spiritual regard by local communities, which ensure their protection and maintenance.

India's Unique Position

- ✓ India is home to the largest concentration of sacred groves in the world, with estimates exceeding 100,000 groves.
- ✓ These groves are recognized by various names, such as:
 - Deora or Malvan in Rajasthan.
 - Bughal in Uttarakhand.

Living Root Bridges of Meghalaya

- ✓ Jingkieng Jri, the living root bridges of Meghalaya, a sacred grove, is recognized as a UNESCO World Heritage Site.

Significance of Sacred Groves:

- Act as biodiversity hotspots and contribute to ecological balance.
- Foster community-led conservation efforts, reflecting the interconnectedness of culture and environment.
- Serve as natural carbon sinks, aiding in climate regulation and sustainability.

Conclusion:

- The Supreme Court's directions mark a crucial step in preserving the cultural and ecological legacy of sacred groves, ensuring their protection for future generations while reinforcing community-driven conservation efforts.

Ministry of Education Abolishes 'No Detention' Policy

Relevance : GS II - Education Sector

- **In News:** The Ministry of Education has removed the 'no detention' policy for Classes 5 and 8 under the Right of Children to Free and Compulsory Education (RTE) (Amendment) Rules, 2024. Schools can now retain students who do not pass their year-end examinations
- **Adoption Status:** Sixteen states and two Union Territories, including Delhi, have already implemented this policy, aligning with their authority under the State subject of education.



Key Highlights of the New Policy:

Policy Background

- ✓ Though the no-detention policy was removed from the RTE Act in 2019, its implementation was deferred until the release of the National Curriculum Framework (NCF) in 2023.

- **Re-examination Provision**
 - ✓ Students failing the promotion criteria will receive additional instruction & will be allowed a re-examination within two months of the result announcement.
- **Protection Against Expulsion**
 - ✓ No child can be expelled from school before completing elementary education.

Arguments Supporting Detention:

- **Decline in Learning Outcomes**
 - ✓ Over 65 lakh students failed in Classes 10 and 12 in 2023, indicating the adverse impact of automatic promotion on academic performance.
- **Reduced Motivation and Accountability**
 - ✓ The absence of a detention mechanism reduces students' drive to perform and weakens teachers' accountability.

Arguments Opposing Detention:

- **Stigmatization and Dropout Rates**
 - ✓ Fear of failure and repetition of grades could stigmatize students and increase dropout rates.
- **Holistic Child Development**
 - ✓ A child-centered educational approach focuses on comprehensive development rather than mere academic performance.

Background of the No Detention Policy:

- **Policy Origin:** The no-detention policy was introduced under the Right to Education (RTE) Act, 2009, with the aim of minimizing dropout rates by ensuring all students progressed without fear of failure.

About the RTE Act, 2009:

- **Key Provisions**
 - ✓ Right to Education: Ensures free and compulsory education for children aged 6 to 14, as mandated by the 86th Constitutional Amendment Act under Article 21A.
 - ✓ Government Schools: Must provide free education to all eligible children.
- **School Governance**
 - ✓ Schools are managed by School Management Committees (SMCs) to ensure accountability and participation.

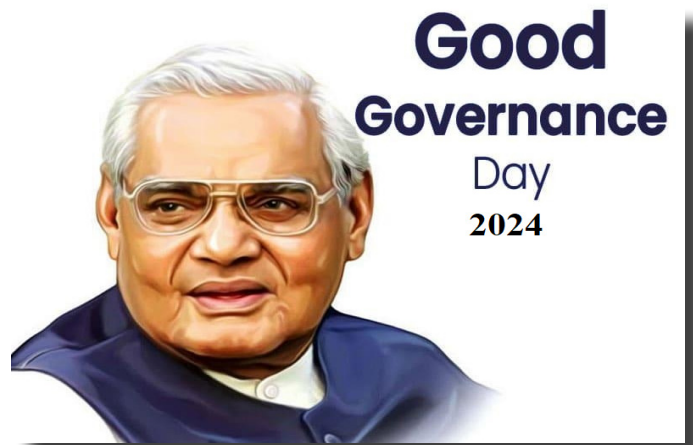
Conclusion:

- The decision to scrap the no-detention policy seeks to strike a balance between enhancing learning outcomes and addressing concerns regarding student motivation and systemic accountability.

Good Governance Day 2024

Relevance : GS II - Governance

- **In News:** Good Governance Day is observed annually on 25th December to promote awareness among citizens about the importance of accountability and effective governance.
- The theme for 2024 is **“India’s Path to a Viksit Bharat: Empowering Citizens through Good Governance and Digitalisation.”**
- Initiated in 2014 to honor the birth anniversary of former Prime Minister Atal Bihari Vajpayee.
- The birth anniversary of Pt. Madan Mohan Malaviya is also commemorated on this day.



Initiatives Launched on Good Governance Day 2024:

- **New iGOT Karmayogi Dashboard:** Enables leaders of Ministries/Departments/Organizations (MDOs) and state administrators to monitor their entities' progress and effectiveness more efficiently.
- **1600th iGOT Karmayogi Course:** Aims to establish a continuous learning environment for government employees, fostering professional growth and lifelong learning.
- **Viksit Panchayat Initiative:** Focuses on empowering Panchayati Raj Institutions (PRIs) to deliver better services, ensure good governance, and enhance the skills of Panchayat leaders.
- **CPGRAMS Annual Report 2024:** Highlights progress in strengthening public service delivery through an efficient grievance redressal system.

About Good Governance:

- **What is Good Governance?**
- Good governance refers to decision-making processes and the implementation of decisions essential for achieving developmental objectives.
 - ✓ As per the World Bank's "Governance and Development, 1992" report, good governance involves the effective exercise of power for managing a nation's economic and social resources.

- ✓ It emphasizes the fulfillment of human rights, including civil, cultural, economic, political, and social rights.
- **Key Characteristics of Good Governance**
 - ✓ **Participatory:** Ensures gender-inclusive participation, either directly or through representatives or institutions.
 - ✓ **Consensus-Oriented:** Mediates diverse societal interests to build consensus aligned with sustainable development goals.
 - ✓ **Accountable:** Institutions should be answerable to those affected by their decisions or actions.
 - ✓ **Transparent:** Decision-making processes should follow established rules, with information accessible to stakeholders.
 - ✓ **Responsive:** Institutions must address the needs of all stakeholders within reasonable timeframes.
 - ✓ **Effective and Efficient:** Ensures that societal needs are met while optimizing resource utilization.
 - ✓ **Equitable and Inclusive:** Prioritizes the well-being of all members of society, especially vulnerable groups.
 - ✓ **Rule of Law:** Advocates fair, impartial legal frameworks supported by independent judiciary systems and corruption-free enforcement agencies.

Significance of Good Governance:

- **Economic Growth:** Promoting equal rights in the workforce can increase India's GDP by USD 770 billion by 2025.
- **Social Development:** Initiatives like SWAYAM and Skill India empower marginalized groups with education and employability. Aadhaar integration and Direct Benefit Transfers (DBT) prevent leakages and eliminate intermediaries in welfare schemes.
- **Strengthening Democracy:** Platforms like MyGov amplify citizens' voices, while e-Governance reduces corruption.
- **Accountability:** The RTI Act, 2005 ensures access to government information, promoting transparency. The Public Financial Management System (PFMS) tracks fund flows, ensuring accountability in public expenditure.
- **Reducing Inequality:** Schemes like Pradhan Mantri Jan Dhan Yojana (PMJDY) foster financial inclusion, while MGNREGA guarantees wage employment for rural households.
- **Building Trust:** The e-Courts Project digitizes court processes for accessibility and efficiency. CPGRAMS addresses citizen grievances, enhancing trust in governance.

Challenges to Good Governance in India:

- **Corruption:** Corruption costs India 0.5% of GDP annually, as reported by the World Bank.
- **Lack of Accountability:** Insufficient accountability reduces public trust, leading to lower voter turnout and weakened civic engagement.
- **Criminalization of Politics:** According to the Association of Democratic Reforms (ADR), 251 (46%) members of the 18th Lok Sabha face criminal cases, with 27 being convicted.
- **Ineffective Implementation of Laws:** Anti-corruption laws like the Prevention of Corruption Act, 1988, face criticism for poor enforcement, eroding public trust.

Way Forward:

- **Decentralization of Power:** Strengthen local bodies like municipalities and Panchayats by providing them with more functional and financial authority.
- **Promoting Ethical Standards:** Instill values of integrity, accountability, and selflessness in public servants, as recommended by the Nolan Committee (1994).
- **Gender Equality:** Encourage women's participation in socioeconomic activities to address the needs of diverse societal groups.
- **Whistleblower Protection:** Provide robust safeguards to whistleblowers exposing corruption within government institutions.

Supreme Court Issues Directions for Effective Compliance of POSH Act

Relevance: GS I - Social Issue

- **In News:** The Supreme Court has issued directions to all States and Union Territories to ensure the uniform and effective implementation of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 (POSH Act).

**Directions Issued by the Supreme Court:**

- **District Officers**
 - ✓ The Court directed the Appropriate Government to notify District Officers for every district.
- **Duties of District Officers include:**
 - ✓ Constitution of Internal Complaints Committees (ICC) in organizations under their jurisdiction.
 - ✓ As per Section 4 of the POSH Act, every employer is mandated to form an ICC to receive complaints, conduct inquiries, and recommend actions.
 - ✓ Formation of Local Committees (LC) as stipulated under Section 6 of the POSH Act.
 - ✓ **These committees handle complaints in:**
 - Establishments with fewer than 10 workers.
 - Cases where the complaint is against the employer.
- **Nodal Officers**
 - ✓ Each Block/Taluka/Tehsil in rural or tribal areas and municipalities in urban areas must designate a Nodal Officer.
 - ✓ The jurisdiction of Local Committees will extend to the respective district.
- **SHe-Box Implementation**
 - ✓ States are encouraged to implement the Sexual Harassment electronic Box (SHe-Box) for registering complaints.

- ✓ SHe-Box provides a single-window access for women to register sexual harassment complaints.

Key Provisions of the POSH Act, 2013:

- **Definition of Sexual Harassment**

- ✓ The Act defines sexual harassment to include:
 - Physical contact and advances.
 - Demands or requests for sexual favors.
 - Sexually colored remarks.
 - Showing pornography.
 - Any other unwelcome physical, verbal, or non-verbal conduct of a sexual nature.

- **Applicability**

- ✓ The Act applies to:
 - All workplaces, including government and private sector organizations.
 - Hospitals, non-governmental organizations (NGOs), and employer-provided transport.
 - Locations visited during employment, including residential spaces.

- **Complaint Committees**

- ✓ The Act mandates the formation of:
 - Internal Complaints Committees (ICC) in organizations with more than 10 employees.
 - Local Committees (LC) for smaller establishments or cases involving the employer.

Significance of the Directions:

- **Ensuring Uniform Implementation:** Addresses disparities in the Act's enforcement across states and regions.
- **Enhancing Redressal Mechanisms:** Strengthens the role of ICCs and LCs in addressing grievances effectively.
- **Promoting Digital Accessibility:** Encourages the use of digital platforms like SHe-Box to provide easy access for women to register complaints.

Conclusion:

- The Supreme Court's directives aim to strengthen the implementation of the POSH Act, ensuring uniform compliance, enhanced grievance redressal mechanisms, and digital accessibility through initiatives like SHe-Box.
- These measures underscore the commitment to creating safe, inclusive, and equitable workplaces, fostering gender justice and accountability nationwide.



Working Paper on Female Labour Force Participation (LFPR)

Relevance: GS I - Social Issue

- **In News:** The Economic Advisory Council to the Prime Minister has published a research paper on Female Labour Force Participation (LFPR), analyzing data from the Periodic Labour Force Survey (PLFS) for the period 2017-18 to 2022-23.



- ✓ LFPR is defined as the proportion of both employed and unemployed individuals (actively seeking or available for work) in relation to the total population aged 15 years and older.

Key Insights:

• Current Status of Female LFPR

- ✓ Female LFPR has shown an upward trend across most states, with notable regional differences.

• Rural-Urban Discrepancy

- ✓ Rural female LFPR saw a considerable increase, from 24.6% to 41.5%, reflecting a 69% rise.
- ✓ Urban female LFPR grew at a slower pace, from 20.4% to 25.4%, indicating a 25% increase.

• Regional Differences

- ✓ States such as Jharkhand and Bihar experienced significant growth in LFPR, while Goa and Lakshadweep saw a slight decline in rural female LFPR.

Factors Affecting Female LFPR:

• Age

- ✓ Female LFPR follows a bell-shaped curve, increasing from 20-30 years, peaking around 30-40 years, and then sharply declining thereafter.
- ✓ In comparison, male LFPR remains high (around 100%) between 30-50 years, with a gradual reduction afterward.

• Marriage

- ✓ Marriage significantly reduces female LFPR, with the decline being more pronounced in urban areas than in rural regions.

• Parenthood

- ✓ The presence of children under 14 years of age greatly influences female

LFPR, particularly for younger women (aged 20-35), and the impact is more substantial in urban settings.

Initiatives to Boost Female LFPR:

- **Economic Empowerment**
 - ✓ Pradhan Mantri Mudra Yojana (PMMY)
 - ✓ Stand-Up India Scheme
- **Encouraging Women in STEM**
 - ✓ Women in Science and Engineering-KIRAN (WISE-KIRAN)
 - ✓ SERB-POWER (Supporting Women in Exploratory Research)
- **Skill Development Initiatives**
 - ✓ “NAMO Drone Didi”: A program aimed at equipping 15,000 women Self-Help Groups and Women Industrial Training Institutes with drones, enabling them to develop skills in drone technology.

Conclusion:

- The research paper highlights significant progress in female LFPR across India, especially in rural areas, but reveals persistent challenges, particularly in urban regions and due to factors like marriage and parenthood. To further improve female LFPR, a combination of economic inclusion, education, and skills development programs is essential. Initiatives such as PMMY, Stand-Up India, and NAMO Drone Didi represent crucial steps towards enhancing women's workforce participation and fostering inclusive growth.

Bima Sakhi Yojana: Empowering Women through Financial Inclusion

Relevance: GS I - Women Empowerment

- **In News:** The Prime Minister recently launched the Life Insurance Corporation of India (LIC)'s Bima Sakhi Yojana, a targeted scheme aimed at empowering women by offering financial independence & employment opportunities.

Bima Sakhi Yojana 2024



About Bima Sakhi Yojana:

- **Key Features**
 - ✓ Nature of the Scheme:

- A stipendiary program exclusively designed for women.
- The stipendiary period spans three years.
- **Stipend Details:**
 - ✓ 1st year: ₹7,000 per month.
 - ✓ 2nd year: ₹6,000 per month.
 - ✓ 3rd year: ₹5,000 per month.
 - ✓ Stipend disbursement is subject to specific conditions.
- **Employment Target:**
 - ✓ Aims to provide job opportunities to 2 lakh women.
- **Eligibility Criteria**
 - ✓ **Age:** Women aged between 18 to 70 years.
 - ✓ **Education:** Minimum qualification of Class 10th pass

Significance of Bima Sakhi Yojana:

- **Women-Centric Employment Generation**
 - ✓ Offers structured training to women, enabling them to serve as LIC agents, thereby promoting financial independence.
- **Career Advancement Opportunities**
 - ✓ Opens pathways for trained participants to be considered for the role of LIC Development Officer, fostering professional growth.

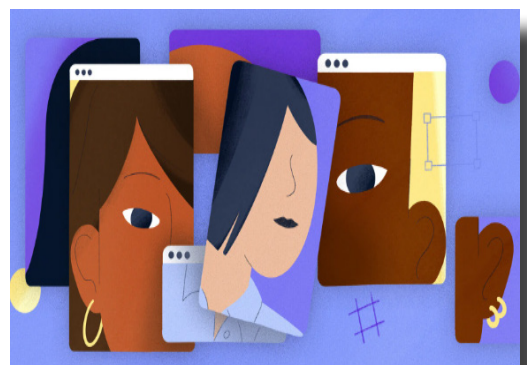
Conclusion:

- Bima Sakhi Yojana serves as a pioneering initiative to bridge the gap in women's employment while contributing to their financial empowerment and skill enhancement in the insurance sector.

Addressing Technology Facilitated Gender Based Violence in the Digital Era

Relevance: GS I - Social Issue

- **In News:** A study by the Economist Intelligence Unit indicates that 38% of adult women globally have experienced technology-facilitated gender-based violence (TFGBV), highlighting its growing prevalence in the digital age.



About Technology-Facilitated Gender-Based Violence:**• Definition**

- ✓ TFGBV involves actions conducted via the internet or mobile technologies that harm individuals based on their gender or sexual identity or reinforce harmful gender norms.

• Forms of TFGBV

- ✓ Includes cyberstalking, online trolling, non-consensual sharing of intimate content, impersonation, fraud through fake profiles, and voyeurism, among others.

Characteristics of TFGBV:**• Anonymity Across Boundaries**

- ✓ Often perpetrated anonymously, transcending geographical limits, making identification and accountability difficult.

• Ease of Execution

- ✓ Carried out with minimal resources, low-cost technology, and little expertise.

• Impunity for Perpetrators

- ✓ Abusers frequently evade legal consequences, fostering a sense of invulnerability.

• Persistent Impact

- ✓ The viral nature of digital content prolongs abuse, causing continuous psychological harm to victims.

Way Forward: Strategies to Combat TFGBV:**• Policy and International Frameworks**

- ✓ Implement the Global Digital Compact, adopted at the UN Summit of the Future, to address gender-based violence enabled by technology.

• Enhancing Digital Literacy

- ✓ Expand access to digital literacy programs, particularly in rural and underserved regions, to empower individuals against online abuse.

• Tech-Industry Collaboration

- ✓ Develop advanced AI-based content moderation tools.
- ✓ Improve user-friendly reporting mechanisms for prompt action against abusive content.

• Support Systems for Survivors

- ✓ Strengthen platforms like TechSakhi, offering survivors comprehensive

support through counseling, legal assistance, and rehabilitation services.

India's Strategy to Combat TFGBV:

- **Strengthening Legal Frameworks**
 - ✓ **Existing Laws:** IT Act (Sections 66E, 67), IPC (Sections 354D, 509), Domestic Violence Act.
 - ✓ **New Laws:** Proposed IT Act amendments; Digital India Act provisions.
- **Digital Literacy and Awareness Campaigns**
 - ✓ **Initiatives:** CCPWC, Digital Saksharta Abhiyan (DISHA).
 - ✓ **Public Campaigns:** Awareness drives in schools, workshops with NGOs.
- **Technological Innovations and Industry Collaboration**
 - ✓ **AI Tools:** For content moderation and harmful content detection.
 - ✓ **Collaborations:** Partnerships with Meta, Google, Twitter.
 - ✓ **Helplines:** Cybercrime Reporting Portal, National Women Helpline (181).
- **Institutional Frameworks and Capacity Building**
 - ✓ **Cybercrime Units:** Specialized cells in all states.
 - ✓ **Training:** For law enforcement and judicial officers.
- **Community and Survivor-Centric Support**
 - ✓ **Support Services:** TechSakhi for counseling and legal aid.
 - ✓ **Empowerment:** Programs for women entrepreneurs, safe spaces online.
- **International Collaboration**
 - ✓ **Global Dialogues:** Participation in UN Global Digital Compact.
 - ✓ **Cross-Border Cooperation:** Tackling transnational cybercrimes..

Conclusion:

- India's strategy to combat TFGBV is rooted in a combination of legal, technological, and community-driven measures. By fostering digital literacy, enhancing institutional capabilities, and promoting collaboration between stakeholders, the country aims to create a safer digital environment for all, especially women and marginalized communities.

The Landfall of a Cyclone: Cyclone Fengal's Impact on Puducherry

Relevance: GS I - Geography

- In News:** The India Meteorological Department (IMD) recently reported that Cyclone Fengal, a tropical cyclone, made landfall over Puducherry, marking a significant weather event in the region.



Formation of a Cyclone:

- A cyclone is a large storm that forms over warm ocean waters. The process begins when water evaporates from the surface of the sea and rises into the atmosphere. As the air rises, it cools and becomes saturated with vapor, eventually forming clouds.
 - ✓ **Air Circulation and Rotation:** As the clouds form, the surrounding air starts to circulate, causing the system to rotate.
 - ✓ **Role of Sea Temperature:** The warmer the sea, the more powerful the cyclone becomes, as warm waters fuel the storm's development. The process requires a specific set of conditions, such as adequate moisture and wind patterns.
- Once fully developed, a tropical cyclone in the northern hemisphere typically has a complex 3D structure with two key features:
 - ✓ **The Eye of the Cyclone:** The eye is the calm center of the storm, where air descends and cools. It is surrounded by a spiral of warm, rising air.
 - ✓ **The Eyewall of the Cyclone:** The eyewall is a ring of intense thunderstorms, which bring rain, lightning, and powerful winds. These storms can also form a central dense overcast, obscuring the view of the eye from above.

Landfall of a Cyclone:

- Definition of Landfall:** A tropical cyclone is said to have made landfall when its eye or center moves over the coast. This marks the moment when the storm transitions from water to land, losing its primary source of moisture.
- Landfall Duration:** The landfall event can last for several hours, depending on the storm's size and the speed of the winds. The duration of landfall is highly variable.

- **Impact of Landfall:** Cyclones can experience strong winds over land, even if the center (or eye) does not directly hit the region. This is because the strongest winds of a cyclone are often found outside the eye, making it possible for areas on land to feel the storm's full force even if landfall does not occur directly.

Conclusion:

- Cyclones like Fengal illustrate the intricate process of storm formation and the impact of landfall on coastal regions.
- The transition from water to land causes a shift in the storm's dynamics, with significant changes in moisture supply and storm strength. Understanding these patterns is crucial for disaster preparedness and mitigation, especially in cyclone-prone areas like Puducherry.

FAO's Global Assessment of Salt-Affected Soils

Relevance: GS I - Geography

- **In News:** The Food and Agriculture Organization (FAO) has released its inaugural comprehensive report on soil health titled "Global Status of Salt-Affected Soils".
- The report provides a detailed analysis of salt-affected soils and their implications for agriculture and environmental sustainability.



About Salt-Affected Soils:

- Salt-affected soils are classified into two main categories:
 - ✓ **Saline Soils:** Contain elevated levels of soluble salts.
 - ✓ **Sodic Soils:** Have an abundance of exchangeable sodium ions.
- These soils are characterized by high electrical conductivity, which adversely impacts soil fertility and plant growth.

Causes of Salinization and Sodification

- **Anthropogenic Factors**
 - ✓ **Unsustainable Agricultural Practices:**
 - Overapplication of fertilizers.
 - Use of substandard water resources & excessive extraction of aquifers for irrigation.
 - Inadequate drainage systems, leading to waterlogging & salt accumulation.
- **Deforestation:** Removal of deep-rooted vegetation, particularly in arid regions, contributes to dryland salinization.

- **Other Human Activities:**

- ✓ Excessive groundwater pumping in coastal and inland regions, leading to saltwater intrusion.
- ✓ Mining operations that expose soils to salt.

- **Natural Factors**

- ✓ **Climate Change:**

- Increasing aridity due to rising global temperatures.
- Thawing of permafrost, releasing salts into the soil.

Key Findings of the Report:

- **Global Perspective**

- ✓ **Extent of Salt-Affected Soils:** Approximately 10% of the global land area, equating to 1.4 billion hectares.
- ✓ **Projected Increase:** Salt-affected soils could expand to 24-32% of the global land area.
- ✓ **Most Affected Countries:**
 1. **Australia:** The largest area of salt-affected soils globally.
 2. **Oman:** The highest percentage of salt-affected soils.

- **India-Specific Insights**

- ✓ **Extent of Affected Area:** Approximately 6.72 million hectares (~2.1% of India's total geographic area).
- ✓ **Most Affected States:**
 - Gujarat (largest area), followed by Uttar Pradesh, Maharashtra, West Bengal, and Rajasthan.

- **Impact on Irrigated Land:** Around 17% of irrigated agricultural land is affected due to the use of brackish groundwater for irrigation.

Sustainable Management Practices:

- **Mitigation Strategies: Mulching:** Helps conserve soil moisture and reduce salt accumulation on the surface.
- **Adaptation Efforts: Salt-Tolerant Crop Varieties:** Breeding and cultivating plants capable of thriving in saline environments.
- **Bioremediation:** Utilizing biological processes to rehabilitate salt-affected soils, such as planting salt-absorbing vegetation.



Ken-Betwa Link Project (KBLP): A Landmark Initiative

Relevance: GS I - Geography

- **In News:** Prime Minister Narendra Modi has laid the foundation stone for the Ken-Betwa River Linking National Project, the first interlinking river project under the National Perspective Plan (NPP) conceptualized in 1980.
- Notably, the project involves submerging over 10% of the core area of the Panna Tiger Reserve.



About the Ken-Betwa Link Project:

- **Objective:** To facilitate the transfer of water from the Ken River to the Betwa River, both tributaries of the Yamuna River.
- **Key Features**
 - ✓ **Ken-Betwa Canal:** The project envisages constructing a 221-kilometer canal, including a 2-kilometer tunnel, to channel water between the rivers.
 - ✓ **Submergence Area:** Covers districts such as Jhansi, Banda, Lalitpur, & Mahoba in Uttar Pradesh, & Tikamgarh, Panna, & Chhatarpur in Madhya Pradesh.
 - ✓ **National Perspective Plan:** It is the first project initiated under the National Perspective Plan of 1980 for river interlinking.
 - ✓ **Timeline:** Targeted completion within 8 years, as stated by the Ministry of Jal Shakti.

Key Components of the Project:

- **Irrigation and Water Supply**
 - ✓ Aims to irrigate 10.62 lakh hectares of agricultural land (8.11 lakh hectares in MP and 2.51 lakh hectares in UP).
 - ✓ Will provide drinking water to approximately 62 lakh people.
- **Energy Generation**
 - ✓ Plans to generate 103 MW of hydropower and 27 MW of solar power.
- **Phases of Implementation**
 - ✓ **Phase-I:** Includes the construction of the Daudhan Dam, tunnels, canals, and hydropower facilities.
 - ✓ **Phase-II:** Focuses on building the Lower Orr Dam, Bina Complex Project, and Kotha Barrage.

Daudhan Dam Highlights:

- Foundation stone laid in December 2024 by PM Narendra Modi.
- Dimensions: 2,031 meters long and 77 meters high, submerging around 9,000 hectares across 10 villages.
- Construction contract awarded to NCC Ltd.

Geographical Features of Ken and Betwa Rivers:

- **Ken River**
 - ✓ Originates near Ahirgawan in Madhya Pradesh.
 - ✓ Flows through Bundelkhand and joins the Yamuna near Chilla village in Uttar Pradesh.
- **Betwa River**
 - ✓ Rises in the Vindhya Range near Hoshangabad, Madhya Pradesh.
 - ✓ Traverses Bundelkhand & merges with the Yamuna at Hamirpur in Uttar Pradesh.
- Both rivers flow through hilly and plateau regions of Bundelkhand, often experiencing drought-like conditions due to their highly seasonal nature and dependence on monsoon rainfall.

Significance of the Project:

- **Addressing Water Scarcity**
 - ✓ Aims to alleviate drought-prone conditions in Bundelkhand by ensuring year-round irrigation.
- **Boosting Agriculture**
 - ✓ Expected to benefit 10.62 lakh hectares of farmland, enhancing crop yields and improving farmer income.
- **Drinking Water Supply**
 - ✓ Targets providing clean water to nearly 62 lakh residents in MP and UP, contributing to better public health.
- **Renewable Energy Expansion**
 - ✓ Will contribute 130 MW of renewable energy (hydropower and solar), addressing energy deficits in rural areas.
- **Bundelkhand's Development**
 - ✓ Expected to drive socio-economic growth, reduce rural migration, and support industrial development in the region.
- **Setting a Precedent**
 - ✓ As the first project under the National Perspective Plan, its successful implementation could serve as a model for future river-linking projects nationwide.



Conclusion:

- The Ken-Betwa Link Project stands as a transformative initiative that promises to address critical challenges of water scarcity, agricultural productivity, and socio-economic development in the drought-prone Bundelkhand region.
- By integrating innovative infrastructure, renewable energy generation, and resource management, the project exemplifies a holistic approach to interlinking rivers under the National Perspective Plan. While its success could serve as a template for similar projects across India, balancing ecological concerns, such as the impact on the Panna Tiger Reserve, with developmental priorities remains crucial.
- Ultimately, the KBLP symbolizes India's commitment to achieving water security, sustainable development, and equitable growth for its citizens.

South Korea Becomes a 'Super-Aged' Society**Relevance : GS I - Geography**

- **In News:** The South Korean Ministry of the Interior and Safety recently announced that the country has officially transitioned into a "super-aged" society, as individuals aged 65 and above now constitute more than 20% of its population.
- South Korea is only the second country in Asia, after Japan, to attain this demographic status



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UN Classification:

- **Aging:** Population aged 65+ surpasses 7%.
- **Aged:** Population aged 65+ exceeds 14%.
- **Super-aged:** Population aged 65+ surpasses 20%.

Status of Aging:

- **Global Trends**
 - ✓ The population aged 60+ worldwide was 1 billion in 2020, projected to reach 2.1 billion by 2050.
 - ✓ While population aging initially affected high-income nations like Japan, it is now accelerating in low- and middle-income countries, which will house two-thirds of the elderly by 2050.

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- **India's Aging Population**

- ✓ By 2050, over 20% of India's population will be elderly (UNFPA 2023).

Challenges of an Aging Society:

- **Economic Challenges**

- ✓ Declining workforce leading to reduced economic productivity.
- ✓ Increased healthcare expenses and social security obligations.

- **Social Challenges**

- ✓ Families face heightened caregiving responsibilities.
- ✓ The need to bridge generational gaps and maintain societal cohesion.

- **Infrastructure Challenges**

- ✓ Urban spaces must be adapted for age-friendly living.
- ✓ Transportation systems need to accommodate reduced mobility.

Steps Taken:

- **Global Efforts**

- ✓ **UN Madrid International Plan of Action on Ageing (2002):** Advocates for enhanced quality of life for the elderly.
- ✓ **WHO Global Strategy (2016–2020):** Promotes healthy aging and supportive environments.
- ✓ **UN Sustainable Development Goals (SDGs):** Address aging through:
 - ✓ **Goal 3:** Ensure healthy lives.
 - ✓ **Goal 10:** Reduce inequality.
- ✓ **UN Decade of Healthy Ageing (2021–2030):** Focuses on collaborative actions to improve the well-being of older adults.

- **India's Initiatives**

- ✓ **Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana (AB-PMJAY):** Public health insurance for vulnerable populations.
- ✓ **National Policy for Older Persons, 1999:** Outlines strategies to support elderly citizens.
- ✓ **Maintenance and Welfare of Parents and Senior Citizens Act, 2007:** Mandates care and financial support for elderly parents.
- ✓ **National Programme for the Health Care for the Elderly (NPHCE):** Provides preventive, curative, and rehabilitative services for senior citizens.

Kilauea Volcano: A Renewed Eruption

Relevance: GS I - Geography

- **In News:** Hawaii's Kilauea Volcano, recognized as one of the world's most active volcanoes, has erupted once again.



About Kilauea Volcano:

- **Location**
 - ✓ Found in the southern region of Hawaii's Big Island, within the boundaries of Hawai'i Volcanoes National Park, USA.
- **Type**
 - ✓ The youngest and most dynamic Hawaiian shield volcano, noted for its frequent and prolonged eruptions.
- **Eruption Zones**
 - ✓ Eruptions originate either from vents at its summit caldera or along rift zones.
- **Mythological Importance**
 - ✓ The Halema'uma'u Crater at its summit is believed to be the abode of Pele, the Hawaiian goddess of fire.
- **Historical Activity**
 - ✓ Hosted a lava lake until 1924.
 - ✓ Experienced nearly continuous eruptions during the 19th & early 20th centuries.
 - ✓ Has erupted 34 times since 1952, with near-continuous activity recorded from 1983 to 2018 in the East Rift Zone.

Key Features of Kilauea Volcano:

- **Summit Caldera**
 - ✓ A large depression formed by the partial collapse of the volcano following magma release.
 - ✓ Measures approximately 3 miles long and 2 miles wide, spanning an area of over 4 square miles.
- **Proximity to Mauna Loa**
 - ✓ The slopes of Kilauea and Mauna Loa seamlessly integrate, creating a region that hosts two of the world's most active volcanoes.

What is a Shield Volcano?

- **Definition**
 - ✓ A volcano characterized by broad and gentle slopes formed by the eruption of

highly fluid basaltic lava.

- **Features**

- ✓ Unlike the steep, conical peaks of composite volcanoes, shield volcanoes exhibit elongated, dome-like shapes.
- ✓ Eruptions are typically non-explosive, with cinder cones and spatter cones forming around vents.
- ✓ Explosions occur only when water interacts with the vent.

- **Examples**

- ✓ Notable shield volcanoes include Kilauea and Mauna Loa in Hawaii.

Volcanoes in India:

- **Active Volcano**

- ✓ Barren Island (Andaman Islands): India's only active volcano.

- **Dormant Volcano**

- ✓ Narcondam (Andaman Islands): Dormant volcanic site.

- **Other Types**

- ✓ **Baratang (Andaman Islands):** Famous for mud volcanoes.
- ✓ **Deccan Traps (Maharashtra):** An extensive volcanic plateau formed by ancient eruptions.
- ✓ **Dhinodhar Hills (Gujarat):** Extinct volcanic site.
- ✓ **Dhosi Hill (Haryana):** Historical volcanic location of ancient origin.

World's Largest Hydropower Dam on Brahmaputra

Relevance : GS I - Geography

- **In News:** China has greenlit the construction of the world's largest dam, which will also be its most significant infrastructure project, in the Medog region of Tibet.
- The proposed dam is set to have a capacity three times greater than the current largest hydropower dam in the world, the Three Gorges Dam in central China.



Project Overview:

- **Location**

- ✓ The dam will be situated on the lower reaches of the Yarlung Zangbo River (the Tibetan name for the Brahmaputra River).

- ✓ It lies at a deep gorge in the Himalayan region where the river makes a dramatic U-turn before flowing into Arunachal Pradesh, India.
- **Stated Purpose**
 - ✓ To advance China's carbon neutrality objectives.
 - ✓ To boost regional industries and generate employment opportunities in Tibet.

Concerns Associated with the Dam Construction:

- **Engineering Challenges**
 - ✓ The Tibetan plateau, known as the "roof of the world," is highly seismically active due to its location over tectonic plate boundaries, making construction complex and risky.
- **Environmental Impact**
 - ✓ **Ecological Disruption:** Potential changes in the local environment and downstream water availability.
 - ✓ Risk of altering the river's natural course, with possible adverse effects on agriculture and biodiversity in downstream areas.
- **Geopolitical Risks**
 - ✓ India and Bangladesh's Concerns:
 - The dam may give China the ability to regulate water flow to downstream countries.
 - Fears of using controlled water release during geopolitical tensions, potentially causing floods in lower riparian states.

Existing Mechanisms and India's Response:

- **Expert Level Mechanism (ELM)**
 - ✓ Established in 2006 to address issues concerning transboundary rivers.
 - ✓ Under this framework, China shares hydrological data on the Brahmaputra and Sutlej Rivers with India during flood seasons.
- **India's Measures**
 - ✓ India is constructing its own hydropower dam on the Brahmaputra River in Arunachal Pradesh, aimed at balancing the hydrological and strategic implications of China's project.

Conclusion:

- This development underscores the need for enhanced regional cooperation to manage shared river resources and mitigate potential ecological and geopolitical risks.

Coastal Erosion in India: A Growing Concern

Relevance : GS III - Environment

- **In News:** The Union Environment Minister has raised concerns over coastal erosion in India, emphasizing the challenges posed to livelihoods along the country's extensive coastline.



Status of Coastal Erosion in India:

Extent of the Problem

- ✓ India's coastline spans 7,500 kilometers, serving as a critical buffer between land and sea.
- ✓ According to the National Centre for Coastal Research (NCCR):
 - 33.6% of the coastline is eroding.
 - 26.9% is accreting (gaining land).
 - 39.5% remains stable.

State-wise Impact

- ✓ More than 40% of erosion is concentrated in four states/UTs:
 - West Bengal (63%)
 - Puducherry (57%)
 - Kerala (45%)
 - Tamil Nadu (41%)

About Coastal Erosion:

Definition

- ✓ Coastal erosion refers to the breakdown and removal of land by the sea.
- ✓ It occurs through destructive waves using processes like:
 - **Hydraulic Action:** Force of water dislodging materials.
 - **Compression:** Air trapped in cracks by waves, causing rock to break.
 - **Abrasion:** Erosion by sediments carried by waves.
 - **Attrition:** Breaking down of particles as they collide.
- ✓ **Erosional Landforms**

- Coastal erosion results in the formation of:
- Cliffs, Terraces, Caves, Stacks, Arches, and Stumps.

Causes of Coastal Erosion:

- **Natural Causes**
 - ✓ Sea-Level Rise
 - ✓ Depletion of Mangroves
 - ✓ Cyclonic Activity
 - ✓ Action of Waves, Winds, Tides, and Currents
 - ✓ Storm Surges
- **Anthropogenic (Human-Induced) Causes**
 - ✓ Unregulated Sand Extraction
 - ✓ Construction of Ports
 - ✓ Dredging of Tidal Entrances and Channels
 - ✓ Dams Reducing Sediment Flow
 - ✓ Beach Nourishment Activities.

Innovative Solutions for Coastal Erosion:

- **Technology and Community Involvement**
 - ✓ Community-Driven Conservation Programs
 - ✓ Real-Time Erosion Monitoring: Leveraging artificial intelligence (AI).
- **Nature-Based Solutions**
 - ✓ Climate-Resilient Sand Nourishment
 - ✓ Mangrove Reforestation
- **Policy-Level Interventions**
 - ✓ Shoreline Management Plans (SMPs) that address local and regional drivers of erosion.

Initiatives to Address Coastal Erosion:

- **Policy Frameworks**
 - ✓ **Shoreline Management Plans:** Developed as per the Coastal Regulation Zone (CRZ) Notification, 2019.
 - ✓ **No Development Zones (NDZs):** Created under CRZ, 2019 to protect coastlines from encroachment and erosion.
- **Key Projects and Tools**
 - ✓ **K-SHORE Project:** Supported by the World Bank for sustainable shoreline management.
 - ✓ **Coastal Management Information System (CMIS):** A data-driven approach for coastal management.



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Conclusion:

- Coastal erosion presents a critical environmental and socio-economic challenge for India. With one-third of its coastline eroding, sustainable solutions such as nature-based interventions, technological tools, and robust policies are imperative to protect coastal ecosystems and livelihoods.

Madhav National Park to be Designated as a Tiger Reserve

Relevance: GS III - Environment

- In News:** The National Tiger Conservation Authority (NTCA) has granted in-principle approval for the designation of Madhav National Park, located in Shivpuri district, as a Tiger Reserve. This will make it the 9th tiger reserve in the state of Madhya Pradesh.



About Madhav National Park:

- History and Location:** Madhav National Park, one of the oldest national parks in Madhya Pradesh, was notified in 1956. It is situated in the upper Vindhyan hills, which is an important ecological zone in India.
- Key Features of the Park**
 - ✓ **Lakes:** The park is home to two prominent lakes, Sakhya Sagar and Madhav Sagar, located in its southern part.
 - ✓ **Wildlife:** The Sakhya Sagar lake is famous for its abundant population of marsh crocodiles.
 - ✓ **Highest Point:** The park also features George Castle, built by Jivaji Rao Scindia of the Gwalior royal family, which is the highest point in the park.
- Forest Type:** Madhav National Park is characterized by Northern tropical dry deciduous mixed forests as well as Dry Thorn Forests, typical of the north-western region of Madhya Pradesh. According to the Champion and Seth system of classification, the park's forest types are classified under the category 5B/C2, based on factors such as climate, species composition, and topography.
- Flora and Fauna**
 - ✓ **Vegetation:** Important tree species found in the park include Kardhai, Salai, Dhaora, and Khair. The understory vegetation includes Ber, Makor, and Karonda, while Jamun and Mahua are found along the nullahs.

- ✓ **Wildlife:** The park is home to a variety of animals, including Nilgai, Chinkara, Chowsinga, Chital, Sambar, and Barking Deer. Larger predators such as the Leopard, Wolf, Jackal, Fox, Wild Dog, Wild Pig, Porcupine, and Python are also found in the park.

Tiger Conservation Efforts in Madhav National Park:

- **Breeding Program:** Madhav National Park has made significant strides in tiger conservation. After a successful breeding program, the park welcomed its first tiger cubs in September 2024, marking a historic milestone in the park's restoration efforts.
- **Ratapani Wildlife Sanctuary:** While Madhav has received in-principle approval for tiger reserve status, Ratapani Wildlife Sanctuary in the state is still awaiting notification despite the NTCA's approval for tiger reserve status in 2008. Once notified, it will become the 8th tiger reserve in Madhya Pradesh.

Tiger Population in India:

- According to the National Tiger Conservation Authority and the Wildlife Institute of India, Madhya Pradesh has the highest tiger population in India, with 785 tigers. This is followed by Karnataka (563 tigers) and Uttarakhand (560 tigers).

Conclusion:

- The designation of Madhav National Park as a Tiger Reserve represents a major step in the state's tiger conservation efforts.
- With successful breeding programs, the addition of new reserves, and the high tiger population in the state, Madhya Pradesh continues to play a leading role in wildlife conservation in India.

Advances & setbacks as Global Plastics Treaty negotiations adjourn

Relevance: GS III - Environment

- **In News:** The fifth session of negotiations for a legally binding treaty on plastic pollution concluded without finalization in Busan, South Korea.
- This treaty, mandated by a 2022 UN Environment Assembly resolution, aims to address the full life cycle of plastics, including production, design, and disposal.



Factors Leading to Non-Finalization of the Treaty:

- **Production Capping**
 - ✓ The European Union, Latin American, and African countries pushed for production cap goals.
 - ✓ Opposition came from countries including India and China.
- **Unclear Definitions**
 - ✓ The draft text lacked clarity on terms such as microplastics, nanoplastics, primary plastic polymers, and recycling, despite defining plastic and plastic products.

India's Stance:

- **Impact on Development**
 - ✓ India opposed regulating the production of primary plastic polymers, citing potential adverse impacts on development rights.
- **Defining Scope**
 - ✓ India emphasized that the treaty should focus solely on addressing plastic pollution and avoid overlapping with mandates of other multilateral environmental agreements.
- **Phase-Out Period**
 - ✓ India resisted including any phase-out list with specific deadlines at this stage.
- **Financial and Technical Assistance**
 - ✓ India advocated for consideration of national circumstances and capabilities, along with provisions for financial aid, technical support, and technology transfer to developing countries.

Plastic Pollution: Current Status and Implications:

- **Global Production**
 - ✓ Over 460 million metric tons of plastic are produced annually, with 19-23 million tonnes leaking into aquatic ecosystems.
- **Environmental Impacts**
 - ✓ Plastic pollution disrupts habitats, natural processes, and ecosystems' ability to adapt to climate change.
 - ✓ It directly affects millions of people by threatening livelihoods, food security, and social well-being.
- **Link to Climate Change**
 - ✓ Approximately 98% of single-use plastic products are derived from fossil fuels, contributing significantly to greenhouse gas emissions.

Conclusion:

- This adjournment highlights the challenges in reaching a global consensus on addressing plastic pollution.
- India's stance underscores the need for an equitable approach that balances environmental priorities with developmental rights.
- The treaty, once finalized, holds the potential to combat the growing global menace of plastic pollution effectively

Forest Rights under FRA, 2006 Granted to Tribals in Anamalai Tiger Reserve (ATR)

Relevance: GS III - Environment

- **In News:** The District Level Committee (DLC) has approved community and individual forest rights under the Forest Rights Act (FRA), 2006, for the Nagaroothu I, Nagaroothu II, and Chinnarpathi tribal settlements located in the Anamalai Tiger Reserve (ATR), Tamil Nadu.



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About the Forest Rights Act (FRA), 2006:**Overview**

- ✓ The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, commonly referred to as the FRA, was enacted to:
 - Address historical injustices faced by forest-dwelling communities.
 - Secure livelihoods and food security for these communities.

Key Features of FRA, 2006:**Forest Rights Recognized****✓ Individual Rights:**

- Rights related to self-cultivation and habitation.
- In-situ rehabilitation for those displaced by forest conservation initiatives.

✓ Community Rights:

- Access to grazing lands, fishing areas, and water bodies in forests.
- Rights to intellectual property and traditional knowledge.
- Protection of customary and traditional practices.

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Critical Wildlife Habitats:

- ✓ While recognizing rights, the Act ensures that critical wildlife habitats in National Parks and Sanctuaries remain inviolate to conserve biodiversity.

Eligibility for Forest Rights:

- Any individual or community can claim rights if they have resided in forest areas and depended on them for their livelihood for at least three generations (75 years) before December 13, 2005.

Institutions for Vesting Forest Rights:

- **Gram Sabha:**
 - ✓ Initiates the process for determining the nature and extent of forest rights.
- **Sub-Divisional Level Committee (SDLC):**
 - ✓ Reviews and examines the resolutions passed by Gram Sabhas.
- **District Level Committee (DLC):**
 - ✓ Grants the final approval for individual and community forest rights.

Challenges in Implementation:

- The Xaxa Committee highlighted several challenges in implementing FRA:
 - ✓ Arbitrary Rejections of claims.
 - ✓ Absence of Deadlines for processing claims.
 - ✓ Exclusion of Displaced Persons: Forest rights of those displaced by development projects are often overlooked.

Conclusion:

- The recent approval of forest rights in ATR, Tamil Nadu, underlines the ongoing efforts to empower tribal communities by acknowledging their legitimate claims to forest resources.
- The FRA, 2006, remains a critical tool in safeguarding the rights and livelihoods of forest-dwelling communities while ensuring the sustainable management of forest ecosystems.



Indigenous Communities & Their Role in Combating Desertification

Relevance : GS III - Environment

- **In News:** The first-ever 'Indigenous Peoples Forum' at COP16 of the UN Convention to Combat Desertification (UNCCD) emphasized the critical contributions of indigenous communities in promoting land conservation & sustainable resource management.



Who are Indigenous Peoples?

- **Definition:** Indigenous communities are groups that preserve unique traditions and maintain distinct social, cultural, economic, and political identities compared to dominant societies.
- **Examples:**
 - ✓ Aborigines (Australia)
 - ✓ Maori (New Zealand)
 - ✓ Santhals (India)
- **Global Representation:** Indigenous peoples constitute only 5% of the global population but are recognized as “gatekeepers of green areas”, which cover 22% of the Earth’s surface.

Role of Indigenous Communities in Combating Desertification:

- **Regenerative Agriculture and Agroforestry:** Example- Mayan communities use the Milpa polyculture technique to sustainably cultivate crops while preserving soil fertility.
- **Protected Area Management:** Example- The Soligas Tribe collaborates in managing the Biligiri Rangaswamy Temple Wildlife Sanctuary (BRTWS) in India.
- **Forest Restoration:** Example- Khasi and Garo tribes of Meghalaya maintain sacred groves, ensuring forest preservation.
- **Water Management:** Example- Indigenous systems like the karez or surang bavi in the Bidar region are used for harvesting and conserving rainwater.

Challenges Faced by Indigenous Peoples:

- **Socioeconomic Issues:** Extreme poverty, forced displacement, and gender discrimination.

- **Political and Service Barriers:** Poor political representation and limited access to social services.
- **Environmental Impact:** Vulnerability to climate change.

Recommendations:

- **Inclusion in Decision-Making:** Actively involve indigenous communities in global discussions on the protection of green areas.
- **Secure Land Rights:** Ensure land ownership for indigenous peoples and provide them with direct financial access to implement conservation measures.
- **Integration of Traditional Knowledge:** Develop frameworks to incorporate traditional ecological practices into national and global policies.

Steps Taken for Green Area Protection Using Indigenous Knowledge:

- **Joint Forest Management (JFM):** Empowers local communities to manage degraded forest lands under government supervision.
- **Green India Mission (GIM):** Focuses on protecting, restoring, and enhancing forest cover in India.
- **Traditional Knowledge Digital Library (TKDL):** A digital repository designed to prevent bio-piracy and misappropriation of indigenous knowledge.
- **Forest Rights Act (FRA), 2006:** Provides for community rights over forests and acknowledges traditional practices for forest and resource management.

UNESCO Environmental DNA (eDNA) Expeditions in World Heritage Marine Sites (WHMS)

Relevance: GS III - Environment

- **In News:** The United Nations Educational, Scientific and Cultural Organization (UNESCO), in its report titled 'Engaging Communities to Safeguard Ocean Life', highlighted the vulnerability of marine species to warming oceans.
- This report is based on findings from Environmental DNA (eDNA) expeditions conducted across UNESCO's World Heritage Marine Sites.



About UNESCO's eDNA Expeditions:

- **Objective:** A global citizen science initiative designed to measure marine biodiversity and analyze the impact of climate change on species distribution within UNESCO's WHMS.
- **Coverage:** eDNA sampling campaigns were conducted in 21 of the 51 UNESCO WHMS between September 2022 and July 2023.

Understanding Environmental DNA (eDNA):

- **Definition:** eDNA refers to genetic material shed by organisms into their surroundings, including cells, tissues, fluids, and excrement.
 - ✓ This material can be extracted and analyzed from environmental samples.

Significance of eDNA:

- **Wide-Scale Application:** Enables sampling across large and geographically distant regions.
- **Technological Advantages:** Highly sensitive and provides rapid data compared to conventional bio-monitoring methods.
- **Sustainability:** As a non-invasive technique, it minimizes environmental impact.
- **Cost-Efficiency:** Collection of samples is cost-effective while detecting rare, transient, and invasive species.
 - ✓ **Example:** Detection of invasive lionfish in Belize.

Limitations of eDNA:

- **Limited Data Insight:** It only confirms the presence of species but does not provide information on population size, sex, or life stage.
- **Identification Challenges:** Many species lack representation in DNA reference databases, leading to difficulties in accurate identification.
- **Other Constraints**
 - ✓ Susceptible to contamination during sample collection.
 - ✓ High costs for sample analysis in specialized laboratories.

UNESCO World Heritage Marine Sites (WHMS):

- **Carbon Storage:** These sites constitute over 20% of the world's blue carbon ecosystems and contain carbon assets equivalent to approximately 10% of global greenhouse gas emissions.
- **Indian Context:** Sundarbans National Park in India is among the listed WHMS.
- **Threats and Biodiversity**



- ✓ Over 70% of these sites are endangered by climate change (as per IUCN reports).
- ✓ They host around 35% of globally threatened marine species.
- **Marine Protected Areas (MPAs):** WHMS serve as proxies for a global network of 18,000 MPAs.
- **India has:**
 - ✓ 26 MPAs in the Peninsular region.
 - ✓ 106 MPAs in the Island territories.

World's First Green Steel Taxonomy

Relevance: GS III - Environment

- **In News:** India has become the first country to introduce a Green Steel Taxonomy, setting a global precedent in defining standards for sustainable steel production.
- This development represents a significant milestone in India's efforts to decarbonize its steel sector.



What is the Green Steel Taxonomy?

- **Definition**
 - ✓ A framework defining “green steel” based on its carbon emission intensity, positioning India as a global leader in setting sustainability benchmarks in steel production.
- **Key Features**
- **Emission Intensity Threshold**
 - ✓ Steel qualifies as “green” if its CO₂ equivalent emission intensity is less than 2.2 tonnes of CO₂e per tonne of finished steel (tfs).
- **Star Rating System**
 - ✓ Categorizes green steel based on emission intensity:
 - Five-star: < 1.6 tCO₂e/tfs
 - Four-star: 1.6 – 2.0 tCO₂e/tfs
 - Three-star: 2.0 – 2.2 tCO₂e/tfs
- **Scope of Emissions**
 - ✓ **Includes**
 - Scope 1: Direct emissions from steel production.

- Scope 2: Indirect emissions from energy consumption.
- Limited Scope 3: Emissions from the supply chain.
- **Nodal Agency**
 - ✓ The National Institute of Secondary Steel Technology (NISST) is responsible for Measurement, Reporting, and Verification (MRV) and issuing greenness certificates.
- **Review Mechanism**
 - ✓ The emission intensity threshold will be reviewed every three years to ensure alignment with technological advancements and environmental goals.

Benefits of the Green Steel Taxonomy:

- **Environmental Sustainability**
 - ✓ Drives decarbonization in the steel sector, which is a major contributor to greenhouse gas emissions.
- **Global Leadership**
 - ✓ Establishes India as a trailblazer in defining and promoting green steel standards.
- **Market Creation**
 - ✓ Encourages demand for low-carbon steel products and fosters innovation in sustainable steelmaking technologies.
- **Policy Coherence**
 - ✓ Provides a clear framework for formulating policies and incentives to support green steel production.

Challenges:

- **Implementation**
 - ✓ Achieving emission intensity targets requires significant investments in technology and infrastructure.
- **Data Collection and MRV**
 - ✓ Ensuring accurate and reliable measurement, reporting, and verification of emissions is critical for success.
- **Competitiveness**
 - ✓ Balancing global market competitiveness while adhering to green steel standards remains a challenge for Indian producers.

Key Initiatives to Decarbonize the Steel Sector in India:

- **National Mission on Green Steel (NMGS)**
 - ✓ Provides a comprehensive framework for the transition to green steel production, offering financial incentives, R&D support, & policy interventions.



- **Green Steel Public Procurement Policy (GSPPP)**
 - ✓ Promotes the use of green steel in government procurement, boosting demand for low-carbon steel products.
- **Steel Scrap Recycling Policy 2019**
 - ✓ Encourages the use of steel scrap, which reduces reliance on carbon-intensive primary steel production routes.
- **Perform, Achieve, and Trade (PAT) Scheme**
 - ✓ Incentivizes energy efficiency improvements in steel manufacturing.
- **Carbon Capture, Utilization, and Storage (CCUS)**
 - ✓ Although in its nascent stage, CCUS holds promise for capturing and storing carbon emissions from steel plants, aiding in long-term decarbonization..

Conclusion:

- The introduction of the Green Steel Taxonomy underscores India's commitment to sustainable development and climate goals. By pioneering a global framework for low-carbon steel production, India sets a strong example for environmental leadership while addressing the challenges of industrial decarbonization.
- This move not only aligns with India's broader climate targets but also positions the country as a key player in shaping the global discourse on green industrial practices.

India Undertakes First-Ever Tagging of Ganges River Dolphins in Assam

Relevance: GS III - Environment

- **In News:** India has undertaken its inaugural dolphin tagging initiative for the Ganges River Dolphin in Assam as part of Project Dolphin.

About the Tagging Initiative:

- **Objective**
 - ✓ The tagging exercise aims to enhance understanding of the dolphins' migratory behavior, range, distribution, and habitat usage, especially in fragmented river systems.
- **Implementation and Funding**
 - ✓ Conducted by the Ministry of Environment, Forest and Climate Change (MoEFCC) and implemented by the Wildlife Institute of India (WII) in collaboration with the Assam Forest Department.



- ✓ **Funding Source:** National CAMPA Authority under the Compensatory Afforestation Fund (CAF) Act, 2016.
 - The National CAMPA Authority oversees the National Compensatory Afforestation Fund, maintained under the Public Account of India.

About Project Dolphin:

- **Launch:** Initiated in 2020 by the MoEFCC, modeled after Project Tiger.
- **Aim:** Focuses on the conservation of Ganges River Dolphins and their associated river ecosystems.

About the Ganges River Dolphin:

- **General Information**
 - ✓ **Scientific Name:** Platanista gangetica
 - ✓ **Status:**
 - IUCN Classification: Endangered
 - India hosts approximately 90% of the global population.
 - ✓ **National Significance:** Recognized as India's National Aquatic Animal and endemic to the Indian subcontinent.
 - ✓ **Habitat:** Found exclusively in freshwater systems including:
 - Ganges-Brahmaputra-Meghna river basins.
 - Karnaphuli-Sangu river systems in Nepal, India, and Bangladesh.

Key Features of Ganges River Dolphin:

- **Blindness and Echolocation**
 - ✓ They are functionally blind and rely on echolocation (using sound reflections) for survival and biological activities.
- **Physical Characteristics**
 - ✓ Long, thin snout and large flippers.
 - ✓ Females are significantly larger than males.
- **Ecological Role**
 - ✓ Considered an umbrella species, often referred to as the “Tiger of the Ganges.”
- **Local Name**
 - ✓ Known as ‘Susu,’ a name derived from the distinctive sound they emit while breathing.

Significance of the Initiative:

- The tagging program marks a significant step towards understanding the species' ecological needs, aiding in conservation planning, and ensuring the health of the riverine ecosystems critical for their survival.

India State of Forest Report (ISFR) 2023

Relevance : GS III - Environment

- In News:** The India State of Forest Report (ISFR) 2023, a biennial publication of the Forest Survey of India (FSI) under the Ministry of Environment, Forest and Climate Change (MoEFCC), was released by the Union Minister for Environment, Forest, and Climate Change.



- The report, first published in 1987, is now in its 18th edition. Batches list - 24-25

Key Findings of ISFR 2023:

Forest and Tree Cover

- ✓ The total forest and tree cover has risen to 25.17% of the country's geographical area, showing an improvement from the 24.62% recorded in the 2021 assessment.
 - **Forest Cover:** 21.76%
 - **Tree Cover:** 3.41%
- ✓ **States with the Maximum Increase**
 - Chhattisgarh, Uttar Pradesh, Odisha, and Rajasthan witnessed the most significant rise in forest cover.
- ✓ **States/UTs with High Forest Cover**
 - Nineteen states/UTs have forest cover exceeding 33% of their area.
 - Among these, eight states/UTs, including Mizoram, Lakshadweep, Andaman & Nicobar Islands, Arunachal Pradesh, Nagaland, Meghalaya, Tripura, and Manipur, boast forest cover above 75%.
- ✓ The National Forest Policy, 1988 recommends a minimum of 33% of the total land area under forest or tree cover as a national goal.

Mangrove Cover

- ✓ The total mangrove cover in India stands at 4,992 km², marking a decrease of 7.43 km² compared to 2021.
 - **Decline:** Gujarat
 - **Increase:** Andhra Pradesh and Maharashtra

Carbon Stock and National Targets

- ✓ The carbon stock has increased to 30.43 billion tonnes (Bt) of CO₂ equivalent.
 - India has achieved an additional 2.29 Bt of carbon sink (compared to 2005 levels), moving closer to its Nationally Determined Contributions (NDCs)

target of 2.5–3.0 Bt by 2030.

- **Bamboo Bearing Area**
 - ✓ The bamboo-bearing area is estimated at 154,670 km², reflecting an increase of 5,227 km² since the 2021 report.

Significance of ISFR 2023 Findings:

- **Policy Alignment:** The report underscores progress toward achieving the goals outlined in the National Forest Policy, 1988, and international commitments under the Paris Agreement.
- **Strategic Insights:** Highlights the importance of mangroves and bamboo as critical resources for ecological balance and carbon sequestration.
- **State-wise Focus:** Provides actionable insights for states and regions to target forest and biodiversity conservation efforts.

Ministry of Environment Notifies Draft Solid Waste Management (SWM) Rules, 2024

Relevance : GS III - Environment

- **In News:** The Ministry of Environment, Forest, and Climate Change (MoEFCC) has issued Draft Solid Waste Management Rules, 2024, which will take effect from 1st October 2025.
- The rules aim to mitigate the adverse effects of unmanaged solid waste, promote the principles of a circular economy, and enhance monitoring in both urban and rural areas.



Key Highlights of SWM Rules, 2024:

- **Role of Waste Generators:** Construction and demolition waste must be stored separately on the generator's premises and disposed of in compliance with the Construction and Demolition Waste Management Rules, 2016.
- **Bulk Waste Generators:** Required to procure Extended Bulk Waste Generator Responsibility Certificates from local authorities for sustainable collection and transport of sanitary waste and other types.
- **Disposal of Non-Recyclable Waste:** Waste with a calorific value of 1,500 Kcal/kg or more cannot be disposed of in landfills.
- **Online Systems and Registration:** The Central Pollution Control Board

(CPCB) will establish a centralized online platform for registration and filing annual returns by obligated entities under these rules.

- **Local Body Accountability:** Local bodies must prevent burning of agricultural and horticultural waste & impose heavy penalties on violators involved in open burning.

Measures for Solid Waste Management in India:

- **Policy and Legal Framework:** Multiple rules, including Solid Waste Management Rules, 2016, Plastic Waste Management Rules, 2016, and Biomedical Waste Management Rules, 2016, have been enacted for the systematic disposal of various waste categories.
- **Swachh Bharat Mission (SBM):** A national initiative aimed at improving waste management systems, promoting source segregation, and encouraging waste processing.
- **Public Awareness and Education:** Government programs have launched campaigns to sensitize the public about the importance of cleanliness and waste management.
- **Infrastructure Development**
 - ✓ Infrastructure for waste processing, such as compost plants, bio-methanation units, and Waste-to-Energy (WTE) facilities, is being developed under various schemes.
 - ✓ Status (2013-14): 553 compost plants, 56 bio-methanation units, 22 RDF plants, and 13 WTE plants established.
- **Research and Innovation:**
 - ✓ Initiatives are being supported for developing advanced waste processing technologies, recycling methods, and sustainable materials.
 - ✓ Hackathons and challenges encourage startups to create innovative waste management solutions.
- **International Collaboration:** Partnerships with global organizations and countries help adopt best practices, access cutting-edge technologies, and secure funding for large-scale projects.

Challenges in Solid Waste Management in India:

- **Inadequate Infrastructure:** Limited systems for waste collection, transportation, and disposal lead to uncollected waste piling up in public areas.
- **Financial Constraints:** Municipal bodies face budgetary limitations, restricting investments in modern infrastructure and advanced technologies.
- **Low Awareness and Participation:** Insufficient public awareness results in



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improper waste segregation, complicating recycling and disposal.

- **Inefficient Waste Segregation:** Lack of segregation at the source leads to mixed waste, hampering effective management.
- **Limited Recycling Facilities:** A significant portion of recycling relies on the informal sector, which operates without proper regulations.
- **Overuse of Landfills:** Landfills, often poorly managed and overburdened, pose environmental risks like groundwater contamination and greenhouse gas emissions.

Way Forward:

- **Strengthening Infrastructure**
 - ✓ Investment in advanced collection, transport, and treatment facilities is crucial.
 - ✓ Public-private partnerships can enhance funding and efficiency.
- **Raising Public Awareness:** Campaigns to educate citizens on waste segregation and responsible disposal should be intensified.
- **Promoting Decentralized Waste Management:** Community-level composting and small-scale recycling units can reduce dependence on central facilities and boost local participation.
- **Integrating the Informal Sector:** The informal waste sector should be formalized with proper regulations to improve efficiency and working conditions.
- **Policy Reforms:** Stricter enforcement of laws and introduction of new regulations can ensure sustainable practices.
- **Adopting Innovative Technologies:** Cutting-edge technologies can help process waste effectively while generating value from byproducts.
- **Implementing Integrated Waste Management:** Combining reduction, recycling, composting, and disposal methods can enhance efficiency and sustainability.

Conclusion:

- Solid waste management in India is a critical issue with far-reaching consequences for environmental health and sustainable development. While efforts are underway to address these challenges, a comprehensive approach involving all stakeholders—government, private sector, and the public—is vital to ensure a cleaner and greener future.

Australia Enacts World-First Law Banning Under-16s from Social Media

Relevance : GS III - Social Media

- **In News:** Australia has introduced a landmark law banning children under 16 from accessing social media platforms such as TikTok and Meta (Facebook, Instagram).
- The legislation holds platforms accountable for preventing underage accounts and places a social responsibility on them to safeguard children from social media addiction.



Reasons for Social Media Addiction Among Children:

- **Exploitation of Reward Circuits**
 - ✓ Social media leverages the brain's dopamine reward system, creating addictive cycles and encouraging prolonged engagement.
- **Lack of Authentic Emotional Connections**
 - ✓ Adolescents often turn to social media as a substitute for genuine relationships, amplifying their dependency on virtual interactions.

Impacts of Social Media Addiction:

- **Screen Time Displacement**
 - ✓ Replaces physical activities and in-person interactions, leading to a decline in real-life relationships and social skills.
 - ✓ Triggers FOMO (Fear of Missing Out), adding to mental stress.
- **Productivity and Academic Decline**
 - ✓ Disrupts important activities like schoolwork, sports, and studies, lowering overall productivity.
- **Psychological Consequences**
 - ✓ Exposure to idealized lifestyles & achievements can foster unrealistic expectations.
 - ✓ Contributes to cyberbullying, reduced self-esteem, lack of focus, & concentration.

- **Health Concerns**
 - ✓ Adversely affects brain development and may cause depression, sleep disturbances, and eating disorders.
- **Harmful Content Exposure**
 - ✓ Increases risks of exposure to self-harm, suicide content, & extremist ideologies.

Negative Implications of the Ban:

- **Loss of Positive Social Media Impact**
 - ✓ Social media offers children opportunities for creative expression, collaborative learning, and interest-based networking.
- **Potential Risk of Unsafe Internet Use**
 - ✓ Banning social media could push children toward more dangerous spaces like the Dark Web.

Alternative Approaches to Social Media Bans:

- **Age Restrictions:** Platforms like Meta (Facebook, Instagram) already impose a self-regulated age limit of 13 years.
- **Tech-Driven Solutions:** Employ tools and applications to encourage responsible and productive use of social media.
- **Adopting Best Practices:** Example: Kerala Police's Digital De-Addiction (D-DAD) Centres provide free counseling for children suffering from digital addiction.

Conclusion:

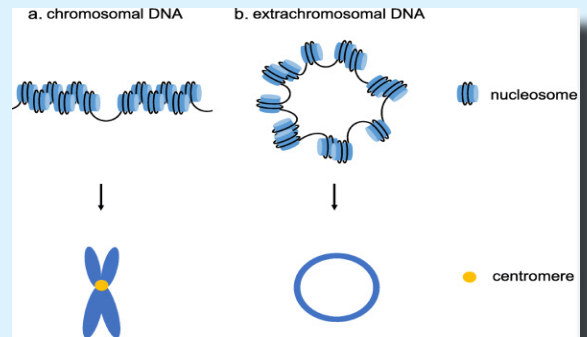
- This development highlights global efforts to address digital addiction and ensure child safety on online platforms, emphasizing the importance of balancing regulation with children's digital literacy and safe internet practices



Extrachromosomal DNA (ecDNA): A New Frontier in Cancer Research

Relevance : GS III - Science & Technology

- **In News:** A research team, eDyNAmiC, recently unveiled a study highlighting how ecDNA forms and contributes to cancer progression and drug resistance.



What is ecDNA?

Definition

- ✓ Normal human cells contain 23 pairs of chromosomes within the nucleus, housing the DNA.
- ✓ Damage or replication errors in DNA can cause small sections to break away from chromosomes, forming circular structures known as ecDNA.

Key Mechanisms

- ✓ Processes like chromothripsis (chromosomal breakage and rearrangement seen in some cancers) contribute to ecDNA formation.
- ✓ ecDNA floats freely in the nucleus, unlike chromosomal DNA, which is fixed.

Cancer Association

- ✓ A 2017 study revealed that ecDNA is present in nearly 40% of cancer cell lines and up to 90% of patient-derived brain tumour samples, highlighting its critical role in cancer biology.

Recent Findings:

- **Triggers of ecDNA Formation:** DNA damage due to environmental factors like smoking, substance exposure, and genetic mutations.
- **Validation:** Findings confirmed using Fluorescence In-Situ Hybridisation (FISH), which identifies specific cancer-related genes in tissue samples.
- **Prevalence:** ecDNA was found in 17% of tumour samples, with higher occurrences in liposarcomas, brain tumours, and breast cancers.
- **Impact of Chemotherapy:** Chemotherapy was linked to an increase in ecDNA, correlating with metastasis and poor patient outcomes.

Role of ecDNA in Cancer Growth:

- **Oncogene Amplification:** ecDNA often carries multiple copies of oncogenes (genes that cause cancer), which are absent in chromosomes.
- **Dynamic Interaction**
 - ✓ Unlike fixed chromosomal DNA, ecDNA can move freely and form hubs, zones where oncogenes are expressed more.
 - ✓ This enhances transcription of oncogenes into mRNA, resulting in higher protein production to support tumour growth.
- **Drug Resistance:** ecDNA accelerates tumour evolution and facilitates resistance to cancer treatments.

ecDNA and Mendel's Third Law:

- **Violation of Mendel's Law**
 - ✓ Mendel's Third Law of Independent Assortment states that genes on the same chromosome are inherited together, while genes on different chromosomes are distributed independently.
 - ✓ ecDNA is passed in clusters during cell division, violating this principle.
- **Implications for Cancer Cells**
 - ✓ Clustered inheritance enhances gene interactions, supports tumour growth, and preserves beneficial genetic combinations, giving cancer cells a survival advantage.

Conclusion:

- The study of extrachromosomal DNA (ecDNA) offers groundbreaking insights into cancer biology, revealing its significant role in tumour progression, metastasis, and drug resistance. By understanding ecDNA's mechanisms, researchers can develop targeted interventions, potentially transforming cancer treatment and improving patient outcomes.

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ISRO Deploys PSLV-C59 with ESA's Proba-3 Satellites

Relevance: GS III - Space Sector

- **In News:** The Indian Space Research Organisation (ISRO) successfully launched the PSLV-C59 rocket, carrying the European Space Agency's Proba-3 spacecraft, as part of a dedicated business mission by NewSpace India Limited (NSIL).



- ✓ The launch occurred from the Satish Dhawan Space Centre (SDSC-SHAR), Sriharikota.
- ✓ This marks ESA's first mission launched from India since the Proba-1 mission in 2001.

About PSLV-C59:

- **Polar Satellite Launch Vehicle (PSLV)**
 - ✓ A third-generation carrier system developed by ISRO.
 - ✓ A four-stage rocket capable of delivering multiple satellites into distinct orbits.
 - ✓ Renowned for its reliability and cost-effectiveness in supporting domestic and international satellite launches.

Proba-3 Mission:

- **Mission Overview**
 - ✓ **Type:** On-Orbit Demonstration (OOD) mission.
 - ✓ **Objective**
 - To monitor the Sun's corona using a pioneering satellite formation system.
 - ✓ **Importance**
 - The mission is the world's first precision formation-flying experiment, where two satellites operate in tandem while maintaining a fixed alignment.
 - ✓ **Components**
 - Coronagraph Satellite (CSC): Gathers data about the Sun's outer atmosphere.
 - Occulter Satellite (OSC): Blocks direct sunlight, enabling CSC to observe the corona.

Advantages of Commercial Space Launches for India:

- **Expanding Share in the Global Space Market**
 - ✓ India currently contributes 2-3% to the global space sector, with significant room for growth.
- **Economic Benefits**
 - ✓ India earned over \$279 million from launching international satellites by 2022.
- **Diplomatic Influence**
 - ✓ Commercial launches amplify India's global standing by nurturing diplomatic ties and showcasing its advanced technological prowess.
- **Additional Advantages**
 - ✓ Support technology transfer, bolster innovation, and stimulate growth in the domestic space sector.

About NewSpace India Limited (NSIL):

- Established in 2019 under the Department of Space, NSIL oversees ISRO's business operations.
- Aims to empower Indian industries to undertake advanced space-related projects.
- Facilitates ISRO's focus on future space exploration and innovation.

Key Developments Elevating India's Commercial Space Capability:

- **Formation of IN-SPACE**
 - ✓ Indian National Space Promotion and Authorization Center promotes private sector involvement in the space industry.
- **Indian Space Policy 2023**
 - ✓ Supports partnerships with startups and companies in the private space sector.
- **Boosting Private Sector Players**
 - ✓ Examples include Skyroot Aerospace and Agnikul Cosmos, leading advancements in the private space domain.
- **Small Satellite Launch Vehicle (SSLV)**
 - ✓ The SSLV provides cost-efficient options for deploying smaller payloads into orbit.

Conclusion:

- The PSLV-C59 mission highlights India's growing stature as a global hub for commercial satellite launches. With its cost-effective solutions, technical expertise, and strategic initiatives like NSIL and IN-SPACE, India is poised to expand its influence in the international space market.

- This progress not only enhances revenue and soft power but also stimulates innovation, making India a key player in the evolving global space economy.

IAO in Hanle, Ladakh: A Promising Site for Satellite-based Quantum Communications

Relevance: GS III - Space Technology

- **In News:** A recent study identifies the Indian Astronomical Observatory (IAO) in Hanle, Ladakh, as a highly suitable location for implementing satellite-based quantum communication technologies, including Quantum Key Distribution (QKD).



Key Features of Satellite-based Quantum Communications

- Employs quantum signals operating at Tera Hertz (THz) frequencies, unlike conventional satellite communications that use Mega or Giga Hertz.
- The Earth's multilayered and dynamic atmosphere poses challenges to transmitting quantum signals with minimal losses, making the selection of an appropriate site critical.

Why Hanle is Ideal?

- **Atmospheric Advantages**
 - ✓ **Arid and Cold Climate:** Hanle experiences harsh winters with temperatures plummeting to -25°C to -30°C , contributing to optimal atmospheric conditions.
 - ✓ **Low Water Vapor and Oxygen Levels:** Reduced atmospheric interference enhances signal clarity and strength.
- **Geographic Benefits**
 - ✓ **Natural Landscape:** Provides an excellent environment for establishing ground stations essential for long-distance quantum communication.
- **Superior Signal Efficiency**
 - ✓ **Minimal Signal Loss:** Hanle exhibits 44 dB loss, outperforming other studied locations like Mt. Abu (47 dB) and Nainital (48 dB).

About Quantum Communication and QKD:

- **What is Quantum Communication?**
 - ✓ Based on quantum physics principles, it uses Qubits (quantum bits) such as



photons for transmitting data.

✓ Properties of Qubits:

- **Quantum Entanglement:** Qubits share interlinked states, regardless of distance.
- **Superposition:** Qubits can simultaneously exist in multiple states (0 & 1).

• Advantages of Quantum Communication

✓ **Enhanced Data Security:** Any attempt to intercept or clone data disturbs the quantum state, ensuring tamper detection.

• Quantum Key Distribution (QKD)

✓ A secure protocol for exchanging encryption keys exclusively between authorized parties.

Conclusion:

- The study underscores the potential of Hanle's unique atmospheric and geographic conditions in facilitating advanced quantum communication technologies.
- Leveraging Hanle for satellite-based QKD and related applications can position India as a global leader in secure communication systems, ensuring national security and technological advancement.

ISRO Successfully Tests CE20 Cryogenic Engine

Relevance : GS III - Space Technology

- **In News:** The Indian Space Research Organisation (ISRO) recently executed a ground-level hot trial of its CE20 Cryogenic Engine at the ISRO Propulsion Complex, Mahendragiri, Tamil Nadu.



About Cryogenic Engine:

• Overview

- ✓ Cryogenic engines utilize rocket propellants stored at ultra-low temperatures.
- ✓ Liquid Oxygen (LOX) and Liquid Hydrogen (LH2) serve as the primary propellants, functioning as the oxidizer and fuel, respectively.
- ✓ Liquid oxygen retains its liquid state below -183°C , and liquid hydrogen remains liquid at temperatures below -253°C . Batches list - 24-25



Key Features of CE20 Cryogenic Engine:

- **Capability for Engine Re-ignition**
 - ✓ Equipped with a multi-point igniter, enabling re-ignition mid-flight, vital for missions like Gaganyaan.
- **Enhanced Nozzle Safety System**
 - ✓ Features an advanced system to prevent flow disintegration and vibratory effects, improving engine performance and test accuracy.

Significance of Cryogenic Engines for India's Space Program:

- **Advancement of Space Program**
 - ✓ Improves rocket performance and thrust, supporting:
 - ✓ Crewed missions such as Gaganyaan.
 - ✓ Satellite deployments.
 - ✓ Deep-space exploration.
- **Domestic Development and Autonomy**
 - ✓ Highlights India's ability to create advanced cryogenic systems, reducing reliance on external expertise.
 - ✓ India joins a select group of nations mastering indigenous cryogenic technology, including USA, Russia, France, China, and Japan.
- **Increased Payload Capacity**
 - ✓ Cryogenic engines deliver greater specific thrust, enabling rockets to transport heavier payloads into space.

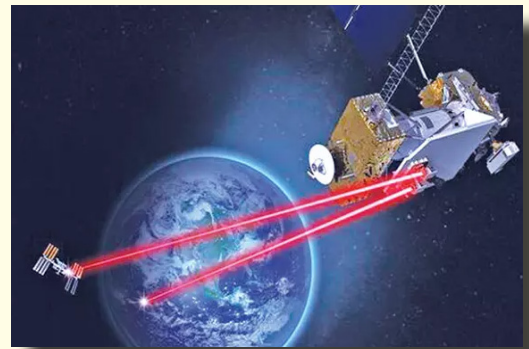
Conclusion:

- The successful testing of the CE20 Cryogenic Engine marks a significant milestone in India's space exploration journey, showcasing ISRO's technological prowess and self-reliance in advanced cryogenic propulsion systems.
- With enhanced capabilities like engine re-ignition and improved efficiency, the CE20 engine is set to bolster India's ambitious space missions, including Gaganyaan, satellite launches, and interplanetary exploration.
- This achievement not only places India among an elite group of nations with indigenous cryogenic technology but also reinforces its position as a leading spacefaring nation, propelling the vision for greater scientific and economic advancements in space endeavors

Laser-Equipped Satellite for Tackling Space Debris

Relevance : GS III - Space Technology

- **In News:** Japanese startup Orbital Lasers and Indian robotics firm InspeCity have partnered to explore solutions for addressing the growing issue of space debris.
- The collaboration includes studying technologies for de-orbiting defunct satellites & extending the operational lifespan of spacecraft.



Key Details of the Initiative:

Technology Overview

- ✓ **Laser-Equipped System:** Orbital Lasers is developing a system to utilize laser energy for deactivating the rotation of space debris. By vaporizing parts of the debris' surface, the system will enable easier orbital maneuvers by servicing spacecraft. Batches list - 24-25

About Space Debris:

- **Definition:** Space debris encompasses all non-functional, human-made objects, including fragments in Earth's orbit or re-entering the atmosphere.
- **Current Statistics:** Out of 35,150 tracked orbital objects, only 25% are operational satellites (United Nations University).

Concerns Related to Space Debris:

- **Threat to Space Exploration:** Collisions with debris can incapacitate operational spacecraft, damaging crucial components like optics & solar panels.
 - ✓ **Example:** A collision with a 10-cm object could lead to catastrophic fragmentation of a satellite.
- **Kessler Syndrome:** Refers to the uncontrolled escalation of debris through cascading collisions, resulting in a self-sustaining chain reaction in space.
- **Risk to Life on Earth:** Large debris objects that re-enter Earth's atmosphere in an uncontrolled manner pose significant risks to populations on the ground.

Way Forward:

- **Passivation of Spacecraft:** Ensuring successful passivation to limit on-orbit breakups.

- **Effective Disposal Strategies:** Adopting robust disposal mechanisms for end-of-mission spacecraft to prevent the addition of new debris.

Global and National Initiatives to Tackle Space Debris:

- **Global Efforts**
 - ✓ **RemoveDEBRIS Mission:** Demonstrating active debris removal (ADR) technologies.
 - ✓ **LignoSat:** A magnolia-wood satellite designed to address debris issues.
 - ✓ **UN Conventions:**
 - **1972 Liability Convention:** Covers international liability for damage caused by space objects.
 - **1976 Registration Convention:** Mandates registration of launched space objects.
- **India's Initiatives**
 - ✓ **Project NETRA:** A space object tracking and analysis program.
 - ✓ **Debris-Free Space Missions:** A commitment by Indian space agencies to achieve debris-free missions by 2030.

Conclusion:

- The collaboration between Japan's Orbital Lasers and India's InspeCity represents a significant step in addressing the challenges posed by space debris. By leveraging advanced technologies, these efforts aim to ensure sustainable space exploration and mitigate the risks associated with orbital clutter.

Quantum Satellite: India's Leap in Secure Communications

Relevance : GS III - Science & Technology

- **In News:** India's National Quantum Mission (NQM) is set to launch a quantum satellite within the next 2–3 years. This initiative marks a major step forward in using quantum physics to enable secure communications, positioning India as a leader in advanced technology.



What is a Quantum Satellite?

- **About Quantum Satellites:** A quantum satellite leverages quantum physics principles to secure communication signals, rendering them highly resistant

to interception. It employs Quantum Cryptography, especially Quantum Key Distribution (QKD), to detect eavesdropping during data transmission.

- **Quantum Cryptography**

- ✓ **Basics of Encryption**

- Traditional encryption methods, such as the Caesar cipher, rely on a secret key to encode and decode messages.
- These classical methods are vulnerable to decryption by quantum computers, which are exponentially faster than conventional supercomputers.

- ✓ **Quantum Encryption**

- Utilizes QKD to secure communication by transmitting keys through quantum states.
- Quantum Measurement: When a quantum system, like a photon, is observed, its state changes. Any attempt to eavesdrop disrupts the system, alerting legitimate users to a breach.
- Quantum Entanglement: Ensures instant changes in one photon are mirrored by its entangled pair, making undetected interception impossible.
- QKD provides “unconditional security” by ensuring immediate detection of any interception.

- **Global Developments in QKD**

- ✓ **China’s Leadership:** Operates the world’s largest QKD network with three quantum satellites and four ground stations.

- ✓ **India’s Progress**

- India is advancing its quantum communication experiments, planning a satellite-based QKD network.
- The Raman Research Institute, Bengaluru, identified the Indian Astronomical Observatory in Hanle, Ladakh, as an ideal location for such experiments.
- The Indian Space Research Organisation (ISRO) successfully demonstrated free-space quantum communication over 300 meters.

- ✓ **International Year of Quantum Science:** The United Nations (UN) declared 2025 as the ‘International Year of Quantum Science and Technology’, aiming to raise awareness of quantum advancements.

- **Limitations of Quantum Key Distribution (QKD)**

- ✓ **Technological Immaturity:** In India, QKD remains experimental, with large-scale deployment yet to be realized.

- ✓ **High Costs:** Specialized hardware and infrastructure requirements make QKD significantly more expensive than traditional encryption.
- ✓ **Integration Issues:** Compatibility with existing communication networks poses a technical challenge.
- ✓ **Authentication Gaps:** QKD lacks reliable authentication mechanisms, allowing potential impersonation attacks.

What is the National Quantum Mission (NQM)?

• Overview

- ✓ Launched in 2023 with a ₹60,000 crore investment, the NQM aims to advance India's capabilities in Quantum Technologies and Applications (QTA).
- ✓ Goal: To develop quantum computers with 50–1000 qubits and establish secure quantum communication networks.

• Key Objectives

- ✓ **Quantum Computers:** Develop intermediate-scale systems over eight years using superconducting and photonic platforms.
- ✓ **Quantum Communication:** Establish satellite-based secure quantum communications and inter-city QKD networks spanning 2,000 km.
- ✓ **Atomic Clocks:** Create precision tools for advanced applications.

Way Forward:

• Post-Quantum Cryptography

- ✓ Integrating quantum-resistant algorithms with classical encryption as a cost-effective alternative to QKD.

• Quantum Authentication

- ✓ Developing protocols for identity verification alongside encryption to address impersonation risks.

• Miniaturization and Accessibility

- ✓ Focus on creating compact, energy-efficient, and affordable quantum devices for mass deployment.

• Global Collaboration

- ✓ India should work on setting international standards for quantum networks through platforms like the International Telecommunication Union (ITU) to ensure interoperability.

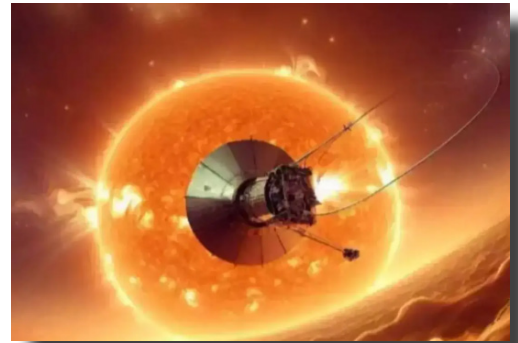
Conclusion:

- This leap into quantum technology underlines India's commitment to securing its digital future and maintaining technological sovereignty in an increasingly interconnected world.

First Human-Made Object to Fly Close to the Sun

Relevance : GS III - Space Technology

- **In News:** NASA's Parker Solar Probe completed a close solar flyby at its perihelion point, marking a significant milestone in space exploration.



- ✓ **Perihelion:** The point in an orbit where a celestial body is nearest to the Sun.
- ✓ **Aphelion:** The opposite of perihelion, where a celestial body is farthest from the Sun.
- ✓ **Speed Record:** The spacecraft achieved a velocity of approximately 700,000 kilometers per hour, making it the fastest human-made object ever.
- ✓ **Venus Flybys:** Utilized Venus's gravity to adjust its trajectory and approach closer to the Sun.

About Parker Solar Probe (Launched in 2018):

- **Objective**
 - ✓ To explore the outermost layer of the Sun's atmosphere, known as the corona, and enhance the understanding of solar wind.
 - ✓ Solar Wind: A continuous flow of charged particles (protons and electrons) originating from the corona.
- **Key Scientific Instruments**
 - ✓ **FIELDS:** Measures electric and magnetic fields in the solar atmosphere.
 - ✓ **ISOIS (Integrated Science Investigation of the Sun):** Analyzes high-energy particles emitted by the Sun.

Why is Solar Activity Research Crucial?:

- **Understanding Space Weather**
 - ✓ **Impact:** Solar phenomena such as solar flares and coronal mass ejections (CMEs) generate space weather events.
 - ✓ **Effect:** These events can interfere with satellite communications, navigation systems, and other space-based technologies.
- **Safeguarding Electric Grids and Technology**
 - ✓ **Geomagnetic Storms:** Solar activity-induced storms can generate currents in power grids, potentially causing blackouts and equipment malfunctions.



- **Other Significance**

- ✓ **Astronaut Safety:** Understanding solar radiation is essential for protecting astronauts during deep space missions.

Conclusion:

- NASA's Parker Solar Probe continues to revolutionize our understanding of the Sun and its influence on the solar system, paving the way for better preparedness against space weather impacts.



India & Bhutan's Top Leaders Discuss Strategic Collaboration

Relevance: GS II - Bilateral Relations

- In News:** During the recent state visit of the Bhutanese King, the Indian Prime Minister reaffirmed India's unwavering support for Bhutan's socio-economic progress and emphasized the significance of their longstanding partnership.



Key Outcomes: Joint Declaration on the Official Visit:

Initiatives and Developments

- ✓ The King of Bhutan shared his vision for the Gelephu Mindfulness City (GMC) Special Administrative Zone.
- ✓ GMC is an ambitious urban initiative that harmonizes economic development with mindful living, sustainability, and holistic growth.
- ✓ Both nations expressed intent to collaborate on advancing this visionary project.

Energy Partnerships

- ✓ The leaders reiterated the pivotal role of hydropower partnerships and agreed on accelerating the completion of the Punatsangchhu-I hydroelectric project.
- ✓ Progress on the 1020 MW Punatsangchhu-II hydro project was highlighted as a cornerstone of their energy cooperation.

Infrastructure and Connectivity

- ✓ The inauguration of the Integrated Check Post at Darranga was recognized as a major facilitator of tourism and economic activities in eastern Bhutan.

Space and STEM Collaboration

- ✓ The leaders acknowledged advancements in implementing the Joint Plan of Action on Space Cooperation.
- ✓ Enhanced academic collaboration, particularly in STEM fields, was celebrated as a significant step toward advancing Bhutan's technological and scientific capacity.

India-Bhutan Relations:

Friendship Treaty

- ✓ The bilateral relationship is guided by the 1949 Treaty of Friendship, which was modernized in February 2007 to reflect contemporary aspirations of mutual cooperation and respect.
- **Trade and Economic Collaboration**
 - ✓ India remains Bhutan's largest trading partner, with bilateral trade expanding from USD 484 million in 2014-15 to USD 1606 million in 2022-23.
- **Development Support**
 - ✓ India has been Bhutan's principal development partner since the 1960s, contributing significantly to Bhutan's Five-Year Development Plans.
- **Security and Defence**
 - ✓ India supports Bhutan's territorial claims, including its stance at the Doklam tri-junction, providing strong backing amid regional geopolitical challenges posed by China.

Conclusion:

- The dialogue underscores the evolving and multifaceted partnership between India and Bhutan, highlighting shared priorities in energy, infrastructure, and education. The collaboration on innovative projects like the Gelephu Mindfulness City reinforces their commitment to fostering sustainable development while addressing regional and global challenges together.

India's Role at the 20th Manama Dialogue

Relevance: GS II - International Issue

- **In News:** External Affairs Minister S. Jaishankar participated in the 20th Manama Dialogue held in Bahrain, underlining India's active diplomatic engagement in addressing critical issues across the Middle East, including the situations in Gaza and Syria.



About Manama Dialogue:

- **Origin and Establishment**
 - ✓ Initiated: 2004 in the Kingdom of Bahrain.
 - ✓ Organized by: The International Institute for Strategic Studies (IISS) in partnership with Bahrain's Ministry of Foreign Affairs.
- **Participating Nations**
 - ✓ Representatives from the Middle East, North America, Europe, Asia, and Africa engage in dialogue, promoting cross-regional collaboration.

Objectives

- ✓ Provide a platform for national leaders, policymakers, and strategic experts to address critical regional security issues.
- ✓ Encourage discussions on geopolitics, emerging security trends, and mechanisms for conflict resolution.

2024 Theme

- ✓ “Middle East Leadership in Shaping Regional Prosperity and Security”

Significance of India’s Participation:

- **Diplomatic Engagement:** Highlights India’s evolving role as a strategic partner in the Middle East.
- **Conflict Resolution:** Advocates peaceful solutions to crises in Gaza, Syria, and other regional flashpoints.
- **Regional Cooperation:** Reinforces India’s commitment to fostering regional prosperity and security through multilateral platforms.

Conclusion:

- India’s presence at the Manama Dialogue underscores its proactive diplomacy in addressing pressing global challenges and strengthening partnerships in the Middle East, a region critical to India’s strategic and economic interests.
- ✓

UK Joins Comprehensive & Progressive Agreement for Trans-Pacific Partnership

Relevance : GS II - International Relations

- **In News:** The United Kingdom has officially become the first European nation to join the Indo-Pacific trade bloc, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP).
- This follows the signing of the accession protocol between the UK and CPTPP members in 2023.



About CPTPP:

Genesis

- ✓ The CPTPP is a Free Trade Agreement (FTA) across the Pacific region, originally signed by 11 countries in March 2018 in Santiago, Chile.



- ✓ The agreement officially came into effect on December 30, 2018, following the withdrawal of the United States from the earlier Trans-Pacific Partnership (TPP) in 2017.
- **Membership**
 - ✓ The CPTPP now includes 12 member nations:
 - ✓ United Kingdom (new entrant).
 - ✓ Original members: Australia, Canada, Japan, New Zealand, Brunei, Chile, Malaysia, Mexico, Peru, Singapore, and Vietnam.
- **Significance of CPTPP**
 - ✓ **Economic Influence:** The bloc accounts for approximately 15% of global GDP.
 - ✓ **Market Access:** It provides trade opportunities to a market comprising over 500 million people.

Relevance of Multilateral Groupings for India:

- The recent statement by the NITI Aayog CEO advocating for India's participation in trade agreements such as CPTPP and RCEP (Regional Comprehensive Economic Partnership) highlights their potential benefits for the country.

Key Benefits for India:

- **Economic Opportunities**
 - ✓ Joining such trade blocs can help India explore new markets and capitalize on the "China Plus One" strategy, which aims to reduce global dependence on China by diversifying production bases.
- **Boosting Exports**
 - ✓ By leveraging reduced tariffs and gaining access to extensive Asia-Pacific markets, India's exports can see significant growth.
 - ✓ This is particularly relevant for Micro, Small, and Medium Enterprises (MSMEs), which contribute to 40% of India's total exports.

Conclusion:

- The UK's entry into the CPTPP underscores the growing significance of multilateral trade agreements in fostering global economic partnerships.
- For India, participation in similar trade blocs could unlock immense economic potential, facilitate export growth, and strengthen its position in the global trade ecosystem.

Germany Heads for Snap Elections After Chancellor Loses Confidence Vote

Relevance : GS II - International Issue

- **In News:** Germany is set to hold snap elections following the loss of a vote of confidence by the Chancellor.
- Snap elections are held earlier than the scheduled date, often to resolve political deadlocks or leverage unique political situations.



How Does Germany's Electoral System Function?

- **Mixed-Member Proportional Representation System**
 - ✓ A hybrid system combining the majority or “first-past-the-post” method with proportional representation based on party votes in federal states (Länder).
 - ✓ **Bundestag Composition**
 - 299 members are elected through the majority system (first votes).
 - The remaining seats are filled based on proportional representation (second votes).
- **Chancellor Selection**
 - ✓ **Indirect Election:** German citizens do not directly elect the Chancellor.
 - Voter preferences shape the parliament, whose members then elect the Chancellor every four years.
- **Dual Voting System**
 - ✓ **First Vote:** Cast for an individual candidate in a constituency (majority system).
 - ✓ **Second Vote:** Cast for a party list in a federal state (Länder), determining proportional representation.
- **Overhang and Balance Seats**
 - ✓ **Overhang Seats:** A party retains additional seats if it wins more constituencies under the majority system than it is entitled to by proportional representation.
 - ✓ **Balance Seats:** To maintain proportionality, additional seats are allocated to other parties, ensuring equitable representation nationwide.

Process of Chancellor Election:

- **Nomination by Federal President**
 - ✓ Post-election, the Federal President nominates a candidate for the position of Chancellor.



- **Bundestag Voting**
 - ✓ Members of the Bundestag vote on the nominated candidate through a secret ballot.
 - ✓ To secure the role, the nominee must achieve an absolute majority in the first round.
- **Subsequent Rounds**
 - ✓ **Second Round:** Held if the candidate fails to gain an absolute majority in the initial vote.
 - ✓ **Third Round:** If no consensus is reached, the candidate with the largest number of votes is elected as Chancellor.

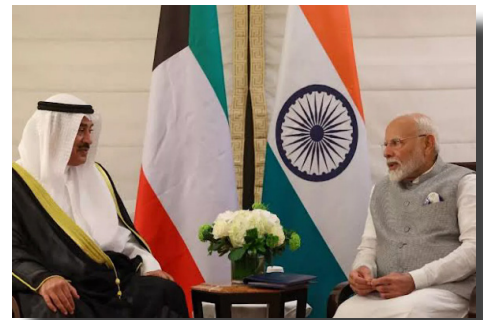
Conclusion:

- Germany's snap elections underscore the dynamic nature of its political landscape and the intricate balance of power within its proportional representation system.
- The upcoming elections will not only decide the leadership but also influence Germany's domestic and international policies in the near future.

Prime Minister's Historic Visit to Kuwait: Strengthening Bilateral Ties

Relevance : GS II - Bilateral Relations

- **In News:** The Prime Minister of India embarked on his first official visit to Kuwait, aimed at enhancing bilateral relations and fostering strategic partnerships. During the visit, the PM was honored with Kuwait's highest civilian award, 'The Order of Mubarak Al Kabeer.'



Key Outcomes of the Visit:

- **Strategic Partnership**
 - ✓ India and Kuwait elevated their bilateral relationship to the level of a strategic partnership, signaling closer cooperation in multiple domains.
- **International Solar Alliance (ISA)**
 - ✓ Kuwait's decision to join the International Solar Alliance was warmly welcomed by India, furthering sustainable energy collaborations between the two nations.
- **Asian Cooperation Dialogue (ACD)**
 - ✓ Emphasized the role of the Asian Cooperation Dialogue (ACD) in fostering regional integration and cooperation.

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- ✓ The ACD, established in 2001, aims to harness Asia's collective strengths.
- ✓ It comprises 35 member nations, with India as a founding member.
- **India-GCC Cooperation**
 - ✓ As the current President of the Gulf Cooperation Council (GCC), Kuwait expressed its commitment to strengthening ties between India and other GCC member states.
- **Other Key Developments**
 - ✓ Renewed the Cultural Exchange Program (2025–2029) to promote collaboration in arts, literature, and other cultural domains.
 - ✓ India commended Kuwait's efforts in hosting the 4th phase of the Dushanbe Process, focused on combating terrorism and bolstering border security.

India-Kuwait Relations:

- **Trade Relations**
 - ✓ Total bilateral trade during FY 2023-24 amounted to USD 10.47 billion, with India facing a trade deficit in this partnership.
- **Energy Security**
 - ✓ Kuwait ranked as India's 9th largest oil supplier in FY 2023-24, fulfilling approximately 3% of India's total energy needs.
- **Diaspora**
 - ✓ Indians constitute the largest expatriate community in Kuwait, numbering around 1 million and playing a significant role in the country's workforce.

About the Gulf Cooperation Council (GCC):

- **Overview**
 - ✓ Established: 1981
 - ✓ Headquarters: Riyadh, Saudi Arabia
 - ✓ Member States: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the UAE
- **Objectives**
 - ✓ Promote coordination, integration, and connectivity among member nations.
- **Energy Security for India**
 - ✓ The GCC contributes to 35% of India's oil imports and 70% of its gas imports, highlighting its strategic importance for India's energy needs.

UN General Assembly Adopts Landmark Convention Against Cybercrime

- ✦ **Relevance: GS II - Important Institution**
- **In News:** The United Nations General Assembly has unanimously adopted the



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Ministry of Mines Initiates First-Ever Auction of Offshore Mineral Blocks

Relevance : GS III - Economy

- **In News:** The Ministry of Mines has launched the maiden tranche of auctions for mineral blocks in offshore areas, marking a significant step toward harnessing India's offshore mineral wealth within its Exclusive Economic Zone (EEZ).



Key Details of the Offshore Mining Auction:

- **Mineral Blocks in Focus**
 - ✓ The auction includes 13 mineral blocks located in the Arabian Sea and Andaman Sea.
- **Types of Minerals and Corresponding Regions**
 - ✓ **Construction Sand:** Off the coast of Kerala (Arabian Sea).
 - ✓ **Lime-Mud:** Off the coast of Gujarat (Arabian Sea).
 - ✓ **Polymetallic Nodules and Crusts:** Off the Great Nicobar Islands (Andaman Sea).

Offshore Mining: Definition and Potential:

- **What is Offshore Mining?**
 - ✓ It refers to the extraction of mineral deposits from the seabed at depths greater than 200 meters.
- **Potential in India**
 - ✓ The Geological Survey of India (GSI) has identified approximately 6 lakh sq. km of offshore areas with mineral potential.

Significance of Offshore Mining for India:

- **Abundant Mineral Reserves**
 - ✓ India's offshore areas host vital minerals such as gold, diamonds, copper, nickel, cobalt, manganese, & rare earth elements critical for modern industries.
- **Economic and Strategic Importance**



- ✓ Enhances self-reliance (Atmanirbharta) in critical minerals.
- ✓ Contributes to India's blue economy and reduces dependency on imports.
- **Developmental Role**
 - ✓ Supports infrastructure development, high-tech manufacturing, and the green energy transition.

Challenges in Offshore Mining:

- **Lack of Private Participation:** Limited private sector interest due to high capital and technological requirements.
- **Skilled Workforce:** Offshore mining demands highly trained professionals and advanced technology.
- **Environmental Concerns:** Risks include marine habitat destruction, disruption of ecosystems, and potential biodiversity loss.

Steps Taken for Offshore Mining:

- **National Geological Data Repository (NGDR):** Developed by the GSI, this portal consolidates exploration data for potential investors.
- **Deep Ocean Mission:** Focused on exploring and extracting polymetallic nodules from the seabed.
- **Offshore Areas (Existence of Mineral Resources) Rules, 2024:** Establishes guidelines for exploration stages and the classification of mineral resources and reserves.

Ethanol Blended Petrol (EBP) Programme

Relevance : GS III - Energy Sector

- **In News:** The Ministry of Petroleum and Natural Gas has announced significant progress in the Ethanol Blended Petrol (EBP) Programme, with the ethanol blending rate rising from 1.53% in 2013-14 to an estimated 14.60% in 2023-24.



About the Ethanol Blended Petrol (EBP) Programme:

- **Objective**
 - ✓ Launched in 2003 to encourage the blending of ethanol with petrol, promoting cleaner energy alternatives.
- **Target**
 - ✓ Achieve 20% ethanol blending by 2025-26, advancing the earlier target of 2030.

Key Initiatives Supporting the EBP Programme:

- **National Policy on Biofuels (2018)**
 - ✓ Provides a roadmap for ethanol blending and biofuel production.
- **Ethanol Interest Subvention Schemes (EISS)**
 - ✓ Promotes the establishment of Dedicated Ethanol Plants (DEPs).
- **Reduction in GST**
 - ✓ Reduced GST on ethanol for EBP Programme from 18% to 5%.
- **Administered Price Mechanism**
 - ✓ Reintroduced to regulate ethanol prices and ensure fair market conditions.
- **Amendment to Industries (Development & Regulation) Act, 1951**
 - ✓ Facilitates the smooth movement of ethanol across states.

Achievements and Benefits of EBP Programme:

- **Foreign Exchange Savings**
 - ✓ Saved ₹1.08 trillion since 2014 by reducing dependence on imported crude oil.
 - ✓ Replaced 18.5 million tonnes of crude oil with ethanol.
- **Environmental Sustainability**
 - ✓ Reduced 55.7 million metric tonnes of carbon emissions.
- **Support to Sugar Industry**
 - ✓ Helped sugar mills manage surplus stock and generate early revenue, enabling timely payment to cane farmers.

About Ethanol:

- **Chemical Composition**
 - ✓ Ethanol (C_2H_5OH) is a renewable fuel made from crops such as sugarcane, maize, and wheat, which have high starch content.
- **Blends with Petrol**
 - ✓ Ethanol can be blended with petrol to form:
 - ✓ E20: 20% ethanol and 80% petrol.
 - ✓ E100: 93-93.5% ethanol, 5% petrol, and 1.5% co-solvent.
- **Flex-Fuel Vehicles (FFVs)**
 - ✓ Designed to run on varying ethanol blends, including up to E100.

Revision of GDP Base Year to 2022-23: A Strategic Move

Relevance : GS III - Economy

- **In News:** The Government of India has decided to update the GDP base year from 2011-12 to 2022-23, with a 26-member Advisory Committee on National Accounts Statistics (NAS), chaired by Biswanath Goldar, tasked to refine methodologies & identify new data sources.



Understanding Base Year:

• Definition

- ✓ The base year serves as a reference point for GDP calculations, enabling meaningful comparisons of economic growth by accounting for inflation.

• Role in GDP Measurement

- ✓ By anchoring calculations to a specific year, it eliminates the effects of inflation and provides a realistic depiction of economic progress over time.

Need for Revising the Base Year:

• Incorporation of New Data Sources

- ✓ Since 2011-12, the availability of high-frequency and quality data has increased significantly due to:
 - Digitization
 - Sectoral advancements
- ✓ Updating the base year ensures these new datasets enhance the accuracy of GDP estimates.

• Accounting for Structural Changes

- ✓ Captures shifts in:
 - Consumption patterns
 - Sectoral contributions
 - Emerging sectors (e.g., digital economy, renewable energy).
- ✓ Reflects the economic realities of the past decade, which the 2011-12 base year cannot adequately address.

• Responding to Economic Dynamics

- ✓ Accounts for post-pandemic transformations in the economy.
- ✓ Aligns with international standards, ensuring global comparability of India's economic statistics.

Addressing Obsolescence

- ✓ The 2011-12 base year, introduced in January 2015, is considered outdated and unsuitable for representing the current economic scenario.

Implications of Base Year Revision:

- **Revised Growth Estimates:** GDP growth figures may undergo adjustments, reflecting a more precise economic landscape.
- **Policy Formulation:** Provides policymakers with accurate and reliable data, essential for evidence-based decision-making.
- **Boosting Investor Confidence:** Offers investors a clearer view of India's economic potential, fostering investment opportunities.

Conclusion:

- The transition to the 2022-23 base year is a significant step toward modernizing India's GDP computation framework. It not only enhances the accuracy of economic metrics but also aligns with evolving global standards, ensuring India remains a reliable player in the global economic arena.

India's First Hyperloop Track

Relevance: GS III - Infrastructure

- **In News:** The Indian Institute of Technology (IIT) Madras has inaugurated India's first Hyperloop test track, spanning 410 meters, to assess the feasibility of Hyperloop technology under Indian conditions. The Mumbai-Pune corridor has been selected for India's first full-scale Hyperloop system.



What is Hyperloop?

Overview

- ✓ Hyperloop is a futuristic, high-speed transportation system comprising a low-pressure tube where capsules can travel, free from friction and air resistance.
- ✓ The concept was initially proposed by Elon Musk in 2013.

Key Components and Working Mechanism

- **Tube:** Near-vacuum tubes reduce air resistance, enabling capsules to achieve ultra-high speeds.
- **Capsules/Pods:**
 - ✓ Designed to carry passengers or cargo.
 - ✓ Utilizes magnetic levitation (maglev) technology to hover above the track,



eliminating ground friction.

- **Compressor:** Draws in air, facilitating capsule movement through the low-pressure tube.
- **Suspension System:** Uses air-bearing suspension to provide stability & reduce drag.
- **Propulsion System:** Capsules are propelled forward using linear induction motors.

Significance of Hyperloop:

- **High-Speed Transit:** Capsules are designed to reach speeds of up to 1,100 km/h, with an operational speed of approximately 360 km/h, revolutionizing long-distance travel.
- **Zero Emissions:** Entirely powered by solar energy, making it an eco-friendly transportation system.

Challenges in Mainstreaming Hyperloop:

- **Infrastructure Constraints**
 - ✓ High initial investment.
 - ✓ Complexities in land acquisition and challenges posed by difficult terrain.
- **Regulatory Bottlenecks**
 - ✓ Lack of a dedicated regulatory framework.
 - ✓ Challenges in obtaining safety certifications.
 - ✓ Adherence to complex environmental regulations.
- **Technological Barriers**
 - ✓ Limited expertise in Hyperloop technology.
 - ✓ Inadequate and incomplete testing facilities for comprehensive assessments.

Way Forward:

- The development of India's first Hyperloop test track by IIT Madras is a significant step towards integrating next-generation transportation solutions.
- With sustained research, innovation, and policy support, Hyperloop can revolutionize the way India envisions high-speed, sustainable transit systems.

India's Nuclear Power Capacity Poised to Triple by 2031-32

- **Relevance : GS III - Energy Sector**
- **In News:** India's nuclear power capacity is set to triple by 2031-32, as announced by the Union Minister for Science and Technology. The 'Vision Document for Amrit Kaal', prepared by the Department of Atomic Energy (DAE),



projects achieving a nuclear energy capacity of 100 GW by 2047.

Current Status of Nuclear Energy in India:

- **Contribution to Power Generation:** Nuclear energy accounts for approximately 3% of India's total electricity generation in 2022-23, making it the fifth-largest source of power in the country.
- **Operational Capacity:** Nuclear Power Corporation of India Limited (NPCIL) operates 24 reactors across 7 power plants, with a total installed capacity of 8,180 MW.

Why Does India Need Nuclear Energy?

- **Rising Energy Demand:** India's growing population and its fast-expanding economy, expected to become the third-largest economy by the end of the decade, require substantial energy resources.
- **Limited Fossil Fuel Resources:** India's heavy reliance on imported coal, oil, and natural gas poses challenges to energy security and economic stability.
- **Environmental Advantages:** Nuclear energy offers cleaner alternatives as every unit of nuclear power replacing coal-based power prevents 1 kg of CO₂ emissions, aiding India's goal of becoming a net-zero emitter by 2070.

Challenges Associated with Nuclear Energy:

- **Raw Material Constraints:** India faces a scarcity of domestic uranium reserves and remains dependent on imports for the expansion of its nuclear program.
- **High Initial Costs:** The capital investment required for nuclear plants is significantly higher compared to conventional energy sources like coal and natural gas.
- **Radioactive Waste Management:** Safe long-term storage and disposal of radioactive waste remain a challenge. Public apprehensions persist due to past nuclear accidents like Chernobyl.

Steps Taken by the Government to Promote Nuclear Energy:

- **World's First Thorium-Based Plant:** The Bhavni plant, using Uranium-233, is under development at Kalpakkam in Tamil Nadu.
- **Policy Reforms for Funding:** The Atomic Energy (Amendment) Act, 2015 enables NPCIL to form joint ventures with other Indian Public Sector Undertakings (PSUs) to raise funds for nuclear power projects.

India's 3-Stage Nuclear Energy Program:

- **Stage I – Pressurized Heavy Water Reactors (PHWR):**
 - ✓ Powered by natural uranium, these reactors produce plutonium-239.
 - ✓ Heavy water (D₂O) acts as both the moderator and coolant.

- **Stage II – Fast Breeder Reactors (FBR):** These reactors utilize Uranium-238 and plutonium-239, produced during Stage I, as fuel.
- **Stage III – Advanced Heavy Water Reactors (AHWR):** In this stage, reactors are designed to use a fuel mix of thorium and Uranium-233, enhancing the sustainability of India's nuclear program.

Conclusion:

- India's focus on nuclear energy expansion highlights its commitment to addressing energy security, economic growth, and climate goals. By leveraging sustainable technologies, innovative policies, and its 3-stage nuclear program, India is set to emerge as a key player in global nuclear energy production while maintaining environmental responsibility.

Switzerland Halts Most Favoured Nation (MFN) Clause in Tax Agreement with India

Relevance: GS III - Economy

- **In News:** Effective January 1, 2025, Switzerland will suspend the Most Favoured Nation (MFN) clause under its Double Taxation Avoidance Agreement (DTAA) with India.
- This decision follows a 2023 Supreme Court judgment, which stated that the MFN clause does not automatically activate when a country joins the Organisation for Economic Co-operation and Development (OECD), if India signed a tax agreement with that nation before its OECD membership.
- The Supreme Court further clarified that DTAA provisions cannot be implemented unless they are officially notified under the Income-Tax Act, 1961.
- The India-Switzerland DTAA, which came into effect in 1994, was designed to prevent double taxation on income-based taxes.



Implications of MFN Clause Suspension:

- **Increased Tax Burden for Indian Companies**
 - ✓ Indian businesses will face higher tax obligations as the withholding tax on dividends received from Switzerland will rise from 5% to 10%.
- **Impact on Swiss Investments in India**
 - ✓ Swiss firms receiving dividends from Indian entities will continue to be subject to a 10% withholding tax, as per the provisions of the India-Switzerland DTAA.
- **Potential Reassessment of MFN Clauses by Other Nations**

- ✓ The Swiss decision may prompt other countries to re-examine the application of MFN clauses in their respective tax treaties with India.
- **No Impact on Other DTAA Benefits**
 - ✓ Other benefits provided under the DTAA will remain intact, and investments made under the European Free Trade Association (EFTA) will continue uninterrupted.
- **Definition**
 - ✓ The MFN principle requires that any preferential trade terms offered by one World Trade Organization (WTO) member to another must be extended equally to all other WTO members.
- **Objective**
 - ✓ The MFN principle aims to foster fairness in global trade by preventing discrimination and ensuring all members receive uniform treatment.
- **Key Agreements**
 - ✓ MFN is an essential component of:
 - ✓ General Agreement on Trade in Services (GATS) – Article 2.
 - ✓ Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) – Article 4.

Conclusion:

- The suspension of the MFN clause in the India-Switzerland DTAA increases tax burdens but highlights the need for clarity in treaty provisions. It may also prompt a re-evaluation of similar clauses in India's tax agreements, balancing domestic interests with foreign investment goals.

Credit Guarantee Scheme for e-NWR Based Pledge Financing (CGS-NPF)

- **Relevance: GS III - Economy**
- **In News:** The Government has introduced the Credit Guarantee Scheme for e-NWR Based Pledge Financing (CGS-NPF) to facilitate post-harvest loans for farmers and promote the usage of electronic Negotiable Warehouse Receipts (e-NWR).



What are Credit Guarantee Schemes?

- **Definition**
 - ✓ Credit Guarantee involves providing a backing to loans without requiring

external collateral or third-party assurance.

- **Mechanism**
 - ✓ Loans extended by member lending institutions are secured through a guarantee scheme that covers a significant portion of the loan amount.

Electronic Negotiable Warehouse Receipts (e-NWR):

- **Introduction**
 - ✓ Launched in 2011, the negotiable warehouse receipt system allows ownership transfer of commodities stored in warehouses without the need for physical delivery.
- **Electronic Form**
 - ✓ e-NWRs exist solely in digital format and are issued in negotiable form, making them eligible as collateral for loans.
- **Regulatory Authority**
 - ✓ The Warehousing Development and Regulatory Authority (WDRA) governs and oversees the operations of NWRs.

About CGS-NPF:

- **Objective**
 - ✓ To enable farmers to easily secure post-harvest loans using electronic warehouse receipts as collateral.
- **Key Features**
 - ✓ **Corpus:** ₹1000 Crores.
 - ✓ **Loan Coverage:**
 - Up to ₹75 Lakhs for agricultural purposes.
 - Up to ₹200 Lakhs for non-agricultural purposes.
 - ✓ **Eligible Lending Institutions:** All scheduled banks and cooperative banks.
 - ✓ **Eligible Borrowers:**
 - Small and Marginal Farmers.
 - Women, SC/ST, and PwD Farmers.
 - MSMEs, traders, Farmer Producer Organizations (FPOs), & cooperatives.
 - ✓ **Risks Addressed**
 - Credit Risk: Risk of borrower default.
 - Warehouseman Risk: Risks associated with warehouse management.
 - ✓ **Guarantee Coverage**
 - 85% for loans up to ₹3 Lakhs.
 - 80% for loans between ₹3 to ₹75 Lakhs for vulnerable groups such as small and marginal farmers, women, SC/ST, and PwD borrowers.
 - 75% for all other borrowers.

Benefits of the Scheme:

- **Boost in Post-Harvest Lending**
 - ✓ Current post-harvest lending is ₹40,000 crore out of ₹21 lakh crore total agricultural lending.
 - ✓ Lending against e-NWRs stands at only ₹4000 crore, highlighting significant growth potential.
- **Enhanced Bank Trust**
 - ✓ The scheme mitigates risks related to both credit default and warehouse management, increasing confidence among financial institutions.
- **Support for Vulnerable Groups**
 - ✓ Focuses on empowering small and marginal farmers, women, SC/ST, and PwD farmers with minimal guarantee fees.
- **Prevention of Distress Selling**
 - ✓ Enables farmers to store their produce in warehouses, secure e-NWRs as collateral, and obtain loans.
 - ✓ Farmers can avoid selling their produce at low prices and wait for better market conditions, ensuring higher income.

Conclusion:

- The CGS-NPF is a significant step toward empowering farmers, addressing vulnerabilities, and enhancing the agricultural loan ecosystem. By leveraging digital infrastructure through e-NWRs, the scheme fosters financial inclusion, improves market efficiency, and promotes sustainable agricultural practices.

Concerns Raised Over India's Crude Oil Storage

Relevance: GS III - Energy Sector

- **In News:** The Ministry of Petroleum and Natural Gas highlighted concerns regarding India's crude oil storage. Despite allocating ₹5,000 crore in the Budget Estimates for 2023-24 to fill crude oil reserves, no expenditure was incurred for this purpose during the financial year.



About India's Strategic Petroleum Reserves (SPR):

- **Genesis of SPR**
 - ✓ Launched in 2004, the Strategic Petroleum Reserve Programme was initiated by the Government of India to ensure the availability of crude oil during emergencies.

- **Managing Institution**
 - ✓ Indian Strategic Petroleum Reserves Limited (ISPRL) oversees the SPR Programme.
- **India's SPR Programme**
 - ✓ **Phase-I:** Completed with a total capacity of 5.33 MMT across three locations: Visakhapatnam, Mangalore and Padur (largest storage site)
 - ✓ **Phase-II:** Approved by the Government in 2021 to add two additional facilities: Chandikhol (4 MMT) in Odisha & Padur (2.5 MMT) in Karnataka
- **India's Total Crude Oil Storage Capacity**
 - ✓ Strategic storage by ISPRL caverns provides 9.5 days of coverage.
 - ✓ Commercial storage by oil companies adds another 64.5 days of coverage.
 - ✓ Upon completion of Phase-II, an additional 11 days of coverage will be added, taking India closer to the International Energy Agency (IEA) standard of 90 days.

Strategic Importance of SPR:

- **Price Stabilization**
 - ✓ Acts as a key strategic tool to stabilize global oil prices.
 - ✓ Example: India's coordinated release of 5 million barrels in 2021, in collaboration with global oil consumers, helped ease price pressures.
- **Energy Security and Diplomatic Leverage**
 - ✓ Strengthens India's energy security.
 - ✓ Example: In 2017, UAE's Abu Dhabi National Oil Company (ADNOC) became the first foreign entity to store crude oil in India's strategic reserves.

About Indian Strategic Petroleum Reserves Limited (ISPRL):

- **Key Features**
 - ✓ Established in 2004 as a Special Purpose Vehicle (SPV).
 - ✓ Wholly owned subsidiary of the Oil Industry Development Board (OIDB) under the Ministry of Petroleum and Natural Gas.
- **Operational Framework**
 - ✓ ISPRL is authorized to commercialize 30% of its storage capacity by leasing it to Indian or foreign companies.
 - ✓ The Government retains first right over the entire crude oil stock during emergencies.

Conclusion:

- India's SPR Programme plays a critical role in bolstering the nation's energy security and enhancing its global strategic footprint, yet concerns about its underutilization demand urgent attention to optimize its potential.

Anti-Drone Unit for Border Security

Relevance : GS III - Security

- **In News:** Union Home Minister announced the formation of a comprehensive Anti-Drone Unit to tackle the growing threat posed by drones & Unmanned Aerial Vehicles (UAVs), emphasizing a 'whole of government' approach involving defense & research organizations.



About Anti-Drone Systems:

Definition

- ✓ Anti-drone systems are mechanisms designed to detect, track, and neutralize unauthorized UAVs or drones that may pose security threats, including:
 - Carrying explosives.
 - Conducting surveillance.
 - Disrupting controlled airspaces.
- ✓ **Technologies Utilized**
 - **Radio Frequency Jammers:** Disrupt drone communication.
 - **Global Positioning System (GPS) Spoofers:** Mislead drones with false coordinates.
 - **Net Guns:** Physically capture drones.

Need for an Anti-Drone Unit in India:

- **Rising Threats**
 - ✓ Drones are being increasingly used for illegal activities along borders.
 - ✓ In 2024, over 260 drones were intercepted near the Pakistan border.
- **Real-Time Detection and Neutralization**
 - ✓ Essential for securing airports, military bases, critical infrastructure, and public gatherings.
- **Countering Non-State Actors**
 - ✓ Drones have been used by terrorists for:

- Weapon smuggling targeting civilians and security forces.
- Reconnaissance and combat missions.
- ✓ Example: Bangladesh recently deployed a Bayraktar TB2 combat drone.
- **Internal Security Concerns**
 - ✓ Militants in Manipur were recently reported to have used drones for dropping explosives, raising alarms about their potential in domestic terrorism.

Recent Anti-Drone Measures by India:

- **DRDO's Soft Kill and Hard Kill Systems**
 - ✓ Soft Kill: Disrupts communication links of drones.
 - ✓ Hard Kill: Utilizes laser-based technology to destroy drones.
- **Laser-Equipped Anti-Drone Mechanisms**
 - ✓ Deployment: Along the India-Pakistan border, these systems have significantly improved drone detection and neutralization capabilities.
- **Bharat Electronics Limited's Counter Drone System (D4 System)**
 - ✓ **Features:**
 - Real-time search and detection.
 - Effective tracking and neutralization of UAV threats.

Conclusion:

- India's move to establish a comprehensive anti-drone framework underscores its commitment to safeguarding its borders and critical infrastructure. These measures aim to address evolving security threats posed by the dual-use capabilities of drones in modern warfare and illicit activities.

DRI Releases 'Smuggling in India' Report 2023-24

Relevance : GS III - Security

- **In News:** The Directorate of Revenue Intelligence (DRI), India's premier anti-smuggling agency, unveiled its 'Smuggling in India' report for 2023-24.
- The DRI operates under the Central Board of Indirect Taxes and Customs (CBIC), Ministry of Finance, and was established in 1957.



Key Highlights of the Report:

- **Gold Smuggling**
 - ✓ Quantity Seized: 1,319 kg.
 - ✓ Routes: Land and air routes accounted for 55% and 36%, respectively, of the total seizures.
- **Narcotics**
 - ✓ Cocaine: Smuggling, primarily through airports, increased by 9%.
- **Illegal Wildlife Products**
 - ✓ Notable Seizures: Elephant tusks weighing approximately 53 kg.

Why is India Vulnerable to Smuggling?

- **Strategic Geographic Location**
 - ✓ Proximity to Drug Trafficking Routes:
 - Golden Crescent: Covers Afghanistan, Iran, and Pakistan.
 - Golden Triangle: Includes Myanmar, Laos, and Thailand.
- **Extensive Borders**
 - ✓ Land Boundaries: Porous borders and challenging terrain.
 - ✓ Coastline: A vast coastline of approx. 7,500 km makes monitoring difficult.
- **High Domestic Demand**
 - ✓ Cultural Affinity: Significant preference for gold.
 - ✓ Youth Demographics: Rising demand for narcotics among the youth.
- **Economic Incentives**
 - ✓ Tax and Price Differences: Cheaper goods in markets like Dubai and Bangkok drive smuggling activities.

Recommendations to Tackle Smuggling:

- **International Collaboration**
 - ✓ Partnering with global agencies such as the World Customs Organization (WCO) for operations like Operation Tentacle, which targets smuggling of currency, diamonds, and gold by airline passengers.
- **Enhanced Border and Coastal Security**
 - ✓ Integrated Border Management: Strengthen coordination across agencies.
 - ✓ Advanced Surveillance: Use technologies like thermal imaging and motion sensors.
 - ✓ Coastal Monitoring: Increase radar installations and enhance patrolling.

Initiatives to Combat Smuggling:

- **Global Initiatives**

- ✓ United Nations Office on Drugs and Crime (UNODC): Focuses on international cooperation against drug trafficking.
- ✓ Paris Pact Initiative: Enhances collaboration among counter-narcotics stakeholders.
- ✓ CITES (Convention on International Trade in Endangered Species): Protects wildlife by regulating international trade.
- **Indian Initiatives**
 - ✓ Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985: Provides a legal framework to counter drug trafficking.
 - ✓ Wildlife Crime Control Bureau: Coordinates enforcement to combat wildlife-related crimes.
 - ✓ Hazardous and Other Wastes (Management and Transboundary Movement) Amendment Rules, 2023: Regulates the movement of hazardous and other wastes.

Dark Eagle Anti-Missile System

Relevance: GS III - Defence Sector

- **In News:** The United States has successfully conducted a test flight of the Dark Eagle, its advanced anti-missile system, signaling that the system is close to achieving operational deployment.



About the Dark Eagle Anti-Missile System:

- **Overview**
 - ✓ The Dark Eagle is a state-of-the-art, long-range hypersonic anti-missile system developed by the United States to intercept and neutralize enemy missile threats during flight.
- **Key Features**
 - ✓ **Comprehensive Interception Capabilities:** Designed to intercept ballistic missiles, cruise missiles, hypersonic missiles, and their associated warheads.
 - ✓ **Extended Operational Range:** Boasts an operational range of over 2,775 kilometers (1,724 miles), enabling it to target and neutralize threats deep within enemy territory.
 - ✓ **Advanced Ballistic Design:**
 - Features a two-stage ballistic missile, one of which is equipped with a Common Hypersonic Glide Body (C-HGB) warhead.
 - The hypersonic glide warhead achieves extraordinary speeds of up to

Mach 17, making it exceptionally difficult to intercept using conventional missile defense systems.

✓ **High-Speed Performance**

- The C-HGB warhead can reach velocities between 3,000 to 3,700 meters per second, operating at altitudes below 50 kilometers.

✓ **Challenging Advanced Defense Systems**

- Designed to outpace and challenge the capabilities of Russia's advanced air defense systems, including the S-300V4, S-400, and S-500.

Conclusion:

- The Dark Eagle Anti-Missile System represents a significant leap in hypersonic defense technology, underscoring the growing importance of advanced missile systems in global strategic defense. Its operational readiness marks a pivotal step in enhancing the United States' capability to counter emerging missile threats.



January - 2025

UK Parliament Passes Historic Assisted Dying Bill

Relevance: GS IV - Ethics

- **In News:** The United Kingdom Parliament has voted in favor of the Terminally Ill Adults (End of Life) Bill, marking a significant step in addressing the contentious issue of assisted dying.



About the Bill:

Provisions

- ✓ Grants terminally ill adults, with a prognosis of less than six months to live, the right to end their life.
- ✓ Requires approval from two doctors & a High Court judge before proceeding.

Key Definitions:

Assisted Dying

- ✓ Involves providing terminally ill patients with lethal drugs, which they self-administer to end their own life.

Euthanasia

- ✓ Entails deliberate administration of life-ending drugs by a physician, often to alleviate suffering, even in non-terminal cases.

Euthanasia and Assisted Dying: Ethical Dilemmas:

Arguments in Favor

✓ Alleviating Suffering

- Offers relief from unbearable pain and prolonged vegetative states.
- Provides a humane approach to end chronic misery.

✓ Dignity and Autonomy

- Empowers patients to exercise control over their end-of-life decisions.

✓ Regulated Framework

- Ensures legal and ethical oversight through medical evaluations and legal

scrutiny, minimizing misuse.

- **Arguments Against**

- ✓ **Ethical and Moral Concerns**

- Contradicts the fundamental principle of medical ethics to preserve life.
 - Creates a moral conflict for healthcare professionals tasked with saving lives.

- ✓ **Potential for Misuse**

- Raises concerns about exploitation, including pressure from vested interests (e.g., organ transplantation demands).

- ✓ **Cultural and Philosophical Sensitivities**

- Challenges religious and cultural beliefs about life and death.
 - **Example:** Philosopher Immanuel Kant argued that the voluntary act of ending one's life is "never, under any circumstances, justifiable."

Conclusion:

- The Terminally Ill Adults (End of Life) Bill reflects a significant shift in balancing individual autonomy and medical ethics. While it offers relief from suffering and upholds dignity, it raises critical concerns about moral boundaries, potential misuse, and cultural sensitivities. A nuanced, well-regulated approach is essential to address these dilemmas responsibly.

India AI calls for proposals on ethical AI

Relevance : GS IV - Ethics

- **In News:** Under the IndiaAI Mission, specifically the Safe & Trusted AI initiative, proposals are being invited to establish safeguards that promote the responsible implementation of AI.
- The mission aims to foster indigenous tools and frameworks that advance the ethical use of AI.
- IndiaAI operates as an Independent Business Division (IBD) under the Ministry of Electronics and IT (MeitY) and serves as the executing body for the IndiaAI Mission.



Need for Ethical AI Framework:

- **The framework is essential to:**
 - ✓ Prevent bias and discrimination in AI systems.

- ✓ Promote transparency and accountability in AI decision-making processes.
- ✓ Enhance societal awareness of AI's potential and implications.

Key Themes for Safe and Trusted AI:

- **Watermarking and Labelling**
 - ✓ Develop mechanisms to verify AI-generated content, ensuring traceability, security, and the absence of harmful elements.
- **Ethical AI Frameworks**
 - ✓ Establish frameworks adhering to global standards to uphold human values and ensure equity in AI systems.
- **AI Risk Assessment and Management**
 - ✓ Design tools and frameworks for assessing risks to facilitate the safe deployment of AI, particularly in public services.
- **Stress-Testing Tools**
 - ✓ Create tools to evaluate AI model performance under extreme conditions, identifying vulnerabilities to build trust in critical applications.
- **Deepfake Detection Tools**
 - ✓ Develop real-time tools to identify and counteract deepfakes, mitigating misinformation and fostering a secure digital environment.

Global and National Initiatives for Ethical AI:

- **Global Efforts**
 - ✓ OECD Principles on AI: Focus on fairness, transparency, and accountability in AI systems.
 - ✓ UNESCO's Recommendation on the Ethics of Artificial Intelligence (2021): A global guideline for ethical AI development and use.
- **Indian Initiatives**
 - ✓ National Strategy for AI (NITI Aayog): A policy framework promoting responsible AI development in India with an emphasis on inclusivity & fairness.
 - ✓ Responsible AI (#AIForAll) by NITI Aayog: Guidelines aimed at creating AI systems that are transparent, free of bias, and respectful of privacy.

Conclusion:

- IndiaAI's initiative underlines the growing emphasis on creating an AI ecosystem that aligns with ethical standards. The development of indigenous tools and adherence to global benchmarks will strengthen India's leadership in fostering responsible AI innovation.

Guidelines for Ethical Use of AI in Financial Sector

☛ **Relevance: GS IV - Ethics**

- **In News:** The Reserve Bank of India (RBI) has constituted a committee to establish a Framework for Responsible & Ethical Enablement of Artificial Intelligence (FREE-AI) in the financial sector.



About Committee:

- The 8-member panel is chaired by **Dr. Pushpak Bhattacharyya**
- The committee will provide recommendations on:
 - ✓ Assessing the current level of AI adoption in financial services.
 - ✓ Identifying potential risks and challenges associated with AI usage.

Benefits of AI in the Financial Sector:

- **Operational Efficiency**
 - ✓ AI streamlines repetitive and time-intensive tasks, enabling financial institutions to handle large data volumes quickly and accurately.
 - ✓ Example: Automated loan application processing.
- **Enhanced Decision-Making**
 - ✓ AI utilizes predictive analytics to offer advanced financial insights and market trend forecasting.
 - ✓ Example: Algorithmic trading to make data-driven investment decisions.
- **Improved Customer Experience**
 - ✓ AI-powered tools like chatbots and virtual assistants enhance customer interactions and provide round-the-clock support.
- **Strengthened Risk Management**
 - ✓ AI enables proactive fraud prevention, shifting from traditional reactive methods of fraud detection to predictive measures.

Concerns Associated with AI in Financial Services:

- **Embedded Bias**
 - ✓ AI systems may replicate or amplify biases and discriminatory patterns present in the training datasets, potentially leading to financial exclusion.

- **Data Privacy and Security**
 - ✓ Risk of breaches in personal data protection and non-compliance with privacy regulations.
- **Other Issues**
 - ✓ Inconsistent AI responses, posing risks to customer satisfaction.
 - ✓ Increased vulnerability to cyberattacks, endangering sensitive financial information.

Conclusion:

- This initiative by the RBI seeks to strike a balance between leveraging AI's potential to revolutionize the financial sector and addressing the ethical, security, and regulatory challenges it presents.



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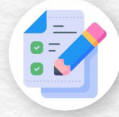
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