



# CURRENT AFFAIRS

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Current Affairs

October - 2024

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## New research reveals a dockyard at Lothal

## Relevance: GS I - Ancient History

- **In News:** A recent investigation by the Indian Institute of Technology-Gandhinagar has unveiled new details about the Lothal dockyard from the Harappan Civilization.



## About Lothal:

- **Location:** Lothal is located about 30 km inland from the Gulf of Khambhat on Gujarat's western coast, India.
- **Historical Significance:** During the Bronze Age Harappan period (circa 2600 BCE to 1900 BCE), Lothal was a major port and a crucial part of the Harappan network of production and distribution centers along the Gulf of Kachchh and the Rann of Kachchh.

## Significance of Lothal Dockyard:

- **Notable Features:** The site is famous for its well-preserved brick-walled dockyard and warehouse, underscoring its role in maritime trade.
- **Study Findings:** New insights into Lothal's dockyard have emerged using advanced technologies such as multi-sensor data, cloud computing, and diverse platforms.

## Path of the Sabarmati River:

- **Historical Flow:** The Sabarmati River once flowed near Lothal during the Harappan era, but it now runs about 20 km east of the site.
- **River Migration:** Satellite images have revealed significant shifts in the river's course during the late Holocene period.
- **Ancient Connectivity:** An ancient route connected Ahmedabad with Lothal, passing through Nal Sarovar wetland, the Little Rann, and reaching Dholavira.



## Sakthan Thampuran: A Legacy of Cochin's Transformation

## Relevance : GS I - Medieval India

- **In News:** Recently, the Minister of State for Tourism pledged to restore the statue of Sakthan Thampuran, commemorating his contribution to the Cochin kingdom.



## About Sakthan Thampuran:

- **Full Name:** Born as Raja Rama Varma Kunjipillai or Rama Varma IX, he is famously known as Sakthan Thampuran.
- **Kingdom:** He ruled the Cochin Kingdom from 1790 to 1805.
- **Birth:** He was born in 1751 to Ambika Thampuran and Chendose Aniyam Namboodiri, members of the Cochin royal family.
- **Nickname:** Raised by his aunt, he was called Sakthan, which means “powerful.”

## The Cochin Kingdom and Sakthan Thampuran's Rule:

- **Geographical Span:** The Cochin Kingdom, a part of the Late Chera Empire, stretched between Ponnani (Malappuram) and Thottappally (Alappuzha).
- **Heir Apparent:** At the age of 18, in 1769, he became the heir apparent to the throne.

## Strategic Leadership and Diplomatic Ties:

- **Diplomatic Relations:** Sakthan Thampuran was a skilled strategist, advising his king to maintain amicable ties with both the Dutch and the British.
- **Mysore Invasion of Travancore:** He was instrumental in Mysore's attempt to invade the Travancore kingdom, showcasing his political acumen.

## The Powney Treaty:

- **Significance:** The invasion led to the signing of the Powney Treaty, which:
  - ✓ Freed the Cochin Kingdom from its allegiance to Mysore.
  - ✓ Helped formalize the kingdom's relations with the British.

### Reforms and Governance:

- **Abolishing Yogiatrippads:** Sakthan Thampuran ended the Yogiatrippads institution—spiritual heads of the Vadakkumnathan and Perumanam Temples—and handed temple management over to the government.
- **Capital Relocation:** He transferred the capital of the Cochin kingdom from Thrippunithura to modern-day Thrissur, establishing a more strategic base.
- **Trade and Commerce:** The king invited merchants of all faiths, along with British officials, to relocate to Thrissur, fostering economic growth.
- **Revenue Overhaul:** He personally supervised the reorganization of the kingdom's revenue management, ensuring financial stability.

### Cultural Contributions:

- **Thrissur Pooram:** In 1797, Sakthan Thampuran started the grand Thrissur Pooram as an alternative to the Arattupuzha Pooram. This festival became a significant cultural event, with major temples in Thrissur gathering to pay homage to Lord Shiva at the Vadakkumnathan Temple.

## Karma Festival or Karma Naach: A Celebration of Tradition and Nature

### Relevance: GS I - Art & Culture

- **In News:** The Karma Festival, also known as Karma Naach, was recently celebrated with great fervor in Jharkhand. This traditional tribal festival marks the beginning of the harvest season and honors the sacred Karam tree.



### About Karma Festival:

- **Region of Celebration:**
  - ✓ The Karma Festival is predominantly celebrated in the eastern parts of India, particularly across the Chota Nagpur Plateau. It spans states like:
    - Chhattisgarh
    - Jharkhand
    - Madhya Pradesh
    - Odisha

- West Bengal

- **Central Deity – Karam Tree:**

- ✓ The Karam tree is central to the festival's rituals, symbolizing Karam Devta or Karamsani, the deity representing strength, vigor, and vitality.

### Cultural Elements of Karma Naach:

- **The Dance:**

- ✓ Both males and females participate in the Karma Naach, dancing in a circle around the sacred Karam tree.
- ✓ The dancers form a circle, intertwining their arms around each other's waists, symbolizing unity and collective strength.

- **Musical Instruments:**

- ✓ Traditional tribal instruments like Thumki, Chhalla, Payri, and Jhumki are used during the dance, adding rhythm and vibrancy to the celebration.

- **Tribes Celebrating Karma:**

- ✓ The festival is observed by various tribal communities, including:
  - Munda
  - Ho
  - Oraon
  - Baiga
  - Kharia
  - Santhal

- **Time of Celebration:**

- ✓ The festival is celebrated on the Ekadashi tithi (eleventh day) of the lunar fortnight in the month of Bhado/Bhadra (August-September as per the Gregorian calendar).

### Rituals and Traditions of Karma Festival:

- **Preparation for the Festival:** A week before the festival, young women gather clear sand from rivers to sow seven varieties of grains, symbolizing fertility and growth.
- **Planting the Karam Tree:** On the festival day, a branch from the Karam tree is planted in the courtyard or akhra. Alongside, the stems of Chirchitti (chaff flower) and Sindwar (chaste tree) are planted in the rice fields as natural pest deterrents.





- **Offerings and Rituals:** Devotees offer jawa (hibiscus) flowers, while the pahan (tribal priest) performs rituals in honor of Karam Raja, invoking blessings for a good harvest and protection from calamities.
- **The Procession and Dance Ritual:** During the dance procession, it is a traditional belief that the karma branch should not touch the ground. It remains elevated between the dancers for the duration of the performance, symbolizing the continuity of life and the protection of crops.

## Harappan Civilization: Enigma Continues Even After a Century of Exploration

### Relevance: GS I - Ancient India

- **In News:** On September 20, 1924, **John Marshall**, who served as the then Director General of the Archaeological Survey of India (ASI), made a landmark announcement revealing the discovery of the Indus Valley Civilization. Even after 100 years of exploration, this ancient civilization still holds many mysteries.
- Two notable archaeologists from the ASI played pivotal roles in this breakthrough:
  - ✓ **Daya Ram Sahni**, the first Indian Director-General of ASI, who led the excavation at Harappa.
  - ✓ **Rakhal Das Banerji**, who was responsible for unearthing Mohenjodaro.



### Overview of the Harappan Civilization:

- The Harappan Civilization is one of the most widespread and ancient cultures, extending over 2,000 sites spread across India, Pakistan, and Afghanistan. The majority of these sites are situated between the Indus and Saraswati River basins.
- **Five Key Cities** of the Harappan Civilization
  1. Rakhigarhi
  2. Mohenjodaro
  3. Harappa
  4. Dholavira

## 5. Ganweriwala

- Geographical Range of the Civilization
  - ✓ **Southernmost Point:** Daimabad in Maharashtra
  - ✓ **Easternmost Point:** Alamgirpur in Uttar Pradesh
  - ✓ **Westernmost Point:** Sutgakhendor in Pakistan
  - ✓ **Northernmost Point:** Manda in Jammu
- Phases of Development
- The Harappan Civilization is divided into three distinct periods:
  - ✓ **Early Phase:** 6000 BCE – 2600 BCE
  - ✓ **Mature Phase:** 2600 BCE – 1900 BCE
  - ✓ **Late Phase:** 1900 BCE – 1300 BCE

**Recent Developments in Harappan Research:**

- **New Archaeological Findings:** Recent excavations at Padta Bet, located in the Kachchh region of Gujarat, have uncovered a 5,200-year-old Harappan settlement.
- **Genetic Research:** DNA analysis conducted on skeletons from Rakhigarhi suggests that the genetic material of the Harappans is still present in today's South Asian population, indicating that a significant portion of the modern population in the region are direct descendants.
  - ✓ Due to the trade and cultural exchanges between the Harappans and far-off regions, a mixture of foreign genes is also found in smaller quantities.

**Salient Features of the Harappan Civilization:**

- **Urban Planning and Architecture:**
  - ✓ The Harappans are renowned for their advanced urban design, which included citadels, Great Baths (like the one in Mohenjodaro), and the extensive use of fired bricks.
  - ✓ A major achievement was the well-planned drainage systems, which demonstrate their architectural expertise.
- **Technological and Craftsmanship Innovations:**
  - ✓ The Harappan people excelled in micro-drilling, bead-making, shell-cutting, metal-working, seal-making, and pottery.
  - ✓ They developed standardized weights and crafted detailed terracotta toys. The Chanhudaro site is particularly noted for its craftsmanship.



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- **Writing System:**
  - ✓ The Harappans had a fully developed Indus script, though it remains undeciphered and continues to puzzle experts.
- **Trade and Commerce:**
  - ✓ The port city of Lothal played a key role in the Harappans' trade activities.
  - ✓ They maintained trade connections with regions like Afghanistan, Iran, and the areas surrounding the Tigris and Euphrates rivers.
  - ✓ In Mesopotamian records, the Indus region was referred to as Meluha, reflecting their long-standing trade relationships.

### Conclusion:

- The Harappan Civilization, discovered a century ago, remains a subject of fascination for its advanced urban planning, technological achievements, and extensive trade networks.
- Despite numerous explorations, the civilization continues to be an enigma, with its undeciphered script and many unresolved questions about its decline.
- As new findings emerge, the story of the Indus Valley Civilization becomes even richer, providing deeper insights into one of the world's most ancient and complex cultures.

## The Great Stupa of Sanchi: A Symbol of Buddhist Heritage

### Relevance : GS I - Art & Culture

- **In News:** Recently, India's External Affairs Minister visited the **replica of the East Gate of the Great Stupa of Sanchi, which is currently displayed in front of the Humboldt Forum Museum in Berlin.** This event highlights the global significance of this ancient Buddhist monument.



### What is a Stupa?

- A stupa is a sacred Buddhist monument, typically **containing the relics**



of Buddha or other revered saints. The stupa's distinctive hemispherical shape can be traced back to pre-Buddhist burial mounds in India, symbolizing its ancient roots. The Great Stupa of Sanchi is an exemplary model of this architectural form.

### The Great Stupa of Sanchi: A Monument of Historical Importance:

#### • Location

- ✓ The Great Stupa of Sanchi is situated in the village of Sanchi in the Raisen district of Madhya Pradesh, India.
- ✓ It is part of a larger complex of Buddhist monuments, including stupas, temples, and monasteries, and is recognized as one of India's oldest stone structures.

#### • Construction and Expansion

- ✓ Mauryan Emperor Ashoka constructed the Great Stupa in the 3rd century BCE. Initially, it was built from large bricks and mud mortar, with a size significantly smaller than the current structure.
- ✓ Ashoka's original stupa is believed to have featured raised terraces at the base, enclosed by a wooden railing, and topped by a stone umbrella.
- ✓ During the Sunga period, around 50 years after Ashoka's death, the stupa was enlarged using local sandstone.

#### • Walkway and Circumambulation

- ✓ A circumambulatory walkway, known as pradakshina, was added to the stupa. This walkway was bordered by a stone railing called Vedika.
- ✓ Circumambulation or walking around the stupa is an essential part of Buddhist ritual practices.

#### • Harmika

- ✓ The main body of the stupa represents the cosmic mountain and is crowned by a square structure called the harmika, which holds the triple umbrella or chhatraveli.
- ✓ This symbolizes the Three Jewels of Buddhism—the Buddha, the Dharma (teachings), and the Sangha (community).

### Key Architectural Features:

#### • Gateways or Toranas

- ✓ The gateways are among the most striking features of the stupa, located at its four cardinal points (North, South, East, and West).



- ✓ These toranas are intricately carved with Buddhist symbols and depictions of historical and religious scenes. Each consists of two stone pillars adorned with capitals.
- **Chronological Sequence of Gateways**
  - ✓ The construction sequence of the gateways is as follows: Southern, Northern, Eastern, and Western.
- **Gupta Period Additions**
  - ✓ In the 5th century AD, during the Gupta period, further modifications were made to the stupa. This included a sculpture of Buddha in dhyana-mudra (meditative posture) on the eastern side of the stupa.
  - ✓ Other additions during this period included a Buddhist temple and a lion pillar.
  - ✓ An inscription celebrating the victory of Chandragupta II is found on the railing of the Great Stupa, dating back to the 4th century AD.



## University of Southampton approved to open a campus in India

## Relevance: GS II - Education Sector

- **In News:** The Union Government has issued a Letter of Intent (LoI) to the University of Southampton, United Kingdom, to set up its campus in India.
- This makes it the first university to receive an LoI under the University Grants Commission's (UGC) new regulations for the establishment of foreign universities in the country.



## About the University of Southampton:

- The University of Southampton is ranked among the top 100 in the QS World University Rankings. Its entry into India marks a significant milestone in the internationalization of higher education in the country.

## Provisions Under National Education Policy (NEP) 2020 &amp; UGC Guidelines:

- **National Education Policy (NEP) 2020:**
  - ✓ **Promotion of Global Universities:** The NEP 2020 aims to encourage renowned global universities to establish their campuses in India. This initiative is a step towards enhancing the quality and accessibility of higher education in the country.
  - ✓ **Internationalization at Home:** It focuses on offering courses in Indian culture, sciences, and traditions, leveraging global interest in these subjects to attract foreign institutions.
- **UGC Guidelines 2023:**
  - ✓ **Framework for Establishing Foreign Universities:** The UGC guidelines, 2023 provide a detailed framework focusing on eligibility criteria, admission processes, fee structures, and operational modalities for foreign universities setting up campuses in India.

## Significance of Foreign Universities in India:

- **Mitigating Brain Drain:** Presence of top foreign universities in India can help

reduce brain drain by offering high-quality education within country.

- **Reducing Financial Burden:** It can also help in mitigating the financial strain on Indian students who seek higher education abroad.
- **Enhancing Quality of Indian Institutions:** The entry of reputed foreign institutions is expected to push emerging private universities in India to enhance their quality and capacity.

### Implementational Challenges:

- **Integrating Indian Culture & Multilingualism:** One of the significant challenges is the incorporation of Indian culture & multilingualism into the curriculum of Foreign Higher Educational Institutions (FHEIs) operating in India.
- **Focus on India-Specific Research:** There is a concern that FHEIs may evolve into large centers focused primarily on India-specific research rather than general research, which could limit the scope and effectiveness of UGC guidelines.
- **Global Trends in Higher Education:** Experiences from around the world highlight that elite, world-class institutions tend to remain domestic, which explains why relatively few FHEIs operate globally. This poses a challenge for India to attract and retain such institutions.

### Future Roadmap for FHEIs in India:

- **Promote Local Partnerships:** Foster collaborations between FHEIs and local institutions to improve research and education quality through global insights.
- **Reform Governance Models:** Update governance in Indian universities by involving global academics and increasing autonomy to align with global standards.
- **Attract International Students:** Highlight the unique benefits of studying in India to attract students from abroad.

## SC forms a five-judge bench to review state borrowing limits

### Relevance: GS II - Governance

- **In News:** The Supreme Court (SC) of India is set to examine whether states have an enforceable right to increase their borrowing limit beyond the cap imposed by the Central Government. Additionally, the SC will review if such restrictions conflict with the role of the Reserve Bank of India (RBI) as the manager of public debt.





- **Reference to Constitution Bench:** Earlier this year, the matter was referred to a Constitution Bench following an original suit filed by the Kerala government. This examination could have significant implications for the principles of federalism and fiscal management in India.

### Impact of Net Borrowing Ceiling (NBC) on States:

- **Violation of Principles of Federalism:**
  - ✓ **Fiscal Decentralization:** Fiscal decentralization is a crucial component of federalism. It involves devolving financial powers to regional and local governments to ensure effective governance.
  - ✓ **Centralized Fiscal Control:** By imposing a borrowing limit, the Centre restricts the states' fiscal autonomy, which could be seen as a violation of the principles of federalism.
- **Impact on Developmental Expenditure:**
  - ✓ **Reduced Spending on Socio-Economic Services:** According to the RBI, the borrowing ceiling affects the states' ability to spend on developmental activities, particularly socio-economic services, which have seen an increasing trend over the years.
  - ✓ **Constraints on Fiscal Flexibility:** States often need to borrow to finance welfare schemes and infrastructure projects. Limiting their borrowing ability impacts their capacity to address local needs and economic development.
- **Limited Sources of Revenue for States:**
  - ✓ **Taxation Powers:** The power to levy taxes primarily lies with the Union Government, leaving states with fewer revenue-generating options.
  - ✓ **Non-sharing of Cess and Surcharge:** Proceeds from cess and surcharge collected by the Centre are not shared with the states, further limiting their financial independence.

### Constitutional Provisions Related to State Borrowing:

- **Article 293:** Powers and Restrictions on State Borrowing
- **Authority to Borrow:** Article 293 of the Constitution grants states the power to borrow within India (not from foreign sources) against the security of the Consolidated Fund of the State.
- **Central Control:** The Centre can provide loans to the states or offer guarantees on the loans they raise. However, if a state has an outstanding debt to the Centre, it cannot raise new loans without the Centre's consent.
- **Net Borrowing Ceiling (NBC):**
  - ✓ **Fixed Borrowing Limit:** The Net Borrowing Ceiling (NBC) for states is set at 3% of the Gross State Domestic Product (GSDP) for the financial year 2023-24. This limit is based on the recommendations of the 15th Finance

Commission.

### Potential Conflict with RBI's Role as Public Debt Manager:

- The Supreme Court's examination will also focus on whether the restrictions on states' borrowing limit conflict with the RBI's role as the public debt manager.
- The RBI is responsible for managing the overall debt of the country, and any conflict or overlap of authority could affect the country's fiscal stability.

### Review of the 2024-25 Gender Budget

#### Relevance : GS II - Government Budgeting

- **In News:** The 2024-25 Union Budget underscores the significance of women-centric growth, achieving a milestone as allocations in the Gender Budget Statement (GBS) reach 1% of India's Gross Domestic Product (GDP) for the first time.
- It also reports that funding for women-focused initiatives has exceeded ₹3 lakh crore.



### Key Points of the 2024-25 Gender Budget Statement (GBS):

- **Increase in Women-Focused Allocations:** The share of funds for women-focused programs has risen to around 6.8% of the total budget for 2024-25, up from the usual average of about 5%.
- **New Reporting Category - Part C:** A new section, Part C, has been added to include programs with up to 30% funding for women, such as the PM Kisan scheme.
  - ✓ **Part A:** Covers Women-Specific Programs with 100% allocation for women, like SAMARTHYA, which now forms nearly 40% of the GBS due to the inclusion of the Pradhan Mantri Awas Yojana (PMAY).
  - ✓ **Part B:** Includes programs with 30% to 99% spending on women-related components, like PM AJAY - Adarsh Gram Yojana.

### What is Gender Budgeting?

- **Definition:** Gender budgeting is a strategic method adopted by governments to ensure public resources are collected and allocated according to the diverse needs and priorities of different genders. It does not create a separate budget for women but addresses their specific needs within the existing budget.
- **Background:** India ratified the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) in 1993, committing to gender equality. This led to the first Gender Budget Statement in the 2005-2006 budget.

Since then, the GBS has been released alongside the Union Budget.

- **Nodal Agency and Structure:** The Ministry of Women and Child Development (MWCD) is the central agency for gender budgeting, and the Ministry of Finance has required the formation of Gender Budget Cells in all central ministries and departments. Gender budgeting is a crucial element of the Samarthya sub-scheme under Mission Shakti, an MWCD initiative to empower women.

### Framework for Gender Budgeting:

- **Situation Analysis:** Evaluate the status of different gender groups in various sectors.
- **Policy Assessment:** Determine if policies address identified gender issues.
- **Budget Evaluation:** Assess if allocations are sufficient for gender-sensitive actions.
- **Expenditure Monitoring:** Check if funds are utilized as planned and evaluate the outcomes.
- **Impact Assessment:** Measure the effects of policies on the initial conditions analyzed.

### Importance of Gender Budgeting:

- **Optimizes Resource Use:** Directs resources to address significant gender gaps.
- **Supports Global Goals:** Aligns with SDG 5, promoting global gender equality efforts.
- **Improves Accountability:** Ensures transparency in fund allocation and expenditure, fulfilling gender equality commitments.
- **Strengthens Governance:** Integrates gender perspectives into public finance management, leading to more inclusive governance.

### Challenges in Gender Budgeting in India:

- **Over-Reporting:** Some programs, like the PM Employment Generation Programme (PMEGP), show exaggerated allocations in the GBS without proper justification. For example, ₹920 crore (40% of the total allocation) is reported without adequate clarity, indicating a problem of over-reporting.
- **Under-Reporting and Missing Allocations:** Key allocations for women's needs are often understated. For instance, the National Rural Livelihoods Mission (NRLM) is now fully reported as focused on women and girls, but this should have been recognized earlier. Similarly, in MGNREGS, where women represent 59.3% of all person-days worked, they receive only 33.6% of its budget under Part B, indicating a disparity.
- **Neglect of Key Areas:** Important sectors like transportation, water collection,



and water security, which significantly impact women, are often overlooked in gender budgeting.

### Way Forward:

- **Improve Reporting Accuracy and Clarity:** To strengthen gender audits and ensure precise accounting, provide comprehensive explanations for all GBS entries. Accurately report allocations that reflect true spending on women's needs and address inconsistencies, as seen in MGNREGS and PMEGP.
- **Expand Coverage:** Broaden the scope of programs impacting women, particularly in underrepresented areas like transportation and water security.
- **Regular Updates and Reviews:** Continuously revise the GBS methodology to incorporate the latest data and insights, including periodic assessments to evaluate the effectiveness of gender-responsive budgeting.
- **Integrate Gender Sensitivity in Planning:** Establish clear gender equality objectives and allocate resources accordingly to ensure government programs are designed with gender considerations from the start.

## Telecommunications Digital Bharat Nidhi Rules, 2024

### Relevance: GS II - Governance

- **In News:** The Department of Telecommunications (DoT) has notified the Telecommunications (Administration of Digital Bharat Nidhi) Rules, 2024, utilizing the authority granted by the Telecommunications Act, 2023. These rules are intended to operationalize the Digital Bharat Nidhi (DBN).



### About Digital Bharat Nidhi (DBN):

- The DBN was established under the Telecommunications Act, 2023, with the **objective of funding telecommunications schemes in underserved and remote rural areas at affordable rates.** It replaces the Universal Service Obligation Fund (USOF), which was created under the Indian Telegraph Act, 1885.
- The USOF was a non-lapsable fund accumulated through a Universal Access Levy imposed on DoT licensees, calculated at 5% of their Adjusted Gross Revenue.

### Key Highlights of the Notified Rules:

- **Criteria for Schemes and Projects:** The rules specify criteria for undertaking telecom schemes and projects, which include:



- ✓ Provisioning telecom services in underserved rural, remote, and urban areas.
- ✓ Introducing next-generation telecom technologies.
- ✓ Encouraging startups and promoting sustainable, green technologies.
- **Sharing of Telecom Networks:** Networks and services established under the DBN must be shared & made available on an open and non-discriminatory basis.

### Process of Allocation of Funds under DBN:

- **Bidding:** This process supports the provision of telecommunication services to enhance access and delivery in underserved areas.
- **Selection by Application:** This process promotes and supports research and development of new or emerging telecommunication technologies, products, or services through mechanisms such as co-funding and Viability Gap Funding (VGF).

## Judiciary as the Guardian of Democracy

### Relevance: GS II - Polity

- **In News:** The Prime Minister underscored the significant achievements of the judiciary during the National Conference of District Judiciary, marking the 75th anniversary of the Supreme Court of India.

### Democracy and the Role of Judiciary



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### Constitutional Provisions Empowering the Judiciary:

- **Article 13:** Establishes the foundation for judicial review by the Supreme Court, allowing it to assess the constitutionality of legislative and executive actions.
- **Articles 32 and 226:** Grant the Supreme Court and High Courts the authority to issue writs for the enforcement of Fundamental Rights, thereby safeguarding individual liberties.

### Role of the Indian Judiciary as a Guardian of Democracy:

- **Kesavananda Bharati Sripadagalavaru vs. State of Kerala (1973):** Introduced the “basic structure doctrine,” limiting Parliament’s amending powers to preserve the essential framework of the Constitution.
- **Indira Gandhi v. Raj Narain (1975):** Affirmed the principle of free and fair elections as fundamental to the essence of democracy.
- **S.R. Bommai v. Union of India (1994):** Imposed restrictions on the misuse of Article 356, thus curbing the arbitrary dismissal of state governments.
- **ADR vs. Union of India (2024):** Declared the electoral bond scheme unconstitutional, reinforcing the need for transparency in political funding.

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### Challenges Facing the Judiciary:

- **Low Judge-Population Ratio:** A significant concern impacting the efficiency of the judiciary.
- **Case Pendency:** The accumulation of pending cases poses a challenge to timely justice.
- **Judicial Activism and Overreach:** Debates around the extent of judicial intervention in policy matters.
- **Threat of Contempt of Court:** Issues related to the balance between judicial authority and freedom of expression.
- **Corruption:** Instances of corruption within the judiciary affecting its credibility.

### Way Forward (Recommendations from Law Commission Report 245):

- **Appointment of Judges:** Prioritize timely and efficient appointments to address the backlog and improve the functioning of the judiciary.
- **Special Traffic Courts:** Establish specialized courts to expedite the handling of traffic-related cases.
- **Periodic Needs Assessment:** Regularly evaluate the needs of the judiciary to ensure adequacy in infrastructure and resources.
- **Encouraging Alternative Dispute Resolution (ADR):** Promote ADR methods to alleviate the burden on courts and offer quicker resolution to disputes.

## CVC Report: Most Corruption Complaints Against Railways, Delhi Municipal Bodies, and Public Sector Banks

### Relevance: GS II - Governance

- **In News:** The Central Vigilance Commission (CVC) has published its Annual Report for 2023, providing a comprehensive analysis of corruption complaints received and addressed, categorized by ministries, departments, and sectors involving public officials.



### Key Insights from the Report:

- **Number of Complaints:** In 2023, the CVC registered a total of 74,203 corruption complaints, out of which 66,373 cases have been addressed, leaving 7,830 cases unresolved.
- **Guidelines Released:** The Commission has issued new guidelines focusing on three key areas of vigilance management: Punitive, Preventive, and Participative Vigilance.

### Types of Vigilance Strategies:

- **Punitive Vigilance:**
  - ✓ This involves taking swift and effective disciplinary action against those found guilty of misconduct to serve as a deterrent.
- **Preventive Vigilance:**
  - ✓ Aims to establish corruption-free governance by implementing proactive measures, such as revising rules, conducting rotational transfers of officers, and re-engineering processes to minimize opportunities for corrupt practices.
- **Participative Vigilance:**
  - ✓ Emphasizes the involvement of all stakeholders—government employees, civil society, and educational institutions—to raise awareness about the harmful effects of corruption. Initiatives like Vigilance Awareness Week are part of this strategy to build capacity in combating corruption.

### About the Central Vigilance Commission (CVC):

- **Legal Status:** The CVC is a statutory body established under the Central Vigilance Commission Act, 2003.
- **Formation:** Initially formed in 1964 through a Government of India resolution, based on recommendations by the K. Santhanam Committee on Prevention of Corruption.
- **Granting of Statutory Powers:** In 1998, the CVC was granted statutory status through an ordinance issued by the Union Government.

### Structure and Appointment Process:

- **Members:** The CVC comprises three members: the Central Vigilance Commissioner and two Vigilance Commissioners.
- **Appointment Procedure:** Members are appointed by the President on the recommendation of a High-Powered Committee, which includes the Prime Minister, the Union Home Minister, and the Leader of the Opposition in the Lok Sabha.

### Responsibilities and Functions of the CVC

- **Monitoring Vigilance Administration:** The CVC supervises vigilance functions across various Central Ministries, Departments, and Government Organizations.
- **Conducting Preliminary Inquiries:** It carries out initial inquiries into complaints forwarded by the Lokpal for officials at various levels.
- **Supervising Investigations:** It oversees the operations of the Delhi Special Police Establishment (CBI) in probing corruption-related offenses and other anti-corruption activities.

## President Approves Formation of 23rd Law Commission

## Relevance: GS II - Polity

- **In News:** The President has sanctioned the establishment of the 23rd Law Commission, which will function from September 1, 2024, to August 31, 2027.



## About 23rd Law Commission:

- **Mandate:** The Commission is tasked with reviewing and recommending legal reforms to improve the Indian legal system.
- **Composition:**
  - ✓ **Chairperson:** A full-time chairperson will lead the Commission.
  - ✓ **Members:** Four members will support the chairperson.
  - ✓ **Additional Members:** The Commission will also include ex-officio and part-time members.

## Terms of Reference (ToR):

- **Review and Repeal of Obsolete Laws:**
  - ✓ Develop a Standard Operating Procedure (SOP) for the regular review of existing laws.
  - ✓ Recommend the repeal or amendment of laws based on their relevance and current economic needs.
- **Law and Poverty:**
  - ✓ Assess laws impacting the poor.
  - ✓ Conduct post-enactment audits of socio-economic legislation to evaluate effectiveness.
- **Review of Judicial Administration:**
  - ✓ Propose measures to eliminate delays and clear case backlogs.
  - ✓ Simplify processes and harmonize rules across various high courts.
- **Directive Principles of State Policy (DPSPs):**
  - ✓ Review existing laws to enhance the effective implementation of DPSPs.
  - ✓ Suggest reforms to achieve the objectives outlined in the Preamble of the Constitution.
- **Gender Equality:**
  - ✓ Strengthen gender equality laws by examining current legislation and recommending necessary amendments.
- **Revision of Central Acts:**
  - ✓ Identify and rectify anomalies and inequities in Central Acts.



### Globalization Impact:

- ✓ Analyze the effects of globalization on food security and unemployment.
- ✓ Recommend protective measures for marginalized communities..

### About the Law Commission of India (LCI):

- **Nature:** The LCI is a non-statutory body established through a notification by the Ministry of Law and Justice.
- **Objective:** To reform laws to maximize justice in society and promote good governance under the rule of law.
- **Functions:** Conducts research and provides recommendations based on specific Terms of Reference.
- **Historical Background:** The Law Commission was first constituted in 1834 under the Chairmanship of Lord Macaulay, following the Charter Act of 1833, by the Governor-General.

## Rajasthan Cabinet Approves 33% Quota for Women in Police Force

### Relevance: GS I - Social Issue

- **In News:** Recently, the Rajasthan government took a significant step towards promoting gender equality in law enforcement by approving a 33% reservation for women in the police force. Additionally, the government has sanctioned an extra 5% allowance for pensioners.



### Other State initiatives to increase Women Representation in Police Forces:

- The move by Rajasthan follows the precedent set by other states like **Bihar, Gujarat, Odisha, and Maharashtra**, which have already implemented women-specific quotas in their respective police forces.
- As of 2022, women constituted approximately 12% of the state police forces in India, with **Chandigarh having the highest** representation at 22% and **Jammu and Kashmir the lowest** at 3.3%, as per the India Justice Report, 2022.

### Need for More Women in the Police Force:

- **Legal Mandates:**
  - ✓ The Protection of Children from Sexual Offences (POCSO) Act and other significant criminal laws mandate that every case of sexual assault must be recorded and investigated by a female police officer.
  - ✓ Furthermore, the arrest and search of women must be conducted by female officers only, highlighting the need for their presence in the force.

- **Better Reporting of Crimes Against Women:**
  - ✓ The presence of female police officers can help build trust among women victims, thereby encouraging them to report crimes more freely and without fear of prejudice or bias.
- **Improved Police-Community Relations:**
  - ✓ Women police officers are generally less likely to use excessive force, which can lead to more positive interactions between the police and the community, fostering better relations.

### Challenges in Increasing Women's Representation:

- **Stereotypes:** There is a prevalent stereotype that women are not suitable for the long and unpredictable hours associated with police work. This perception often hampers recruitment and retention efforts.
- **Policy Gaps:** Many states lack a formal reservation policy for women in the police force. This is significant because police matters fall under the State List as per the 7th Schedule of the Indian Constitution.
- **Implementation Gaps:** Even in states with existing reservation policies, there is often a gap between policy and practice. For example, Bihar has a policy providing 35% reservation for women, but the actual representation of women in its police force is only around 17.4%.

### Initiatives to Increase Women's Representation:

- **Advisories from the Ministry of Home Affairs (MHA):** The MHA has issued advisories to all States and Union Territories to establish at least one all-women police station in each district.
- **Target for Women's Representation:** The MHA has also advised States and UTs to increase the representation of women in the police force to 33% of the total strength.
- **Supportive Facilities:** The Central Armed Police Forces (CAPFs) have established creches and day care centres to support women employees, making it easier for them to balance professional and personal responsibilities.
- **Exemption from Application Fees:** All female candidates are exempted from paying the application fee for exams conducted by the CAPFs, encouraging more women to apply for these positions.

### Universal Access to Health care: Digital Solutions

#### Relevance : GS II - Health Sector

- **In News:** Recently, a National Conference on Universal Access to Healthcare was organized by the National Human Rights Commission

(NHRC) in collaboration with various stakeholders.

- The conference focused on enhancing universal access to healthcare through digital solutions.

### Objective of the Conference:

- To bring together healthcare practitioners, experts, policymakers, and innovators to discuss **strategies for achieving universal access to affordable and quality healthcare**.
- To specifically address challenges in providing healthcare services in rural, remote, and hilly areas.



### Key Participants:

- The National Human Rights Commission (NHRC)
- Sankala Foundation, supported by NITI Aayog
- Ministry of Health & Family Welfare (MoHFW)

### Key Report Released:

- During the conference, a report titled “**Leveraging Digital Solutions for Universal Health Coverage**” was released by the **Sankala Foundation**, highlighting the potential of digital healthcare technologies in achieving universal health coverage.

### Digital Health Initiatives in India:

- Universal access to healthcare is recognized as a basic human right, and India is committed to achieving Universal Health Coverage (UHC) by 2030 through the use of digital health solutions to bolster the public health infrastructure at the primary level.
- **Bridgital Model:** The Ministry of Health and Family Welfare implemented the Bridgital Model at AIIMS, New Delhi, to manage overcrowding by streamlining the registration and appointment processes through digital means.
- **Digital Nerve Centre (DiNC):** The Digital Nerve Centre is a unique healthcare delivery model designed to provide quick access to primary healthcare services. It ensures a well-coordinated continuum of care for citizens visiting government health facilities.
- **Global Initiative on Digital Health (GIDH):** India, in collaboration with the World Health Organization (WHO), launched the Global Initiative on Digital Health (GIDH) during the 2023 G20 Health Ministerial Meeting. This initiative aims to harness digital health innovations on a global scale.

- **National Digital Health Mission (NDHM):** Implemented by the National Health Authority, the NDHM aims to make India self-reliant in providing universal health coverage to all citizens. It focuses on creating an integrated digital health ecosystem, linking healthcare providers, patients, and insurance companies.
- **Digital Health Incentive Scheme:** This scheme focuses on digitizing patients' health records and linking them with the Ayushman Bharat Digital Health Account (ABDHA). The goal is to enhance the accessibility, efficiency, and quality of healthcare services.

## Conclusion

- The National Conference on Universal Access to Healthcare underscores the importance of leveraging digital solutions to bridge the gap in healthcare access, particularly in underserved areas.
- Through various initiatives such as the Bridgital Model, Digital Nerve Centre, and the National Digital Health Mission, India is taking significant strides toward achieving Universal Health Coverage by 2030.

## The first global 'legally binding' pact on use of AI

### Relevance: GS II - IR & Governance

- **In News:** The United States, European Union (EU), and United Kingdom (UK) are set to sign the Council of Europe's convention on artificial intelligence (AI), marking the creation of the first "legally binding" international treaty focused on governing the use of AI.



### Objectives of the AI Treaty:

- The treaty, named the **Framework Convention on Artificial Intelligence, Human Rights, Democracy, and Rule of Law**, aims to:
  - ✓ Mitigate the threats posed by AI to **human rights, democracy, and the rule of law**.
  - ✓ Ensure that AI systems' development and lifecycle activities are **aligned with fundamental human rights principles**.

### Key Features of the AI Treaty:

- The treaty was formulated by the **Council of Europe** and operates separately from the **EU AI Act**, which was enforced last month.
- It is distinct due to its **mandate to ensure AI activities** are consistent with human rights, democracy, and rule of law principles throughout the entire AI



lifecycle.

- **Major Provisions of the AI Framework Convention:**

- ✓ **Risk-Based Approach:** AI systems deemed to pose risks that are incompatible with human rights will be banned.
- ✓ **Global Applicability:**
  - The treaty covers both the public and private sectors across different geographic regions.
- ✓ **Accommodating Diverse Legal Systems:**
  - It allows signatory countries the flexibility to regulate the private sector directly under the convention or through alternative legal measures that align with the treaty's principles.
- ✓ **Exemptions:**
  - The convention does not apply to areas concerning national security, defense, or research and development (R&D) activities.

### Impact of AI on Human Rights, Democracy, & Rule of Law:

- **Human Rights:**
  - ✓ AI's capacity to predict human behavior, create stereotypes, and introduce discriminatory biases poses significant threats to individual rights.
  - ✓ AI-powered biometric tools have implications for privacy rights.
- **Democracy:** Biometric surveillance may affect the freedom of social and political discourse, a foundational element of democratic societies.
- **g**The affordability of AI systems for elites, coupled with the control AI developers exert over these technologies and the potential surveillance of citizens, can threaten the principle of equality before the law.

### Conclusion

- The Framework Convention on Artificial Intelligence, Human Rights, Democracy, and Rule of Law represents a significant step toward establishing a global governance framework for AI technologies.
- By incorporating a risk-based approach and accommodating global legal diversity, the treaty seeks to safeguard human rights, uphold democratic values, and ensure adherence to the rule of law in the AI era.

## Pradhan Mantri Kisan Maandhan Yojana (PM-KMY) Marks Five Years

### Relevance : GS II - Welfare Scheme

- **In News:** The Pradhan Mantri Kisan Maandhan Yojana (PM-KMY) has recently completed five successful years since its launch in 2019, marking a significant milestone in providing social security to Small and Marginal Farmers (SMFs) across India.



### About PM-KMY:

- **Introduction:** PM-KMY was introduced to offer social security to eligible Small and Marginal Farmers (SMFs) by providing a fixed monthly pension of ₹3,000 after they attain the age of sixty.
- **Definition of Farmers:**
  - ✓ **Marginal Farmers:** Those holding below 1.0 hectares of cultivable land.
  - ✓ **Small Farmers:** Those holding 1.0 to 2.0 hectares of cultivable land.
- **Administration:** It is a Central Sector Scheme managed by the Department of Agriculture, Cooperation & Farmers Welfare, under the Ministry of Agriculture & Farmers' Welfare, in collaboration with the Life Insurance Corporation of India (LIC).
- **Nature of Scheme:** This is a voluntary and contributory pension scheme designed for old-age security.
- **Scheme Enrolment Process:**
  - ✓ **Eligibility and Contribution:** Farmers aged between 18 and 40 years can enroll by paying a monthly subscription ranging from ₹55 to ₹200 until they reach 60 years of age.
  - ✓ **Fund Management:** The pension fund is managed by the Life Insurance Corporation of India (LIC). Enrolment is facilitated through Common Service Centres (CSCs) and state governments.
    - **Common Service Centres (CSCs):** These are access points for delivering Government-to-Citizen (G2C) e-services, providing a physical ICT infrastructure to bring government services within citizens' reach.
  - ✓ **Current Enrolment Status:** As of August 6, 2024, 23.38 lakh farmers have joined the scheme. Bihar leads with over 3.4 lakh registrations, followed by Jharkhand with over 2.5 lakh registrations.

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- ✓ **State/UT Contribution Option:** State/UT governments have the option to share the contribution burden of individual SMF beneficiaries.

### Key Benefits of the PM-KMY:

- **Family Pension:** If a subscriber dies while receiving the pension, their spouse is entitled to a family pension of 50% of the amount the subscriber was receiving, i.e., ₹1,500 per month. This benefit is available only if the spouse is not already a scheme beneficiary.
- **Integration with PM-KISAN:** SMFs can opt to use their PM-KISAN benefits to make voluntary contributions to the PM-KMY. This option allows for the automatic debit of their contributions from the bank account where PM-KISAN benefits are credited.
- **Government Contribution:** The Central Government, through the Department of Agriculture Cooperation and Farmers Welfare, matches the contribution made by the eligible subscriber to the pension fund.

### Conditions for Exiting the Pension Scheme:

- **Exit Before 10 Years:** If a subscriber exits the scheme within ten years of joining, their share of the contribution will be returned along with the applicable savings bank interest rate.
- **Exit After 10 Years but Before 60 Years:** If the subscriber exits after ten years but before reaching sixty years of age, they will receive their contribution plus accumulated interest, whichever is higher—either as earned by the pension fund or at the savings bank rate.

### Significance of the PM-KMY Scheme:

- **Empowerment of Small and Marginal Farmers:** PM-KMY has been instrumental in providing financial stability to Small and Marginal Farmers (SMFs) amid the uncertainties associated with seasonal agriculture and fluctuating incomes.

### Shortcomings of the Scheme:

- **Eligibility Constraints:** The scheme is limited to farmers owning up to two hectares of cultivable land, thereby excluding tenant farmers, sharecroppers, and larger landowners.
- **Contribution Challenges:** The requirement for farmers to make monthly contributions can be a burden for those with irregular incomes.
- **Implementation Issues:** Reports have highlighted delays in enrolment and problems with the auto-debit system for contributions, affecting the scheme's smooth execution.

### Conclusion:



- The Pradhan Mantri Kisan Maandhan Yojana (PM-KMY) continues to play a crucial role in safeguarding the social security of Small and Marginal Farmers, although challenges related to eligibility, contributions, and implementation need to be addressed for the scheme's greater effectiveness.

## MOFAHD Launches New Initiatives on PMMSY's 4<sup>th</sup> Anniversary

### Relevance: GS II - Government schemes

- **In News:** On the occasion of the 4th anniversary of the Pradhan Mantri Matsya Sampada Yojana (PMMSY), the Ministry of Fisheries, Animal Husbandry & Dairying launched several new initiatives aimed at transforming India's fisheries sector.



### Key Initiatives Launched:

- **National Fisheries Development Program Portal:** This portal, created under the Pradhan Mantri Matsya Kisan Samridhi Sah-Yojana, a sub-scheme of PMMSY, will act as a central hub for fisheries stakeholders. It will provide comprehensive information, services, and support related to the fisheries sector.
- **Specialized Fisheries Production and Processing Clusters:**
  - Dedicated clusters have been established for Pearl Cultivation, Ornamental Fisheries, and Seaweed Cultivation to foster innovation and growth in these niche sectors.
- **Pilot Project on Drone Technology:** A pilot project for the use of drones in fish transportation will be undertaken by the Central Inland Fisheries Research Institute. This aims to explore the potential of drone technology in monitoring and managing inland fisheries.
- **Mandapam Regional Centre as a Centre of Excellence:** The Mandapam Regional Centre of the Central Marine Fisheries Research Institute is being established as a Centre of Excellence for promoting seaweed farming and research.
- **Nucleus Breeding Centres:**
  - Nucleus Breeding Centres are being set up for both marine and inland species. These centres aim to improve seed quality through the genetic enhancement of economically important species
- **Incubation Centres:**
  - Three Incubation Centres will be established in Hyderabad, Mumbai, and Kochi. These centres will promote at least 100 fisheries startups, cooperatives, and other ventures



**Priority Projects:**

- Key priority projects include the development of five Integrated Aqua Parks in Assam, Chhattisgarh, Madhya Pradesh, Tripura, and Nagaland.
- Establishment of two World-Class Fish Markets in Arunachal Pradesh and Assam is also part of the initiatives.

**About Pradhan Mantri Matsya Sampada Yojana (PMMSY):**

- **Aim:** Launched in 2020, the PMMSY aims to bring about a Blue Revolution through the sustainable and responsible development of the fisheries sector in India.
- **Tenure:** The scheme is implemented from FY 2020-21 to FY 2024-25.
- **Targets:**
  - Increase fish production to 22 million metric tons.
  - Reduce post-harvest losses from 20-25% to about 10%.
  - Double export earnings to Rs. 1 lakh crore.
- **Scheme Type:** The PMMSY is both a Central Sector Scheme and a Centrally Sponsored Scheme, combining efforts across different levels of government for the development of the fisheries sector.

**Supreme Court Reaffirms Rights of Individuals in Preventive Detention Cases****Relevance : GS II - Governance**

- **In News:** In the *Jaseela Shaji vs Union of India (2024)* case, the Supreme Court underscored the rights of a detenu (person in detention) to present a valid representation against preventive detention.
- This ruling reinforces constitutional safeguards for individuals detained without trial under preventive detention laws.

**Key Points of the Ruling:**

- **Right to Detention Grounds:** The Court ruled that a detenu must be provided with the reasons for detention, along with any supporting documents used in the detention process.
- **Delay in Providing Documents:** Failure or delay in furnishing these documents violates the detenu's right to submit an effective representation, as guaranteed by

Article 22(5) of the Constitution.

### Key Provisions Under Article 22(5):

- **The detaining authority must:**
  - ✓ Inform the detenu of the reasons for their detention promptly.
  - ✓ Provide the detenu with the earliest opportunity to challenge the detention order.

### Preventive Detention:

- **Article 22(3) of the Constitution** permits authorities to detain individuals without trial for preventive purposes, such as maintaining public order or national security. However, safeguards exist to prevent misuse:
- **Detention beyond three months** requires approval from an Advisory Board.
- Grounds for detention must be communicated **at the earliest opportunity**.
- The **detenu should be given the chance to make a representation** as soon as possible.

### Preventive Detention Laws:

- **National Security Act (NSA), 1980:** Allows detention for national security and public order.
- **Unlawful Activities (Prevention) Act (UAPA), 1967:** Permits detention for activities deemed unlawful or related to terrorism.
- **Conservation of Foreign Exchange and Prevention of Smuggling Activities Act (COFEPOSA), 1974:** Aims to curb smuggling and foreign exchange violations.
- **Prevention of Black Marketing and Maintenance of Essential Commodities Act (PBMSECA), 1980:** Prevents hoarding and black marketing of essential goods.

## Expert Group Report on Future Pandemic Readiness

### Relevance: GS II - Governance

- **In News:** NITI Aayog has unveiled an Expert Group Report that outlines strategies for improving future pandemic preparedness.
- It reflects on the difficulties encountered during the COVID-19 outbreak and suggests a comprehensive framework to handle upcoming public health crises.



## Challenges Highlighted During COVID-19:

- **Legal Gaps:** Existing laws like the National Disaster Management Act (NDMA) and Epidemic Diseases Act (EDA) were not fully equipped to manage the complexities of a pandemic.
- **Data and Surveillance Deficiencies:** The pandemic revealed issues in integrating data from different sources, impeding informed decision-making.
- **Research and Innovation Shortcomings:** There was an inadequate connection between research institutions and industries for the rapid development of vaccines and diagnostics.

## Key Recommendations of the Report:

- **Governance:**
  - ✓ **Public Health Emergency Management Act (PHEMA):** The report suggests enacting new legislation to address public health emergencies, covering non-communicable diseases, disasters, and bioterrorism.
  - ✓ **Empowered Group of Secretaries on Pandemic Preparedness and Emergency Response (PPER):** Chaired by the Cabinet Secretary, this group will oversee future public health crisis responses.
  - ✓ **PPER Fund:** A dedicated fund should be established to finance pandemic preparedness and response efforts.
- **Data Management, Surveillance, and Early Warning:**
  - ✓ **Enhanced Surveillance System:** A well-coordinated system is essential to collect real-time data for effective analysis.
  - ✓ **Predictive Modeling and Forecasting:** Creating a network for early detection of potential pandemics using advanced predictive models.
- **Research and Innovation:**
  - ✓ **Institute of Innovation for New Platform Technologies:** This institute will focus on developing vaccines and technologies to respond quickly to new diseases.
  - ✓ **Centers of Excellence for Training:** Establish specialized centers to train personnel in key areas identified as lacking during the pandemic.
- **Existing Framework for Managing Epidemics/Pandemics:**
  - ✓ **Public Health and Sanitation (State List):** Under Entry 6 of the State List, states are primarily responsible for public health.
  - ✓ **Concurrent List (Entry 29):** Both the Centre and States can legislate on preventing the spread of infectious diseases.
  - ✓ **International Health Regulations (2005):** Provides an international legal framework for managing public health emergencies.
  - ✓ **Epidemic Diseases Act (EDA), 1897:** The primary law for epidemic control.

- ✓ **Integrated Disease Surveillance Programme (IDSP):** A national programme aimed at improving disease surveillance.

## Health Insurance for Senior Citizens

### Relevance: GS II - Government Schemes

- **In News:** The Union Cabinet has sanctioned a health insurance plan for senior citizens under the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB PM-JAY), which aims to benefit around 6 crore elderly individuals.



### Details of the Scheme Expansion:

- **Eligibility Criteria:**
  - ✓ Available to all senior citizens aged 70 and above, regardless of income.
- **Benefits Provided:**
  - ✓ Senior citizens will receive an annual health insurance of ₹5 lakh for their family.
  - ✓ Those already enrolled in AB PM-JAY will get an additional ₹5 lakh per year on top of their existing family coverage.
- **Access and Flexibility:**
  - ✓ Eligible seniors will be issued a special health card for easy identification.
  - ✓ Those covered under other public health insurance plans can either continue with their current plan or switch to AB PM-JAY.
  - ✓ Senior citizens with private health insurance or covered under Employees' State Insurance are also eligible for AB PM-JAY.

### About AB PM-JAY Scheme:

- **Ministry:** Managed by the Ministry of Health & Family Welfare.
- **Type:** Centrally Sponsored Scheme under Ayushman Bharat Mission.
- **Target:** Covers 12 crore families (approximately 55 crore people).
- **Objective:** To advance Universal Health Coverage (UHC) by offering affordable healthcare.
- **Benefits:**
  - ✓ ₹5 lakh per family annually for secondary and tertiary care.
  - ✓ Includes coverage for up to 3 days before hospitalization and 15 days after, including diagnostic services and medicines.
  - ✓ Recognized as the world's largest publicly funded health assurance program.

### Other Schemes for Senior Citizens:



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- **Atal Vayo Abhyuday Yojana:** Enhances the quality of life for seniors through specific interventions.
- **Senior Aging Growth Engine (SAGE) Initiative:** Encourages products and services for elderly care.
- **Senior Able Citizens for Re-Employment in Dignity (SACRED) Portal:** Connects seniors with private employers for re-employment opportunities.

## Port Blair renamed as Sri Vijaya Puram

### Relevance : GS II - Governance

- **In News:** A Union Minister recently announced via a post on X (formerly Twitter) that Port Blair, the capital of the Union Territory of Andaman and Nicobar Islands, will now be known as 'Sri Vijaya Puram'.



### About Port Blair:

- **Capital of Andaman and Nicobar Islands:** Port Blair serves as the administrative center and the primary entry point for the Andaman and Nicobar Islands.
- **Historical Naming:** The city was named after Archibald Blair, a naval surveyor and lieutenant in the Bombay Marine. He was the first officer to conduct a thorough survey of the Andaman Islands.

### Archibald Blair's Survey Mission:

- **Career in Bombay Marine:** Archibald Blair joined the Bombay Marine in 1771 and embarked on several survey missions along the coasts of India, Iran, and Arabia.
- **Survey Expeditions:** Blair participated in survey missions in the Chagos Archipelago, Diamond Harbour near Calcutta, and along the Hooghly River in the late 1780s.
- **First Survey Voyage to Andamans:** In December 1778, Blair embarked on his first survey voyage to the Andaman Islands from Calcutta, commanding two ships, the Elizabeth and Viper. The mission lasted until April 1779, during which Blair explored the west coast of the island and eventually reached a natural harbor, initially named Port Cornwallis.
- **Recognition by East India Company (EIC):** Blair's detailed report on the Andaman Islands was well received by the East India Company (EIC) officials, leading them to colonize the islands as a strategic harbor to monitor the activities of Malay pirates. The island was later renamed after Blair.

- **Strategic Importance:** EIC intended the islands to serve as a refuge for shipwreck survivors and a shelter for officers during conflicts with other powers.
- **Establishment as Penal Colony:** The arrival of convicts marked the transformation of the island into a penal colony, where prisoners were sent to perform unpaid labor.

### Shift of the Colony:

- **Move to Port Cornwallis:** In December 1792, the colony was moved to the northeastern part of the Andaman Islands to the newly established Port Cornwallis for strategic purposes. However, due to rampant disease and death, the colony was abandoned by 1796.

### Revival after the 1857 Revolt:

- **Post-1857 Penal Colony:** Following the Revolt of 1857, the British had a surge in prisoners, leading to the revival and resettlement of Port Blair as a penal colony. Many convicts were sentenced to life imprisonment, while others succumbed to disease or execution in the harsh conditions.
- **Kaala Paani:** By 1906, with the rise of the Indian Independence Movement, a massive cellular jail was constructed, popularly known as Kaala Paani. It housed prominent freedom fighters, including Veer Damodar Savarkar.

### Connection with the Cholas:

- **Chola Naval Base:** Historical records indicate that during the 11th century, the Chola emperor Rajendra I used the Andaman and Nicobar Islands as a strategic naval base to launch an attack on Srivijaya, which is in present-day Indonesia.
- **Thanjavur Inscription:** A 1050 CE inscription found in Thanjavur refers to the islands as Ma-Nakkavaram, which possibly influenced the modern name 'Nicobar' under British rule.
- **Sri Vijaya Puram:** The renaming of Port Blair to Sri Vijaya Puram honors the ancient Sri Vijaya Empire, which had influence over the region.

## Cabinet Approves Proposal for One Nation, One Election (ONOE)

### Relevance : GS II - Polity

- **In News:** Recently, the Union Cabinet approved a proposal for simultaneous elections across the country, aligning elections for the Lok Sabha, state Assemblies, and local bodies. The decision follows the submission of a report by a high-level committee chaired by former President Ram Nath Kovind.

### Key Recommendations of the Committee:

- **Constitutional Amendments:** The committee recommended amending the Constitution to enable simultaneous elections through two bills:
  - ✓ **Bill 1:** Simultaneous elections for the Lok Sabha and State Assemblies. This bill does not require ratification by the states.
  - ✓ **Bill 2:** Synchronization of municipality and panchayat elections with Lok Sabha and state Assembly elections. This will require ratification by at least half of the states.
- **Important Amendments:** The committee suggested 15 amendments to the Constitution to facilitate simultaneous elections. Key amendments include:
  - ✓ **Article 82A:** Introduction of this new article to establish a system for simultaneous elections for the Lok Sabha & State Assemblies. It expands Parliament's powers under Article 327 to conduct such elections.
  - ✓ **Article 83 and 172:** Lok Sabha and state Assembly terms would be adjusted so that they serve only the "unexpired term" before being dissolved for simultaneous elections.
  - ✓ **Article 324A:** This new article would empower Parliament to ensure that elections for municipalities and panchayats are held simultaneously with Lok Sabha and State Assembly elections.
- **Single Electoral Roll & Election ID:** Election Commission of India (ECI), in consultation with State Election Commissions (SEC), can prepare a single electoral roll & election ID for all three tiers of elections. This shift will require a constitutional amendment, with ratification by half of the states, to transfer powers from SECs to the ECI regarding electoral roll and ID management.
- **Addressing Hung Assemblies or Premature Dissolution:** In the case of a hung House, no-confidence motion, or similar events, fresh elections should be held for the unexpired term of the Lok Sabha or state Assembly.
- **Meeting Logistics Requirements:** The Election Commission of India would plan in advance with State Election Commissions to ensure sufficient manpower, polling personnel, security forces, and election equipment (like EVMs/VVPATs) for simultaneous elections.
- **Synchronisation of Elections:** The committee proposed that the President set an 'Appointed Date' to mark the beginning of the new electoral cycle. After this date, state Assemblies elected during any general election will conclude their terms when the Lok Sabha completes its term, irrespective of whether the Assemblies complete their full five-year term.
- **Example of Synchronisation:** For instance, West Bengal's next Assembly elections (due in 2026) and Karnataka's (due in 2028) would end in May or June 2029, coinciding with the end of the next Lok Sabha's term..

### Previous Recommendations on Simultaneous Elections:

- **Law Commission:** 21st Law Commission in 2018 proposed simultaneous elections to reduce costs and ease the strain on administrative structures and security forces. Earlier in 1999, the Law Commission also recommended simultaneous elections as a way to improve the electoral system.
- **Parliamentary Standing Committee:** The 79th report of the Parliamentary Standing Committee on Personnel, Public Grievances, Law and Justice recommended a practicable approach to simultaneous elections.
- **NITI Aayog:** In 2017, NITI Aayog advocated for simultaneous elections to enhance governance by reducing the frequency of election cycles.

### About Simultaneous Elections:

- **Definition:** Simultaneous elections refer to holding elections for the House of the People, all State Legislative Assemblies, and local bodies (municipalities and panchayats) at the same time. Voters would cast their votes for all levels of government on a single day, or in a phase-wise manner. This concept is also known as 'One Nation, One Election.'
- **Historical Context:** Simultaneous elections were held until the fourth general elections of 1967. The practice ended due to the dismissal of state governments before their terms and frequent collapses of coalition governments at the Center and in the states. This led to the current system of multiple elections held independently.
- **Current Election Cycle:** Today, the country witnesses five to six elections annually, and if municipality and panchayat elections are included, the number increases significantly.

### Need for Simultaneous Elections:

- **Cost Reduction:** General elections for the Lok Sabha cost approximately ₹4,000 crore, with state Assembly elections incurring additional significant expenses. Simultaneous elections would lead to substantial savings.
- **Permanent Campaign Mode:** Frequent state elections keep political parties, including Ministers, in a permanent campaign mode, affecting policy-making and governance.
- **Model Code of Conduct (MCC):** The MCC prevents governments from announcing new schemes or projects during election periods, which can last 45-60 days, further disrupting governance.
- **Administrative Efficiency:** During elections, the administrative machinery slows down as the focus shifts to conducting elections. This includes diverting paramilitary forces from their regular duties to election duties.
- **Social Cohesion:** Frequent elections and polarizing campaigns increase societal divides in a multi-religious and multilingual country like India.
- **Economic Impact:** Asynchronous elections cause uncertainty, disrupting



business investments, economic growth, and other outcomes.

- **Voter Fatigue:** Frequent elections contribute to voter fatigue, leading to lower voter engagement. Simultaneous elections offer a way to simplify voting.

### Concerns Associated with Simultaneous Elections:

- **Federalism Concerns:** National political parties may have an advantage over regional parties, weakening the federal spirit. This could marginalize regional parties that rely on local issues and grassroots campaigning.
- **Electoral Feedback Mechanism:** Elections provide a feedback mechanism for governments. Holding elections only once every five years could reduce this timely feedback, impacting governance.
- **Premature Dissolutions:** If simultaneous elections are conducted and the government loses its majority in the Lok Sabha, new elections may be needed in all states, even where the ruling party holds a majority.
- **Constitutional Amendments:** Simultaneous elections would require amendments to Articles 83, 85, 172, and 174 of the Constitution, which govern the duration and dissolution of the Lok Sabha and state Assemblies. Changes to Article 356 (dissolution under President's rule) would also be required.
- **Voter Engagement:** Regional parties rely on personal voter engagement methods like door-to-door campaigning. Simultaneous elections may shift the focus to corporate media and large rallies, disadvantaging regional parties.

### Addressing Concerns:

- **Accountability in Governance:** The Council of Ministers remains accountable to the legislature, and judicial oversight plays a role in political accountability. Frequent elections are not the only mechanism to hold politicians accountable.
- **Checking Corruption:** Elections require substantial expenditure, often leading to corruption. Simultaneous elections could help reduce the financial burden on politicians and curb corruption.
- **International Examples:** Countries like South Africa, Sweden, and Germany have fixed legislative terms. South Africa holds simultaneous national & provincial elections every five years, while Sweden & Germany have mechanisms to handle no-confidence motions without early elections.

### Conclusion:

- Simultaneous elections offer numerous potential benefits, including reduced costs, administrative efficiency, and minimal disruption to governance. However, they also present challenges, such as constitutional amendments, logistical difficulties, and concerns over federalism. A balanced approach involving stakeholder consultations and phased implementation could address these concerns while realizing the advantages of simultaneous elections across India.

## New Pension Scheme (NPS) Vatsalya Scheme

## Relevance : GS II - Welfare Scheme

- **In News:** The Union Finance Minister recently introduced the New Pension Scheme (NPS) Vatsalya Scheme, a significant initiative aimed at ensuring long-term financial security for minors.
- This scheme allows parents or guardians, including Non-Resident Indians (NRIs) and Overseas Citizens of India (OCIs), to open pension accounts for minors, building a retirement corpus from childhood.



## Key Features of the NPS Vatsalya Scheme

- **Target Beneficiaries:**
  - ✓ **Eligibility:** Any minor citizen up to 18 years old is eligible to participate in the NPS Vatsalya scheme.
  - ✓ **Guardianship:** Parents, guardians, NRIs, or OCIs can open pension accounts on behalf of minors, providing a secure financial future.
- **International Access:**
  - ✓ **NRI and OCI Participation:** The scheme accommodates NRIs and OCIs, enabling them to contribute from their Non-Resident External (NRE) or Non-Resident Ordinary (NRO) accounts, making it accessible to the Indian diaspora.

## Account Management:

- **Managing Body:** The scheme is managed by the Pension Fund Regulatory and Development Authority (PFRDA), ensuring regulatory oversight and efficient fund management.
- **Account Opening Options:** The NPS Vatsalya account can be opened both offline and online, simplifying the process for different user preferences.
- **PRAN Cards:** Minors registered under this scheme will receive Permanent Retirement Account Number (PRAN) cards, facilitating seamless access to the benefits.

## Financial Contributions and Withdrawals:

- **Minimum Contribution:** A contribution as low as Rs 1,000 annually makes the scheme affordable for families from various economic backgrounds, promoting inclusivity.

- **Withdrawal Terms:** After a 3-year lock-in period, partial withdrawals (up to 25%) are allowed for specific purposes such as education, illness, or disability. Withdrawals can be made up to three times during the account's tenure.

### Transition and Exit Policies:

- **Automatic Transition:** When the minor turns 18, the NPS Vatsalya account automatically transitions to an NPS Tier-I account under the 'All Citizen' category, ensuring continuity in savings and investments.
- **Exit Conditions:**
  - ✓ If the total savings corpus exceeds Rs 2.5 lakh, 80% of the corpus must be used to purchase an annuity, while the remaining 20% can be withdrawn as a lump sum.
  - ✓ If the corpus is Rs 2.5 lakh or less, the entire amount can be withdrawn in one go, offering flexibility to account holders.
- **In the Event of Death:** In case of the minor's unfortunate death, the entire corpus will be returned to the guardian, ensuring financial security for the family.

### Conclusion:

- The NPS Vatsalya Scheme is an inclusive initiative designed to provide long-term financial security for minors through early investment.
- Its accessible contribution model and flexibility for NRIs and OCIs make it a valuable tool for creating a robust financial foundation for future generations.

## Pradhan Mantri Janjatiya Unnat Gram Abhiyan (PM-JUGA)

### Relevance: GS II - Welfare Scheme

- **In News:** The Union Cabinet has recently approved the Pradhan Mantri Janjatiya Unnat Gram Abhiyan (PM-JUGA), a comprehensive initiative designed to uplift the socio-economic status of tribal communities.
- The scheme builds on the success of the Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN) and focuses on achieving saturation coverage for tribal families across tribal-majority villages and aspirational districts.



### Key Details of PM-JUGA:

- **Objective:** The primary aim of PM-JUGA is to improve the socio-economic conditions of tribal communities by focusing on comprehensive coverage in tribal-majority regions.

- It targets saturation coverage for tribal families in 63,000 villages, benefiting over 5 crore tribal people across 549 districts in 30 States/UTs.
- **Outlay:** The scheme has a total outlay of Rs. 79,156 crore, with the Central Share amounting to Rs. 56,333 crore. This significant allocation reflects the government's commitment to empowering tribal communities.

### Implementation Strategy:

- **Comprehensive Interventions:** 25 interventions are planned under PM-JUGA, implemented by 17-line ministries through funds allocated under the Development Action Plan for Scheduled Tribes (DAPST).
- **Monitoring Mechanism:** The progress of the scheme will be monitored on the PM Gati Shakti platform, ensuring real-time tracking and efficient implementation of various initiatives across mapped tribal villages.
- **Federal and Government Approach:** PM-JUGA is an exemplary case of cooperative federalism and reflects a whole-of-government approach. This ensures the involvement of multiple ministries and the effective integration of various schemes to benefit tribal communities.

### Mission's Four Key Goals:

- **Developing Enabling Infrastructure:** Pucca houses for households and improved village infrastructure are central to this goal, focusing on improving living conditions in tribal regions.
- **Promotion of Economic Empowerment:** Mission promotes skill development, entrepreneurship, and enhanced livelihood opportunities (self-employment), aiming for the economic empowerment of tribal communities.
- **Universalization of Access to Good Education:** Ensuring access to quality education in tribal areas is a priority, with an emphasis on educational reforms and facilities.
- **Healthy Lives and Dignified Ageing:** Health and well-being, including provisions for dignified ageing, are vital goals under the scheme, ensuring improved healthcare and social security for the tribal population.

### Innovative Schemes under PM-JUGA:

- **Tribal Home Stay Program:** In a bid to tap into tribal tourism and offer alternate livelihood options, the government plans to promote 1,000 Home Stays under the Swadesh Darshan scheme.
- **Sustainable Livelihood for Forest Right Holders (FRA):** Scheme focuses on 22 lakh FRA patta holders living in forest areas, with an emphasis on recognizing and securing forest rights to ensure sustainable livelihoods.
- **Improving School Infrastructure:** The scheme includes improvements to



Government residential schools and hostels, modeled on PM-Shri Schools, to enhance educational facilities for tribal students.

- **Healthcare Facilities for Sickle Cell Disease:** Advanced healthcare facilities will be provided for the diagnosis and treatment of sickle cell disease, which is prevalent among many tribal communities.
- **Tribal Multipurpose Marketing Centre:** Includes the establishment of Tribal Multipurpose Marketing Centres to facilitate the marketing of tribal products, promoting local businesses and economic growth in tribal areas.

## Contempt of Court

### Relevance: GS II - Polity & Governance

- **In News:** The Jharkhand government has recently filed a contempt petition against the Central government, citing delays in the appointment of the Chief Justice of the Jharkhand High Court.



### About Contempt of Court:

- **Legal Provisions:**
  - ✓ Contempt of Court is governed by the Contempt of Courts Act, 1971.
  - ✓ Under the Indian Constitution, the power to punish for contempt is granted to the Supreme Court and High Courts through Article 129 and Article 215, respectively.

### Types of Contempt:

- **Civil Contempt:**
  - ✓ **Definition:** Intentional disobedience to any judgment, decree, directive, order, writ, or any other legal process issued by a court.
  - ✓ It also includes the deliberate violation of a promise made to the court.
- **Criminal Contempt:**
  - ✓ **Definition:** The act of publishing any material or performing any action that:
    - Undermines or diminishes the authority of a court;
    - Causes prejudice or interferes with the course of judicial proceedings;
    - Hinders or obstructs the delivery of justice.

## Call for Early Elections to Delhi Assembly

### Relevance: GS II - Polity

- In News:** Recently, the Chief Minister of Delhi has advocated for premature assembly elections in the capital, suggesting synchronization with elections in Maharashtra, where a new assembly must be elected by November 26, 2024. The current term of the Delhi Assembly is slated to conclude on February 23, 2025.



### Rules and Provisions for Conducting Elections:

- Constitutional Framework:** The Election Commission of India (ECI) is tasked with overseeing and conducting elections under Article 324 of the Constitution. This article empowers the ECI with the superintendence, direction, and control of the electoral process, ensuring that elections occur before the term of the existing Assembly ends.
- Representation of the People Act (RPA Act), 1951:** According to Section 15(2) of the RPA, elections cannot be announced less than six months prior to the conclusion of the Assembly's term unless the assembly is dissolved prematurely. This provision highlights the importance of adhering to established timelines for electoral activities.

### Dissolution of the Assembly

- Role of the Governor:** Article 174(2)(b) of the Constitution grants the Governor the authority to dissolve the Legislative Assembly "from time to time." The Chief Minister and the Council of Ministers can propose dissolution before the term expires. Once dissolved, the ECI is mandated to conduct elections within six months.
- Special Case of Delhi:** In Delhi, the Government of National Capital Territory of Delhi Act, 1991 regulates the dissolution of the Assembly. Section 6(2) (b) states that the Lieutenant Governor (LG) may dissolve the Assembly, but the final decision rests with the Central Government. Thus, even if the Chief Minister recommends dissolution, it ultimately requires approval from both the LG and the Central Government.

### Factors Considered by the ECI for Election Scheduling:

- Term End Date:** The new Assembly must be in place before the current Assembly's term concludes.
- Logistical Considerations:** Factors such as weather conditions, availability

of security forces, and the training needs for election officials are taken into account.

- **Administrative Inputs:** The ECI collects inputs from local administrative and police agencies during field visits.
- **Clubbing Elections:** The ECI aims to combine elections in states wherever feasible to streamline the electoral process.

### Governance Model of Delhi:

- **Constitutional Provisions:** Delhi is classified as a Union Territory under Schedule 1 of the Constitution, designated as the National Capital Territory (NCT) under Article 239AA.
- **Article 239AA:** Inserted by the Constitution (69th Amendment) Act, 1991, this article grants special status to Delhi, following recommendations from the S Balakrishnan Committee, which examined demands for statehood for the region.
- **Provisions of Article 239AA:**
  - ✓ The NCT of Delhi will have an Administrator and a Legislative Assembly.
  - ✓ The Legislative Assembly has the authority to legislate on matters relevant to Union territories, excluding police, public order, and land.
  - ✓ The LG must either act on the advice of the Council of Ministers or implement decisions made by the President upon receiving a reference from him.
  - ✓ The LG can also refer differences of opinion with the Council of Ministers to the President.
- This dual control creates a power struggle between the LG and the elected government.
- **Article 239AB:** Also introduced by the Constitution (69th Amendment) Act, 1991, this article allows the President to suspend the operation of provisions under Article 239AA or any related law.

### About the Election Commission of India (ECI):

- **Overview:**
  - ✓ The Election Commission of India (ECI) is an autonomous constitutional body responsible for administering elections at both Union and State levels in India. It does not oversee elections to Panchayats and Municipalities, which are managed by separate State Election Commissions.
- **Constitutional Provisions:**
  - ✓ Part XV (Articles 324-329) governs elections and establishes the ECI.
    - **Article 324:** Empowers the ECI with the superintendence, direction, and control of elections.
    - **Article 325:** Ensures no one is ineligible for inclusion in electoral rolls



based on religion, race, caste, or gender.

- **Article 326:** Mandates that elections for the House of the People and Legislative Assemblies are based on universal suffrage.
- **Article 327:** Grants Parliament the authority to legislate concerning elections to Legislatures.
- **Article 328:** Allows State Legislatures to make provisions regarding their elections.
- **Article 329:** Bars court interference in electoral matters.
- **Appointment & Tenure of Commissioners:**
  - ✓ The President appoints the Chief Election Commissioner (CEC) and other Election Commissioners under the CEC and Other ECs (Appointment, Conditions of Service and Term of Office) Act, 2023. They serve a fixed tenure of six years or until they reach the age of 65, whichever comes first. Their salaries and conditions of service are equivalent to those of a Supreme Court Judge.

## PM Mega Integrated Textile Regions & Apparel (PM MITRA) Park

### Relevance : GS II - Welfare Schemes

- **In News:** Maharashtra recently witnessed the launch of a PM MITRA Park under the PM Mega Integrated Textile Regions and Apparel (PM MITRA) Scheme.
- The project is being **developed by the Maharashtra Industrial Development Corporation (MIDC)**, serving as the State-Level Executing Agency.
- Maharashtra's park is part of the seven PM MITRA Parks proposed under this initiative.
- The other six states involved are **Tamil Nadu, Telangana, Gujarat, Karnataka, Madhya Pradesh, and Uttar Pradesh.**



### About the PM MITRA Park Scheme:

- **Origins and Vision:** The PM MITRA Park Scheme was announced by the Ministry of Textiles in 2021 and is driven by the 5F Concept:
  - ✓ Farm to Fibre to Factory to Fashion to Foreign Markets.
- **Objective:** The scheme seeks to establish expansive, cutting-edge industrial infrastructure, which integrates the entire production cycle of the textile industry.
- **Duration:** The initiative will be rolled out from 2021-22 to 2027-28.

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- **Executing Body:** The scheme is administered through a Special Purpose Vehicle (SPV) jointly operated by the Central and State Governments.
- **Eligibility and Selection Standards:**
  - ✓ Participating states are required to offer continuous, unencumbered land plots of at least 1000 acres.
  - ✓ Each state's Textile and Industrial Framework is also taken into account.
  - ✓ PM MITRA Parks can be developed as either Greenfield (new projects) or Brownfield (upgraded existing projects).

### Anticipated Advantages of PM MITRA Parks Scheme:

- **Lowering Logistics Expenses and Boosting Competitiveness:**
  - ✓ The scheme aims to lower logistics expenses and enhance competitiveness by providing an integrated value chain in one location, encompassing:
    - Spinning, Weaving, Processing/Dyeing, Printing, and Apparel Manufacturing.
- **Job Creation:** Each park is expected to generate 1 lakh direct employment opportunities and 2 lakh indirect jobs, contributing significantly to the labor market in the textile sector.
- **Contributing to Sustainable Development Goals (SDGs):** The scheme aligns with SDG 9, which focuses on developing resilient infrastructure, fostering sustainable industrialization, and encouraging innovation.

### Additional Initiatives for the Textile Sector:

- **Scheme for Capacity Building in Textile Sector (SAMARTH):**
  - ✓ This scheme focuses on meeting the skilled workforce demand in the textile sector, enhancing the industry's human resources.
- **Amended Technology Up-gradation Fund Scheme (ATUFS):**
  - ✓ The initiative provides capital-linked investment subsidies to textile units for the acquisition of advanced machinery in various textile segments.
- **National Technical Textiles Mission:**
  - ✓ This national mission aims to promote and develop the application of technical textiles in different industries.
- **Production Linked Incentive (PLI) Scheme for Textiles:**
  - ✓ This scheme offers production-based incentives to encourage large-scale investment in the textile manufacturing sector.



## Launch of Food Import Rejection Alerts (FIRA) Portal

### Relevance: GS II - Governance

- **In News:** The Food Import Rejection Alerts (FIRA) portal was recently introduced during the second edition of the Global Food Regulators Summit 2024, organized by the Food Safety and Standards Authority of India (FSSAI) at Bharat Mandapam, New Delhi.



### Aim of FIRA Portal:

- The portal is an **online platform designed to notify both the public and food safety authorities** about food import rejections at Indian borders.
- Its primary goal is to **ensure timely alerts on food consignments that fail to meet safety standards**, thereby preventing potential risks before any harm occurs..

### Key Features of FIRA Portal:

- **Real-Time Alerts:** The portal will issue notifications on rejected food imports due to substandard safety conditions.
- **Proactive Risk Management:** Relevant food authorities can take immediate actions to control and prevent potential risks from rejected consignments.
- **Interactive Interface:** The portal offers a user-friendly interface for rapid information dissemination, promoting traceability and transparency.
- **Data Repository:** It serves as a comprehensive database, helping to track rejected products and strengthen the food safety risk management system further.

### Food Safety and Standards Authority of India (FSSAI):

- **Overview of FSSAI**
  - ✓ The Food Safety and Standards Authority of India (FSSAI) is an independent statutory body operating under the Ministry of Health and Family Welfare.
  - ✓ It was established to regulate the manufacture, storage, distribution, sale, and import of food products while setting standards to ensure food safety across India.
- **Legal Foundation:** The FSSAI was constituted under the Food Safety and Standards Act, 2006 to maintain uniform food safety regulations throughout the country.
- **Headquarters:** The FSSAI is headquartered in New Delhi.

### Functions of FSSAI:

- **Setting Standards for Food:** FSSAI establishes science-based food standards to ensure consistency and quality in food safety. These include:
  - ✓ **Horizontal Standards:** Applicable across a wide range of food categories.
  - ✓ **Vertical Standards:** Target specific food products.
- **Regulation of Food Manufacturing and Distribution:**
  - ✓ FSSAI plays a crucial role in regulating the manufacturing, storage, distribution, sale, and import of food products to uphold food safety.
- **Providing Technical Support:**
  - ✓ The authority offers scientific advice and technical support to the government on various aspects of food safety and standards.
- **Inspection and Licensing:** Food Business Operators (FBOs) must comply with FSSAI regulations. The FSSAI:
  - ✓ Inspects food premises to ensure adherence to safety standards.
  - ✓ Grants a 14-digit license number, a mandatory requirement for operating in the food industry.
- **Raising Public Awareness:**
  - ✓ FSSAI actively promotes awareness about food safety regulations and standards, aiming to educate the public and food businesses about best practices in food handling and production.

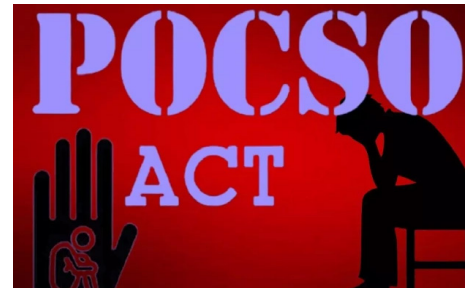


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## Parliament should consider bringing amendment to POCSO Act: SC

### Relevance: GS II - Governance

- **In News:** Recently, the Supreme Court declared that possessing or viewing sexually explicit content involving minors is prohibited under the Protection of Children from Sexual Offences (POCSO) Act, 2012.



### What are the Key Highlights of the Supreme Court Ruling?

- **Revision of Terminology:** The Supreme Court (SC) recommended that the Union government replace the term “child pornography” with “child sexual exploitative and abuse material” (CSEAM). This change in terminology is crucial as the term “pornography” often refers to consensual adult content, which may not accurately represent the exploitation and abuse of minors.
- **Broadened Scope of Section 15 of the POCSO Act, 2012:**
- The SC expanded the interpretation of “storage of child sexual content” under Section 15 of the Act, introducing three main offenses:
  - ✓ **Possession Without Reporting:** Anyone who stores or possesses child

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sexual content must delete, destroy, or report it to the authorities. Failure to do so is punishable under Section 15(1).

- ✓ **Intent to Transmit or Share:** Those in possession of such material with the intention of transmitting or displaying it, except for reporting, can be charged under Section 15(2).
- ✓ **Commercial Possession:** Storing child sexual content for profit-making purposes falls under Section 15(3), attracting the most stringent penalties.
- **Concept of Preparatory Offenses:** The judgment categorized offenses under Section 15 as “preparatory” or incomplete crimes, indicating actions taken in preparation for committing other offenses.
- **Expanded Definition of Possession:** The SC broadened the meaning of “possession” to include constructive possession, which refers to the ability to control material even if not physically in possession of it. For instance, viewing child sexual content online without downloading can still be considered possession. If someone receives a link to such content and fails to report it, they may be held accountable, even if the material is no longer in their possession after closing the link.
- **Educational Initiatives:** The SC called for the government to promote comprehensive sexual education in schools and across society to address misconceptions that discourage discussions about sexual health. This education should cover topics like consent, healthy relationships, gender equality, and respect for individual differences.
- **Awareness About POCSO Act, 2012:** Sections 43 and 44 of the POCSO Act, 2012, mandate the central and state governments, along with the National Commission for Protection of Child Rights (NCPCR), to raise public awareness of the Act.
- **Creation of an Expert Panel:** The SC recommended the formation of an expert panel tasked with developing extensive programs on health, sexual education, and increasing awareness of the POCSO Act, 2012, among children.
- **Support for Victims and Awareness:** The judgment emphasized the importance of robust support mechanisms for victims of CSEAM, including psychological support, therapeutic interventions, and educational assistance. Programs like cognitive behavioral therapy (CBT) may be helpful in addressing the distorted thinking patterns that contribute to such behaviors in offenders.

### What is the Status of Crimes Against Children?

- **Growing Problem:** As per the US-based National Centre for Missing and Exploited Children (NCMEC), India now leads the world in the number of online images of child sexual abuse, followed by Thailand. Between April and August 2024, Indian users uploaded around 25,000 images or videos.
- **Geographical Distribution:** Delhi records the highest number of uploads of



child sexual content, followed by Maharashtra, Gujarat, Uttar Pradesh, and West Bengal.

- **Rising Circulation:** The National Crime Records Bureau (NCRB) 2023 report revealed that there were 781 cases of creating or storing child sexual content in 2018, an increase from 331 cases in 2017. The sharing of such material accounted for 1,171 cases in 2022.

### What is the POCSO Act?

- **Overview:**

- ✓ The POCSO Act was established to tackle the sexual abuse and exploitation of children, with a child defined as anyone under the age of 18. The Act was created in response to India's ratification of the UN Convention on the Rights of the Child in 1992.

- **Key Features:**

- ✓ **Gender-Neutral Nature:** The Act acknowledges that both boys and girls can be victims of sexual abuse, and the crime is considered an offense regardless of the victim's gender.
- ✓ **Confidentiality of the Victim's Identity:** Under Section 23, the identity of child victims must remain confidential. The media is prohibited from disclosing any information that may reveal the child's identity, including their name, address, or family details.
- ✓ **Mandatory Reporting of Child Abuse:** Sections 19 to 22 require anyone aware or suspicious of child abuse to report it to the appropriate authorities.

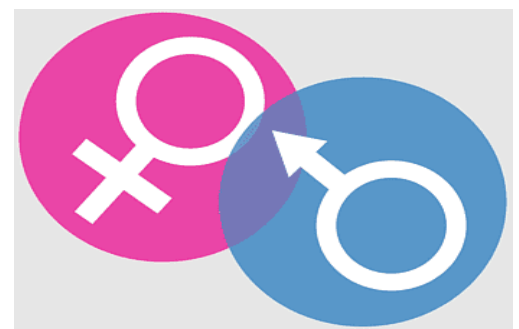
### Conclusion:

- A collaborative effort involving educators, healthcare professionals, and law enforcement is necessary for early detection and prevention of child sexual exploitation.
- Society must take responsibility and change attitudes to prevent victimization, providing the necessary support to ensure victims can recover, rebuild their dignity, and regain hope.

## MoRD Organizes National Conclave on Gender Mainstreaming

- **Relevance : GS II - Governance**

- **In News:** Recently, the National Conclave on Gender Mainstreaming was organized under the Deendayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM), **aiming to fortify gender-sensitive**



**community institutions (GSCI).** The conclave was focused on addressing women's issues through community-driven mechanisms.

- DAY-NRLM, a prominent scheme of the Ministry of Rural Development (MoRD), **targets poverty alleviation by building resilient institutions** of the underprivileged, particularly women.
- The DAY-NRLM initiative also recognizes that gender-based violence acts as a major obstacle to the personal and societal development of women and girls.

### About Gender-Sensitive Community Institutions (GSCI):

#### Defining Gender-Responsiveness

- ✓ Gender-responsiveness refers to addressing the distinct needs of women and girls by appreciating their viewpoints, recognizing developmental differences, and empowering them. This concept, as described by UNICEF, is crucial in promoting equality.
- ✓ While no formal definition exists, GSCI generally refers to community-driven organizations that incorporate gender-conscious perspectives in the formulation, execution, and outcomes of policies.

#### Examples of GSCI include:

- ✓ Self-Help Groups (SHGs)
- ✓ Village Organizations (VOs)
- ✓ Cluster-Level Federations
- ✓ Women-Led Organizations (WLOs)

### Role of Gender-Sensitive Community Institutions (GSCI):

- **Promoting a Gender-Conscious Society:** These institutions play a key role in raising awareness about the challenges faced by women and girls, ensuring effective implementation of women-focused policies, and holding relevant bodies accountable.
- **Supporting Inclusive Development:** GSCIs are instrumental in providing essential services to women, girls, and other underrepresented communities, thus promoting inclusive progress.
- **Enhancing Crisis Response:** These organizations are crucial for community outreach, ensuring that no marginalized group is overlooked during humanitarian interventions in times of crisis.

### Key Initiatives Supporting Gender-Responsiveness:

- **Nayi Chetna – A Step Towards Change:** This national initiative aims to eradicate discrimination and violence based on gender. It is spearheaded by DAY-NRLM in partnership with UNICEF, the Bill & Melinda Gates Foundation,



and various civil society organizations.

- **Uddeshya - Gender-Responsive Urban Mobility Systems:** This program, initiated by the World Resources Institute - India, seeks to promote gender-sensitive urban transportation planning on a nationwide scale.
- **Gender Budgeting:** Gender-responsive budgeting involves setting up Gender Budgeting Cells in ministries and government departments to ensure that fiscal policies are designed to address gender-specific concerns.
- **Nirbhaya Fund:** The Nirbhaya Fund is a non-reverting corpus fund aimed at enhancing the safety and security of women. It is managed by the Department of Economic Affairs under the Ministry of Finance.

## Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana (PMJAY)

### Relevance: GS II - Welfare Scheme

- **In News:** The Ministry of Health and Family Welfare is celebrating five years of Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (PMJAY) through the Arogya Manthan event.
- This landmark occasion underscores the impact of one of the world's largest health assurance programs.



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### About Ayushman Bharat Scheme:

- **Introduction:** The Ayushman Bharat Scheme is recognized as the world's largest health assurance program, launched in 2018 in response to recommendations from the National Health Policy, 2017.
- **Key Details:**
  - ✓ **Ministry:** Managed by the Ministry of Health and Family Welfare (MoHFW).
  - ✓ **Objective:** The scheme aims to achieve Universal Health Coverage (UHC), encompassing promotive, preventive, curative, palliative, and rehabilitative care.
  - ✓ **Funding:** As a centrally sponsored scheme, the financial burden is shared between the Central and State Governments.
  - ✓ **Coverage:** Targets over 10 crore families (around 50 crore beneficiaries), based on the Socio-Economic Caste Census (SECC).
  - ✓ **Implementing Body:** The National Health Authority (NHA) is responsible for overseeing the program.
- **Components:** The Ayushman Bharat scheme has two main components, offering

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comprehensive care:

- ✓ **Health and Wellness Centres (HWC):** Focuses on primary care, including services for non-communicable diseases, maternal and child health, and other essential services.
- ✓ **Pradhan Mantri Jan Arogya Yojana (PM-JAY):** Provides Rs. 5 lakhs health cover per family per year for secondary and tertiary care hospitalization. This coverage includes up to 3 days of pre-hospitalization and 15 days of post-hospitalization expenses like diagnostics and medicines.
- **Unique Features:**
  - ✓ No restrictions on family size, age, or gender.
  - ✓ Benefits are portable across the country, meaning beneficiaries can access cashless treatment at any empanelled public or private hospital nationwide.
- **Ayushman Bharat Digital Mission (ABDM):** Launched in 2021, ABDM aims to provide Unique Digital Health IDs (UHID) to all citizens, facilitating easy access to health records by hospitals, insurance companies, and individuals when needed.

### Key Factors Contributing to the Success of AB-PMJAY:

- **Private Sector Engagement:** Private hospitals are encouraged to participate through Health Benefit Packages (HBPs).
- **Efficient Claims Settlement:** Efforts are made to settle claims within 15 days. Some states, like Uttarakhand, have reduced the settlement time to less than 7 days.
- **Rewarding Trustworthy Service Providers:**
  - ✓ Hospitals with a good track record receive upfront payments of 50% of the claim amount without adjudication.
  - ✓ In 2023, Uttar Pradesh received two awards for its excellent work in PM-JAY and Ayushman Bharat Digital Mission (ABDM).
- **Support and Guidance:** Every hospital has dedicated Pradhan Mantri Arogya Mitras (PMAMs) to guide beneficiaries.
- **Interstate Portability:** Beneficiaries can receive treatment in any state with the AB-PMJAY program, a crucial feature for migrant workers during emergencies.
- **Digitalized Service Delivery:**
  - ✓ The NHA has developed a public dashboard for day-to-day tracking.
  - ✓ Ensures privacy through faceless claims processing and protects beneficiary details.
- **Fraud Detection and Monitoring:**
  - ✓ Anti-Fraud Units at the national and state levels use Artificial Intelligence (AI) and Machine Learning (ML) to identify suspicious transactions.



- ✓ Aadhaar-based authentication is required for creating cards and registering for treatment.
- **Feedback Mechanism:** The NHA call center contacts beneficiaries within 48 hours of discharge to verify the quality of treatment received.
- **Inclusivity:** 50 health packages have been specially designed for the transgender community, including packages for Sex Reassignment Surgery (SRS).
- **Comprehensive Care:** The scheme offers cashless secondary and tertiary inpatient care for almost all health conditions.

### Challenges Highlighted by CAG (2018-2021):

- **Beneficiary Registration:**
  - ✓ The use of SECC data for identifying beneficiaries may now be outdated.
  - ✓ The CAG report reveals that the matching of beneficiaries with SECC data was not carried out properly, and both registration and rejection were often arbitrary.
  - ✓ Multiple beneficiaries were registered under the same Aadhaar or mobile number.
- **Insurance Claim Malpractices:** The audit uncovered large-scale corruption in insurance claims settlement.
- **Issues in Hospital Empanelment:** Empanelled hospitals must meet specific criteria, including round-the-clock availability of support systems like pharmacy, blood bank, laboratory, and ICU care. However, many hospitals failed to provide these services post-empanelment.
- **Non-Existent Hospitals:** Some empanelled hospitals listed in the scheme were found to be non-existent.
- **Infrastructure and Personnel Shortages:** Several states and union territories face shortages of healthcare infrastructure, medical professionals, and equipment.

### Current Status of the Ayushman Bharat Scheme:

- 15.5 crore families are currently covered under the scheme.
- This accounts for 50% of India's population.
- 11 states/UTs have achieved 100% coverage of their populations.
- 48% of treatments under the scheme have been availed by women.
- Over 24 crore Ayushman Cards have been generated.
- Beneficiaries have saved more than Rs 1 lakh crore, often cited as Out-of-Pocket Expenditure (OOPE).
- According to the World Bank, India's OOPE is among the highest in emerging economies at 50.59%.

## Way Forward:

- The National Health Authority (NHA), along with state counterparts, must aim to issue Ayushman Cards to every potential beneficiary.
- Encouraging more private hospitals to join as empanelled hospitals will enhance access to healthcare under the Ayushman Bharat Scheme.

## Bombay High Court Declares Fact Check Unit Unconstitutional

## Relevance: GS II - Governance

- **In News:** The Bombay High Court has recently ruled that the Centre's Fact Verification Unit (FVU) is unconstitutional, striking down the revised Information Technology (IT) Rules, 2023, in its recent decision.



## Revised Information Technology Rules, 2023:

- **Objective:** The revised IT Rules granted authority to the Centre to create a Fact Verification Unit (FVU), responsible for identifying inaccurate, erroneous, and misleading information related to the government and its bodies on social media platforms.
- **Obligations for Social Media Platforms:** The rules required social media platforms to take necessary measures to prevent users from posting or sharing content flagged by the FVU as misinformation.
- **Content Removal Deadline:** Flagged content must be removed within 36 hours if platforms wished to retain their "safe harbour protection", which exempts them from liability for third-party content.

## Constitutional Violations:

- **Article 14 - Right to Equal Treatment:** The actions of the FVU were found to be discriminatory, infringing on the principle of equal treatment under the law.
- **Article 19 - Freedom of Speech and Expression:** The rules were seen as a violation of the right to free expression, raising concerns about the imposition of unjustified restrictions on speech.
- **Article 19(1)(g) - Right to Practice Any Profession:** The revised rules were also deemed to interfere with the right to pursue a profession, as they imposed undue censorship on online platforms.

## Divided Verdict:

- **First Judge's Opinion:** One judge ruled that the revised rules promoted censorship, and that the restrictions did not fit within the scope of reasonable



limitations allowed under Article 19(2) of the Constitution.

- **Second Judge's Perspective:** The second judge maintained that the government was in the best position to provide accurate information about itself, and that the rules were aimed purely at countering misinformation.

### Tie-Breaking Ruling:

- **Chief Justice's Action:** Following the divided verdict, the Chief Justice of the Bombay High Court appointed another judge to reconsider the case and deliver a tie-breaking judgment, as per High Court rules.

### Supreme Court's Intervention:

- **FVU Notification:** While awaiting the final decision, the Centre issued a notification for the Fact Verification Unit under the Press Information Bureau (PIB).
  - ✓ This action led the Supreme Court to suspend the notification, pending the final judgment from the High Court.

### Final Verdict:

- **Lack of Clarity in the Rules:** The High Court determined that the terms “inaccurate, erroneous, and misleading” used in the IT Rules were vague and lacked precise definition, rendering the provision legally problematic.
- **Effect on Social Media Platforms:** The rules were seen as creating a “deterrent impact” on social media platforms, putting their safe harbour protection at risk due to the lack of clear guidelines.

## Sahariya Tribe: Malnutrition Crisis in Rajasthan

### Relevance: GS II - Social Justice

- **In News:** Recently, more than 100 cases of malnourished children have been reported among the Sahariya tribe in the Baran district of Rajasthan.
- This alarming situation highlights the ongoing health and nutritional challenges faced by the tribe.



### About Sahariya Tribe:

- **Geographical Distribution:** The Sahariyas are primarily found in the states of Madhya Pradesh, Uttar Pradesh, and Rajasthan.
- **PVTG Status:** They are classified as one of the Particularly Vulnerable Tribal

Groups (PVTGs) in India. PVTGs are tribal communities that exhibit specific vulnerabilities, such as:

- ✓ **Declining or Stagnant Population:** These tribes often show either a decrease or stagnation in population growth.
- ✓ **Use of Pre-Agrarian Technology:** The Sahariyas rely on traditional methods and tools for their livelihoods.
- ✓ **Economic Backwardness:** They face severe economic hardships due to limited access to resources and opportunities.
- ✓ **Low Literacy Levels:** Educational attainment among PVTGs is significantly lower compared to other communities.
- **Social Structure:** The Sahariyas generally reside in separate settlements within a village, known as Saharana.

### Economic Activities:

- **Agriculture:** The tribe predominantly engages in rainfed agriculture, which is highly dependent on monsoon rains and often subject to variability and uncertainty.
- **Collection of Minor Forest Produce:** In addition to farming, they also collect minor forest produce like honey, fruits, nuts, and medicinal herbs to sustain their livelihoods.

### Conclusion

- The recent reports of malnutrition among Sahariya children in Rajasthan underscore the critical need for targeted interventions.
- Addressing the nutritional, educational, and economic challenges of PVTGs like the Sahariyas is crucial for ensuring their well-being and sustainable development.

## Vice-President Stresses Addressing Subtle Gender Discrimination in Society

### Relevance: GS I - Social Issue

- **In News:** The Vice-President has recently emphasized the need to focus on addressing subtle gender discrimination, which continues to pervade society. While overt forms of gender discrimination, such as the lack of gender-sensitive infrastructure, have diminished, subtle manifestations remain persistent and harmful.





### Subtle Forms of Gender Discrimination:

- Subtle gender discrimination is often expressed through attitudes and behaviors that seem supportive but reinforce traditional gender roles and perpetuate inequality.
  - ✓ **Compliments That Reinforce Stereotyping:** Positive comments, such as praising women's ability to multitask, might appear encouraging but actually reinforce traditional gender roles, undermining women's diverse capabilities.
  - ✓ **Hiring, Promotion, and Evaluation:** Unconscious biases still exist in favor of male candidates for roles traditionally perceived as requiring physical strength or leadership, often leading to unequal opportunities for women.
  - ✓ **Microaggressions:** Microaggressions—small, seemingly innocent comments—perpetuate gender stereotypes. For example, implying that women are less committed to their careers due to family responsibilities reinforces a harmful stereotype.
  - ✓ **Work-Life Balance Assumptions:** Societal expectations around caregiving and family responsibilities lead to assumptions about women's need for a work-life balance, which may disproportionately affect their career growth.

### Addressing Subtle Forms of Gender Discrimination:

- Several steps can be taken to combat these subtle forms of gender bias in various sectors, particularly in workplaces.
  - ✓ **Blind Evaluation:** Implementing systems that hide job applicants' physical attributes to ensure fairer hiring practices and reduce bias based on gender.
  - ✓ **Creating a Culture of Inclusivity:** Fostering a workplace culture that values and respects input from everyone, regardless of gender, to ensure equal participation.
  - ✓ **Assessing Unconscious Gender Bias at the Workplace:** Regular assessment of unconscious biases through various methods such as perception surveys, language analysis, and gender gap studies in pay and career advancement can highlight areas needing improvement.
  - ✓ **Changing the Male Mindset:** Gender sensitization programs should be expanded to reshape societal views, particularly among men, about gender roles and the importance of equality.

### Steps Taken to Curb Gender Discrimination:

- The Government of India has introduced several initiatives to address both subtle and overt forms of gender discrimination and promote gender equality.
  - ✓ **Equal Remuneration Act of 1976:** Enforces equal pay for equal work, aiming to reduce the gender wage gap.
  - ✓ **Beti Bachao Beti Padhao Scheme:** Focuses on educating citizens to reduce

gender bias and improve access to welfare services for girls and women.

- ✓ **Prime Minister's Employment Generation Programme (PMEGP):** Helps women to set up their own enterprises, promoting entrepreneurship among women.
- ✓ **Mission Shakti:** An umbrella scheme designed for the safety, security, and empowerment of women through various targeted interventions.

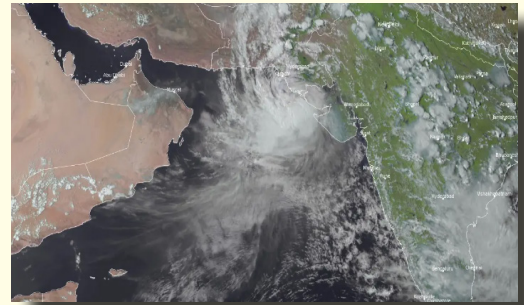
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## A rare land-based cyclone, Asna, formed over Gujarat's Kutch coast

### Relevance: GS I - Geography

- **In News:** Cyclone Asna is notable for its rarity as it formed over land rather than the typical warm ocean waters.
- It originated as a deep depression over the Kutch coast in Gujarat and is expected to intensify into a tropical cyclone as it moves towards the Arabian Sea.



### Historical Context:

- According to the India Meteorological Department (IMD), cyclones originating over mainland India and strengthening as they enter the Arabian Sea have been observed only three times before—in 1944, 1964, and 1976.

### Possible Reasons for Cyclone Asna's Formation:

- **Unusual Monsoon Wind System:** The monsoon wind patterns may have contributed to the cyclone's formation over land.
- **Moisture Sources:** Moisture from the Arabian Sea and soil moisture from the land may have played a role.
- **Indian Ocean Warming:** The warming of the Indian Ocean could have influenced the cyclone's development.

### Tropical Cyclones:

- **Tropical Cyclone:** A rapidly rotating storm system originating over tropical oceans.
- **Classification:** Cyclones are categorized into two main types:
  - ✓ **Extratropical Cyclones:** Also known as temperate cyclones.
  - ✓ **Tropical Cyclones:** Known by different names based on their region of formation:
    - Typhoons in the China Sea and Pacific Ocean:
    - Hurricanes in the Caribbean Sea and Atlantic Ocean
    - Tornadoes in West Africa and southern USA
    - Willy-willies in Australia

## • Cyclones in India:

- ✓ **Frequency:** India experiences about 10% of the world's tropical cyclones, which primarily occur during the pre-monsoon (May-June) and post-monsoon (October-November) periods.
- ✓ **Regional Distribution:** More cyclones occur in the Bay of Bengal compared to the Arabian Sea, with a ratio of approximately 4:1.
- ✓ **Increasing Trends:** Due to the climate crisis and warming of the Arabian Sea, cyclones are becoming more frequent along India's western coast.

## Conclusion:

- Cyclone Asna's formation over land and its anticipated development into a tropical cyclone highlight significant meteorological anomalies.
- The event underscores the broader trends of increasing cyclone activity influenced by climate change, particularly in the Arabian Sea region.
- The phenomenon of land-originating cyclones is rare and provides important insights into shifting weather patterns and their implications for coastal regions.

## Asian cities are expanding vertically rather than horizontally

### Relevance : GS I - Urbanization

- **In News:** A recent study published in Nature Cities has revealed that cities worldwide, particularly in Asia, are experiencing more rapid upward growth compared to outward expansion.
- This shift towards vertical development is reshaping urban landscapes globally.



### About the Study:

- The study found that cities with **populations exceeding 10 million are showing significant vertical growth**, especially noticeable in the 2010s.
- In India, upward growth is not uniform across all cities; only large cities with **populations over 5 million have shown both upward and outward** or primarily outward growth, mainly in the 2010s.
- Countries like China, Japan, South Korea, and other East Asian nations have undergone some of the most dramatic urban transformations globally, characterized by a rapid increase in high-rise buildings in major cities.
- Cities like Shanghai, Shenzhen, Beijing, and Guangzhou in China are renowned for their impressive skylines filled with high-rise buildings and skyscrapers.



- In India, cities such as **Mumbai, Delhi, Bengaluru, and Chennai** are witnessing significant **vertical development**.

### Reasons for Upward Growth in Cities:

- **Global Urbanization Trends:** The world is becoming increasingly urbanized, with more people living in cities than in rural areas. To manage this demographic shift, cities are expanding vertically rather than horizontally.
- **High Land Costs:** Rising land prices in urban centers make building upwards more economically feasible compared to horizontal expansion.
- **Improved Construction Techniques:** Advances in engineering and construction technology have made it easier and safer to build taller structures. Innovations in materials, design, and construction methods have facilitated vertical urban growth.
- **Changing Lifestyles:** Urban residents, especially younger generations, prefer the convenience and amenities of high-rise living, such as proximity to workplaces, shopping centers, and entertainment facilities.

### Advantages of the Vertical Shift in Urban Growth:

- **Efficient Land Use:** Taller buildings allow more people to live in a smaller area, maximizing the use of limited urban land.
- **Reduced Urban Sprawl:** Vertical growth can help reduce urban sprawl, thereby preserving green spaces and agricultural land outside city limits.
- **Efficient Public Service Delivery:** Concentrated populations in vertical developments enable more efficient delivery of public services like transportation, waste management, and utilities.
- **Reduced Commutes and Emissions:** Vertical cities minimize the need for long commutes as people live closer to work, which reduces traffic congestion and lowers greenhouse gas emissions.
- **Energy Efficiency and Sustainability:** High-rise buildings designed with green technologies can be more energy-efficient and sustainable compared to low-density urban development..

### Disadvantages of the Vertical Shift in Urban Growth:

- **Gentrification and Social Inequality:** The rise of vertical development often leads to gentrification, displacing lower-income populations and exacerbating social inequality.
- **Infrastructure Overload:** Existing infrastructure such as roads, sewage systems, and public transportation may be insufficient to handle increased density, resulting in overcrowding and potential service breakdowns.
- **Urban Heat Islands:** High-rise buildings can create urban heat islands, where the concentration of concrete and lack of green space raise local temperatures,

affecting the microclimate.

- **Challenges for Emergency Services:** Taller buildings pose difficulties for emergency services, such as firefighting and evacuation, especially during natural disasters.
- **Social Isolation:** Vertical living can lead to social isolation, as it may reduce opportunities for neighborly interactions compared to more horizontal, community-based urban designs.

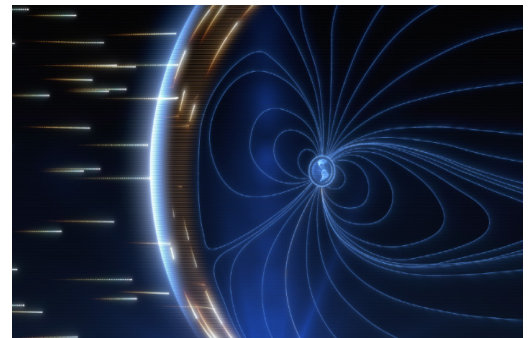
### Conclusion:

- The trend towards high-rise buildings is a response to **the challenges posed by rapid urbanization, land scarcity, and the need for sustainable urban development.** While vertical growth offers numerous advantages, it also presents challenges that require careful management.
- The future of high-rise development will likely **focus on balancing economic growth, social equity, and environmental sustainability,** aiming to create livable and resilient urban environments.

## NASA uncovers Earth's third energy field known as the 'Polar Wind'

### Relevance: GS I - Geography

- **In News:** NASA scientists have recently detected and measured Earth's third energy field using a suborbital rocket as part of the Endurance Mission. This discovery sheds light on a weak, yet crucial electric field known as the ambipolar electric field.



### Understanding the Ambipolar Electric Field:

- The **Ambipolar Electric Field is a weak, planet-wide electric field that counteracts gravity and is essential in ejecting particles into space,** similar to Earth's gravity and magnetic fields.
- Although this field is relatively weak, it plays a significant role in balancing gravity and lifting the atmospheric layers upwards.
- Any planet with an atmosphere is expected to have an ambipolar electric field.
- Scientists theorized that this **electric field begins at around 250 kilometers altitude,** where atmospheric atoms break into negatively charged electrons and positively charged ions.
- The electric field is termed **“ambipolar” because it is bidirectional, operating in both directions:**

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- Ions are pulled down with gravity, dragging electrons with them.
- Simultaneously, electrons push ions to higher altitudes as they attempt to escape into space.
- The net effect of this ambipolar field is to extend the height of the atmosphere, elevating some ions high enough to escape with the polar wind.

### Significance of the Polar Wind:

- The concept of the ambipolar electric field was first hypothesized more than 60 years ago. It has since been identified as a key driver of the polar wind, a continuous outflow of charged particles into space occurring above Earth's poles.
- **The Polar Wind was uniquely characterized by particles moving at supersonic speeds while remaining cold, a phenomenon that contradicted initial expectations.**

### Key Findings of Polar Wind and Ambipolar Electric Field:

- **Hydrogen Ions and Electric Field Strength:**
  - ✓ Hydrogen ions, which are abundant in the polar wind, are propelled into space by an electric field that is 10.06 times stronger than Earth's gravity.
  - ✓ This powerful electric field was found to push hydrogen ions into space, significantly affecting the ionosphere's density.
- **Impact on Ionosphere's Density:** The ambipolar electric field was observed to increase the ionosphere's density by 271%, helping maintain its density at higher altitudes.
- **Mechanism of Action:** The field functions like a conveyor belt, lifting atmospheric particles into space, enabling the steady flow of charged particles away from Earth.

### Conclusion:

- The discovery of the ambipolar electric field as Earth's third energy field offers profound insights into atmospheric physics. By influencing the polar wind, this field plays a crucial role in the dynamics of Earth's upper atmosphere, extending its height and regulating particle outflow into space.
- This groundbreaking observation provides new perspectives on atmospheric escape processes, not just on Earth but potentially on other planetary bodies with atmospheres as well.

## Record Low Water Levels in Paraguay River

☛ **Relevance: GS I - Geography**

- **In News:** The Paraguay River is currently experiencing its lowest water level in more than a century, raising concerns about the environmental and socio-economic impacts on the region.



**About the Paraguay River:**

- **Geographical Significance:** The Paraguay River is the fifth largest river in South America and serves as the principal tributary of the Paraná River.
- **Origin and Course:** The river originates in the Brazilian state of Mato Grosso, specifically south of Diamantino. It flows predominantly from north to south, traversing through Brazil, Paraguay, and Argentina.
- **Notable Features:** One of the river's distinguishing features in its upper basin is the Pantanal, a vast seasonal swamp known for its unique ecosystem and biodiversity.
- **Climate Characteristics:** The drainage basin of the Paraguay River is characterized by a hot and humid climate, with dry winters and heavy rains during the summer months, which significantly influence the river's water levels.

**Conclusion:**

- The Paraguay River's historically low water level is indicative of broader environmental challenges, such as climate change and regional water management issues, affecting the South American region.

**Union Cabinet Approves ₹2,000 Crore 'Mission Mausam' for Two Years**

☛ **Relevance: GS I - Geography**

- **In News:** The Union Cabinet has recently approved the 'Mission Mausam' with an outlay of ₹2,000 crore over the next two years. This initiative aims to significantly enhance India's capabilities in weather and climate-related science, research, and services.





### About 'Mission Mausam':

- **Focus Areas:** The mission is designed to provide accurate weather and climate data, such as monsoon forecasts, air quality alerts, and extreme event warnings. It will also address issues like fog, hail, and rain while focusing on building capacity and awareness in these areas.
- **Key Components:**
  - ✓ **Next-Generation Radars and Satellites:** Deployment of advanced radars and satellite systems equipped with state-of-the-art sensors.
  - ✓ **Supercomputers and Models:** Introduction of high-performance supercomputers and enhanced Earth system models to improve prediction accuracy.
  - ✓ **GIS-Based Decision Support System:** Creation of an automated GIS-based system for real-time data dissemination to assist in decision-making.
- **Implementing Agency:** The mission will be implemented by three institutes under the Ministry of Earth Sciences (MoES):
  - ✓ India Meteorological Department (IMD)
  - ✓ Indian Institute of Tropical Meteorology (IITM)
  - ✓ National Centre for Medium-Range Weather Forecasting (NCMRWF)

### Significance of 'Mission Mausam':

- **Sectoral Benefits:** The mission will benefit multiple sectors, such as:
  - ✓ Agriculture
  - ✓ Disaster Management
  - ✓ Defence
  - ✓ Environment
  - ✓ Aviation
  - ✓ Water Resources
- **Tackling Climate Change:** By empowering stakeholders with precise weather data, it will enable better management of extreme weather events and climate change impacts.
- **High-Precision Predictions:** The mission aims to set a new standard for high-precision weather forecasting in India.
- **Data-Driven Decision Making:** Enhanced weather data will improve decision-making in areas like urban planning and transportation (roads, railways, etc.).

### Other Initiatives to Improve Weather Forecasting:

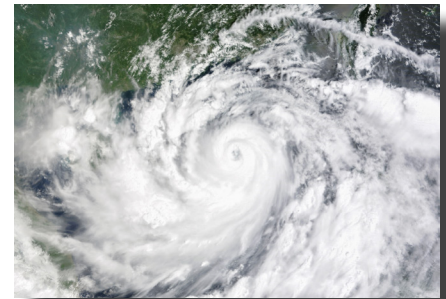
- **Monsoon Mission (2012):** This initiative focuses on improving dynamic modelling systems for better short-range to seasonal monsoon forecasts.

- **Weather Information Network and Data System (WINDS):** A system designed to generate long-term, hyper-local weather data for better prediction.
- **Earth Observation Satellites:** Several satellites have been launched to support weather forecasting, including:
  - ✓ INSAT-3D (2013)
  - ✓ INSAT-3DR (2016)
  - ✓ INSAT-3DS (2024)
- **Supercomputers for Weather Forecasting:** In 2018, the Ministry of Earth Sciences operationalized Pratyush and Mihir, two supercomputers that significantly enhance India's weather forecasting capabilities.

## Super Typhoon Yagi Strikes Vietnam

### Relevance: GS I - Geography

- **In News:** Super Typhoon Yagi, one of the strongest storms to hit Vietnam in the past 30 years, recently made landfall, affecting the northern and central regions of the country.



### Typhoon Yagi's Journey:

- **Path and Development:** After passing through Hainan Island in China, Tropical Cyclone Yagi intensified into a super typhoon and made landfall in Quang Ninh province and Hai Phong City in Vietnam.
- **Widespread Impact:** Typhoon Yagi has become the most powerful storm in Asia in 2024, severely affecting multiple countries, including the Philippines, China, Laos, Myanmar, Thailand, and especially Vietnam.
- **Global Context:** Yagi is the second most powerful storm globally in 2024, following Hurricane Beryl.

### Formation of Tropical Cyclones:

- **Conditions for Formation:**
  - ✓ **Warm Ocean Waters:** Tropical cyclones form over warm ocean waters, typically near the equator, where sea temperatures are at least 27°C.
  - ✓ **Low Pressure Development:** Warm, moist air rises from the ocean, creating a low-pressure area, drawing in surrounding winds to form a storm.
- **Cyclone Formation Process:**
  - ✓ **Converging Winds:** Winds near the ocean surface converge towards the low-pressure zone, forcing air to rise and form storm clouds.

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- ✓ **Low Wind Shear:** Low variation in wind speed with height allows storm clouds to rise vertically and intensify.
- ✓ **Coriolis Effect:** Tropical cyclones are far enough from the equator for the Coriolis force to cause the spinning motion of the cyclone.
- ✓ **Storm Clouds and Thunderstorms:** As warm, moist air rises, it cools and forms clouds and thunderstorms, fueling the cyclone.
- **Classification of Tropical Cyclones:**
  - ✓ **Saffir-Simpson Hurricane Wind Scale:** Tropical cyclones are categorized into five categories based on sustained wind speeds. The scale measures the highest wind speed averaged over a one-minute interval 10 meters above the surface.

### Climate Change and Tropical Cyclones:

- **Impact of Climate Change:**
  - ✓ **More Intense Cyclones:** Rising global temperatures are contributing to the increased intensity of tropical cyclones, with storms becoming more powerful and destructive.
- **Study Findings:**
  - ✓ **Rapid Intensification:** Tropical cyclones in Southeast Asia are forming closer to coastlines, intensifying more rapidly, and lingering longer over land.
  - ✓ **Sea Surface Temperature Rise:** Global mean sea surface temperatures have increased by 0.9°C since 1850, with a 0.6°C rise in the past four decades.
- **Effects on Storms:**
  - ✓ **Marine Heat Waves:** Higher sea surface temperatures are causing marine heat waves, which escalate storm intensity with stronger winds, heavier rainfall, and increased flooding.

### World Ozone Day, 2024

- **Relevance : GS I - Geography**
- **In News:** The Ministry of Environment, Forest, and Climate Change in India marked the 30th World Ozone Day, hosting a celebration in New Delhi.



### About World Ozone Day:

- Observed annually on September 16, the International Day for the Preservation of the Ozone Layer was declared by the United Nations General Assembly. It commemorates the signing of the Montreal Protocol in 1987, aimed at phasing out ozone-depleting substances (ODS). The protocol, ratified by all UN member



states, is one of the most successful environmental agreements in history. India has observed World Ozone Day since 1995.

- 2024 Theme: “Montreal Protocol: Advancing Climate Actions.”

### Understanding Ozone (O<sub>3</sub>):

- **Significance:** The ozone layer shields the Earth from harmful ultraviolet (UV) radiation from the Sun.
- **Nature:** Ozone (O<sub>3</sub>) is a reactive gas consisting of three oxygen atoms, occurring both naturally and due to human activities. It is primarily found in the stratosphere (upper atmosphere).
- **Ozone Depletion:** “Ozone hole” refers to areas where ozone concentration is significantly reduced, allowing more UV radiation to reach Earth.

### Formation of Ozone:

- **Stratospheric Ozone:** Located 15 to 30 km above Earth, stratospheric ozone forms naturally when solar UV light interacts with molecular oxygen (O<sub>2</sub>).
- **Tropospheric Ozone:** Ground-level ozone forms through photochemical reactions involving volatile organic compounds (VOCs) and nitrogen oxides (NO<sub>x</sub>). It is an unstable, pale blue gas with a sharp odor.

### Measuring Ozone:

- **Dobson Unit (DU):** The standard measurement for the total ozone in a column of air. The global average is around 300 DU, with variations near the poles and equator. The largest recorded ozone hole, measuring 28.4 million square kilometers, was observed in September 2000.

### Current Status of the Ozone Layer:

- Ozone depletion is evident in both hemispheres, particularly over Antarctica in the Southern Hemisphere and the Arctic in the Northern Hemisphere. Stratospheric clouds formed at temperatures below -78°C further intensify the depletion.
- **India’s Initiatives:**
  - ✓ **Indian Cooling Action Plan (ICAP):** A strategic framework aimed at phasing out chlorofluorocarbons (CFCs) by 2037-38. These chemicals contribute significantly to ozone depletion and climate change.
  - ✓ **Global Commitment:** In 2016, during the 28th Meeting of the Parties to the Montreal Protocol in Kigali, Rwanda, world leaders agreed to eliminate CFCs by 2040.

### Kunming-Montreal Global Biodiversity Framework:

- **Theme:** “Ecological Civilization: Building a Shared Future for All Life on Earth.”



- **Objective:** Adopted during the UN Convention on Biodiversity (COP-15), this framework seeks to halt and reverse biodiversity loss by 2030 while ensuring the protection of indigenous and local communities.
- **Key Framework Targets:**
- **'30 by 30' Target:** Protect 30% of Earth's land and ocean by 2030.
- **Reducing Harmful Subsidies:** Eliminate environmentally damaging subsidies by at least \$500 billion annually.
- **Ecosystem Restoration:** Restore at least 30% of degraded ecosystems globally.
- **Increasing Protected Areas:** Currently, 16% of the world's terrestrial area is protected. The framework aims to increase this to 30%, with a focus on inland, terrestrial, and coastal/marine ecosystems.

## Melting Glaciers in Central Asian Countries: A Growing Concern

### Relevance: GS I - Geography

- **In News:** The glaciers in the Tian Shan mountain range are melting at an alarming rate, posing a significant risk to towns and cities in Kyrgyzstan.



### About Tian Shan Mountain Range:

- **Location and Importance:**
  - ✓ The Tian Shan mountain range spans China, Kazakhstan, Kyrgyzstan, and Uzbekistan.
  - ✓ Tian Shan is often referred to as the "Water Tower of Central Asia" due to its vast freshwater resources stored in the form of glaciers.
  - ✓ The mountain range serves as a natural indicator of climate change.
- **Historical Stability of Glaciers:**
  - ✓ Until the end of the 1960s, glaciers in Central Asia, and worldwide, were relatively stable.
  - ✓ However, from the early 1970s, the degradation of glaciers sharply accelerated.
  - ✓ Between 1973 to 1978, the winter glacier mass balance in the region decreased by more than three times, marking a significant shift.

### Factors Contributing to Glacial Melting:

- **Climate Change in Central Asia:**
  - ✓ The effects of climate change have been particularly pronounced in Central Asia, leading to:
  - ✓ Extreme weather events.

- ✓ Rising temperatures that have accelerated the melting of glaciers.
- **Human Activity:**
  - ✓ Increased demand for natural resources, particularly in the extraction of gold, has further exacerbated glacial melting. Chemical processes involved in mining contribute to the degradation of glaciers.

### Recent Findings and Impact:

- **Retreat of Glaciers:**
  - ✓ Recent data highlights the retreat of countless glaciers in the region, posing severe risks to both water security and food security.
  - ✓ Up to 50% of the annual glacial runoff during the vegetative season comes from melted glacial waters.
- **Water Scarcity in the Region:**
  - ✓ Kyrgyzstan shares its water with downstream countries like Kazakhstan, Uzbekistan, and Turkmenistan, which are heavily dependent on these glacial water reserves.
  - ✓ The shrinking glaciers are depleting the region's primary freshwater sources, endangering agriculture and drinking water supplies.
- **Threat of Floods:**
  - ✓ As glaciers recede, new glacial lakes are forming from the meltwater, creating a risk of overflow and dangerous torrents.
  - ✓ These torrents can carry rocks and other debris, flowing down valleys and threatening towns and cities, including the Kyrgyz capital, Bishkek.
- **Alarming Forecasts:** Forecasts predict that by 2050, Central Asia's glaciers will have halved, and by 2100, they may disappear entirely.

### Mitigation Measures:

- **Local Initiatives:** Residents of the region have installed sensors approximately 50 cm above water levels, which transmit radio alerts in case of impending flooding.
- **UN Response:** The United Nations has taken notice, responding to an initiative by the government of Tajikistan. As a result, the UN declared the next year as the "Year of Glacier Conservation" to raise awareness and encourage efforts to protect these vital resources.

## Solimoes River Faces Unprecedented Drought

## Relevance: GS I - Geography

- **In News:** The Solimões River, one of the major tributaries of the Amazon River, is currently experiencing the worst drought on record. This severe environmental crisis has also led to the nearby Lake Tefé drying up, raising concerns about the broader impact on the region's ecosystem and communities.



## About the Amazon River:

## • Largest River System:

- ✓ The Amazon River is recognized as the largest river system in the world, both in terms of the volume of water flow and the extensive area of its basin. It plays a critical role in maintaining the ecological balance of the vast Amazon Rainforest, often referred to as the “lungs of the Earth.”

## • Origin:

- ✓ The river originates high in the Peruvian Andes, where it begins its journey before expanding into the vast river system we know today.

## • River Basin:

- ✓ The Amazon River basin encompasses a significant portion of South America, including:
  - The greater part of Brazil and Peru
  - Large sections of Colombia, Ecuador, and Bolivia
  - A small area of Venezuela.

## • Tributaries:

- ✓ The Amazon River system boasts around 1,100 tributaries. Some of the most notable tributaries include:
  - Japurá River (referred to as Caquetá in Colombia)
  - Juruá River
  - Madeira River
  - Negro River
  - Purus River
  - Xingu River.

## • Outflow:

- ✓ The river ultimately drains into the Atlantic Ocean along the northeastern coast of Brazil, where it deposits an enormous amount of water, sediments,

and nutrients.

### Significance of the Current Drought:

- The drought affecting the **Solimões River and Lake Tefé** is a stark reminder of the vulnerability of even the largest river systems to environmental and climatic changes.
- As one of the key tributaries of the Amazon River, the Solimões plays a crucial role in supporting the biodiversity and livelihoods of millions. Such extreme weather patterns highlight the need for urgent attention to climate adaptation strategies, especially in regions as ecologically significant as the Amazon basin.

### Conclusion:

- The current drought facing the Solimoes River and its devastating effect on Lake Tefé underscore the potential threats posed by changing climate patterns.
- The Amazon River, despite its massive size and significance, is not immune to these challenges. Conservation efforts must be strengthened to safeguard this critical ecosystem, ensuring the continued flow of the river and the survival of the countless species and communities that depend on it.

## Philadelphi Corridor and its Strategic Significance

### Relevance: GS I - Geography

- **In News:** The Philadelphi Corridor has emerged as a focal point in the recent ceasefire negotiations between Israel and Hamas, with Israel making the corridor's control a key condition.



### About the Philadelphi Corridor:

- **Location and Description:**
  - ✓ The Philadelphi Corridor is a narrow strip of land, approximately 14 kilometers long and 100 meters wide, running along Gaza's border with Egypt, including the Rafah crossing.
  - ✓ This corridor stretches from the Mediterranean Sea to the Kerem Shalom crossing with Israel, serving as a strategic link between Gaza and Egypt.
- **Historical Context:**
  - ✓ Following Israel's withdrawal from Gaza in 2005, which included the evacuation of Israeli settlements and military forces, the Philadelphi Corridor was designated as a demilitarized border zone.



- ✓ The responsibility for controlling the corridor was handed over to Egypt and the Palestinian Authority after Israel's withdrawal.

### Geopolitical Importance:

- The Philadelphi Corridor holds significant importance due to its **location along Gaza's southern border with Egypt**. It has historically been a critical point for monitoring **cross-border movement and smuggling activities, including the flow of weapons**.
- Control over the corridor is seen as a security priority for Israel, especially in light of the ongoing conflict with Hamas. Israel seeks to prevent the movement of weapons and militants through the area.

### Conclusion:

- The Philadelphi Corridor remains a vital and contested area in the Israel-Palestine conflict. Its strategic significance stems from its geographic position, and Israel's demand for control of the corridor highlights its central role in regional security dynamics.

## India Signs Accord on Marine Biodiversity Beyond National Jurisdiction

### Relevance : GS I - Geography

- **In News:** India has recently endorsed the Accord on Marine Biodiversity Beyond National Jurisdiction (BBNJ) at the United Nations General Assembly.
- Officially termed the Biodiversity Beyond National Jurisdiction (BBNJ) Agreement, it was accepted in 2023 at the Intergovernmental Conference on Marine Biodiversity of Areas Beyond National Jurisdiction. The Ministry of Earth Sciences has been entrusted with overseeing its implementation in India.



### About the Accord on Marine Biodiversity Beyond National Jurisdiction (High Seas Treaty):

- The BBNJ Accord is an international pact instituted under the umbrella of the United Nations Convention on the Law of the Sea (UNCLOS).
- **Objective:** The core goal of the treaty is the protection and sustainable utilization of marine biodiversity in regions outside the jurisdiction of any single nation.

- **Salient Features:**
  - ✓ The treaty delineates and establishes marine protected zones in biodiversity-abundant oceanic areas that face environmental pressure.
  - ✓ Signatory nations are prohibited from asserting sovereign control over marine resources extracted from international waters.
- **Importance:**
  - ✓ **Strategic Advantage for India:** The treaty strengthens India's geopolitical foothold in waters beyond its Exclusive Economic Zone (EEZ).
  - ✓ **Sustainable Development Objectives:** It plays a key role in realizing various Sustainable Development Goals (SDGs), particularly SDG 14 (Life Below Water), which emphasizes marine conservation and sustainable usage.
  - ✓ **Marine Preservation and Research:** The accord will amplify India's marine preservation initiatives while creating new opportunities for scientific exploration and technological advancements in marine environments.
  - ✓ **Integration of Knowledge:** The agreement encourages the amalgamation of traditional knowledge systems with cutting-edge scientific data.

### Key Focus Areas of the Accord:

- **Marine Genetic Resources:** Ensures equitable distribution of benefits derived from marine genetic resources.
- **Area-Based Management Tools:** Includes the designation of marine protected areas to safeguard marine ecosystems.
- **Environmental Impact Assessments:** Implements mechanisms to evaluate the environmental consequences of human activities in international waters.
- **Capacity Building & Technology Transfer:** Stresses the significance of transferring marine technologies & enhancing capacity-building initiatives among nations.

### About UNCLOS & High Seas:

- The United Nations Convention on the Law of the Sea (UNCLOS) is a global legal framework adopted in 1982, which took effect in 1994. It establishes a comprehensive legal structure for regulating the world's oceans and seas, including their use and protection.
- High Seas refer to the portions of the ocean that fall beyond a nation's Exclusive Economic Zone (EEZ), territorial waters, internal waters, or the archipelagic waters of any state.
  - ✓ **Jurisdiction and Regulation:** The high seas and their resources are not under the direct ownership or regulation of any single country.
  - ✓ **Global Ocean Coverage:** High seas constitute approximately 64% of the world's oceanic expanse, underscoring their vital role in sustaining global marine biodiversity.

## Groundwater Contamination: Rajasthan records the highest fluoride levels in groundwater

### Relevance : GS III - Environment

- In News:** A recent study by the National Remote Sensing Centre (NRSC) has revealed that fluoride contamination in groundwater is highest during the dry, pre-monsoon months, with Rajasthan, particularly Jaisalmer, being the most affected area in India.



### Fluoride Contamination in Groundwater:

- Natural Occurrence and Limits:** Fluoride naturally occurs in groundwater. The national drinking water limit for fluoride is set at 1.50 milligrams per litre.
- Health Implications:** Excessive fluoride levels in drinking water can lead to skeletal fluorosis, accelerated dental decay, and various health risks, especially for children.

### Key Findings on Fluoride Contamination:

- States with Above-Permissible Levels:** The states with the highest levels of fluoride contamination include Rajasthan (highest), Telangana, western Andhra Pradesh, eastern Karnataka, and others.
- Seasonal Variation:** Fluoride contamination peaks during the dry summer pre-monsoon months, making it a critical time for monitoring water quality.
- Regional Differences:** Arid regions, particularly in western India, exhibit higher levels of fluoride contamination compared to more humid areas.

### Key Statistics on Groundwater Usage:

- Global Usage:** India is the largest user of groundwater globally, accounting for one-fourth of total global withdrawal.

- **Usage Distribution:** 87% of groundwater in India is used for irrigation purposes.
- **Current Status:** Approximately 67% of groundwater units are considered safe (where extraction is less than 70% of recharge), while 14% are overexploited, and 4% are critical.
- **High Extraction Regions:** States like Haryana, Punjab (with 78% of wells overexploited), and Rajasthan face the highest levels of groundwater extraction.
- **Climate Concerns:** Rising temperatures in southwest India may hinder the natural replenishment of groundwater.

### Causes of Groundwater Contamination:

- **Natural Sources:** Substances like arsenic found in rocks and soils can lead to contamination, as observed in the Ganges Plain.
- **Septic Systems:** Poorly managed septic tanks can release harmful bacteria, nitrates, and other chemicals into groundwater.
- **Pesticides and Fertilizers:** Agricultural runoff containing pesticides and fertilizers contributes to groundwater pollution, such as in the Yamuna floodplains.
- **Landfills:** Leachate from landfills can pollute groundwater, as seen near Delhi's landfill sites.
- **Sewage:** Leaking sewers and sewage sludge are responsible for cross-contamination, which may lead to the presence of pharmaceutical residues, as observed in some studies from Germany.
- **Other Sources:** Groundwater contamination can also result from over-pumping, chemical spills, illegal dumping, and atmospheric pollutants.

### Status of Other Groundwater Contaminants in India:

- **Arsenic Contamination:** States like West Bengal, Bihar, Jharkhand, and Uttar Pradesh contribute to 90% of arsenic contamination in India.
- **Uranium Contamination:** Found in around 12 states, including Punjab.
- **Iron Contamination:** States such as Rajasthan, Jharkhand, and Assam report high levels of iron in groundwater.
- **Other Contaminants:** These include antimony, cadmium, copper, barium, etc., all of which can have severe health impacts like toxicity, hypertension, liver, and kidney damage.



### Steps Taken to Address Groundwater Contamination:

- **Legislative Measures:** Key legislative measures include the Water (Prevention and Control of Pollution) Act, 1974, the Environment Protection Act, 1986, and the Water Cess Act, 1977.
- **Groundwater Recharging Initiatives:**
  - ✓ **Rainwater Harvesting:** Efforts like the Prime Minister Krishi Sinchayee Yojna - Watershed Development and Atal Bhujal Yojana aim at recharging groundwater through rainwater harvesting and other sustainable practices.
- **Strategies for Improving Groundwater Quality:**
  - ✓ **Community Measures:** Promote tree planting, rainwater harvesting, and community-based watershed management to enhance groundwater recharge.
  - ✓ **Policy Measures:** Regulate bore wells, construct water tanks, raise public awareness about water conservation, and enforce pollution control measures.
  - ✓ **Legal Measures:** Include cleaning and maintaining urban water bodies, installing decentralized treatment plants, and preventing pollution of water sources.
  - ✓ **Technological Measures:** Implement artificial groundwater recharge techniques, use stormwater for creating new water bodies, and build effective water harvesting structures.

### Conclusion:

- The study by NRSC highlights critical challenges related to groundwater contamination in India, especially with fluoride levels.
- Addressing these challenges requires a multi-faceted approach involving community participation, policy reforms, technological advancements, and effective implementation of existing legislation to safeguard public health and ensure sustainable use of groundwater resources.

### Discovery of New Spider Species: Carrhotus piperus

#### Relevance: GS III - Environment

- **In News:** Recently, a novel spider species named Carrhotus piperus has been identified in the lower Palani Hills of Tamil Nadu.



### About Carrhotus piperus:

- **Species Overview:** Carrhotus piperus is a newly discovered jumping spider species.
- **Habitat:** It was located on pepper (*Piper nigrum*) plants, approximately two meters above the ground.
- **Etymology:** The species name, 'piperus,' is derived from the plant's generic name, highlighting the spider's specific habitat.
- **Significance:** This discovery underscores the rich biodiversity of the region, increasing the number of known Carrhotus species in India to 10, & globally to 37.
- **Distinctive Features:** The spider is recognizable by its unique prolateral protrusion and beak-shaped embolus, which differentiate it from other species within its genus.

### Key Facts about Palani Hills:

- **Geographical Context:** The Palani Hills are an eastward extension of the Western Ghats, located in southwestern Tamil Nadu, southern India.
- **Range Continuation:** The range extends as a continuation of the Anaimalai Hills in Kerala, with steep slopes marking its southern end.

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## Haryana environmentalists release a 'Green Manifesto' on ecological issues

### Relevance : GS III - Environment

- **In News:** In a pioneering effort, environmentalists, ecologists, and various civil society members from across Haryana have launched a 'Green Manifesto' to address critical environmental issues such as air pollution, waste management, depleting groundwater levels, and the need for the protection of the Aravalis.



### Aim of the Green Manifesto:

- The manifesto aims to have environmental demands included in the manifestoes of various political parties ahead of the upcoming Haryana Assembly election.

### Environmental Concerns in Haryana :

- **Land Degradation:** According to the Desertification and Land Degradation Atlas of India, 2021, around 8.24% of Haryana's total geographical area is

degraded.

- **Air Pollution:** Haryana is home to 8 of the 50 most polluted places in the world.
- **Waste Management:** Unsegregated waste is indiscriminately dumped across the state, resulting in toxic landfills that impact natural ecosystems and water bodies.
- **Groundwater Depletion:** Groundwater levels have significantly dropped, particularly in South Haryana, reaching alarming depths of 1,500-2,000 feet.
- **Industrial Pollution:** Chemical waste from industries is contaminating water sources, causing skin diseases, respiratory problems, and other health issues in humans and animals.

### Key Demands in the Green Manifesto, 2024:

- **Critical Ecological Zones:** The manifesto's primary demand is for the legal designation of the Aravallis, including the Bhood areas and the Shivaliks, as 'Critical Ecological Zones.'
- **Deemed Forests:** It calls for legal protection for all forests in the state, including un-notified forests to be recognized as 'deemed forests' under the Punjab Land Preservation Act (PLPA).
- **Tree Act:** A demand for a stringent 'Tree Act' for Haryana, akin to the Delhi Preservation of Trees Act, 1994.
- **Open Natural Ecosystems (ONEs):** The manifesto urges the declaration of all open natural ecosystems, such as the blackbuck natural habitat in Fatehabad district, as conservation or community reserves.
- **Low Forest Cover:** Haryana has the lowest forest cover in India, standing at just 3.6%, compared to the national average of 21%.
- **Increasing Tree Cover:** A call for an action plan to increase native forest and tree cover to 10% within 4 years.

### Promoting Crop Diversification:

- **Climate-Change Adaptation:** Advocates for promoting crop diversification as a crucial climate-change adaptation strategy.
- **Guaranteed Purchase:** Ensuring the guaranteed purchase of every crop grown by farmers at the Minimum Support Price (MSP) announced by the Centre.
- **Soil Restoration:** Developing an action plan to restore soil and its microbial diversity.
- **Natural Farming Practices:** Incentivizing natural farming practices that contribute to soil health.



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## India's First 'Teal Carbon' Study Highlights Wetlands' Role in Climate Adaptation

### ☛ Relevance : GS III - Environment

- **In News:** India recently conducted its inaugural study on 'teal carbon' at Keoladeo National Park (KNP) in Bharatpur district, Rajasthan.



- The research identified **elevated levels of methane emissions from the wetlands** and proposed the use of specialized biochar to mitigate these emissions.
- The study highlights the **critical importance of wetland conservation** for climate adaptation and resilience, advocating for nature-based solutions to tackle climate change challenges.

### Understanding Biochar:

- Biochar is a **carbon-rich substance that enhances soil fertility, water retention, and crop productivity**. It is produced through pyrolysis, a process of heating organic material with minimal or no oxygen.

### Defining Teal Carbon:

#### • What is Teal Carbon?

- ✓ Teal carbon refers to carbon stored in freshwater (non-tidal) wetlands, which includes carbon found in vegetation, microbial life, dissolved organic compounds, and particulate organic matter.

#### • Types of Carbon:

- ✓ **Teal Carbon:** Distinguished by its role in wetland ecosystems and its location within these systems. Unlike black and brown carbon, which result from incomplete combustion and contribute to atmospheric pollution, teal carbon is focused on carbon sequestration in wetland environments.
- ✓ **Black Carbon:** A component of particulate matter, this is a dark, sooty substance produced from burning fossil fuels, significantly impacting air quality.
- ✓ **Brown Carbon:** Generated from the partial combustion of organic materials, such as biomass; it absorbs ultraviolet and visible solar radiation,



contributing to global warming.

- ✓ **Blue Carbon:** Refers to carbon captured in oceans and marine environments.
- ✓ **Green Carbon:** Carbon stored in terrestrial plants through the process of photosynthesis.
- ✓ **Gray Carbon:** Emissions from industrial activities, stored in fossil fuels like coal, oil, and biogas.
- ✓ **Red Carbon:** Emissions released by biological particles found on snow and ice surfaces.
- **Role in Addressing Climate Change:**
  - ✓ Teal carbon ecosystems play a crucial role in mitigating climate change by:
    - Capturing and storing carbon.
    - Increasing groundwater levels.
    - Reducing urban heat island effects.
    - Controlling greenhouse gas emissions.
    - Mitigating the impact of floods.
- **Key Reservoirs of Teal Carbon:**
  - ✓ The primary reservoirs of teal carbon include peatlands, freshwater swamps, and natural freshwater marshes. These ecosystems are vital for global carbon sequestration, with an estimated storage of about 500.21 petagrams of carbon (PgC) globally.
- **Threats to Teal Carbon Ecosystems:**
  - ✓ Teal carbon ecosystems are highly prone to degradation due to factors such as:
    - Pollution.
    - Land-use changes.
    - Water extraction.
    - Alterations in the landscape.

### About Keoladeo National Park:

- Keoladeo National Park is a prominent wetland and bird sanctuary and is designated as a UNESCO World Heritage Site, located in Bharatpur, Rajasthan.
  - ✓ **Ramsar Sites:** Chilika Lake (Odisha) and Keoladeo National Park (Rajasthan) were designated as India's first Ramsar Sites in 1981.
  - ✓ Currently, Keoladeo National Park and Loktak Lake (Manipur) are included in the Montreux Record.

- ✓ **Avian Diversity:** Known for its rich avifauna, Keoladeo National Park houses over 365 bird species, including several rare and endangered species like the Siberian crane.
- **Fauna:**
  - ✓ The park also supports a wide variety of fauna, including:
  - ✓ Jackals, Sambar, Nilgai, wild cats, hyenas, wild boar, porcupine, and mongoose.
- **Flora:**
  - ✓ The predominant vegetation consists of tropical dry deciduous forests, mainly *Acacia nilotica*, interspersed with dry grassland.
- **Rivers:**
  - ✓ The Gambhir and Banganga rivers flow through Keoladeo National Park, enhancing its distinctive ecological landscape.

### Conclusion:

- India's first study on teal carbon highlights the essential role of wetland ecosystems in climate adaptation and resilience.
- By concentrating on these ecosystems and employing innovative approaches like biochar, India can strengthen its climate mitigation strategies, ensuring ecological balance and sustainability.
- Safeguarding wetlands such as Keoladeo National Park is crucial to these efforts, given their capacity to sequester carbon and support rich biodiversity.

### Fourth Annual Air Quality and Climate Bulletin

#### Relevance: GS III - Environment

- **In News:** The World Meteorological Organization (WMO), a specialized agency of the United Nations, has released its fourth annual Air Quality and Climate Bulletin.
- The bulletin provides an analysis of the current state of air quality worldwide and examines its intricate connections to climate change.



#### Key Findings:

- **Global PM2.5 Concentrations:**

- ✓ The report highlights contrasting trends in PM2.5 pollution levels across different regions:
  - **Europe and China:** Observed a decline in PM2.5 emissions.
  - **North America and India:** Witnessed an increase in PM2.5 levels, primarily due to anthropogenic activities.
- ✓ PM2.5 refers to particulate matter with a diameter of less than 2.5 micrometers, which poses significant health risks due to its ability to penetrate deep into the lungs and even enter the bloodstream.
- **Global PM Hotspots:**
  - ✓ The report identifies several global hotspots where PM (particulate matter) emissions are notably high:
    - Agricultural areas in Central Africa, Pakistan, India, China, and South-East Asia.
- **Impacts of Particulate Matter (PM) on Crops:**
  - ✓ The bulletin highlights that PM2.5 pollution has a detrimental effect on crop yields, reducing them by as much as 15%. This is because the particulate matter reduces the amount of sunlight that reaches leaf surfaces, thereby impacting photosynthesis.

### Advancements in Aerobiology:

- **About Aerobiology:**
  - ✓ Aerobiology is the scientific study that focuses on the movement, dispersion, and impact of airborne biological particles, known as bioaerosols, on the health of humans, animals, and plants.
  - ✓ **Bioaerosols consist of biological particles such as:**
    - Bacteria, fungal spores, pollen grains, viruses, etc.
  - ✓ These bioaerosols serve as indicators of changes in biodiversity, plant flowering patterns, and species distribution, all of which are sensitive to climate shifts.
- **Importance of New Technologies in Aerobiology:**
  - ✓ Due to the sensitivity of bioaerosols to climate change, there is a need for advanced technologies to better understand their behavior and impact. This would, in turn, enhance forecasting capabilities and improve assessments related to the impacts of climate change.
- **New Observational Techniques:**
  - ✓ The bulletin emphasizes the development of new observational techniques to



monitor bioaerosols in real-time. These technologies include:

- High-resolution image analysis.
- Holography.
- Multi-band scatterometry.
- Fluorescence spectrometry.
- Nanotechnology for DNA sequencing.

## India leads the world in plastic pollution: Key findings of a recent study

### Relevance: GS III - Environment

- **In News:** A recent study published in the journal Nature has identified India as the largest contributor to global plastic pollution.
- The study reveals that India is responsible for approximately one-fifth of the world's total plastic waste generation.



### Key Findings of the Study:

- **Plastic Waste Generation in India:** India generates around 9.3 million tonnes of plastic waste annually. Out of this, 5.8 million tonnes (mt) are incinerated, while 3.5 million tonnes are discharged into the environment as debris. This amount is considerably higher compared to countries like Nigeria (3.5 mt), Indonesia (3.4 mt), and China (2.8 mt).
  - India's plastic waste generation rate is about 0.12 kilograms per capita per day.
- **Global North-South Divide in Plastic Waste Emissions:**
  - Plastic waste emissions are predominantly high in Southern Asia, Sub-Saharan Africa, and South-eastern Asia, highlighting a clear divide in the sources of plastic pollution.
  - Countries in the Global South, such as India, predominantly rely on open burning for waste management, leading to significant unmanaged waste. In contrast, the Global North employs controlled waste management systems, resulting in less unmanaged waste.
- **Disparity Between High and Low-Income Countries:**

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- Globally, 69% or 35.7 Mt per year of plastic waste emissions originate from 20 countries. In the Global South, plastic pollution is mainly due to open burning associated with poor waste management practices, whereas in the Global North, it stems largely from uncontrolled debris.
- Although high-income countries have higher plastic waste generation rates, they do not rank among the top 90 polluters because of 100% collection coverage and controlled disposal systems.

### Criticism of the Research:

- **Narrow Focus:** The study has been criticized for focusing excessively on waste management, while neglecting the more crucial need to reduce plastic production.
- **Misplaced Priorities:** This focus could divert attention from essential upstream solutions, such as the phasing out of single-use plastics.
- **Industry Support Concerns:** The study's endorsement by plastics industry groups has raised questions about its alignment with industry interests, rather than prioritizing broader environmental objectives.
- **Undermining Comprehensive Solutions:** By concentrating on waste management, the study may undermine more holistic approaches addressing issues related to plastic production and recycling.

### Reasons for High Plastic Pollution in India:

- **Rapid Population Growth and Urbanization:** India's increasing population and rising affluence have led to higher consumption rates and, consequently, greater waste generation. The pace of urbanization exacerbates the problem by increasing the demand for plastic products and packaging.
- **Inadequate Waste Management Infrastructure:** The country's waste management systems are insufficient to handle the vast volumes of waste generated. There are more uncontrolled dumping sites than sanitary landfills, reflecting substandard disposal facilities and practices.
- **Discrepancies in Waste Collection Data:** Official records claim a waste collection rate of 95%, but research suggests it is closer to 81%, indicating a substantial gap in waste collection efficiency.
- **Open Burning of Waste:** India incinerates approximately 5.8 million tonnes of

plastic waste annually, significantly contributing to pollution and releasing toxic pollutants that pose severe health and environmental hazards.

- **Informal Sector Recycling:** The unregulated informal recycling sector processes a significant portion of plastic waste, which is not accounted for in official statistics, complicating efforts to accurately understand plastic pollution levels.

### Issues Associated with Mismanaged Plastic Waste in India:

- **Environmental Degradation:** Plastic waste clogs waterways, leading to flooding and marine pollution. It endangers marine life through ingestion, and burning plastic releases toxic pollutants that degrade air quality.
- **Public Health Concerns:** Microplastics in water and food pose potential long-term health risks. Plastic waste also creates breeding grounds for disease vectors, increasing the prevalence of diseases like dengue and malaria. Burning plastic releases harmful substances, affecting respiratory health.
- **Economic Challenges:** According to a FICCI report, India could lose over USD 133 billion worth of material value used in plastic packaging by 2030. Uncollected plastic packaging waste alone accounts for USD 68 billion of this potential loss.
- **E-commerce and Packaging Waste:** The rapid growth of e-commerce has led to an increase in plastic packaging waste, much of which is challenging to recycle and ends up as litter or in landfills.
- **Regulatory and Enforcement Challenges:** Inconsistent enforcement of plastic waste regulations and issues with the Extended Producer Responsibility (EPR) system hinder effective waste management. India remains one of the top contributors to global plastic waste.
- **Microplastic Pollution in Agriculture:** The use of plastic in agriculture and inadequate wastewater treatment lead to microplastics accumulating in the soil, impacting soil health and food safety.
- **Technological and Infrastructure Gaps:** Inadequate waste segregation and processing facilities, coupled with limited access to advanced recycling technology, hinder effective plastic waste management. Additionally, a lack of comprehensive waste tracking further complicates these efforts.

### Regulations Related to Plastic Waste Management in India:

- Plastic Waste Management Rules, 2016

- Plastic Waste Management (Amendment) Rules, 2018
- Plastic Waste Management Amendment Rules, 2021
- Plastic Waste Management (Amendment) Rules, 2022
- Plastic Waste Management (Amendment) Rules, 2024

### Way Forward:

- **Circular Economy:** Promote Reduce, Reuse, Recyclability (RRR) in product design, set up recovery facilities, incentivize recycled plastics, and mandate recycled content in products.
- **Smart Waste Management:** Integrate smart technology in waste management using IoT-enabled bins, AI for sorting, and mobile apps for reporting illegal dumping and locating recycling centers.
- **Extended Producer Responsibility (EPR):** Strengthen EPR by introducing graded fees for difficult-to-recycle plastics, a plastic credit trading system, and extending EPR to the informal sector to improve conditions for waste pickers.
- **Awareness Campaigns:** Launch national campaigns in multiple languages, integrate plastic waste education in schools, conduct community workshops, and use influencers to promote plastic-free lifestyles. Establish a national innovation challenge for youth involvement.
- **Waste-to-Energy:** Invest in advanced waste-to-energy technologies like pyrolysis and gasification for non-recyclable plastics. Ensure strict emissions controls and use generated energy to power waste management facilities.
- **Green Procurement:** Implement plastic waste reduction criteria in government procurement policies and use government buildings as models.

## Operation Bhediya: Capturing Wolves in Bahraich

### Relevance : GS III - Environment

- **In News:** Recently, the fifth wolf was captured in Bahraich following a series of deadly attacks on humans, prompting the continuation of Operation Bhediya.



### What is Operation Bhediya?

- **Operation Bhediya** is an initiative by the **Uttar Pradesh Forest Department** aimed at capturing wild wolves responsible for attacks in the Bahraich region.

- The operation covers around 35 villages in the district where wolf attacks have posed a significant threat to residents.
- **Launched by:** The Forest Department of Bahraich District, Uttar Pradesh.

### Measures Taken Under Operation Bhediya:

- **Monitoring Wolf Habitats:** Authorities have increased surveillance of known wolf habitats and areas where frequent attacks have occurred. This is to track wolf movements and prevent future incidents.
- **Wildlife Management Improvements:** The initiative also seeks to improve broader wildlife management practices, including enhanced waste management to reduce conflicts.
- **Prevention Measures:** Barriers are being established to prevent wolves from entering human settlements, minimizing the risk of attacks.

### Use of Technology:

- **Thermal Drones:** These advanced tools are being deployed to track wolf movements at night and in dense areas where visibility is limited.
- **Camera Traps:** Installed in strategic locations, these cameras automatically trigger by motion, capturing the presence of wolves and aiding in their identification.
- **Pugmark Identification:** Tracking pugmarks (footprints) and gathering information from locals are additional methods used to locate wolves.

### Additional Measures:

- **Permission to Tranquilise:** The Chief Wildlife Warden has granted permission to tranquilise wolves as a humane measure for capture.

### Declaration of Bahraich as a 'Wildlife Disaster Area':

- The Uttar Pradesh government has officially declared Bahraich a 'Wildlife Disaster' affected area, accelerating efforts under Operation Bhediya.
- This declaration also streamlines the process for affected families to receive ex-gratia compensation for damages and losses caused by wolf attacks.

### Conclusion:

- Through Operation Bhediya, authorities aim to reduce human-wildlife conflicts, enhance wildlife management, and ensure the safety of residents in Bahraich.



## Herpetofauna Survey: First-Ever Conducted in Grass Hills & Karian Shola National Parks

### Relevance : GS III - Environment

- **In News:** A preliminary herpetofauna survey has been conducted for the first time in **Grass Hills National Park and Karian Shola National Park within the Anamalai Tiger Reserve (ATR)**, revealing the rich biodiversity of these areas in the Pollachi division of Tamil Nadu's Anamalai Hills.



### Key Findings:

- The survey unveiled significant herpetofaunal diversity, identifying 20 species of reptiles and 34 species of amphibians, which underscores the ecological richness of these protected zones.
- **Grass Hills National Park:**
  - ✓ **Location:** Situated in the Anamalai Hills, Tamil Nadu.
  - ✓ **Biodiversity:**
    - **Reptiles:** 11 species recorded.
    - **Amphibians:** 12 species recorded.
  - ✓ **Ecosystem:** Unique montane shola grassland ecosystem, characteristic of the Western Ghats.
- **Karian Shola National Park:**
  - ✓ **Location:** Part of the Anamalai Tiger Reserve in Tamil Nadu.
  - ✓ **Biodiversity:**
    - **Reptiles:** 9 species recorded.
    - **Amphibians:** 22 species recorded.
  - ✓ **Ecosystem:** Features tropical rainforests, with grassland surrounded by semi-evergreen and deciduous forests.

### Anamalai Tiger Reserve:

- The Anamalai Tiger Reserve is located in the Western Ghats and encompasses critical ecological zones like Grass Hills and Karian Shola. This reserve plays a vital role in protecting the unique biodiversity of these regions.

### Critically Endangered and Endangered Species:

- The survey highlighted the presence of several **endangered and critically endangered species**, including:
  - ✓ **Anaimalai Flying Frog** (*Rhacophorus pseudomalabaricus*)
  - ✓ **Deccan Night Frog** (*Nyctibatrachus deccanensis*)
  - ✓ **Cold Stream Torrent Frog** (*Micrixalus frigidus*)
  - ✓ **Resplendent Shrubfrog** (*Raorchestes resplendens*).

### Rare and Newly Described Reptiles:

- Three-lined Shieldtail** (*Platyplectrurus trilineatus*), last observed in 2018.
- Anamudi Dwarf Gecko** (*Cnemaspis anamudiensis*), first report since its discovery.
- Newly described species like **Cnemaspis anaimalaiensis** and **Tail-spot Shieldtail** (*Uropeltis caudomaculata*).

### Ecological Significance:

- Nearly 85% of the species recorded in the survey are endemic to the Western Ghats, indicating the critical role these regions play in conserving biodiversity.
- Many species are restricted to the Anaimalai sub-cluster, further emphasizing the unique ecological significance of the Anaimalai Tiger Reserve.

### Bhadra Tiger Reserve (BTR)

#### Relevance: GS III - Environment

- In News:** The rapid proliferation of the invasive plant *Mikania micrantha* in Bhadra Tiger Reserve (BTR) is endangering the region's biodiversity.



#### About Bhadra Tiger Reserve:

- Location:** Located in Karnataka's Western Ghats, BTR spans the Chikmagalur and Shimoga districts.
- Wildlife Corridor:** Bhadra Tiger Reserve is part of a broader ecological network, including Kudremukh National Park and Shettihalli Wildlife Sanctuary, serving as a crucial corridor for wildlife movement.
- River System:** The reserve is nourished by the Bhadra River, a tributary of the Tungabhadra River.

- **Project Tiger Inclusion:** In 1998, Bhadra Wildlife Sanctuary was incorporated into the Project Tiger initiative, emphasizing its role in tiger conservation.
- **Forest Types:** Tropical Moist Mixed Deciduous, Tropical Dry Deciduous, Semi-Evergreen Forest
- **Wildlife:** The reserve is home to a wide array of fauna, including tigers, leopards, and herbivores such as gaur, sambar, and barking deer.

### About Mikania micrantha:

- **Origin:** Mikania micrantha is a perennial climber, originally from tropical America.
- **Invasive Nature:** It is recognized as a highly invasive species, especially impacting Southeast Asia and the Pacific islands, where it disrupts native ecosystems.

### Discovery of Onitis vishthara

#### Relevance : GS III - Environment

- **In News:** Entomologists from the Ashoka Trust for Research in Ecology and the Environment (ATREE) recently discovered a new species of dung beetle, *Onitis vishthara*, in the Hesaraghatta grasslands, located in northwest Bengaluru.



### About Onitis vishthara:

- **New Species of Dung Beetle:** *Onitis vishthara* is a newly identified species of dung beetle belonging to the genus *Onitis*.
- **Nomenclature:** The name *vishthara* derives from the Kannada word for “breadth,” which reflects the beetle’s relatively broader appearance.
- **Family:** Scarabaeidae.
- **Genus Onitis:** The genus *Onitis* is known to be relatively rare, and species are typically found in the Afrotropical, Oriental, and Palaearctic regions. Prior to the discovery of *Onitis vishthara*, only 176 species of *Onitis* had been reported globally.

### Ecological Role of Onitis Species:

- **Tunnellers:** *Onitis* species are tunnellers, which means they bury large quantities of cattle dung beneath the dung pat to provide food for their larvae.

- **Dung Decomposition:** These beetles play a crucial role in processing and decomposing cow dung by feeding, breeding, and nesting in it.
- **Environmental Significance:** Cattle dung is a major source of greenhouse gas emissions, contributing to climate change. With over 535 million livestock heads, India has the world's largest livestock population. An average cow produces about 30 kg of dung daily, which amounts to more than 10 tons per year.
- **Ecosystem Services:** Dung beetles enhance nutrient cycling, improve soil aeration, aid in secondary seed dispersal, and help control parasites, thus benefiting the overall ecosystem.

### Other Species Discovered:

- **Onitis kethai:** Discovered in Biligiri Rangaswamy Temple Tiger Reserve, Karnataka, this species is named in honor of the late Ketha Gouda, a field assistant to the entomologists.
- **Onitis bhomorensis:** Found in Tezpur, Assam, this species is named after the Kolia Bhomora Bridge across the Brahmaputra River, where the new species was collected.

### Hesaraghatta Lake:

- **Location:** Hesaraghatta Lake is a human-made reservoir situated northwest of Bengaluru, Karnataka.
- **History:** The lake was created in 1894 by damming the Arkavathy River to meet Bengaluru's drinking water needs. It was a part of the 'Chamarajendra Water Works' project, designed by M.C. Hutchins, the chief engineer of Mysuru, during the tenure of Dewan K. Seshadri Iyer.

## Environmental Compensation Guidelines Issued for Battery Waste Management

- **Relevance : GS III - Environment**
- **In News:** The Central Pollution Control Board (CPCB) has released new Environmental Compensation (EC) Guidelines under the Battery Waste Management Rules, 2022 to ensure sustainable battery waste management practices across India.





## What is Environmental Compensation (EC)?

- **Empowerment of CPCB Under 2022 Rules:**
  - ✓ The Battery Waste Management Rules, 2022 empower the CPCB to impose and collect Environmental Compensation (EC) from producers and other entities involved in the refurbishment and recycling of waste batteries in case of non-compliance with the rules.
- **Polluter Pays Principle:**
  - ✓ EC can also be imposed on entities operating without proper registration, or those providing false information or deliberately concealing key facts, following the polluter pays principle.
- **Extended Producer Responsibility (EPR):**
  - ✓ EC is levied on producers who fail to meet their EPR targets or fulfill the obligations outlined in these rules.
  - ✓ EPR refers to the responsibility of any producer of batteries for the environmentally sound management of waste batteries.
  - ✓ However, payment of EC does not absolve the producer of their EPR obligations; any unfulfilled EPR targets for a particular year must be carried forward to the next year.

## Key Highlights of the Guidelines Issued:

- **EC Divided into Two Regimes:**
  - ✓ **EC Regime 1:**
    - EC will be imposed on producers for failing to meet their metal-specific EPR targets. This includes targets for both Lead Acid Batteries and Lithium-ion/Other Batteries.
  - ✓ **EC Regime 2:**
    - EC will be levied on any entity that violates the Battery Waste Management (BWM) Rules, 2022, based on their application fees. This applies to entities that fail to comply with the rules in their operations.

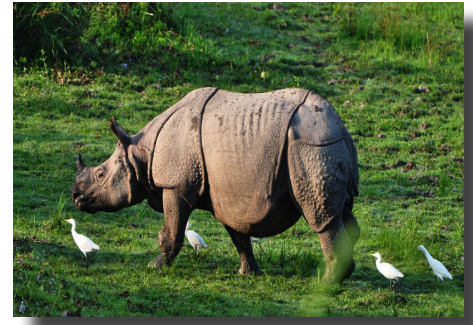
## Conclusion:

- The new EC guidelines aim to enhance environmental sustainability and ensure that all entities in the battery supply chain adhere to proper waste management practices, reinforcing the Extended Producer Responsibility (EPR) framework in India.

## IRF Publishes 'State of the Rhino' Report

## Relevance: GS III - Environment

- **In News:** The International Rhino Foundation (IRF) has recently published its annual 'State of the Rhino' report, shedding light on the current status and conservation efforts for various rhino species, particularly the Greater One-Horned Rhino.



## Key Findings of the Report:

- The Greater One-Horned Rhinos have shown **significant improvement due to enhanced habitats and the development of wildlife corridors**, which aid their movement and survival.
- The population of this species has seen a 20% increase over the past decade, now surpassing 4,000 animals globally, a testament to successful conservation initiatives.

## About the Greater One-Horned Rhino:

- **Habitat:** This species primarily inhabits the Indo-Nepal Terai, the northern parts of West Bengal, and the state of Assam in India. These areas provide the essential grasslands and riverine forests needed for their survival.
- **Conservation Status:** According to the International Union for Conservation of Nature (IUCN), the Greater One-Horned Rhino is currently classified as Vulnerable, highlighting the need for continued conservation efforts to prevent further threats.
- **Social Behavior:** Greater One-Horned Rhinos are generally solitary animals, except for females who stay with their young. Males tend to maintain loosely-defended territories, allowing some overlap with other males.
- **Reproduction:** The gestation period for these rhinos lasts approximately 15 to 16 months, after which a mother gives birth to one calf. The birth interval is typically 2 to 3 years, which contributes to the gradual increase in population numbers.

## Population in India:

- As of 2021, the Greater One-Horned Rhino population in India stands at 3,262, with the **majority residing in the state of Assam**. Kaziranga National Park in **Assam holds more than 90%** of India's Greater



One-Horned Rhinos, making it a crucial site for the conservation of this species.

### Conclusion:

- The findings of the 'State of the Rhino' report reflect the positive outcomes of ongoing conservation efforts for the Greater One-Horned Rhino.
- The species has made remarkable progress, particularly in India, where careful management of habitats and the establishment of wildlife corridors have facilitated its recovery.
- Despite these successes, the vulnerable status of the species underscores the importance of sustaining and expanding these efforts to secure the long-term future of the Greater One-Horned Rhino.

## Cabinet's Approval for India's Membership in the International Big Cat Alliance (IBCA)

### Relevance : GS III - Environment

- **In News:** The Union Cabinet has recently given its approval for India to become a member of the International Big Cat Alliance (IBCA).
- India became a founding member by signing and ratifying the Framework Agreement for the establishment of IBCA.
- Other countries, including Nicaragua, Eswatini, and Somalia, have also joined the IBCA as members.

### About the International Big Cat Alliance (IBCA):

- **Genesis:** The IBCA was launched by India in 2023 during the 50th-anniversary celebration of Project Tiger, India's landmark wildlife conservation initiative.
- **Aim:** The primary objective of IBCA is to foster international cooperation in conserving seven major big cat species: tiger, lion, leopard, snow leopard, cheetah, jaguar, and puma, along with their respective habitats.
- **India's Unique Position:** India is home to five of the seven big cat species: tiger, lion, leopard, snow leopard, and cheetah. Puma and jaguar are absent from the Indian subcontinent.
- **Multi-country and Multi-agency Coalition:**
  - ✓ The IBCA is a coalition that includes 95 big cat range countries, non-range countries interested in big cat conservation, conservation partners, and scientific organizations.

- ✓ All United Nations (UN) member countries are eligible to join IBCA as members.
- ✓ Nine international organizations have also agreed to participate as partner organizations of IBCA.
- **Funding and Headquarters:**
  - ✓ India has committed financial support of ₹150 crore for five years, from 2023-24 to 2027-28, to strengthen the efforts of IBCA.
  - ✓ The headquarters of IBCA will be established in India.

### Significance of Protecting Big Cats and Their Habitats:

- **Keystone Species:** Big cats, as apex predators, play a crucial role in maintaining the ecological balance. Their conservation helps protect the intricate web of biodiversity in their ecosystems.
- **Maintaining Ecosystem Health:** By controlling herbivore populations, big cats ensure the health of ecosystems. Their predatory role prevents overgrazing and promotes habitat sustainability.
- **Economic Support:** Big cats are a source of economic benefits through ecotourism, which provides livelihood opportunities for local communities and encourages conservation efforts.

### Conservation Status of Big Cats in India:

- **IUCN Status:**
  - ✓ The International Union for Conservation of Nature (IUCN) classifies the conservation status of big cats as follows:
    - Endangered: Tiger
    - Vulnerable: Lion, Cheetah, Snow Leopard, Leopard
    - Near Threatened: Jaguar
    - Least Concern: Puma.
- **Legal Protection in India:**
  - ✓ All five big cat species found in India are listed under Schedule I and IV of the Wildlife Protection Act, 1972.
  - ✓ They are also included in Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), providing them with the highest level of legal protection.



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### Amur Falcons: Migratory Raptor under Protection in Manipur

#### ☛ Relevance : GS III - Environment

- **In News:** The Tamenglong district of Manipur has recently imposed a strict ban on hunting, capturing, killing, and trading of Amur Falcons ahead of their annual migratory arrival.



#### Overview of Amur Falcons:

- **Scientific Name:** Falco amurensis
- **Local Name:** Known as 'Kahuaipuina' in Manipur.
- **Family:** Belongs to the Falconidae family.

- **Size:** These are small raptors, typically measuring between 28-30 cm in length.

### Migratory Journey of Amur Falcons:

#### Migration Pattern:

- ✓ **Breeding Grounds:** The Amur Falcons originate from the Amur River region in Northeastern Asia during autumn.
  - ✓ **Initial Movement:** From their breeding grounds, they head south, crossing the Himalayas to reach Nagaland, in Northeastern India.
  - ✓ **Further Route:** After leaving Nagaland, they either cross the Bay of Bengal or travel overland across India, reaching the Western Ghats and the west coast of India.
  - ✓ **Final Leg:** From the Indian coastline, these falcons cross the Indian Ocean, navigating through East Africa before reaching their final destination in South Africa.
- **Remarkable Migration:** Amur Falcons are known for their extraordinary long-distance migration, covering approximately 22,000 kilometers annually, making it one of the most remarkable migrations among raptors.

### Breeding and Diet:

- **Breeding Habitat:** The falcons breed in Southeastern Russia and Northern China.
- **Diet:** These birds are carnivorous, primarily insectivores, feeding on insects.

### Conservation Status

- **IUCN Red List:** The Amur Falcons are classified as a species of Least Concern under the IUCN Red List.
- **Wildlife Protection Act, 1972:** The bird is protected under Schedule IV of India's Wildlife Protection Act, 1972, which ensures legal protection against poaching and hunting.

## NGT Orders Environmental Sensitivity and Capacity Classification for Nainital Town

### Relevance: GS III - Environment

- In News:** The National Green Tribunal (NGT) recently issued a directive during the hearing of a case involving illegal large-scale deforestation, which has reportedly resulted in the deterioration of forest regions and disrupted the natural replenishment of Naini Lake.



### Key Highlights of the NGT Order:

- Zoning of Nainital:** The town is to be categorized into development-permissible or restricted zones, along with regulated zones, based on environmental fragility and conditions.
- Rehabilitation of Lakes:** The state government has been instructed to implement catchment area management plans for the lakes within the district to restore ecological stability.
- Formulation of Master Plans and Carrying Capacity Assessment:** A detailed master plan for Nainital is to be developed, evaluating its carrying capacity. This evaluation will consider elements such as hydrological systems, sanitation infrastructure, vegetation cover, and existing tourism patterns.

### Understanding Carrying Capacity:

- Definition:** Carrying Capacity refers to the maximum level of population or activity that a region can sustainably support given its available natural resources.
- Key Determinants:** It is influenced by both biotic factors like vegetation and water systems and abiotic factors like topography and climate conditions.

### Methods for Assessing Carrying Capacity:

- Planetary Boundaries Method:** This approach is utilized in the context of global environmental crises, including climate change, soil degradation, pollution, and water shortages. It evaluates how human actions push the Earth beyond its safe environmental thresholds.



- **Biocapacity Overshoot Method:** This technique measures the extent to which human demand on Earth's ecosystems surpasses what those ecosystems can regenerate annually. One prominent example is Earth Overshoot Day, the date when humanity's resource use exceeds what the planet can sustainably produce within a year.

### Importance of Carrying Capacity Evaluation:

- **Harmonizing Development and Environmental Sustainability:**
  - ✓ The assessment of carrying capacity using precautionary strategies helps bridge the conflict between the need for developmental governance and ensuring the sustainability of growth.
  - ✓ By setting scientifically based limits, this approach offers a pragmatic framework for growth without exceeding ecological boundaries.

### Conclusion:

- The National Green Tribunal's directive to classify Nainital based on its carrying capacity is a crucial measure to address the environmental stress the town is facing due to unchecked tourism and deforestation.
- By zoning the town into development-permissible and restricted zones, emphasizing lake rehabilitation, and implementing a capacity-based master plan, the NGT aims to ensure that Nainital's development is sustainable and ecologically responsible.
- Moreover, adopting both the Planetary Boundaries and Biocapacity Overshoot methods provides comprehensive tools to measure and mitigate the environmental impacts of human activity in environmentally sensitive areas such as Nainital.

## White Rhinos: A Slight Increase in Population Amid Rising Poaching Threats

### Relevance : GS III - Environment

- **In News:** The population of white rhinoceroses has seen a slight uptick; however, the threat of poaching, primarily in South Africa, is on the rise due to the high demand for rhino horns in illegal markets.



### Overview of White Rhinos:

- White rhinos are the second-largest terrestrial mammals after elephants, playing a vital role in Africa's ecological balance.
- **Nomenclature**
  - ✓ The term white rhino comes from the Afrikaans word "weit," meaning broad, which refers to the wide shape of its mouth.
  - ✓ Contrary to its name, the white rhinoceros is grey, not white.
  - ✓ Known as the square-lipped rhinoceros, this species is distinguished by its square-shaped upper lip, which has very little hair.

### Subspecies of White Rhinos:

- White rhinos are categorized into two subspecies:
  - ✓ **Northern White Rhinoceros (*Ceratotherium simum cottoni*)**
  - ✓ **Southern White Rhinoceros (*Ceratotherium simum simum*)**

### Scientific and Physical Characteristics:

- **Scientific Name:** *Ceratotherium simum*
- **Height:** Generally between 5 to 6 feet, with males significantly larger than females.
- **Weight:** Between 3,080 to 7,920 pounds, making them one of the heaviest land mammals.

### Habitat and Geographic Range:

- **Natural Habitat:** White rhinos are found in savanna grasslands, feeding primarily on long and short grasses.
- **Native Range:** This species is indigenous to Africa, notably in countries like South Africa, Namibia, and Kenya.

### Dietary Preferences:

- As mega herbivores, white rhinos graze predominantly on grasses, using their broad upper lip, which is specifically adapted for grazing purposes.

### Behavioral Traits:

- **Social Grouping:** Female white rhinos and juveniles often form social groups.
- **Solitary Nature of Males:** Male rhinos, or bulls, are usually more isolated and territorial in nature.

**Conservation Status:**

- **IUCN Red List:** Currently listed as near threatened, mainly due to the persistent threat of poaching.
- **CITES:** Classified under Appendix II, which regulates international trade to prevent their exploitation.

**Threats to White Rhinos:**

- The most pressing danger to white rhinos is poaching, driven by the illegal demand for rhino horns, which are highly sought after, especially in Asian countries for traditional medicinal use.

**Conclusion:**

- While there has been a small increase in the white rhinoceros population, the escalating poaching crisis continues to pose a severe threat. Urgent and coordinated conservation efforts are essential to safeguard this iconic species for the future.

**Barak Bhuban Wildlife Sanctuary: A Critical Conservation Issue****Relevance: GS III - Environment**

- **In News:** The National Green Tribunal (NGT), through its eastern bench in Kolkata, has issued a stay on the ongoing road construction within the Barak Bhuban Wildlife Sanctuary, located in Assam's Cachar district.
- This action emphasizes the importance of preserving the ecological integrity of this significant wildlife sanctuary.

**About Barak Bhuban Wildlife Sanctuary:**

- **Geographical Location**
  - ✓ The Barak Bhuban Wildlife Sanctuary is situated in the Barak Valley of Assam, a region known for its rich biodiversity.
  - ✓ The sanctuary derives its name from the Barak River, the second-largest river in the northeastern region of India.
  - ✓ It is uniquely positioned between the Barak and Sonai rivers, providing a diverse ecological habitat for various species.

- **Biodiversity and Fauna**

- ✓ The sanctuary is home to a variety of primates, with eight species recorded within the area. These include:
  - Slow Loris, Rhesus Macaque, Pig-tailed Macaque, Stump-tailed Macaque, Assamese Macaque, Capped Langur, Hoolock Gibbon, Phayre's Leaf Monkey.
- ✓ Additionally, the region is known for endemic species such as the King Cobra, Gorals, and the Himalayan Serow, further enhancing its ecological significance.

### Barak Valley: The Heart of Southern Assam:

- **Geographical Significance**

- ✓ The Barak Valley is located in the southern part of Assam and is characterized by its scenic landscapes and rich biodiversity. This region is a major part of the Indo-Myanmar biodiversity hotspot, making it crucial for global conservation efforts.
- ✓ The valley is shaped like a horseshoe, bordered by states such as Mizoram, Tripura, Meghalaya, and Manipur, and also shares international borders with Bangladesh.

- **Economic and Cultural Aspects**

- ✓ Known for its tea cultivation, the Barak Valley is often referred to as the "Valley of Peace" due to its relatively peaceful environment.
- ✓ The valley consists of three administrative districts:
  - Cachar
  - Karimganj
  - Hailakandi
- ✓ The primary languages spoken in the region are Bengali and Meitei (Manipuri).

- **Key City and Infrastructure**

- ✓ The main urban center of the Barak Valley is Silchar, which serves as the administrative divisional office and is a hub for both commercial and governmental activities in the region.

- **Conservation Importance**

- ✓ Assam's first wildlife sanctuary, the Borel Wildlife Sanctuary, is also located in the Barak Valley, highlighting the region's longstanding commitment to wildlife conservation and ecological preservation.





### Conservation Challenges and Ecological Importance:

- The Barak Bhuban Wildlife Sanctuary and the broader Barak Valley region hold **significant ecological value due to their diverse wildlife, unique habitats, and their role in the Indo-Myanmar biodiversity hotspot**. However, issues like infrastructure development—such as road construction—pose threats to the delicate balance of these ecosystems.
- The recent intervention by the National Green Tribunal underscores the need for cautious, **sustainable development that does not compromise the region's biodiversity**.
- The Barak Bhuban Wildlife Sanctuary not only plays a **critical role in preserving rare and endangered species but also contributes to the broader ecological stability of Assam and the northeastern region**.
- Conservation efforts in the area must be strengthened to protect these invaluable natural resources for future generations.

### Conclusion:

- The National Green Tribunal's action to halt road construction within the Barak Bhuban Wildlife Sanctuary draws attention to the fragile balance between development and conservation.
- With the sanctuary's rich biodiversity and its location in the Indo-Myanmar biodiversity hotspot, it is imperative to adopt sustainable measures that safeguard both the environment and the region's ecological heritage.
- The Barak Valley, with its unique landscape and diverse fauna, remains a critical area for conservation efforts, requiring continued vigilance and responsible development planning.

### New Catfish Species: *Exostoma sentiyonoae* Found in Nagaland

#### Relevance: GS III - Environment

- **In News:** A new species of catfish, *Exostoma sentiyonoae*, has recently been discovered in the Dzuleke River, a tributary of the Barak River in Nagaland.



#### About the Species:

- *Exostoma sentiyonoae* is a newly identified species belonging to the glyptosternine catfish family within the genus *Exostoma*.

- ✓ **Genus:** The genus *Exostoma* comprises sisorid catfishes that are native to Asia. This species is the first from the genus *Exostoma* to be found in the Dzuleke River, marking a significant discovery in Nagaland.
- ✓ **Endemism:** While the species was recently discovered in Nagaland, *Exostoma sentiyonoae* is typically endemic to the Mekong River basin, particularly in Thailand.
- ✓ **Nomenclature:** The species was named by Dr. Limatemjen, the discoverer, in honor of his daughter. The name combines “Senti” from the Ao Naga language with “Yono” from the Angami Naga language, reflecting cultural significance and honoring familial ties.
- ✓ **Significance:** This discovery marks the fourth species of the genus *Exostoma* described from the Barak drainage system, highlighting the region’s rich biodiversity.

### Unique Characteristics:

- **Adipose Fin:** The adipose fin is attached to the upper procurrent caudal-fin rays.
- **Dorsal-Fin Spine:** Presence of tubercles on the dorsal-fin spine.
- **Body Structure:** A slender head and a long distance between the dorsal and adipose fins.
- **Eyes:** The species has small eyes.
- **Vertebrae Count:** It possesses 41 vertebrae.

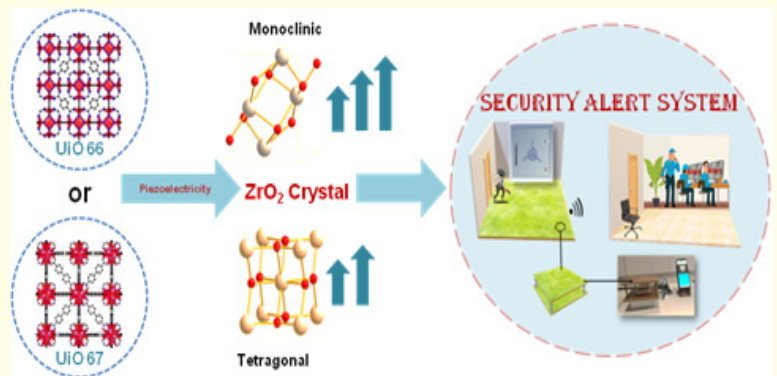
### Distinction from Other Species:

- **Comparison with *E. berdmorei*:**
  - ✓ *Exostoma sentiyonoae* differs by having a shorter dorsal-fin base, a longer dorsal-adipose distance, and smaller eyes.
- **Comparison with *E. gaoligongense*:**
  - ✓ The new species has a shorter pectoral-pelvic distance and smaller eyes compared to *E. gaoligongense*.
- **Comparison with Species in Thailand’s Chao Phraya Drainage:**
  - ✓ **Distinction from *E. effreni*:**
    - *Exostoma sentiyonoae* has an adipose fin confluent with the upper procurrent caudal-fin rays, unlike *E. effreni*, where the adipose fin is separate. Additionally, *E. sentiyonoae* has a wider head and a deeper caudal peduncle.
  - ✓ **Distinction from *E. peregrinator*:**
    - The species is also distinct from *E. peregrinator*, with a longer dorsal-adipose distance and a shorter anal-fin base.

## New piezoelectric polymer nanocomposite developed for energy harvesting

## Relevance : GS III - Science &amp; Technology

- In News:** Recently, researchers from the Centre for Nano & Soft Matter Sciences (CeNS) & the National Chemical Laboratory (CSIR-NCL) have developed an innovative security alert system utilizing a piezoelectric polymer nanocomposite.



## Key Concepts:

- Piezoelectricity:** Defines piezoelectricity as a phenomenon where certain materials generate an electric current when mechanically stressed. It also highlights the bidirectional energy conversion capability of these materials, emphasizing their versatile use in various applications.
- Piezoelectric Polymer Nanocomposite Material:** Explains the composition of these materials, which combine piezoelectric polymers with nanoparticles or nanomaterials to enhance their properties. The emphasis is on how nanoparticles improve the piezoelectric response.
- Polymer Nanocomposites:** Describes polymer nanocomposites as materials made of polymer matrices infused with nanometer-sized additives. It discusses the improvements these additives bring to the polymers, such as enhanced mechanical strength, thermal stability, and electrical conductivity.

## Recent Findings:

- The recent research focuses on using metal oxide nanomaterials as fillers to amplify the piezoelectric properties of the polymer composite. It details the synthesis process involving zirconia-based metal-organic frameworks (UiO-66 and UiO-67), which were converted to zirconia nanoparticles.
- The nanoparticles were integrated into poly (vinylidene difluoride) (PVDF) to create nanocomposite films. The study revealed that nanocomposites with

monoclinic zirconia nanoparticles derived from UiO-66 showed superior piezoelectric output compared to other derivatives and the pure polymer.

### Application in Security Alert Systems:

- Research describes a practical application of the piezoelectric nanocomposite in a laboratory-scale security alert system. This system uses a Bluetooth-based wireless communication module activated by footsteps on a piezoelectric pavement, demonstrating its dual capabilities in security alert functionality and energy generation.

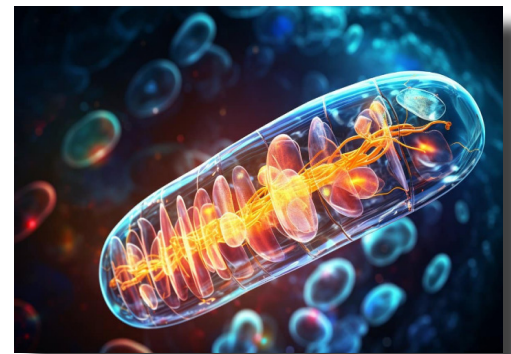
### Conclusion:

- The potential applications of piezoelectric polymer nanocomposites lie in advanced security systems and energy harvesting. This innovative development could pave the way for practical implementations in diverse fields, enhancing both security measures and sustainable energy solutions.

## Researchers Investigate Mitochondrial Dynamics for Parkinson's Disease Treatment

### Relevance: GS III - Science & Technology

- **In News:** By decreasing the activity of **Drp1, a crucial protein regulating mitochondrial dynamics**, researchers recently restored normal mitochondrial function and protected neurons from disease, allowing them to continue functioning.



### About Parkinson's Disease:

- Parkinson's disease is a **progressive neurodegenerative disorder resulting from the death of brain cells.**
- Research indicates that environmental toxins and harmful proteins contribute to mitochondrial fragmentation and dysfunction. For instance, manganese-induced Parkinsonism is a case of such toxicity.

### Recent Findings:

- Researchers have identified that inhibiting the activity of Dynamin-related protein (Drp1) could potentially restore mitochondrial function and offer a new



treatment avenue for Parkinson's disease.

- Drp1 is a protein naturally present in cells, which relocates to mitochondria during their division, facilitating their **segmentation into smaller units for enhanced mobility and quality control**.
- However, excessive Drp1 activity can lead to over-fragmentation of mitochondria, impairing their function.

### About Mitochondria:

- **Mitochondria** are membrane-bound organelles **crucial for energy production in cells**. They are often referred to as the cell's powerhouses due to their role in generating most of the cell's energy in the form of ATP (adenosine triphosphate).

### Functions of Mitochondria:

- **Energy Production:** Mitochondria are the sites of aerobic respiration, where ATP is produced, thus powering various cellular functions.
- **Genetic Material:** Mitochondria possess their own circular DNA (mtDNA), RNA, ribosomes, and machinery for protein synthesis. mtDNA is particularly useful for tracing maternal genetic lines.

### Mitochondrial Diseases:

- Mitochondrial diseases arise due to mutations in either mitochondrial DNA (mtDNA) or nuclear DNA. Notably, mtDNA is inherited exclusively from the mother, leading to maternally inherited conditions.
- Mitochondrial Replacement Therapy (MRT) is a method designed to prevent the transmission of mitochondrial diseases from mother to child by replacing defective mtDNA with healthy donor mtDNA.

## Needle-free intranasal booster for SARS-CoV-2

### Relevance : GS II - Health Sector

- **In News:** Indian Immunologicals Ltd (IIL), in collaboration with Griffith University, has recently developed a live-attenuated, needle-free intranasal booster vaccine targeting SARS-CoV-2.



### Intranasal Vaccines: Overview

- **Definition and Features:**

- ✓ **Intranasal Vaccines:** These vaccines are administered through the nasal pathways.
- ✓ **Non-invasive and Needle-free:** They eliminate the need for injections, reducing associated risks and making administration simpler.
- ✓ **Ease of Administration:** The nasal route does not require trained healthcare professionals, making it more accessible.
- ✓ **Elimination of Needle-related Risks:** This approach mitigates risks such as needle injuries and infections.
- ✓ **High Compliance:** The non-invasive nature encourages better adherence to vaccination schedules.
- ✓ **Scalable Manufacturing:** The production process can be scaled up to meet global demand effectively.

### Mucosal Immunity:

- **Prevention of Infection:** The intranasal vaccine is designed to prevent SARS-CoV-2 from establishing an infection at its primary entry point—the nasal passages.
- **Broad Immune Response:** It stimulates a comprehensive immune response, including neutralizing IgG, mucosal IgA, and T cell responses.
- **Localized Immunization:** Immune responses generated at the nasal mucosa can block both infection and transmission of COVID-19.
- **Extended Protection:** This localized immune response could potentially offer protection for up to a year with just a single dose.

### Codon Deoptimization Technology:

- **Process:** This method involves altering the virus to mimic a natural infection without causing harm.
- **Mechanism:** It reduces the frequency of certain codon pairs (genetic determinants for amino acids) while maintaining the amino acid sequences.
- **Efficiency:** This strategy allows for precise regulation of the virus's attenuation level, ensuring safety and effectiveness.
- **Advantages:** It is a quicker and safer alternative to traditional virus attenuation methods, which often take several years.

## Vishvasya-Blockchain Technology Stack

### Relevance: GS III - Digital Governance

- **In News:** The Government of India has recently unveiled the Vishvasya Blockchain Technology Stack alongside other blockchain initiatives to enhance digital trust and transparency.

### About Vishvasya Blockchain Technology Stack:

- The Vishvasya Blockchain Technology Stack is a robust set of platforms and frameworks designed to strengthen trust through innovative distributed software architectures. It ensures a single source of truth by enabling tamper-resistant storage and providing an audit trail for verifying transactional data.



- ✓ **Nodal Ministry:** Ministry of Electronics & Information Technology (MeitY).
- ✓ **Key Blockchain Feature:** Ideal for applications with transactional data distributed across a network of nodes, ensuring secure, immutable, and auditable records.

### Key Components of the Vishvasya Blockchain Technology Stack:

- **Vishvasya BaaS (Blockchain as a Service):**
  - ✓ Provides a BaaS model ensuring security across the stack's blockchain components.
  - ✓ Offers technical support to organizations for developing and deploying blockchain applications.
  - ✓ Features a geographically distributed infrastructure to support diverse permissioned blockchain-based applications.
- **National Blockchain Framework (NBF):**
  - ✓ Aims to create trusted digital platforms that encourage research and blockchain application development.
  - ✓ Facilitates transparent, secure, and reliable digital service delivery to citizens.
- **Key Features:**
  - ✓ **Distributed Infrastructure:** Ensures robust & scalable blockchain solutions.
  - ✓ **Core Framework Functionality:** Offers essential tools & protocols for

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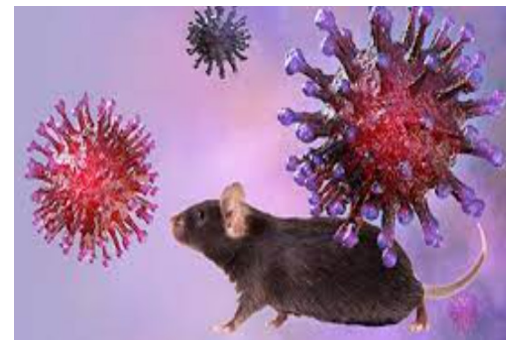
blockchain deployment.

- ✓ **Smart Contracts & API Gateway:** Enables integration and execution of smart contracts.
- ✓ **Security, Privacy & Interoperability:** Focuses on high standards for security, privacy, and seamless integration.
- ✓ **Application Development Offering BaaS:** Provides a platform for developing blockchain applications.
- ✓ Currently supports two permissioned blockchain platforms and is **expandable for future enhancements.**
- **NBFLite:**
  - ✓ A blockchain sandbox platform tailored for startups and academia to support rapid prototyping, research, and capacity building.
  - ✓ Developed through collaboration among C-DAC, NIC, IDRBT Hyderabad, IIT Hyderabad, IIIT Hyderabad, and SETS Chennai.
- **Praamaanik:**
  - ✓ A blockchain-powered solution designed to verify the origins of mobile applications.
  - ✓ Built on the National Blockchain Framework, it leverages blockchain technology to establish trust in mobile app authenticity.
- **National Blockchain Portal:**
  - ✓ Developed to manage and disseminate content related to the National Blockchain Framework initiatives.
  - ✓ Acts as a centralized hub for information and updates on blockchain projects under the Vishvasya initiative.

### Mice study identifies the 'true' cause of long COVID

#### ☛ **Relevance: GS III - Science & Technology**

- **In News:** A recent study on mice indicates that **fibrin**, a crucial protein involved in blood clotting, may be the primary cause of long COVID symptoms, rather than merely a byproduct of the disease.



#### **About Coronavirus Disease (COVID-19):**

- **COVID-19** is an infectious disease caused by the **SARS-CoV-2 virus**.



- Most people infected with SARS-CoV-2 experience mild to moderate respiratory illness and recover without requiring special treatment.
- However, some individuals may become severely ill and require medical attention. Vulnerable groups include:
  - ✓ Older people and those with underlying medical conditions such as cardiovascular disease, diabetes, chronic respiratory disease, or cancer.
- COVID-19 can cause severe illness or even death in individuals of any age.
- SARS-CoV-2 is recognized as a **vasculopathic agent**, meaning it damages blood vessels.
  - ✓ The dominant respiratory symptoms associated with COVID-19 are largely due to **clotting and inflammation in the blood vessels** of the lungs, rather than direct infection of the airways.
  - ✓ Severe complications, including neurological issues like **stroke**, are also linked to the vasculopathic nature of the virus.

### Recent Findings from the Study:

- **Role of Fibrin in COVID-19 Complications:**
  - ✓ The study highlights that fibrinogen, a soluble glycoprotein complex produced in the liver, binds with the SARS-CoV-2 spike protein, forming fibrin, which in turn causes inflammation and complications in the lungs and brain.
  - ✓ This finding challenges the earlier belief that inflammation due to the virus was the root cause of clotting.
- **Spike Protein Interaction:**
  - ✓ The study demonstrates that the spike protein interacts with fibrinogen in the lungs, altering the clot structure and prompting an immune response.
  - ✓ This interaction may be a significant factor in driving long COVID symptoms even after the active infection phase is over.
  - ✓ Spike proteins are protruding proteins found on the surface of an enveloped virus, forming a large structure known as a spike or peplomer.
- **Implications for Treatment:**
  - ✓ A monoclonal antibody was identified that can block the interaction between the spike protein and fibrinogen without disrupting normal clotting functions.
  - ✓ This antibody is currently undergoing clinical trials, showing promise for new treatments targeting long COVID.
  - ✓ Monoclonal antibodies are lab-made proteins that bind specifically to a single

antigen.

- **Limitations of the Study:**

- ✓ The conclusions are derived from a preliminary mouse model and have not yet been validated through long-term human studies.
- ✓ Although the study provides hope for developing effective treatments for long COVID, additional research is essential to confirm these findings.

### Conclusion:

- The recent study opens new avenues for understanding the true cause of long COVID symptoms, focusing on the role of fibrin rather than inflammation. While preliminary, these findings hold potential for novel therapeutic approaches, though more extensive research in human models is needed to validate the results.

## Successful Launch of Agni-4 Missile

### Relevance: GS III - Defence Sector

- **In News:** The Agni-4, an Intermediate Range Ballistic Missile (IRBM), was successfully launched from the Integrated Test Range in Chandipur, Odisha. This test marks another milestone in India's strategic defense capabilities.

### About Agni Missiles:

- The Agni missile series was conceived under the **Integrated Guided Missile Development Programme (IGMDP)**, initiated by the Defence Research and Development Organisation (DRDO) in the 1980s.
- Agni missiles are **surface-to-surface ballistic missiles** with a range varying from **medium to intercontinental**.
- The missiles are fueled by **solid propellants**, forming the mainstay of India's nuclear launch capability.
- The Agni Prime is the latest missile in the Agni series, showcasing advanced technology and enhanced range and accuracy.



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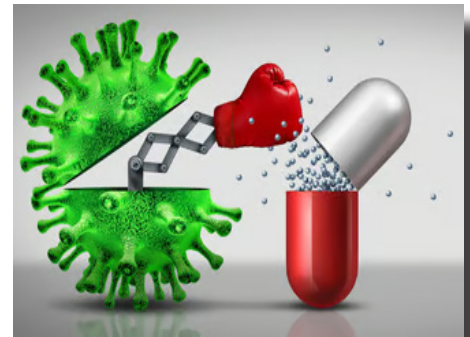
### Other Missiles Developed Under IGMDP:

- **Prithvi Missile:** A short-range, surface-to-surface ballistic missile designed for quick deployment and response.
- **Trishul Missile:** A short-range, low-level, surface-to-air missile, which is versatile in usage for naval, air, and land forces.
- **Akash Missile:** A medium-range, surface-to-air missile capable of engaging multiple aerial targets at different altitudes.

## First-Ever Guidance to Address Antibiotic Pollution in Manufacturing Processes

### Relevance: GS III - Science & Technology

- **In News:** The World Health Organization (WHO) has released its first-ever guidance aimed at tackling antibiotic pollution resulting from manufacturing processes, a key contributor to the growing Antimicrobial Resistance (AMR) crisis.



### AMR and Pharmaceutical Manufacturing:

- **Antibiotic Pollution from Manufacturing:** Wastewater from antibiotic manufacturing contains antibiotic residues that often pollute water bodies such as rivers and seep into the land, contributing to the spread of AMR.
- **Lack of Regulation:** Currently, antibiotic pollution from manufacturing is largely unregulated, and quality assurance criteria in most cases do not consider environmental emissions.

### About Antimicrobial Resistance (AMR):

- **Definition of AMR:** According to the WHO, AMR occurs when bacteria, viruses, fungi, and parasites no longer respond to antimicrobial medicines. It is a natural phenomenon that occurs over time due to genetic changes in pathogens.
- **Accelerating Factors:** The misuse and overuse of antimicrobials by humans, as well as antibiotic pollution, accelerate the emergence of AMR.
- **Impact of Superbugs:** The creation of superbugs, or drug-resistant microbes, leads to severe challenges in healthcare. The effect is particularly dangerous for patients suffering from multiple diseases.

### Concerns Related to AMR:

- **Human and Animal Health:** WHO lists AMR as one of the top 10 global health threats. In 2019, 1.27 million deaths were directly attributed to drug-resistant infections worldwide.
- **Environmental Impact:** AMR has the potential to harm biodiversity through pollution and increase the risk of zoonotic diseases.
- **Food and Nutrition Security:** The rise of AMR poses a threat to agriculture and animal husbandry, undermining food security.
- **Economic and Social Impact:** AMR can result in productivity losses, increased healthcare costs, and contribute to poverty due to rising treatment costs and reduced economic growth.

### Initiatives to Tackle AMR:

- **Adopting a One Health Approach:** This integrated strategy focuses on achieving a balance in the health of people, animals, and ecosystems, recognizing the interconnectedness of these domains.
- **WHO Good Manufacturing Practices (GMP), 2020:** This includes guidelines for managing environmental aspects of manufacturing, such as waste management, to reduce antibiotic pollution.
- **National Action Plan on Containment of Antimicrobial Resistance (NAP-AMR), 2017:** Launched by the Indian government, this plan outlines strategies to curb the spread of AMR.
- **Ban on Inappropriate Fixed Dose Combinations (FDCs):** The government has banned 40 FDCs, which were found to be inappropriate and contributed to the misuse of antibiotics.
- **Ban on Colistin in Poultry:** Colistin, an antibiotic used as a growth promoter in poultry, has been banned due to its contribution to AMR.
- **Development of Antimicrobial Vaccine (AV0328):** Bharat Biotech, in collaboration with a US firm, is developing an antimicrobial vaccine aimed at reducing the spread of resistant infections.



## WHO Prequalifies First Vaccine Against Mpx

## Relevance: GS II - Health Sector

- In News:** The World Health Organization (WHO) has prequalified the first vaccine against Mpx. The MVA-BN vaccine, developed by the Danish pharmaceutical company Bavarian Nordic, has been given prequalification status by the WHO.



## Key Details of the MVA-BN Vaccine:

- Eligibility:** Vaccine is authorized for individuals aged 18 years and older.
- Previous Approvals:** It has already been approved for use in Europe and the United States.
- Effectiveness:**
  - ✓ A single dose of the vaccine, if administered before exposure, has shown an effectiveness of around 76%.
  - ✓ A double dose has demonstrated a higher effectiveness rate of about 82%.

## About WHO Vaccine Prequalification (PQ):

- Genesis:** WHO Vaccine Prequalification program was established in 1987.
- Objective:** To ensure the quality of vaccines distributed by United Nations (UN) purchasing agencies.
- WHO List of Prequalified Vaccines:**
  - ✓ Vaccines are included in the WHO's list after a thorough evaluation process, which includes: Data analysis, Sample testing, WHO inspection of manufacturing sites.
- Important Note:** Inclusion in the prequalified list does not equate to formal approval by the WHO.
  - ✓ **National Regulatory Authorities (NRAs):** Approval of vaccines and manufacturing sites remains the prerogative of NRAs in each country.

## Significance of WHO Vaccine Prequalification:

- Support for WHO Expanded Programme on Immunization:** WHO's prequalification efforts significantly contribute to its immunization program, which aims for universal vaccine access for populations at risk.

- **Accelerated Vaccine Procurement:** Prequalification helps speed up vaccine procurement by governments and international agencies, such as:
  - ✓ Vaccine alliance GAVI,
  - ✓ UN Children's Fund (UNICEF).
- **Fast-tracked Approvals by NRAs:** It also aids national regulatory bodies in expediting their vaccine approval processes.

### About Mpox (Formerly Known as Monkeypox):

- **Zoonotic Disease:** Mpox is a zoonotic disease, meaning it is spread between animals and humans.
- **Causative Agent:** Caused by the Monkeypox Virus (MPXV), which is an enveloped double-stranded DNA virus of the Orthopoxvirus genus.
- **History of Discovery:**
  - ✓ **Origin:** The virus was first discovered in 1958 in Denmark in monkeys used for research.
  - ✓ **First Human Case:** First reported human case occurred in 1970 in the Democratic Republic of Congo (DRC), involving a nine-month-old boy.
- **Transmission:** Mpox can be transmitted through close contact with an affected individual or animal. It can also spread from mother to fetus during pregnancy.
- **Symptoms:** Skin rash or mucosal lesions, Fever, Headache, Swollen lymph nodes.
- **Public Health Emergency:** Mpox was declared a Public Health Emergency of International Concern by the WHO in both 2022 and 2024. The declaration underscores the severity of the disease and its global health impact.

### Global Cybersecurity Index (GCI) 2024

#### Relevance : GS III - Science & Tech

- **In News:** The International Telecommunication Union (ITU) has published the Global Cybersecurity Index (GCI) 2024, evaluating the cybersecurity commitments of countries across various pillars.
- The GCI 2024 assesses countries based on their progress in five key areas: legal, technical, organizational, capacity development, and cooperation.



The report employs a five-tier analysis (ranging from Tier 1 to Tier 5) to evaluate each nation's cybersecurity advancements and their effectiveness in combating cyber threats.

### Key Highlights:

#### • India Among Role Model Countries:

- ✓ 46 countries, including India, have been classified under Tier 1, which represents "role model countries" that exhibit strong commitments to all five cybersecurity pillars.

#### • Global Improvement in Cybersecurity:

- ✓ Compared to the previous report published in 2021, all regions have shown substantial improvements in cybersecurity measures.
- ✓ Notably, Africa has made the most significant strides in enhancing its cybersecurity infrastructure.

#### • Expansion of Digital Services:

- ✓ The report indicates that most countries fall under Tier 3 ("establishing") or Tier 4 ("evolving").
- ✓ These nations have significantly expanded their digital services and connectivity, yet they face challenges in integrating robust cybersecurity measures to protect their digital infrastructure.

### Key Issues:

#### • Worrisome Cybersecurity Threats:

- ✓ **Ransomware attacks:** Malicious software that restricts access to systems or data until a ransom is paid.
- ✓ **Cyber breaches:** Incidents where unauthorized access to data or systems impacts critical sectors.
- ✓ **Costly system outages:** Downtime in digital systems that disrupts services and results in financial losses.

#### • Prevalence of Cybercapacity Gaps:

- ✓ **Insufficient skills and staffing:** A shortage of trained professionals in cybersecurity.
- ✓ **Inadequate equipment:** Lack of necessary tools to monitor and defend against cyber threats.
- ✓ **Limited funding:** Insufficient financial resources to build robust cybersecurity infrastructures.

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- **Challenges in Operating Cybersecurity Frameworks:** Despite having formal cybersecurity agreements and frameworks in place, many countries find it difficult to translate these commitments into practical operations.

### Key Recommendations:

- **Comprehensive National Cybersecurity Strategy:** Countries should develop and regularly update a comprehensive national cybersecurity strategy to address evolving cyber threats and mitigate risks effectively.
- **Capacity Building:** Focus on training cybersecurity professionals, particularly targeting youth and vulnerable groups to bridge the cybercapacity gap.
- **Enhancing Domestic and International Cooperation:** Encourage greater cooperation both domestically and internationally to share information, offer training opportunities, and collaborate on building a resilient cybersecurity environment.

## India's First CO<sub>2</sub>-to-Methanol Pilot Plant

### Relevance : GS III - Science & Technology

- **In News:** India is set to establish its first CO<sub>2</sub>-to-Methanol Pilot Plant in Pune, Maharashtra, with a capacity of 1.4 tons per day. This project is being implemented under a Public-Private Partnership and receives support from the Department of Science and Technology (DST).



### About CO<sub>2</sub>-to-Methanol Conversion:

- **Current State of CO<sub>2</sub> Utilization Technologies:**
  - ✓ Carbon Utilization Technologies, such as CO<sub>2</sub>-to-Methanol conversion, are still in the early stages of development, especially compared to carbon capture technologies.
- **Process of CO<sub>2</sub>-to-Methanol Conversion:**
  - ✓ CO<sub>2</sub>-to-Methanol conversion involves capturing carbon emissions before they are released into the atmosphere, particularly from industrial sources like power plants, or directly from the air through Direct Air Capture technologies.
  - ✓ The captured CO<sub>2</sub> is then subjected to hydrogenation, where it reacts with hydrogen to produce methanol.



- **Environmental Impact and Benefits:**

- ✓ This process has the potential to significantly reduce greenhouse gas emissions and provide a sustainable fuel source.
- ✓ The establishment of the CO<sub>2</sub>-to-Methanol plant in Pune marks a major step in advancing indigenous Carbon Capture and Utilisation (CCU) technologies and supports India's Panchamrit declaration to mitigate climate change.

### About Carbon Capture, Utilization, and Storage (CCUS):

- CCUS refers to a group of technologies that involve capturing CO<sub>2</sub> from large, stationary sources such as fossil fuel-based power plants and other industrial facilities.
- According to the International Energy Agency (IEA), CCUS technologies also involve transporting the captured CO<sub>2</sub> (through pipelines, shipping, rail, or trucks) to sites for utilization in various applications, or for injection into geological formations or depleted oil and gas fields for permanent CO<sub>2</sub> storage.

### Significance of CCUS:

- **Decarbonization of Hard-to-Abate Sectors:**

- ✓ CCUS plays a critical role in decarbonizing industries like cement and steel, where fossil fuel use is well established and challenging to replace with alternative technologies.

- **Propelling Low-Carbon Hydrogen:**

- ✓ Coal gasification combined with CCUS can help in producing low-carbon hydrogen, further promoting cleaner energy sources.

- **Achieving Net-Zero Targets:**

- ✓ The advancement of technologies like Direct Air Capture (DAC) is crucial for achieving global net-zero emission targets.

### Challenges in Adopting CCUS in India:

- **Variation in Carbon Capture Costs:**

- ✓ The cost of carbon capture varies significantly across sectors depending on the source and concentration of CO<sub>2</sub> emissions, making it economically challenging in some cases.

- **Limited CO<sub>2</sub> Storage Capacity:**

- ✓ There are limitations in the storage capacity for CO<sub>2</sub> in India, especially for options like saline aquifers and basaltic storage, due to the lack of geological data on pore space availability.

- **Absence of Downstream Infrastructure:**

- ✓ India lacks the necessary downstream infrastructure for the transportation and storage of captured CO<sub>2</sub>, posing another significant hurdle to the widespread adoption of CCUS technologies.

## Venus Orbiter Mission (VOM) Receives Approval

### Relevance : GS III - Space Technology

- **In News:** The Union Cabinet, chaired by the Prime Minister, has recently granted approval for the development of the Venus Orbiter Mission (VOM).



### About Venus Orbiter Mission (VOM):

- **Executing Agency:**

- ✓ The Indian Space Research Organisation (ISRO) will carry out this mission.

- **Mission Objective:**

- ✓ The VOM is designed to explore Venus, focusing on its atmosphere, geology, and various characteristics. It aims to gather crucial scientific data, with a specific focus on studying the planet's dense atmosphere.

- **Timeline:**

- ✓ The mission is scheduled for completion by March 2028.

- **Scientific Relevance:**

- ✓ Through the study of Venus, Indian scientists aim to address important questions about planetary evolution. Despite Venus sharing several similarities with Earth, it followed a vastly different evolutionary path.
- ✓ This mission seeks to understand why Venus diverged from Earth's development, offering valuable insights into planetary environments and their evolution.

### About Venus:

- **Position in the Solar System:**

- ✓ Venus is the second planet from the Sun and the closest planetary neighbor to Earth.

- **Size:**

- ✓ Venus ranks as the sixth-largest planet in the solar system and is similar in

size to Earth, often being referred to as Earth's "twin."

- **Temperature and Atmosphere:**

- ✓ Venus is believed to have once had life-supporting conditions, but over time, it transformed into a hostile environment with surface temperatures exceeding 450°C. Its toxic atmosphere contributes to an intense greenhouse effect.

- **Hottest Planet:**

- ✓ Venus holds the highest surface temperatures in the solar system, even hotter than Mercury, despite its greater distance from the Sun. According to NASA, these temperatures can melt lead.

- **Surface Characteristics:**

- ✓ Beneath its thick cloud cover, Venus has volcanic terrains and deformed mountain ranges.

- **Distance from the Sun:**

- ✓ Venus orbits the Sun at an average distance of 67 million miles (108 million kilometers), or approximately 0.72 astronomical units (AU). For comparison, 1 AU equals the distance between Earth and the Sun.

- **Light Travel Time:**

- ✓ Sunlight takes roughly 6 minutes to reach Venus at this distance.

- **Moons:**

- ✓ Venus, like Mercury, has no moons. However, it does have a quasi-satellite named Zoozve, which occasionally orbits Venus.

### Conclusion:

- The approval of the Venus Orbiter Mission (VOM) by the Union Cabinet marks a major advancement in India's space exploration initiatives.
- Through this mission, Indian scientists aim to unravel critical questions regarding planetary evolution, particularly in understanding how planets with similar origins can evolve into radically different environments.



## Saturn-like Ring Around Earth: A New Discovery

### Relevance : GS III - Space Technology

- **In News:** A recent study has proposed that Earth may have once had a Saturn-like ring, which was formed from the debris of a shattered asteroid approximately 466 million years ago.



### Key Findings of the Study:

- **Duration of the Ring:** The ring existed for tens of millions of years during the Ordovician period.
- **Formation Process:** The ring was created when an asteroid passed too close to Earth. The planet's gravitational pull broke the asteroid into small and large fragments.
- These fragments collided and gradually formed a debris-filled ring around Earth's equator.
- **Disintegration of the Ring:** Over time, Earth's gravity attracted the ring's material towards the planet.
- Smaller fragments would have been burned up in the atmosphere, while larger pieces impacted the Earth's surface, forming craters near the equator.
- **Impact Craters:** Scientists identified the presence of the ancient ring by analyzing 21 crater sites from the Ordovician period (between 488 million and 443 million years ago). These impact sites were all located close to the equator.

### Impact of the Ring on Earth:

- **Giant Parasol Effect:**
- The ring over Earth's equator would have had significant effects on the planet's climate.
- **Axial Tilt Influence:** Due to the Earth's axial tilt relative to the Sun, this ring could have shaded the winter hemisphere, while increasing the amount of solar energy reaching the summer hemisphere.
- This would result in intensified winter cooling and a slight increase in summer heating.
- **Global Cooling:** Scientists hypothesize that the ring may have acted like a giant parasol, leading to global cooling by reflecting sunlight away from the planet.



**Dramatic Cooling in Earth's Climate:**

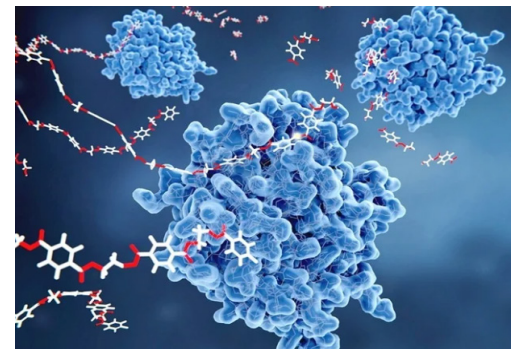
- During the period when this ring existed, Earth experienced dramatic cooling.
- **Hirnantian Ice Age:** By 445 million years ago, Earth was witnessing the peak of the Hirnantian Ice Age, recognized as one of the coldest periods in the past half-billion years.
- The study suggests that Earth's ancient ring could have played a role in significant climate changes during that time.

**Next Steps in Research:**

- **Mathematical Models:** To further understand the effects of the ancient ring, scientists plan to create mathematical models to study the dispersal of asteroid debris.
- These models will help investigate how such rings may have influenced Earth's climate, particularly the cooling effect caused by the ring.

**Nanozymes: A Breakthrough in Biomedical & Environmental Applications****Relevance: GS III - Science & Tech**

- **In News:** A recent study conducted by CSIR-Central Leather Research Institute (CSIR-CLRI) has highlighted that nanozymes can preserve the structural integrity of collagen and enhance its resistance to enzymatic degradation.
- Collagen, the most prevalent protein in the human body, is an essential component found in bones, skin, muscles, and tendons.

**What are Nanozymes?**

- **Definition:** Nanozymes are nanomaterial-based artificial enzymes that possess enzyme-like properties. Unlike biological enzymes, which are typically organic, nanozymes are generally composed of inorganic materials, such as metals, metal oxides, or carbon-based nanostructures.
- **Advantages of Nanozymes:**
  - ✓ **High Stability:** Nanozymes demonstrate greater stability compared to biological enzymes, ensuring longer shelf life and reliability under various

conditions.

- ✓ **Easy Modification:** Their structure allows for flexible alterations, making it easier to tailor them for specific applications.
- ✓ **Designability:** Nanozymes can be designed with precision to target desired reactions or processes.
- ✓ **Ease of Preparation:** These materials can be synthesized using relatively straightforward procedures.
- ✓ **Low Cost:** Unlike biological enzymes, which can be expensive to extract and purify, nanozymes offer a more cost-effective solution.

### Applications of Nanozymes:

- **Biomedical Field:**
  - ✓ **Biosensing:** Nanozymes are employed in detecting biological molecules, enhancing diagnostic accuracy.
  - ✓ **Drug Delivery:** Their ability to interact at the molecular level makes them suitable for targeted drug delivery, improving treatment efficacy.
  - ✓ **Diagnosis and Therapy:** Nanozymes are increasingly being used in diagnostic tools and therapeutic treatments, offering a new avenue for medical innovation.
- **Environmental Remediation:**
  - ✓ **Water Purification:** Nanozymes can be utilized to remove pollutants and toxins from water, providing an effective solution for water purification.
  - ✓ **Air Purification:** Their properties enable nanozymes to break down harmful contaminants in the air, contributing to cleaner environments.

### Conclusion:

- The development and application of nanozymes present significant advancements in both biomedical and environmental fields. Their unique characteristics, combined with their versatility and cost-effectiveness, offer promising solutions for future challenges in medicine, environmental protection, and beyond.

## Launch of PARAM Rudra Supercomputers

### Relevance: GS III - Science & Technology

- **In News:** Prime Minister Narendra Modi has recently launched three PARAM Rudra supercomputers, along with a High-Performance Computing (HPC) system dedicated to weather research.



### About PARAM Rudra Supercomputers:

- The PARAM Rudra supercomputers have been indigenously developed under the National Supercomputing Mission (NSM).
  - ✓ **Developed by:** These supercomputers were built by the Centre for Development of Advanced Computing (C-DAC) in Pune.
  - ✓ **Deployment:** The supercomputers have been deployed in three cities—Pune, Delhi, and Kolkata—where they will play a vital role in facilitating cutting-edge scientific research:
    - **Pune:** The Giant Metre Radio Telescope (GMRT) will utilize the supercomputer to study Fast Radio Bursts (FRBs) and other astronomical phenomena.
    - **Delhi:** The Inter-University Accelerator Centre (IUAC) will leverage the supercomputer to advance research in fields such as material science and atomic physics.
    - **Kolkata:** The S. N. Bose Centre will employ supercomputing technology to propel advanced research in physics, cosmology, and earth sciences.

### National Supercomputing Mission (NSM):

- **Aim:**
  - ✓ The primary goal of the National Supercomputing Mission (NSM) is to enhance the capabilities of Indian academic and research institutions by establishing a network of over 70 high-performance computing (HPC) facilities across the country.
  - ✓ The mission seeks to expand India's supercomputing infrastructure to meet the growing demand in sectors such as academia, research, Micro, Small, and Medium Enterprises (MSMEs), and startups.
- It is India's first major initiative to significantly boost its computing power.

- **Launched in:** The mission was launched in 2015 to revolutionize India's computing capabilities.
- **Developed by:** The NSM is a joint collaboration between the Ministry of Electronics and Information Technology (MeitY) and the Department of Science and Technology (DST).
- **Implemented by:** The mission is being implemented by C-DAC, Pune, and the Indian Institute of Science (IISc), Bengaluru.
- **Network:** These supercomputers will be interconnected through the National Supercomputing Grid via the National Knowledge Network.
- **National Knowledge Network (NKN):** The National Knowledge Network is a government initiative that connects academic institutions and R&D labs through a high-speed network, fostering collaboration and research.
- **Key Participants:** Academic and research institutions, along with key government departments and ministries, will actively participate by utilizing these facilities and developing applications that are crucial for national progress.
- **Milestones:** Under the National Supercomputing Mission, the first indigenously assembled supercomputer, named PARAM Shivay, was installed at IIT (BHU) in 2019. This set the stage for the development and deployment of more advanced computing systems like PARAM Rudra.



## WHO Releases “South-East Asia Regional Status Report on Road Safety”

### Relevance: GS II - Global Groups

- In News:** The World Health Organization (WHO) has released the “South-East Asia Regional Status Report on Road Safety” at the 15th World Conference on Injury Prevention and Safety Promotion.
- The report highlights that the South-East Asia Region accounts for 28% of global road traffic deaths, totaling an estimated 330,222 fatalities.



### Findings Related to India:

- Road Traffic Deaths:**
  - ✓ **2021 Statistics:** India experienced an estimated 216,618 road traffic deaths, marking a 2.1% increase since 2010. Officially reported road traffic deaths were 153,972.
  - ✓ **High Risk Groups:** Drivers and riders of two- and three-wheelers are the most affected, constituting 45.1% of road traffic deaths.
  - ✓ **Death Rate:** The rate of road traffic deaths per 100,000 population was 15.4 in India (2021), which is higher than the global rate of 15.

### Issues Related to Road Safety in South-East Asia:

- Fragmented Efforts:**
  - ✓ **Lack of Coordination:** The region suffers from fragmented road safety initiatives due to the absence of an effective lead agency with the necessary expertise and resources.
- Poor Quality Infrastructure:**
  - ✓ **Budgetary Constraints:** Insufficient budget allocations for road safety & a lack of structured road safety audits contribute to subpar infrastructure quality.
- Other Challenges:**
  - ✓ **Non-compliance:** There is widespread non-compliance with safe vehicle standards.



- ✓ **Inadequate Emergency Care:** The region lacks robust emergency and trauma care systems.

### Recommendations for Enhancing Road Safety:

- **Integrate Road Safety:** Incorporate road safety into broader processes such as urban planning and environmental policy.
- **Align with International Standards:** Ensure road design aligns with star ratings according to the International Road Assessment Programme standards.
- **Additional Recommendations:**
  - ✓ **Time-bound Targets:** Implement specific, time-bound targets for road safety improvements.
  - ✓ **Post-Crash Care:** Strengthen the post-crash care system.
  - ✓ **Data Surveillance:** Establish dedicated departments for road safety data surveillance.

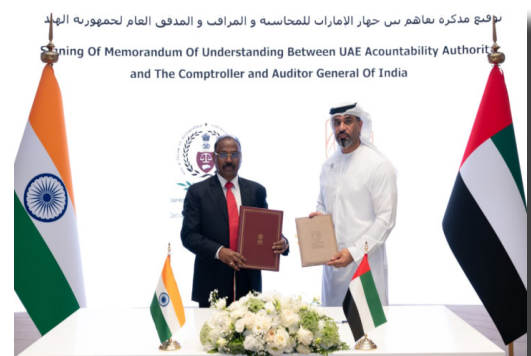
### Road Safety Measures in India:

- **National Road Safety Policy (2010):** Develop road safety information databases and promote safer road infrastructure.
- **Motor Vehicle (Amendment) Act, 2019:** Creation of a Motor Vehicle Accident Fund and the implementation of a Cashless Treatment Scheme during the Golden Hour.
- **Integrated Road Accident Database:** An initiative by the Ministry of Road Transport and Highways to enhance accident databases.
- **Additional Measures:**
  - ✓ **Road Safety Audits:** Conduct regular road safety audits.
  - ✓ **National Road Safety Council:** Establish a council dedicated to road safety issues.

### India's CAG Signs MoU with UAE's Accountability Authority

#### Relevance : GS II - Bilateral Issue

- **In News:** The Comptroller and Auditor General of India (CAG) has recently signed a Memorandum of Understanding (MoU) with the United Arab Emirates Accountability Authority (UAEAA).
- This significant development aims to strengthen the professional capacity and



cooperation between the two institutions.

### Objective of the MoU:

- **Promotion of Cooperation:** To foster collaboration between CAG and UAEAA, ensuring the exchange of knowledge and experiences in public sector auditing.
- **Strengthening Professional Capacity:** To enhance the methodologies employed in the field of public sector audit, thereby improving the effectiveness and efficiency of auditing practices.

### Areas of Cooperation:

- **Exchange of Knowledge and Experiences:** Both institutions will actively share their expertise in public auditing to improve auditing standards and practices.
- **Capacity Development Programs:** CAG and UAEAA will conduct capacity development programs at the Supreme Audit Institution (SAI) in India or UAE, as required. These programs aim to build and enhance the skills of auditors in both countries.

### Significance of the MoU:

- **Reaffirmation of Shared Values:** The MoU underscores the shared values and goals of the two institutions, emphasizing their commitment to transparency, accountability, and good governance in public financial management.
- **Enhancement of Bilateral Ties:** By facilitating opportunities for knowledge exchange and professional cooperation, the MoU strengthens the bilateral relationship between India and the UAE. This partnership is expected to yield long-term benefits in the field of public sector auditing.

### Comptroller and Auditor General of India (CAG):

- **Constitutional Foundation:** Comptroller and Auditor General of India (CAG) is a constitutional body established under Article 148 of the Constitution of India. CAG is entrusted with the responsibility of auditing the accounts of the Union and State governments, as well as public sector undertakings.
- **Role and Responsibilities:** Head of the Indian Audit and Accounts Department: The CAG leads the Indian Audit and Accounts Department, which is responsible for auditing all receipts and expenditure of the Government of India and the state governments.
- **Upholding the Constitution and Laws:** The CAG's duty is to uphold the Constitution of India and the laws of Parliament, particularly in the realm of financial administration. The CAG ensures that public funds are used efficiently and for the intended purposes.
- **Constitutional Provisions Related to CAG:**
  - ✓ The Constitution of India provides several important provisions related to the

CAG:

- **Article 149:** Defines the duties and powers of the CAG concerning the accounts of the Union and States.
- **Article 150:** Prescribes the form in which the accounts of the Union and States shall be kept, as determined by the President on the advice of the CAG.
- **Article 151:** Mandates that the reports of CAG, relating to the accounts of the Union and States, be laid before the respective legislatures.
- **Article 279:** Provides for the ascertainment of net proceeds of any tax or duty, a responsibility entrusted to the CAG.

## India-UK FTA Almost Finalized: NITI Aayog CEO

### Relevance: GS II - Bilateral Issue

- **In News:** Recently, a significant agreement under the UK-India Infrastructure Financing Bridge (UKIIFB) was signed between NITI Aayog, India's policy think tank, and the City of London Corporation in London.



### About UKIIFB:

- The UK-India Infrastructure Financing Bridge (UKIIFB) is a joint initiative launched by NITI Aayog and the City of London Corporation to promote investment in India's infrastructure sector.
- The agreement for the UKIIFB was finalized during the UK Economic and Financial Dialogue (EFD) in September 2023 and was officially signed in September 2024.
- **Agreement Duration:** The partnership is set for a period of two years.
- **Aim of the UKIIFB:**
  - ✓ **Facilitate International Investments:** Act as a bridge to attract and channel international investments into India's ambitious and expansive infrastructure projects, particularly those focused on sustainability.

### Key Functions of the UKIIFB:

- **Accelerate Mobilisation of Private Sector Investment:** The initiative aims to expedite the flow of international private sector investments into India's sustainable infrastructure projects.
- **Address Barriers to Investment:** The UKIIFB will provide strategic



recommendations to remove barriers that currently hinder international private sector investment in India. This includes regulatory challenges, financial risks, and market access issues.

- **Develop Knowledge and Best Practices:** A critical component of the UKIIFB is to collaboratively work on developing knowledge resources and best practices related to sustainable infrastructure projects. This will involve creating frameworks that make such projects investable and attractive to global investors.

### Steering Committee Composition:

- A Steering Committee will oversee the implementation and progress of the UKIIFB. The committee is composed of representatives from both countries and includes:
  - ✓ **Government Treasury Departments:** Officials from the finance and treasury departments of both India and the UK.
  - ✓ **Construction Companies:** Key players in the construction industry involved in sustainable infrastructure projects.
  - ✓ **Engineering and Legal Firms:** Experts from engineering and legal firms that specialize in infrastructure development and financing.

### Identified Projects for Investment and Support:

- **Delhi-Meerut Regional Rapid Transit System:** A high-speed regional transit system connecting Delhi and Meerut, aimed at reducing travel time and enhancing regional connectivity.
- **Highways Projects:** Various highway projects to improve road connectivity and facilitate efficient transportation across key economic corridors.
- **Green Hydrogen Projects:** Projects related to the development and adoption of green hydrogen as a sustainable energy source, contributing to India's clean energy goals.
- **Renewable Energy Initiatives:** Several initiatives focused on expanding renewable energy capacities, including solar, wind, and other clean energy solutions.

## Aiming to build stronger ties with Brunei

### Relevance : GS II - Bilateral Relations

- **In News:** India's Prime Minister Narendra Modi made a historic visit to Brunei Darussalam on an official two-day trip, marking the first-ever bilateral visit by an Indian Prime Minister to the



Southeast Asian nation.

- The visit coincides with the 40th anniversary of the establishment of diplomatic relations between India and Brunei.

### Key Highlights of Prime Minister Modi's Visit to Brunei:

- **Inauguration of the New Chancery of the High Commission of India:**
  - ✓ PM Modi inaugurated a new Chancery building for the High Commission of India and visited the Omar Ali Saifuddien Mosque, an architectural marvel blending Mughal and Italian Renaissance styles.
  - ✓ The new Chancery, featuring Indian motifs, symbolizes India's cultural spirit and strengthens diplomatic relations between the two countries.
- **Defense Cooperation:**
  - ✓ A Joint Working Group will be established to enhance defense ties between India and Brunei, fostering security cooperation.
- **Space Cooperation Pact:**
  - ✓ Discussions were held on signing a space cooperation agreement, reflecting mutual interest in technological collaboration in space exploration and satellite technology.
  - ✓ PM Modi appreciated Brunei's support for hosting ISRO's Telemetry Tracking and Telecommand (TTC) Station.
- **Cooperation in the Energy Sector:**
  - ✓ Both countries explored possibilities for long-term cooperation in LNG supplies, significant in light of India's shifting focus from Brunei's oil to Russian oil imports.
- **Strengthening Bilateral Ties: Enhanced Partnership:**
  - ✓ India and Brunei elevated their bilateral relationship to an "enhanced partnership," agreeing to cooperate on key sectors such as defense, trade, investment, space, health, education, and cultural exchanges.
  - ✓ Emphasis was placed on maintaining regular dialogue through mechanisms like the Joint Trade Committee (JTC).

### Significance of Brunei for India:

- **Importance in India's 'Act East' Policy:**
  - ✓ Brunei is a significant partner in India's 'Act East' Policy and Indo-Pacific Vision.
  - ✓ As a member of the Association of Southeast Asian Nations (ASEAN), Brunei plays a central role in India's strategic outreach to Southeast Asia.
- **Economic Significance:**
  - ✓ Southeast Asia has experienced rapid economic growth in recent decades,

and economic cooperation is a key component of India-Brunei relations.

- ✓ India-Brunei trade reached approximately \$286.20 million last year.
- ✓ Brunei is a major producer of oil and gas in the region.
- **Strategic Location: South China Sea:**
  - ✓ Brunei's location in the South China Sea is strategically significant for India, as nearly 55% of India's trade passes through these disputed waters.
  - ✓ Countering China: Brunei maintains a muted stance on its claims in the South China Sea and focuses on trade ties with China, presenting an opportunity for India under the China+1 strategy.
- **Indian Diaspora:**
  - ✓ The Indian community in Brunei dates back to the 1920s, with the discovery of oil. Currently, there are approximately 14,000 Indians in Brunei.
  - ✓ The contributions of Indian professionals in Brunei's healthcare and education sectors are well-recognized.
- **Sultan Haji Hassanal Bolkiah's Visits to India:**
  - ✓ Sultan Bolkiah, one of the world's longest-reigning monarchs, has visited India four times, with the most recent visit in 2018 as the Chief Guest at India's Republic Day parade, underscoring the strong bilateral ties.

### Way Forward:

- **Exploring New Opportunities:**
  - ✓ Both countries should explore new opportunities for trade and investment, including joint ventures in technology, healthcare, and renewable energy.
  - ✓ India could leverage Brunei's expertise in the oil and gas sector, while Brunei can benefit from India's knowledge in technology and pharmaceuticals.
- **Strengthening Economic Partnerships:**
  - ✓ Economic partnerships can be strengthened through bilateral trade agreements and business forums.
- **Improving Connectivity:**
  - ✓ Establishing direct flights and improving logistical links could promote trade, tourism, and people-to-people contact.
- **Promoting Cultural Exchange:**
  - ✓ Initiatives like cultural exchange programs, educational collaborations, and language training can bridge cultural gaps and improve mutual understanding.
- **Aligning Regional Security Interests:**
  - ✓ Both nations should work together on regional security issues and align their interests in the Indo-Pacific region.
  - ✓ Joint military exercises and strategic dialogues could help address regional

challenges and align security interests.

### Conclusion:

- By addressing trade imbalances, enhancing connectivity, promoting cultural exchanges, strengthening strategic cooperation, and diversifying energy partnerships, both countries can build a more comprehensive bilateral relationship and achieve mutual benefits.

## India-UAE Relations: Advancing Strategic Cooperation

### Relevance : GS II - Bilateral Relations

- **In News:** Recently, India and the United Arab Emirates (UAE) conducted bilateral discussions to deepen their relationship and strengthen their Comprehensive Strategic Partnership.
- The Crown Prince of Abu Dhabi was welcomed by India's Prime Minister at Hyderabad House in New Delhi, where multiple agreements were signed to enhance energy collaboration and strategic partnerships between the two nations.



### Major Agreements Finalized During the Visit:

- **Civil Nuclear Collaboration:** A Memorandum of Understanding (MoU) was signed between the Nuclear Power Corporation of India Limited (NPCIL) and the Emirates Nuclear Energy Corporation (ENEC) for collaboration in the management and upkeep of the Barakah Nuclear Power Plant. Situated in Al Dhafra, Abu Dhabi, the Barakah Plant is the first nuclear facility in the Arab world.
- **Energy Sector:**
  - ✓ **LNG Supply Agreement:** An MoU was established for the long-term provision of Liquefied Natural Gas (LNG) from the UAE to India.
  - ✓ **Strategic Petroleum Reserve (SPR):** An MoU with India Strategic Petroleum Reserve Limited (ISPRL) was signed to secure petroleum supplies. SPRs are stocks of crude oil maintained by countries to guarantee stable supply during geopolitical tensions or supply interruptions.
- **Development of Food Parks:** An MoU was signed with the Government of Gujarat to develop food parks in India. This aligns with the I2U2 grouping (India, Israel, UAE, US), which envisioned food parks in Gujarat and Madhya Pradesh..

### Significance of UAE for India:



- **Strategic Political Alliance:** The elevation of India-UAE relations to a ‘Comprehensive Strategic Partnership’ and the creation of a ‘Strategic Security Dialogue’ demonstrate the growing political and strategic alignment between the two countries.
- **Bilateral Commerce:** The UAE is India’s third-largest trading partner. The Comprehensive Economic Partnership Agreement (CEPA), signed in 2022, boosted bilateral trade from USD 72.9 billion (April 2021-March 2022) to USD 84.5 billion (April 2022-March 2023), reflecting a 16% year-on-year growth.
- **Foreign Direct Investment (FDI):** The UAE became the fourth-largest investor in India in FY23, with FDI increasing over threefold from USD 1.03 billion in 2021-22 to USD 3.35 billion in FY23.
- **Energy Assurance:** The UAE is a major oil provider for India and plays a significant role in India’s Strategic Petroleum Reserve (SPR), which is essential for the country’s energy security.
- **Financial Collaboration:** The introduction of India’s RuPay card and Unified Payments Interface (UPI) in the UAE indicates growing financial cooperation. Both nations have also agreed on a Local Currency Settlement (LCS) System to facilitate cross-border transactions in the Indian Rupee and UAE Dirham (AED).
- **Space Collaboration:** ISRO and the UAE Space Agency (UAESA) signed an MoU to collaborate on the exploration and utilization of outer space for peaceful purposes.
- **Defence and Security Ties:** The UAE and India have bolstered their defense collaboration, focusing on counter-terrorism, intelligence sharing, and joint military exercises such as Exercise Desert Cyclone. The UAE has also shown interest in Indian defense products like BrahMos missiles, Akash air defense systems, and the Tejas fighter jet.
- **Multilateral Cooperation:** The establishment of the I2U2 grouping (India-Israel-UAE-US) and the UAE’s involvement in the India-Middle East-Europe Economic Corridor (IMEC) underscore the UAE’s strategic and economic relevance in regional and global multilateral platforms.
- **Regional Stability:** The UAE’s role in the Abraham Accords and the subsequent normalization of diplomatic ties with Israel highlight its significance in promoting regional peace. Stability in the Middle East is crucial for India, given its heavy reliance on Gulf countries for energy imports (oil and gas).
- **Cultural and Diaspora Connections:** The large Indian community in the UAE, comprising approximately 3.5 million people, serves as an essential cultural and economic bridge between the two countries. The opening of the first Hindu temple in Abu Dhabi reflects shared values of tolerance and coexistence.
- **Cooperation During the Covid-19 Pandemic:** During the Covid-19 crisis, both countries supported each other by providing medical supplies, equipment, and

vaccines, illustrating their commitment to collaboration in times of need.

### Challenges in India-UAE Relations:

- **Limited Trade Diversification:** Despite CEPA boosting overall trade, there is a lack of progress in expanding trade into new sectors. The trade remains focused on a few categories like gems and jewellery, petroleum, and smartphones, limiting broader economic gains.
- **Increasing Import Costs:** Imports from the UAE rose by 19% year-on-year to USD 53,231 million in FY23. This surge, combined with heavy reliance on specific sectors, impacts the trade balance and adds pressure on India's trade surplus.
- **Non-Tariff Obstacles:** Indian exports face challenges like mandatory Halal certification, which affects the export volume of processed foods. Such non-tariff barriers can restrict India's market access and competitiveness in the UAE.
- **Human Rights Issues:** Concerns related to the Kafala system, especially regarding the rights of migrant workers, are a major issue. The Kafala system gives Gulf citizens and companies almost total control over migrant workers' employment and immigration status.
- **Diplomatic Challenges:** Navigating regional conflicts, such as the Israel-Hamas war and tensions between Iran and Arab nations, presents challenges to India-UAE relations.
- **Financial Aid to Pakistan:** The UAE's financial support to Pakistan raises concerns about the potential misuse of funds for anti-India activities, which could create tensions and complicate diplomatic efforts.

### Way Forward:

- **Promote Trade Diversification:** Focus on emerging sectors such as technology, renewable energy, and pharmaceuticals to achieve a more balanced trade relationship and tap into broader economic opportunities.
- **Strengthen Economic Relations:** Explore opportunities for joint ventures and partnerships that enhance economic cooperation and mitigate the impact of high import costs.
- **Enhance Dialogue on Human Rights:** Engage in discussions with UAE authorities to address concerns related to the Kafala system and advocate for reforms that improve the rights and working conditions of migrant laborers in line with international standards.
- **Focus on Common Interests:** Engage in proactive diplomacy to align on shared interests and ensure that geopolitical tensions do not negatively affect bilateral relations.

## India & GCC Agree on Joint Action Plan for Strategic Cooperation

### Relevance: GS II - International Relations

- In News:** The Joint Action Plan 2024-2028 was adopted during the recently held first-ever India–Gulf Cooperation Council (GCC) Joint Ministerial Meeting for Strategic Dialogue.



### Key Outcomes of the Ministerial Meeting:

- Adoption of Joint Action Plan 2024-2028:** The plan outlines various joint activities in diverse sectors, including health, trade, security, agriculture and food security, transportation, energy, and culture, among others.
  - Additional areas of cooperation may be incorporated into the Joint Action Plan based on mutual agreement in the future.
- 3P Framework for Enhanced Partnership:** India underscored the 3P Framework—People, Prosperity, and Progress—as the foundation for strengthening the partnership between India and the GCC.
- Humanitarian Crisis in Gaza:** The External Affairs Minister reiterated India's principled and consistent stance on the humanitarian crisis in Gaza, emphasizing that any response should be guided by the principles of humanitarian law.

### India-GCC Relations: An Overview:

- Political Relations:**
  - The first India-GCC Political Dialogue was held in 2003. India currently has strategic partnerships with Saudi Arabia, UAE, and Oman, indicating strong political ties and ongoing diplomatic engagement.
- Trade and Investment:**
  - Bilateral Trade:** The bilateral trade volume between India and the GCC countries stood at USD 161.59 billion in the fiscal year 2023-24.
  - The UAE is notably the 7th largest source of Foreign Direct Investment (FDI) in India, reflecting deep economic interconnections.
- Diaspora and Remittances:**
  - Indian Diaspora in GCC:** Approximately 8.9 million Indian expatriates, constituting about 66% of the Non-Resident Indians (NRIs), reside in GCC countries.
  - The GCC region is a significant source of inward remittances to India, accounting for around 30% of the total remittances received in 2020-21.
- Energy Cooperation:**

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- **Energy Imports:** The GCC countries are vital energy suppliers to India, contributing to 35% of India's oil imports and 70% of its gas imports. This underscores the critical role of the GCC in ensuring India's energy security.

### About the Gulf Cooperation Council (GCC):

- **Establishment:** The GCC was established in 1981 with the aim of fostering regional unity.
- **Headquarters:** Located in Riyadh, Saudi Arabia.
- **Objective:** The GCC seeks to achieve unity among its member states, capitalizing on their common objectives and similar political and cultural identities.

### Conclusion:

- The adoption of the Joint Action Plan 2024-2028 marks a significant step in strengthening India-GCC relations across various domains, setting the stage for deeper collaboration and mutual growth in the coming years.

## U.S.-India Strategic Clean Energy Partnership (SCEP)

### Relevance: GS II - Bilateral Relations

- **In News:** The U.S.-India Strategic Clean Energy Partnership (SCEP) Ministerial meeting was recently convened in Washington, D.C., to review progress under the partnership, aimed at fostering clean energy innovation and accelerating clean energy transitions.



### Key Initiatives Highlighted at SCEP Ministerial:

- **Progress Across Five Core Pillars:**
  - ✓ Both countries emphasized joint efforts under five core pillars:
    1. Power and Energy Efficiency
    2. Responsible Oil and Gas
    3. Renewable Energy
    4. Emerging Fuels and Technologies
    5. Sustainable Growth
- **Major Initiatives Launched:**
  - ✓ **Renewable Energy Technology Action Platform (2023):** Focuses on developing roadmaps for technologies like hydrogen, long-duration energy storage, and offshore wind, leveraging incubation-investment-industry



networks.

- ✓ **National Centre for Hydrogen Safety in India:** Established to promote hydrogen safety protocols and best practices.
- ✓ **Public-Private Energy Storage Task Force:** Addressing policy frameworks, safety, manufacturing, and supply chain issues related to energy storage
- ✓ **Battery Energy Storage System (BESS) Projects:** Technical feasibility studies of BESS in Assam and pilot projects in Haryana were launched, marking significant progress.
- ✓ **Pumped Storage:** Recognized as a promising long-term energy storage solution.
- ✓ **Engagement on Sustainable Aviation Fuels (SAF):** Focused on training, supply chain capacity building, and fuel certification to support sustainable aviation fuel initiatives.
- ✓ **Smart Grid Developments:**
  - Under the UI-ASSIST program, new developments in smart grid technology were discussed, which bridges gaps between smart grid, energy storage, and renewable energy research.
  - UI-ASSIST is funded by the U.S. Department of Energy and India's Department of Science and Technology under the U.S.-India Partnership to Advance Clean Energy-Research (PACE-R).

### About U.S.-India SCEP:

- Launched in 2021, the Strategic Clean Energy Partnership (SCEP) aims to advance energy security and innovation, with a focus on scaling up clean energy technologies, electrification, and decarbonization.
- It forms part of the broader U.S.-India Climate and Clean Energy Agenda 2030 Partnership.

### Need for Clean Energy:

- **Enhances Energy Security:** Shifting to renewable sources reduces dependence on traditional energy sources, contributing to energy security.
- **Reduction of Air Pollutants:** Clean energy transitions help mitigate air pollution and improve air quality.
- **Achieving Sustainable Development Goals (SDGs):** Plays a pivotal role in achieving SDG 7 (Clean Energy) and SDG 13 (Climate Action).

6<sup>th</sup> Quad Summit 2024: Advancing Collaboration in the Indo-Pacific

- **Relevance: GS II - Regional Groupings**

- **In News:** Recently, the 6th Quad Summit took place in Delaware, United States, marking the 4th in-person Quad Leaders' Summit. The summit highlighted key initiatives led by the Quad to address global challenges such as health, climate change, cybersecurity, and more.



### Key Highlights of the 6th Quad Summit:

- **Health**

- ✓ **Quad Health Security Partnership (QHSP):** Launched in 2023, QHSP enhances health security coordination in the Indo-Pacific region.
- ✓ **Quad Cancer Moonshot:** A new initiative focused on the treatment of cervical cancer.
- ✓ **Pandemic Preparedness:** The United States pledged over USD 84.5 million to strengthen infectious disease prevention and response capabilities across 14 Indo-Pacific nations.

- **Maritime Security**

- ✓ **MAITRI (Maritime Initiative for Training in the Indo-Pacific):** Launched to enhance regional maritime security capabilities.
- ✓ **Indo-Pacific Partnership for Maritime Domain Awareness (IPMDA):** Initiated in 2022 to improve maritime security and monitor illegal activities.
- ✓ **Indo-Pacific Logistics Network:** This initiative aims to enhance airlift capacity for disaster response across the Indo-Pacific.
- ✓ **Coast Guard Cooperation:** The first-ever Quad-at-Sea Ship Observer Mission is planned for 2025 to boost interoperability among Quad nations.

- **Quality Infrastructure Development**

- ✓ **Digital Infrastructure Principles:** Focus on developing secure and inclusive digital public infrastructure.
- ✓ **Quad Ports of the Future Partnership:** Aimed at enhancing resilient port infrastructure and regional connectivity in the Indo-Pacific. The inaugural Regional Ports and Transportation Conference will be held in Mumbai in 2025.
- ✓ **Undersea Cables and Digital Connectivity:** Quad partners committed over USD 140 million to undersea cable projects for telecommunication connectivity in Pacific island nations. Australia launched the Cable

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Connectivity and Resilience Centre in July 2024.

- ✓ **Quad Infrastructure Fellowship:** Focused on building capacity and professional networks to attract investment in regional infrastructure projects.
- **Critical and Emerging Technologies**
  - ✓ **Open Radio Access Network (RAN) and 5G:** The first Open RAN deployment in Palau was initiated in 2023, with a USD 20 million investment to build a secure telecommunications ecosystem.
  - ✓ **AI-ENGAGE Initiative (2023):** Collaborative research to harness artificial intelligence (AI) and robotics for next-generation agriculture.
  - ✓ **BioExplore Initiative:** Utilising AI to study biological ecosystems, innovate in disease diagnosis, and improve crop resilience and clean energy solutions.
  - ✓ **Semiconductors:** A Memorandum of Cooperation was finalised to address semiconductor supply chain risks.
  - ✓ **Quantum Technology:** The Quad Investors Network (QUIN) explored ways to leverage quantum ecosystems for mutual benefits.
- **Climate and Clean Energy**
  - ✓ **Enhanced Early Warning Systems:** The US will provide 3D-printed weather stations to Pacific Island countries. Australia and Japan are enhancing disaster risk reduction efforts in the region.
  - ✓ **Quad Clean Energy Supply Chain Diversification Program (2023):** Aimed at developing secure and diversified clean energy supply chains in the Indo-Pacific. India committed USD 2 million to new solar projects in Fiji, Comoros, Madagascar, and Seychelles.
- **Cybersecurity**
  - ✓ **Quad Action Plan:** Focused on protecting commercial undersea telecommunications cables, advancing digital connectivity, global commerce, and prosperity.
  - ✓ **Countering Disinformation:** The Quad's Countering Disinformation Working Group supports media freedom and addresses foreign information manipulation.
- **Space Cooperation**
  - ✓ **Space Situational Awareness (SSA):** Quad partners are collaborating on space situational awareness, contributing to the long-term sustainability of the space environment.
- **Countering Terrorism**
  - ✓ **Quad Counter Terrorism Working Group (CTWG):** Focuses on countering unmanned aerial systems (C-UAS), chemical, biological, radiological, and nuclear devices (CBRN), and the use of the internet for terrorism.

- **People-to-People Initiatives**

- ✓ **Quad Scholarships:** India announced fifty Quad scholarships worth USD 500,000 for students from the Indo-Pacific to pursue undergraduate engineering programs at Indian technical institutions.

### Quad Principles for Development and Deployment of Digital Public Infrastructure:

- **About the Principles**

- ✓ The Quad countries outlined principles for building and using digital public infrastructure (DPI) that are inclusive, transparent, and respect democratic values.

- **Key Principles for DPI Development**

- ✓ **Inclusivity:** Removing barriers and ensuring last-mile access while avoiding algorithmic bias.
- ✓ **Interoperability:** Using open standards while considering legal and technical constraints.
- ✓ **Scalability:** Designing systems flexibly to handle increased demand.
- ✓ **Security and Privacy:** Incorporating privacy-enhancing technologies and ensuring data protection.
- ✓ **Governance for Public Benefit:** Ensuring transparency and promoting competition and data protection.
- ✓ **Sustainability:** Supporting continuous operations with adequate financing.
- ✓ **Intellectual Property Protection:** Safeguarding intellectual property rights.
- ✓ **Alignment with SDGs:** Ensuring systems are aligned with the 2030 Agenda for Sustainable Development and SDGs.

### Conclusion:

- The 6th Quad Summit reaffirmed the commitment to addressing pandemics, climate change, and cybersecurity while fostering innovation and collaboration across these critical sectors.
- The Quad's initiatives aim to ensure a resilient and prosperous Indo-Pacific, contributing to global stability and sustainable development.



## India Signs Groundbreaking Agreements Under Indo-Pacific Economic Framework (IPEF)

### Relevance : GS II - Regional Groupings

- **In News:** India recently inked and exchanged landmark agreements focusing on three key areas: Green Economy, Equitable Economy, and the overarching arrangement under the Indo-Pacific Economic Framework for Prosperity (IPEF).



### About Indo-Pacific Economic Framework (IPEF):

- **Year of Launch:**
  - ✓ IPEF was launched in 2022 in Tokyo, Japan.
- **Member Countries (14):**
  - ✓ IPEF member nations include Australia, Brunei, Fiji, India, Indonesia, Japan, Republic of Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand, Vietnam, and the United States.
- **Goal:**
  - ✓ The main aim of the IPEF is to enhance economic collaboration and interaction among its partner countries. The framework seeks to advance growth, economic stability, and shared prosperity across the Indo-Pacific region.
- **The IPEF is built upon four pillars:** Commerce (Pillar I), Resilient Supply Chains (Pillar II), Sustainable Economy (Pillar III), and Equitable Economy (Pillar IV). Earlier, in February 2024, India had endorsed the Agreement on Supply Chain Resilience (Pillar II) while maintaining an observer role under Pillar I.

### IPEF Sustainable Economy Agreement (Pillar III):

- **Advancing Clean Energy Technologies**
  - ✓ The agreement seeks to hasten the development and deployment of clean energy solutions, boosting energy security, enhancing climate adaptability, and cutting down emissions among IPEF member nations.
- **Investment and Capacity Enhancement**
  - ✓ The focus will be on promoting investments in industries, especially targeting Micro, Small, and Medium Enterprises (MSMEs). Through joint initiatives like the IPEF Catalytic Investment Fund and the IPEF Accelerator, the goal is to integrate Indian enterprises into global supply chains and enhance their competitiveness.



**IPEF Equitable Economy Agreement (Pillar IV):**

- **Fostering a Transparent and Predictable Business Ecosystem**
  - ✓ This agreement strives to establish a fair and transparent business environment by tackling corruption and endorsing initiatives aimed at improving tax clarity, enhancing domestic revenue collection, and strengthening tax governance.
- **Strengthening Global Cooperation**
  - ✓ The provisions include encouraging data sharing, supporting asset recovery efforts, and fortifying cross-border probes and legal actions to combat corruption effectively.

**Overarching IPEF Agreement:**

- **Establishment of a High-Level Oversight Mechanism**
  - ✓ The overarching agreement sets up a political oversight mechanism at the ministerial level, tasked with overseeing the execution of individual IPEF agreements.
- **Importance**
  - ✓ This agreement formalizes the IPEF partnership by providing it a distinct identity and long-term stability. It has the potential to bolster India's production capabilities, further integrate the country into global supply chains, and cement its position in the Indo-Pacific economic landscape.

**Major Initiatives Under IPEF:**

- **IPEF Skills Development Initiative**
  - ✓ This initiative focuses on empowering women and young girls in developing and middle-income IPEF partner countries by providing them with skills training, thereby promoting gender equity in the workforce.
- **Critical Mineral Cooperation**
  - ✓ Aiming to strengthen the supply chain of essential minerals, this initiative also focuses on ensuring sustainable mining practices across the Indo-Pacific region.
- **Other Programs**
  - ✓ Other noteworthy programs include the formation of a Technology Council and the introduction of a Collaborative Work Plan (CWP) to foster technological advancement and capacity building.

**Conclusion:**

- India's active engagement in the IPEF highlights its commitment to strengthening economic collaboration in the Indo-Pacific region.
- The newly signed agreements in the areas of Green Economy, Equitable

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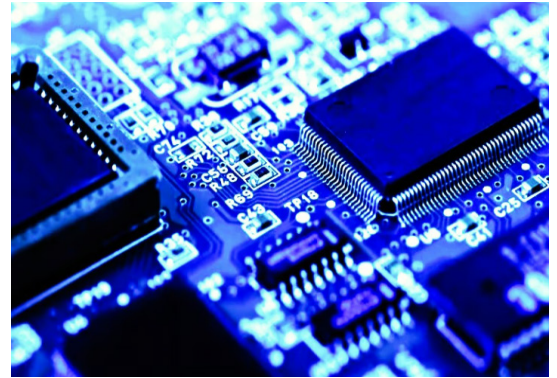
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Economy, and the overarching IPEF framework will not only reinforce India's influence in shaping global sustainable trade practices but also provide long-term benefits in promoting energy security, transparency, and inclusive economic growth across the region.

## India & the US Sign Deal for Semiconductor Fabrication Plant for National Security

### Relevance: GS II - Bilateral Relations

- In News:** India and the United States have finalized an agreement to set up **India's first Semiconductor Fabrication Plant dedicated to national security, marking a significant advancement in the Indo-US technology alliance.**
- This plant, which will be the world's first multi-material fabrication facility, is also a trailblazing initiative within the Quad framework. Importantly, this marks the first instance of the US military partnering with India on high-value technology sharing



### About the Semiconductor Fabrication Plant:

- The Semiconductor Fabrication (Fab) Plant, to be named '**Shakti**', will focus on three essential components for modern defense operations:
  - Advanced Sensing Technologies
  - Next-Generation Communications
  - High-Voltage Power Electronics
- This facility will produce infrared, gallium nitride, and silicon carbide semiconductors. The project will receive backing from the India Semiconductor Mission and will be established as a strategic technological collaboration between Bharat Semi, 3rdiTech, and the U.S. Space Force.

### Significance of the Semiconductor Fabrication Plant:

- Strategic Transformation:** The establishment of the Shakti Fab Plant will transition India from a semiconductor consumer to a semiconductor producer, significantly bolstering national defense capabilities and positioning India as a key player in the global semiconductor supply chain. This development will further enhance India's role as a regional security provider in the Indo-Pacific.
- Decreasing Reliance on Imports:** Presently, India imports \$1 billion worth of semiconductors annually to meet its national security requirements. The

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new facility will help India reduce this dependency by enabling domestic semiconductor production.

- **Strengthening National Infrastructure:** The Fab Plant will fulfill the increasing demand for semiconductors in various sectors, including telecommunications, transportation, and renewable energy, thereby reinforcing India's overall security and infrastructure systems.
- **Enhancing R&D in Chip Manufacturing:** The agreement will also stimulate research and development (R&D) collaborations between India and the US in chip manufacturing technologies. A notable example is the establishment of the GlobalFoundries (GF) Kolkata Power Center, which will contribute to advancements in semiconductor technologies.

### India Semiconductor Mission:

- The India Semiconductor Mission, operating under the Ministry of Electronics and Information Technology (MeitY), seeks to develop a robust ecosystem for semiconductor and display manufacturing in India. Its primary goal is to make India a leading hub for electronics manufacturing and design.
  - ✓ **Specialized Division:** The Mission functions as a dedicated and autonomous division within the Digital India Corporation, focusing on semiconductor-related initiatives.
  - ✓ **Coordinating Agency:** It acts as the coordinating body for the execution of various schemes approved under the Semicon India Programme, ensuring the establishment of a self-sufficient semiconductor industry in India.

### Cancer Moonshot Initiative Launched by QUAD Countries

- **Relevance: GS II - Regional Group**
- **In News:** The QUAD Countries, comprising India, the United States, Australia, and Japan, have initiated the Cancer Moonshot Initiative aimed at enhancing cancer care across the Indo-Pacific region.



### About the Cancer Moonshot Initiative:

- The primary objective of the Cancer Moonshot Initiative is to bolster the overall cancer care ecosystem in the Indo-Pacific by:
  - ✓ **Enhancing Health Infrastructure:**
    - Strengthening health facilities and systems to provide better cancer care.
  - ✓ **Fostering Research Collaborations:**



- Encouraging joint research efforts among countries to advance cancer treatment and management.
- ✓ **Promoting HPV Vaccination:**
  - Advocating for the vaccination against human papillomavirus (HPV) to combat cervical cancer effectively.
- ✓ **Increasing Access to Screenings:**
  - Ensuring more individuals can receive timely cancer screenings to facilitate early detection.
- ✓ **Expanding Treatment Options:**
  - Enhancing the variety of treatment methods available for cancer patients.

### India's Contribution to the Cancer Moonshot Initiative:

- **Financial Support:**
  - ✓ Providing a grant of US \$7.5 million aimed at cancer testing, screening, and diagnostics within the Indo-Pacific region.
- **Radiotherapy Treatment Support:**
  - ✓ Offering assistance for radiotherapy services and capacity-building initiatives in partner countries across the region.
- **Technical Assistance:**
  - ✓ Delivering technical support to interested countries on Digital Public Infrastructure (DPI) for cancer screening, care, and continuous treatment, facilitated by its US \$10 million contribution to the WHO's Global Initiative on Digital Health.

### Conclusion:

- The launch of the Cancer Moonshot Initiative by the QUAD countries underscores a collective commitment to improving cancer care and outcomes in the Indo-Pacific.
- With India's substantial financial contributions and support for various aspects of cancer management, the initiative aims to create a robust health infrastructure, facilitate research collaborations, and enhance access to critical cancer prevention and treatment services across the region.



## WHO Releases 'Guidance for Best Practices for Clinical Trials'

## Relevance : GS II - Health Sector

- **In News:** The World Health Organization (WHO) has recently issued guidance to enhance best practices in clinical trials.
- The primary objective is to **improve the efficiency of clinical research, minimize research waste, and establish protocols for sustained clinical trials** that are always active for endemic conditions and can adapt during emergencies or pandemics.



## Understanding Clinical Trials:

- Clinical trials are **meticulously controlled research studies designed to evaluate the safety, efficacy, and overall effectiveness of new medical treatments, drugs, devices, or other interventions.**
- These trials play a critical role in ensuring the development and approval of safe and effective medical solutions.

## Persistent Challenges in Clinical Trials:

- **Waste in Clinical Trials**
- Several factors contribute to research waste, including:
  - ✓ Lack of well-defined research questions.
  - ✓ Duplication of earlier research efforts.
  - ✓ Use of inefficient trial processes.
- **Inadequate Funding for Clinical Trial Infrastructure**
  - ✓ This results in inequity and a lack of justice in accessing affordable, safe, and effective treatments, as was prominently observed during the COVID-19 pandemic.
- **Other Challenges**
  - ✓ A global divide exists between high-income and low-income countries in conducting clinical trials.
  - ✓ Lack of diversity in trial cohorts.
  - ✓ Absence of standardized practices, which can erode trust in research findings.

### Key Highlights of the WHO Guidance:

- **Regional and Global Health Priorities**
  - ✓ The guidance emphasizes that national research programs should align with both regional and global health research priorities, ensuring that the funding is directed appropriately.
- **Competent Local Research Ethics Committees**
  - ✓ Ethics committees should have multi-disciplinary membership, operate independently, and possess autonomy in decision-making to ensure ethical integrity in clinical trials.
- **Encouraging Automated and Digital Processes**
  - ✓ The integration of automated and digital methods in clinical trials will enhance speed, efficiency, and transparency in the research process.
- **Diversity in Trial Cohorts**
  - ✓ WHO recommends greater inclusion of pregnant and lactating women in clinical trials, acknowledging their unique healthcare needs and the importance of diverse representation in research.

### Regulation of Clinical Trials in India:

- **Regulatory Framework**
  - ✓ Clinical trials of new drugs in India are governed under Schedule Y of the Drugs and Cosmetic Rules, 1945.
  - ✓ The Good Clinical Practice (GCP) guidelines issued by the Central Drugs Standard Control Organisation (CDSCO) also guide clinical trial processes in India.
- **Approval Process**
  - ✓ Both the sponsor and investigator must understand the various approval processes involved in conducting clinical trials, particularly for vaccines.
- **Medical Device Safety**
  - ✓ For medical devices, safety data from animal trials should be obtained, and any potential risks posed by the device should be carefully considered before approval.
- **Informed Consent**
  - ✓ Obtaining informed consent is mandatory before conducting any diagnostic procedures during clinical trials to ensure ethical compliance.
- **Ethical Guidelines**
  - ✓ India has established ethical guidelines for clinical research, such as:
  - ✓ Ethical Guidelines for Biomedical Research on Human Participants (2006).



- ✓ National Ethical Guidelines for Biomedical Research Involving Children (2017) issued by the Indian Council of Medical Research (ICMR).

### Conclusion:

- This WHO guidance sets a significant benchmark for countries globally, including India, in enhancing the efficiency, ethics, and inclusivity of clinical trials.
- The focus on minimizing waste and promoting transparency in research processes is expected to improve public trust and accelerate medical advancements across the globe.





## Dhangars in search of legal pastures

## Relevance : GS III - Agriculture &amp; Allied Sector

- **In News:** Recently, a significant number of Dhangars, a shepherd community, marched to the office of the Subdivisional Officer in Khamgaon, located in Maharashtra's Buldhana district. Their protest was to demand a "grazing corridor" for their sheep & goats.



## Who are the Dhangars?

- **Community Classification:** Dhangars are primarily a community of shepherds categorized under the nomadic tribe (Vimukta Jati and Nomadic Tribes) in Maharashtra.
- **Central Level Classification:** At the national level, they are classified under the Other Backward Classes (OBC) category.
- **Alternate Names:** In other regions, they are also known as Dhangad Golla & Kuruba.

## Demographic Details:

- **Population Size:** According to the 2011 Census, the Dhangars are the second-largest community in Maharashtra after the Marathas, comprising 9% or approximately 1.5 crore of the State's population.
- **Geographical Spread:** Predominantly, Dhangars reside in the central plateau of Maharashtra during the monsoon season. Apart from Maharashtra, they are also found in Gujarat, Karnataka, and Andhra Pradesh.

## Traditional Livelihood:

- **Occupations:** The Dhangars are traditionally engaged in diverse occupations such as shepherding, cowherding, buffalo keeping, weaving blankets and wool, butchery, and farming.
- **Seasonal Crop Cultivation:** During the monsoon season, they sow dry crops like 'bajra' in the Deccan region while allowing their herds to graze.
- **Migration Patterns:** By October, the Dhangars harvest their crops and migrate to Konkan, a fertile agricultural region. They are welcomed by Konkan farmers

who rely on the Dhangars to manure and fertilize their fields for the Rabi crop. After the monsoon arrives, they return to the dry plateau, carrying rice provided by the Konkan farmers.

### Legal Restrictions on Grazing:

- **Indian Forest Act, 1927:** The act prohibits cattle grazing in designated forest areas and imposes a penalty of up to ₹500 along with compensation for any damage caused to the forest.
- **Forest Rights Act, 2006:** The Scheduled Tribes (ST) and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act of 2006 allows traditional activities like grazing. However, the Dhangars, classified as a nomadic tribe, do not benefit from this provision.

### Current Demands:

- **Scheduled Tribe Status:** The Dhangars have been persistently demanding recognition under the Scheduled Tribe (ST) category.
- **Grazing Corridors:** They are also advocating for the creation of “grazing corridors” that would acknowledge and safeguard their traditional grazing routes, ensuring their rights and livelihoods are maintained.

## INS Arighaat: Enhancing India's Strategic Nuclear Deterrence

### Relevance: GS III - Defence Sector

- **In News:** The Indian Navy recently commissioned the second Arihant-Class submarine, INS Arighaat, at Visakhapatnam, marking a significant step in bolstering India's naval capabilities.



### About INS Arighaat:

- **Type:** INS Arighaat, also known as S-3, is the second Ship Submersible Ballistic Nuclear (SSBN) submarine in the Arihant class.
- **Strategic Objective:** The primary aim of deploying INS Arighaat is to enhance nuclear deterrence and maintain a strategic balance in the region.
- **Role in Nuclear Triad:** It contributes to India's nuclear triad, which refers to the capability to launch nuclear weapons from land, air, and sea, providing a credible second-strike capability.
- **Manufacturing Hub:** The submarine was built by the Shipbuilding Centre (SBC) in Visakhapatnam.
- **Dimensions and Weight:** INS Arighaat measures approximately 112 meters in length and has a displacement of around 6,000 tonnes.

### Technical Specifications:

- **Power & Speed:** Submarine is powered by a nuclear reactor, allowing it to achieve speeds of 12-15 knots on the surface & 20-24 knots when submerged.
- **Armament Capabilities:** INS Arighaat is armed with 10-12 K-15 nuclear-tipped submarine-launched ballistic missiles (SLBMs) that have a range of around 750 km. Equipped with four vertical launch tubes for missile launches.
- **Stealth and Strategic Advantage:** As a nuclear-powered submarine, INS Arighaat is highly stealthy, capable of diving to greater depths and remaining submerged for longer periods. This significantly boosts India's deterrence capability and reinforces its position in the nuclear triad.

### Future Developments:

- **INS Aridaman (S-4):** Another nuclear-powered submarine, INS Aridaman, is under construction. It is expected to be equipped with ballistic missiles having a longer range of over 3,000 km, further strengthening India's second-strike capability.

### Ship Submersible Ballistic Nuclear (SSBN) Submarines:

- **Definition:** A Ship Submersible Ballistic Nuclear (SSBN) is a type of nuclear-powered submarine designed specifically for carrying and launching ballistic missiles. SSBNs are key assets in maintaining a nation's strategic deterrence.
- **Primary Role:** Unlike attack submarines, SSBNs are primarily used as a deterrent force. They serve as a reliable platform for a second-strike capability in the event of a nuclear attack.
- **Components Explained:**
- **Ship Submersible:** This refers to the submarine's ability to operate underwater, which makes it less detectable and harder to target compared to surface ships.
- **Ballistic:** The term indicates that the submarine is equipped with ballistic missiles—long-range missiles that, once launched, follow a predetermined trajectory to their target, usually armed with nuclear warheads.
- **Nuclear:** The nuclear aspect has two components:
  - **Nuclear Power:** The submarine is powered by a nuclear reactor, providing it the ability to remain submerged for extended periods and travel vast distances without the need to surface.
  - **Nuclear Armament:** The ballistic missiles it carries are typically armed with nuclear warheads.
- **Role in Nuclear Triad:** SSBNs are an essential element of a nation's nuclear triad, which usually includes land-based missiles, air-delivered nuclear weapons, and sea-based nuclear capabilities. The triad ensures a robust and secure second-strike capability, crucial for national defense and strategic deterrence.



## NITI Aayog's Report on Edible Oils and the Path to Atmanirbharta

**Relevance: GS III - Food Security**

- **In News:** NITI Aayog recently released a comprehensive report titled “Pathways and Strategies for Accelerating Growth in Edible Oils Towards the Goal of Atmanirbharta.”
- This report presents strategic measures aimed at boosting India’s domestic production of edible oils, thereby moving the country closer to self-reliance.

**Report Overview:**

- **Strategic Objective:** The report outlines targeted interventions to increase India’s domestic edible oil production by a substantial 43.5 million tonnes (MT). This ambitious target aims to reduce the nation’s reliance on imports and achieve self-sufficiency in edible oils.

**Key Highlights:**

- **Surge in Edible Oil Consumption:**
  - ✓ **Per Capita Consumption:** The consumption of edible oil in India has seen a marked rise, reaching 19.7 kg per person per year.
  - ✓ **Current Import Dependency:** In the fiscal year 2022-23, India imported 16.5 million tonnes (MT) of edible oils. Currently, domestic production meets only 40-45% of the total demand.
- **Projected Growth and Demand:**
  - ✓ **Future Projections:** Under a Business-As-Usual (BAU) scenario, India’s domestic supply of edible oils is expected to grow to 16 MT by 2030 and 26.7 MT by 2047.
  - ✓ **Demand Forecasts:** Projections indicate potential supply-demand gaps, with demand possibly exceeding domestic supply by 29.5 MT by 2030 and 40 MT by 2047, particularly under scenarios of high consumption.

**Strategic Interventions for Self-Sufficiency:**

- The report suggests a multi-faceted approach to achieving self-sufficiency, structured around three key pillars:
  - ✓ **Crop Retention and Diversification:**
    - **Definition:** This strategy involves retaining current crop cultivation while introducing new crops or cropping systems on farms.
    - **Objective:** To diversify crop production, reduce dependency on a single crop, and improve resilience and profitability.



### ✓ Horizontal Expansion:

- **Definition:** Horizontal expansion refers to increasing the cultivation area for oilseeds by utilizing additional lands such as rice fallow lands and wastelands.
- **Focus on Palm Cultivation:** Expanding the cultivation area for crops like palm oil to leverage unused lands and boost production.

### ✓ Vertical Expansion:

- **Definition:** Vertical expansion involves growing crops in stacked layers or optimizing land use through advanced farming techniques to enhance yields.
- **Enhanced Yields:** This includes the adoption of improved farming practices, the use of better-quality seeds, and the integration of advanced production technologies.

## State-Wise Quadrant Approach for Targeted Interventions:

- **Cluster Identification:** The report introduces a state-wise quadrant approach that categorizes states into four clusters based on cultivation area and yield:
  - ✓ High Area-High Yield (HA-HY)
  - ✓ High Area-Low Yield (HA-LY)
  - ✓ Low Area-High Yield (LA-HY)
  - ✓ Low Area-Low Yield (LA-LY)
- **Objective:** This approach allows for targeted interventions tailored to the specific needs and potential of each state cluster.

## Potential Gains from Strategic Interventions:

- **Expected Increase in Production:** The proposed strategies could potentially raise domestic edible oil production by 43.5 MT, thereby significantly reducing import dependency.
- **Specific Strategies:**
  - ✓ **Utilization of Rice Fallow Areas:** Promoting the use of fallow rice fields for oilseed cultivation.
  - ✓ **Improving Yield Gaps:** Closing the yield gaps in oilseed production through better farming practices.
  - ✓ **Expanding Palm Oil Cultivation:** Increasing the area under palm oil cultivation to augment domestic supply.

## Recommendations for Achieving Atmanirbharta:

- **Systemic Strengthening:** The report emphasizes the need for robust systems and frameworks, public-private partnerships, and dynamic trade policies to support sustainable growth in edible oil production.
- **Public Awareness and Consumption:** Encouraging public awareness about domestic oilseed consumption and promoting adherence to dietary guidelines.

- **Focused Implementation:** The report calls for a rigorous and focused implementation of these strategies to meet future edible oil demands and achieve self-sufficiency by 2030 and beyond.

### Conclusion:

- By implementing these strategic interventions, India aims to transform its edible oil sector, reduce import dependence, and achieve the goal of Atmanirbharta, thereby ensuring food and nutritional security for its population.

## Global Fintech Fest 2024

### Relevance : GS II&III - Governance & Economy

- **In News:** Prime Minister recently addressed the Global Fintech Fest (GFF) 2024 held at the Jio World Convention Centre in Mumbai, Maharashtra.
- This event is significant as it underscores India's rapid strides in the fintech sector and its growing role in the global financial ecosystem.



### About the Global Fintech Fest (GFF):

- **Organizers:** GFF is jointly organized by the Payments Council of India, the National Payments Corporation of India, and the Fintech Convergence Council.
- **Objective:** The event aims to showcase India's advancements in the fintech sector and serves as a platform to bring together key stakeholders, including financial institutions, technology providers, startups, and regulators.

### Understanding Fintech:

- **What is Fintech?**
  - ✓ **Definition:** Fintech, or financial technology, refers to the application of technology to deliver financial services more efficiently, accessibly, and user-friendly.
  - ✓ **Scope:** It encompasses a broad range of innovations designed to improve and automate the delivery and use of financial services, often through digital platforms.
- **Key Applications of Fintech:**
  - ✓ **Digital Payments:** Platforms like UPI and Google Pay allow users to make payments, transfer money, and conduct financial transactions online or through mobile devices.

- ✓ **Lending and Borrowing:** Digital platforms offer loans to individuals or businesses, often using data-driven algorithms to assess creditworthiness (e.g., peer-to-peer lending, digital loan apps).
- ✓ **Wealthtech:** Tools and platforms for investment management and financial planning, including robo-advisors, online brokerage services, and digital asset management.
- ✓ **Blockchain and Cryptocurrency:** Technologies that enable secure, decentralized financial transactions, including cryptocurrencies like Bitcoin and blockchain-based financial services.
- ✓ **Regtech:** Solutions that help financial institutions comply with regulations more efficiently and cost-effectively, often leveraging AI and big data.
- ✓ **Neobanking:** Digital-only banks that provide banking services without physical branches, typically through mobile apps or online platforms.

### Benefits of Fintech:

- **Promoting Financial Inclusion:**

- ✓ **Accessibility:** Through digital platforms, fintech companies have extended banking and financial services to underserved and unbanked populations, especially in rural and remote areas.
- ✓ **Empowerment:** Mobile banking, digital wallets, and micro-lending platforms have empowered millions, enabling participation in the formal economy, saving, accessing credit, and investing.

- **Driving Job Creation and Economic Growth:**

- ✓ **Employment Opportunities:** The fintech sector has become a major source of job creation in India, offering roles in technology, finance, marketing, and customer service.
- ✓ **Economic Contribution:** As fintech companies expand, they contribute to the economy by creating jobs and stimulating demand for various ancillary services.
- ✓ **Business Efficiency:** Fintech has streamlined financial processes and reduced transaction costs, enhancing business efficiency and supporting the growth of small and medium-sized enterprises (SMEs).

- **The Digital Payments Revolution:**

- ✓ **Widespread Adoption:** India's fintech revolution is best exemplified by the widespread adoption of digital payments, which has increased transparency, reduced corruption, and made financial transactions more secure and efficient.

- **Bridging the Urban-Rural Divide:**

- ✓ **Equal Access to Financial Services:** Fintech has helped bridge the urban-rural divide by providing equal access to financial services, regardless of

geographic location. People in rural areas can access the same financial tools as those in urban centers, promoting economic equity and reducing regional disparities.

### Money Laundering and Fraud Concerns:

- **Exploitation by Scammers:** A Parliamentary Committee highlighted that fintech companies were exploited by scammers for money laundering. An example cited was an Abu Dhabi-based app called Pyppl, reportedly administered by Chinese investment scammers, posing challenges for Indian law enforcement in tracking illicit funds.
- **Fraud Trends and Impact:** Despite the increasing volume of transactions over the past five years, the ratio of fraudulent transactions to total transactions has remained relatively low.
- **Impact on UPI Users:** The percentage of UPI users affected by fraud is only 0.0189%, indicating that while there are concerns about illegal activities, the overall impact on users remains minimal.

### Key Highlights from PM's Speech at GFF 2024:

- **India's Fintech Revolution and Global Recognition:**
  - ✓ **Diversity and Growth:** Modi emphasized how India's fintech diversity impresses foreign visitors as much as its cultural diversity. The sector has attracted over \$31 billion in investments over the past decade and seen 500% growth in startups.
  - ✓ **Infrastructure Development:** The increase in broadband users from 60 million to 940 million and the widespread adoption of Aadhaar and Jan Dhan accounts have been key drivers of this revolution.
- **The Jan Dhan, Aadhaar, and Mobile Trinity:**
  - ✓ **Digital Transactions:** The combination of Jan Dhan accounts, Aadhaar, and mobile technology has facilitated half of the world's digital transactions in India.
  - ✓ **Impact of UPI:** India's Unified Payments Interface (UPI) has transformed 24/7 banking, even in rural areas.
- **Empowerment Through Financial Inclusion:**
  - ✓ **Women Empowerment:** The Jan Dhan Yojana has empowered women with over 29 crore bank accounts, and self-help groups have provided significant benefits to rural women.
  - ✓ **Mudra Yojana:** This scheme has disbursed Rs 27 trillion, benefiting 70% women, showcasing fintech's role in financial inclusion.
- **Promoting Transparency and Good Governance:**
  - ✓ **Curbing Parallel Economy:** Fintech has enhanced transparency in financial transactions, especially through Direct Benefit Transfer (DBT) in government



schemes, reducing leakages.

- **Social Impact and Bridging the Urban-Rural Gap:**

- ✓ **Transformative Access:** Fintech has enabled access to financial services for farmers, fishermen, and middle-class families, allowing them to manage finances through mobile phones.
- ✓ **Democratization of Financial Services:** Credit, investments, and insurance have become more accessible, benefiting small vendors through schemes like PM SVANidhi.

- **Advancements in Digital Banking:**

- ✓ **Neobanking and Digital Twins:** Modi discussed innovative concepts like neobanking, the shift from currency to QR codes, and advancements like Digital Twins technology and Open Network for Digital Commerce (ONDC).
- ✓ **Account Aggregators and e-RUPI:** These tools are enhancing financial management for small businesses and have global applicability.

- **Ensuring Cybersecurity and Regulation:**

- ✓ **Policy Support:** The government supports fintech growth by removing Angel Tax, investing in research, and implementing the Digital Personal Data Protection Act.
- ✓ **Combating Cyber Fraud:** Modi emphasized the need for digital literacy and robust regulatory measures to counter cyber fraud.

- **Focus on Sustainable Economic Growth:**

- ✓ **Green Finance:** The government prioritizes sustainable growth, focusing on green finance and financial inclusion to strengthen markets with advanced technologies.

## Indian Army Launches Project NAMAN to Support Veterans & Families

### Relevance: GS III - Defence Sector

- **In News:** The Indian Army has inaugurated the first phase of Project NAMAN, an initiative aimed at enhancing support and services for Defence pensioners, veterans, and their families.



### About Project NAMAN:

- **Purpose:** Project NAMAN is designed to provide comprehensive assistance to Defence personnel and their families, addressing their pension and service-related needs.
- **Core Component:** The project is centered around SPARSH (System for Pension Administration Raksha), which is tailored to manage pension sanction and disbursement for the Armed Forces.

- **Government to Citizen (G2C) Services:** Facilitates direct services between the government and the citizens.
- **Business to Consumer (B2C) Services:** Offers services directly to consumers, enhancing accessibility and convenience.

### Implementation and Significance:

- The project includes setting up reception and facilitation centres to support Defence pensioners and veterans. The initiative is enabled through a tripartite Memorandum of Understanding (MoU) involving: Indian Army Common Service Centre (CSC) and HDFC Bank.
- Project NAMAN aims to streamline and improve the efficiency of pension administration and support services for Defence personnel, leveraging digital solutions and collaborative partnerships to better serve the Armed Forces community.

## De-Hyphenating Rice and Wheat Production: A Policy Shift

### Relevance : GS III - Agriculture

- **In News:** Policymakers have recently called for a decoupling of rice and wheat production strategies due to notable differences in their production dynamics and consumption trends.



### Need to Separate Rice and Wheat Production Policies:

- **Contrasting Stock Situations:**
  - ✓ **Rice Surplus:** India's rice exports were substantial—21.21 million tonnes (mt) in 2021-22, 22.35 mt in 2022-23, and 16.36 mt in 2023-24. Despite these exports, government rice stocks soared to a record 45.48 mt by August 2024.
  - ✓ **Wheat Shortage:** Wheat exports fell sharply from 7.24 mt in 2021-22 to 4.69 mt in 2022-23, and plummeted to 0.19 mt in 2023-24. Even after the export ban in May 2022, wheat stocks dwindled to a low of 26.81 mt in August 2024, among the lowest in recent years.
- **Differences in Growing Regions:**
  - ✓ **Rice:** Cultivated in both kharif (monsoon) and rabi (winter-spring) seasons, rice is grown in a wide range of areas, with 16 states producing over 2 mt each, spanning North (Punjab, UP), South (Tamil Nadu, Telangana), Central (MP, Chhattisgarh), East (West Bengal, Assam), and West (Maharashtra, Gujarat). Some states, like West Bengal, even produce three rice crops—aus, aman, and boro.

- ✓ **Wheat:** Grown only during the rabi season, wheat production is concentrated in eight states, each producing over 2 mt, with Uttar Pradesh, Madhya Pradesh, Punjab, and Haryana contributing 76% of the total output.
- **Volatility in Production:** Production is more volatile due to its limited seasonal and geographical spread, making it highly prone to fluctuations.
- **Key Constraints:**
  - ✓ **Rice:** Primary constraint is water, which can be managed effectively. For instance, Telangana has significantly increased rice production by enhancing irrigation and ensuring a steady Minimum Support Price.
  - ✓ **Wheat:** More vulnerable to climate change, with erratic weather patterns affecting yields. Warmer winters and rising temperatures in March (grain formation) and November-December (sowing) have negatively impacted production, leading to reduced government reserves.
- **Diverging Consumption Patterns:**
  - ✓ **Wheat:** The 2022-23 household expenditure survey shows per capita monthly wheat consumption at 3.9 kg in rural and 3.6 kg in urban areas, equating to around 65 mt for the population of 1.425 billion. Wheat is increasingly consumed in processed forms like maida, sooji/rava, bakery products, and convenience foods, trends driven by urbanization and rising incomes.
  - ✓ **Rice:** Unlike wheat, rice consumption remains steady, with fewer innovations in rice-based convenience foods.

### Recommendations to Address Rice-Wheat Consumption Divergence:

- **Wheat Strategy:** Given the growing demand and production challenges due to geographic and climate limitations, India could face short-term wheat imports. To mitigate this, the government should focus on enhancing per-acre productivity and developing climate-resilient wheat varieties.
- **Rice Strategy:** As domestic rice consumption lags behind production, the government should consider lifting the ban on white non-basmati rice exports. It could also remove the 20% duty on parboiled non-basmati rice and the USD 950/tonne floor price on basmati exports to balance supply and demand. Additionally, innovating in rice-based processed foods like breakfast cereals, soups, baby foods, and packaged mixes could boost consumption.
- **Policy Decoupling:** It is essential to separate the policy frameworks for rice and wheat. Both crops face unique challenges, requiring customized approaches rather than a unified policy strategy.

## One more semiconductor unit under India Semiconductor Mission (ISM)

### Relevance: GS III - Industrial Policy

- **In News:** The Cabinet has approved the establishment of a new semiconductor manufacturing unit in Sanand, Gujarat. This unit will have a daily production capacity of 60 lakh chips.
- Additional semiconductor units are also being developed in Dholera, Gujarat, Morigaon, Assam, among other locations, with a total capacity of approximately 7 crore chips per day.

### Focus on Semiconductor Manufacturing in India:

- **Dependency on Imports:**
  - ✓ **Importance of Semiconductors:** Semiconductors are crucial for various modern technologies, including smartphones, medical devices, and vehicles.
  - ✓ **Rising Demand:** The consumption of electronic devices in India has surged, with a significant portion of this demand being met through imports.
  - ✓ **Trade Imbalance:** In 2019, semiconductor exports from India amounted to \$0.33 billion, while imports were considerably higher at \$4.65 billion.
- **Global Supply Chain Diversification:**
  - ✓ **Impact of Pandemic:** The global semiconductor value chain has been disrupted by the pandemic & rising labor costs, leading to a shift in production locations.
  - ✓ **Current Concentration:** Approximately 70% of global semiconductor manufacturing is concentrated in South Korea, Taiwan, China, the United States, and Japan.

### About India Semiconductor Mission (ISM):

- **Overview:**
  - ✓ **Role:** India Semiconductor Mission (ISM) is a dedicated Business Division within the Digital India Corporation, serving as the nodal agency for semiconductor schemes under the Semicon India Programme.
- **Semicon India Programme/Modified Programme:**
  - ✓ **Funding:** Approved with an outlay of ₹76,000 crore, the programme aims to develop the semiconductor and display manufacturing ecosystem in India.
  - ✓ **Support Schemes:** The programme provides financial assistance through various schemes, including:
    - ✓ **Semicon India Future Design:** Design Linked Incentive (DLI) Scheme
    - ✓ **Modified Scheme for Setting Up Display Fabs in India:** Focused on



manufacturing TFT LCD or AMOLED-based display panels

- ✓ Modified Scheme for Setting Up Compound Semiconductors / Silicon Photonics / Sensors Fab, etc.

### Future Developments:

- This strategic move is part of India's broader effort to enhance its semiconductor manufacturing capabilities and reduce dependency on imports, contributing to the development of a robust domestic electronics ecosystem.

## Households are rebuilding financial savings, says RBI Deputy

### Governor Patra

#### Relevance : GS III - Indian Economy

- **In News:** At the recent Financing 3.0 Summit by the Confederation of Indian Industry (CII), the Reserve Bank of India (RBI) Deputy Governor emphasized the gradual recovery of financial savings among Indian households in the post-pandemic period.
- This shift has crucial consequences for the overall economy and the financial sector.



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### Current Trends in Household Savings:

- **Decline During Pandemic:** Household financial savings almost halved from 2020-21 levels due to reduced cautious savings from the pandemic period. There was also a marked shift towards physical assets like real estate.
- **Rebuilding Post-Pandemic:** With increasing incomes post-pandemic, households are now rebuilding financial savings.
- **Rise in Financial Assets:** The portion of financial assets has grown from 10.6% of GDP (2011-17) to 11.5% (2017-23, excluding the pandemic year).
- **Growth in Physical Savings:** Physical savings have exceeded 12% of GDP post-pandemic, though this is still below the 16% seen in 2010-11.
- **Future Outlook:** With ongoing income growth, household financial savings are expected to recover to early 2000s levels, possibly reaching 15% of GDP.

### Impact of Household Savings on the Economy:

- **Interest Rates:**
  - ✓ **Influence on Monetary Policy:** Household savings patterns can affect monetary policy and interest rates. Lower financial savings may lead to

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increased interest rates to encourage more savings, and vice versa.

- **Enhanced Lending Potential:**
  - ✓ **Financial Resilience and Lending:** As households strengthen financially, they are poised to become the main net lenders in the economy, especially amid a likely increase in corporate borrowing.
- **Corporate Sector Borrowing:**
  - ✓ **Decline in Borrowing but Rising Needs:** Although corporate borrowing has reduced recently, future capital expenditure (capex) demands may increase borrowing needs.
  - ✓ **Closing the Financing Gap:** With higher borrowing expectations from the corporate sector, households could play a critical role in bridging the financing gap, supporting economic growth.
- **Economic Stability:**
  - ✓ **Investment Diversification:** More savings in physical assets can diversify investment portfolios and potentially enhance long-term wealth, though it might also restrict liquidity.
- **Implications for External Financing:**
  - ✓ **Reduced Reliance on External Financing:** With a rise in domestic savings, dependency on external financing may decline, but maintaining external debt sustainability will remain vital.
  - ✓ **Changing Financing Landscape:** The composition of external financing could change as the economy's ability to utilize foreign resources evolves.
  - ✓ **Public Sector Borrowing:** Although the public sector's net dissaving has decreased, it remains a net borrower, underlining the need for continuous fiscal support.

### About Household Savings:

- **Definition:** Household (HH) savings in India consist of net financial savings (NFS) and physical savings.
- **Net Financial Savings (NFS):** Calculated by subtracting financial liabilities (annual borrowing) from gross financial savings (GFS).
- **Components of GFS:** Includes currency, bank and non-bank deposits, insurance, provident and pension funds (P&PF), public provident fund (PPF), shares and debentures (S&D), small savings, and others.
- **Physical Savings:** Primarily consists of residential real estate (about two-thirds) and machinery owned by household producers.
- **Savings to GDP Ratio:** Combines the net financial savings to GDP ratio, physical savings to GDP ratio, and savings in gold and ornaments.
- **Shift Towards Riskier Financial Assets:** Increasing investments in riskier assets like stocks and debentures.

- **Preference for Physical Assets:** More savings directed towards physical assets (e.g., real estate) instead of financial instruments.

### Pandemic Impact on Household Savings:

- **Increase in Savings During Pandemic:** Limited spending opportunities led to higher financial savings (Rs 23.3 lakh crore in 2020-21).
- **Surge in Post-Pandemic Spending:** With the easing of restrictions, spending rose, decreasing savings. Households have shifted more savings from financial to physical assets like real estate and gold, reducing net financial savings.
- **Decline in Net Financial Savings:** Dropped to Rs 14.2 lakh crore in 2022-23 from Rs 17.1 lakh crore in 2021-22, a sharp decline from Rs 23.3 lakh crore in 2020-21.
- **Increase in Physical Asset Savings:** Savings in real estate and gold have surged, with physical savings reaching Rs 34.8 lakh crore and gold savings Rs 63,397 crore in 2022-23.
- **Financial Overextension and Reduced Liquidity:** Many households are financially stretched due to high Equated Monthly Instalment (EMI) payments for home purchases, reducing liquidity.
- **Rising Healthcare and Education Costs:** Increasing expenses in these areas have further pressured household savings.
- **Changing Priorities Among Younger Generations:** Preferences for lifestyle and experiences over savings, enabled by easy online shopping and borrowing, contribute to declining savings and rising household debt.

### AgriSURE Fund and Krishi Nivesh Portal

#### Relevance : GS III - Agriculture

- **In News:** Union Agriculture Minister has recently introduced “AgriSURE – Agri Fund for Startups & Rural Enterprises” to provide support to startups in the agriculture sector.
- Alongside this, the Krishi Nivesh Portal has been launched as a centralized platform to assist agricultural investors in accessing benefits from various government schemes.



#### About AgriSURE Fund:

- **Introduction and Purpose:** Announced in the 2022-23 Budget, the AgriSURE Fund aims to promote agricultural startups, particularly in rural regions.

- **Fund Structure:** The AgriSURE Fund will be set up as a Category-II Alternative Investment Fund (AIF) with a corpus of Rs 750 crore. It will provide equity and debt support to agri-startups and rural enterprises.
- **Alternative Investment Fund (AIF):** An AIF is an Indian-incorporated, privately pooled investment vehicle that raises capital from sophisticated investors to invest according to a pre-defined investment strategy.
- **Funding Contributions:** The fund will consist of Rs 250 crore each from the National Bank for Agriculture and Rural Development (NABARD) and the Ministry of Agriculture, along with an additional Rs 250 crore from other sources, including private investors.
- **Fund Management:** NABVENTURES Ltd., a fully-owned subsidiary of NABARD, will manage the investments for the AgriSURE Fund.

### Schemes under the AgriSURE Fund:

- **AgriSURE – Fund of Funds (FoF) Scheme:**
- This scheme is designed to provide financial support to Category I and Category II AIFs that invest in agricultural startups.
- **AgriSURE – Direct Scheme:**
- This initiative focuses on direct equity investments in early-stage startups, providing them with essential capital for growth.

### Importance of the AgriSURE Fund:

- **Encouraging Agricultural Innovation:** The fund aims to stimulate innovation by supporting new agricultural technologies and solutions.
- **Strengthening the Agricultural Value Chain:** It will help optimize the agricultural value chain by enhancing the management of farm produce.
- **Rural Infrastructure Development:** The fund will support the development and improvement of rural infrastructure, crucial for the growth of rural enterprises.
- **Job Creation:** By backing startups and rural enterprises, the fund is expected to generate employment opportunities in rural areas.
- **Promoting IT-Based Solutions:** The initiative will encourage the creation of IT-based solutions to address agricultural challenges and improve productivity.

### About the Krishi Nivesh Portal:

- The Krishi Nivesh Portal is **designed to serve as a comprehensive, integrated, and centralized platform for agricultural investors.** It simplifies access to benefits from various government schemes, helping investors navigate the agricultural investment landscape more easily.



### Challenges Faced by Rural Startups:

- **Limited Access to Finance:** Rural startups often struggle with financial accessibility due to the unwillingness of financial institutions to provide loans and the limited availability of banking services in rural regions.
- **Connectivity and Logistics Issues:** Entrepreneurs frequently face difficulties in obtaining raw materials and other resources due to poor connectivity and logistical challenges in remote areas.
- **Lack of Technological Awareness and Training:** The absence of sufficient technological awareness, training programs, and comprehensive support services hinders the growth of rural startups.

### Centre notifies Galathea Bay as a 'Major Port'

#### Relevance : GS III - Infrastructure

- **In News:** The Central Government has notified the development of a port in Galathea Bay, Andaman & Nicobar Islands, under the authority granted by Section 5 of the Indian Ports Act, 1908. The port is being developed as an International Container Transshipment Port (ICTP).



### Understanding Transshipment Ports:

- A transshipment port acts as a hub where cargo is transferred from one vessel to another for further transportation to its final destination.
- The ICTP at Galathea Bay aims to serve as a major hub in this context.

### Significance of the ICTP at Galathea Bay in Andaman & Nicobar:

- **Economic Importance:**
  - ✓ The ICTP at Galathea Bay is strategically positioned on an international shipping route, which will facilitate EXIM trade (Export-Import trade) for India.
  - ✓ Currently, about 75% of India's transshipped cargo is handled at ports located outside the country, such as Colombo (Sri Lanka), Singapore, and Klang (Malaysia).
  - ✓ Developing this port would lead to substantial foreign exchange savings, attract foreign direct investment (FDI), and increase economic activity at other Indian ports.
- **Strategic Importance:**

- ✓ The proposed transshipment port will be located near critical choke points like the Malacca Strait and along the East-West shipping route, which connects Europe, Africa, and Asia.
- ✓ This location enhances India's strategic positioning in global maritime trade routes.

### Overview of Ports in India:

- **Major and Non-Major Ports:**
- India has a total of 12 major ports and 200 non-major ports (minor ports).
- The major ports in India are regulated under the Major Ports Authority Act, 2021 and fall under the administrative control of the Ministry of Ports, Shipping and Waterways.
- The non-major ports and their concessionaires are regulated by State Maritime Boards under the jurisdiction of respective State Governments.

### Conclusion:

- The development of the International Container Transshipment Port (ICTP) at Galathea Bay represents a significant strategic and economic move by India to boost its maritime trade capabilities.
- By reducing dependency on foreign ports for transshipment, India can achieve significant foreign exchange savings, attract investments, and strengthen its presence in crucial global trade routes.

## Launch of 'Jal Sanchay Jan Bhagidari' Initiative

### Relevance: GS II - Welfare Schemes

- **In News:** Prime Minister has launched the 'Jal Sanchay Jan Bhagidari' Initiative in Surat, Gujarat. This initiative focuses on water conservation with a strong emphasis on community partnership and ownership, driven by a whole-of-society and whole-of-government approach.



### Key Features of the 'Jal Sanchay Jan Bhagidari' Initiative:

- The initiative aims to **construct around 24,800 rainwater harvesting structures through community participation**, ensuring long-term water sustainability across the state.
- It is aligned with the ongoing **Jal Shakti Abhiyan: Catch the Rain** campaign, which promotes water conservation and management efforts across the country.

## Role of Community Participation in Water Conservation:

- **Leveraging Local Knowledge:** The initiative emphasizes the sharing of invaluable local knowledge and insights about water sources, consumption patterns, and environmental dynamics. For example, Nagaland's Zabo Water Conservation Method utilizes community practices for water management.
- **Renovation of Traditional Water Sources:** Revival of traditional water management practices is crucial. For instance, Tamil Nadu has revived kudimaramathu, a centuries-old practice of building and maintaining ponds and tanks with community involvement.
- **Rejuvenating and Revitalizing Water Bodies:** Community participation in desilting and maintaining feeder channels is encouraged, such as Neeru-Chuttu in Andhra Pradesh.
- **Inclusive Water Management Strategies:** Ensures that water management strategies are inclusive and cater to the needs of diverse socio-economic groups. An example is Zing, small tanks in Ladakh that collect melting glacier water.
- **Adoption of Water-Efficient Practices:** Encourages the adoption of water-efficient practices. For instance, the Jal Jeevan Hariyali initiative in Bihar focuses on water conservation and sustainable usage.

## Emphasis on Water Conservation:

- The Prime Minister emphasized the 'Reduce, Reuse, Recharge, and Recycle' mantra to secure the nation's water future.
- He also highlighted that water conservation is not just a policy; it is an effort, a virtue, and a **social commitment**.

## Other Initiatives Promoting Community Participation in Water Conservation:

- **Atal Bhujal Yojana:** Demonstrates community-led sustainable groundwater management to ensure long-term water security.
- **Jal Jeevan Mission:** Focuses on the active involvement of women in paani samitis, recognizing their primary role in water collection and usage in rural households.
- **Ek Ped Maa ke Naam:** Encourages communities to engage in groundwater replenishment through afforestation.
- **Namami Gange Initiative:** Has become an emotional resolution for citizens, where people have given up old traditions to ensure the cleanliness and sustainability of rivers.

## Conclusion:

- The 'Jal Sanchay Jan Bhagidari' Initiative and other community-led water conservation efforts signify the crucial role of local communities in safeguarding



water resources. Through collective action and commitment, these initiatives aim to build a water-secure future for India, ensuring sustainable and inclusive water management practices across the country.

## Maritime State Development Council (MSDC)

### Relevance: GS III - Infrastructure

- In News:** The 20th Maritime State Development Council (MSDC) meeting concluded in Goa, addressing critical issues in the maritime sector, such as the establishment of Places of Refuge for distressed ships and enhancing port security through the development of radioactive detection equipment.



### Key Discussions at the MSDC Meeting:

- Seafarers' Conditions:** The MSDC also focused on improving the conditions for seafarers, advocating for their recognition as essential workers. This initiative aims to facilitate better working conditions for them.
- Challenges in the Maritime Sector:** Emerging challenges like providing safe refuge for distressed ships and improving maritime security were key topics of discussion.

### Key Initiatives Launched at the 20th MSDC:

- Indian Maritime Centre - Policy Think Tank:**
  - ✓ **Objective:** Aimed at uniting siloed maritime stakeholders, this think tank is designed to foster innovation, promote knowledge sharing, and enable strategic planning.
  - ✓ **Purpose:** To drive development in India's maritime sector and ensure holistic growth.
- Indian International Maritime Dispute Resolution Centre:**
  - ✓ **Objective:** Establishing India as a global hub for maritime dispute arbitration.
  - ✓ **Alignment:** This aligns with the "Resolve in India" initiative, offering merit-based, industry-governed solutions.
  - ✓ **Focus:** The center will address the multi-modal, multi-contract, multi-jurisdictional, and multinational aspects of maritime transactions.
- National Safety in Ports Committee Application on National Single Window System Platform:**



- ✓ **Purpose:** This application is introduced to streamline regulatory processes and improve ease of doing business in the maritime sector.
- ✓ **Impact:** It will enhance operational efficiency across ports.
- **State-Led Innovations Showcased:**
  - ✓ **Examples:**
    - Kerala's innovative monetization techniques for dredging.
    - Gujarat's port-driven urban development projects.
  - ✓ **Significance:** These initiatives highlight state-driven advancements that contribute to the broader maritime sector's growth.
- **Construction of India's Largest Dredger:**
  - ✓ **Collaboration:** The construction of India's largest dredger has begun at Cochin Shipyard Limited in partnership with Royal IHC Holland.
  - ✓ **Objective:** To strengthen India's maritime infrastructure capabilities.
- **Mega Shipbuilding Park Plan:**
  - ✓ **Discussion:** A nationwide plan for shipbuilding parks across states was discussed.
  - ✓ **Goal:** This plan seeks to consolidate shipbuilding capabilities across regions to foster efficiency and promote innovation.
- **State Ranking Framework:**
  - ✓ **Objective:** The framework is aimed at promoting healthy competition among coastal states by evaluating performance, encouraging sustainable practices, and enhancing overall maritime efficiency.

### About Maritime State Development Council (MSDC):

- **Constitution:** The MSDC was established in 1997 under the Ministry of Ports, Shipping, and Waterways as the apex advisory body for the development of the maritime sector in India.
- **Mandate:** It is tasked with ensuring the integrated development of major and non-major ports in coordination with state governments.
- **Chairmanship:** The council is chaired by the Union Minister of Ports, Shipping, and Waterways.
- **Meeting Frequency:** The MSDC is required to meet at least once every six months.
- **Key Contributions:** The MSDC has been instrumental in aligning policies and initiatives such as the Indian Ports Bill and the Sagarmala program, aimed at enhancing port-led development in India.

### Conclusion:

- The 20th MSDC meeting in Goa marks significant progress in India's maritime sector, addressing emerging challenges, launching key initiatives, and fostering

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cooperation between central and state governments.

- The discussions on enhancing seafarers' conditions, maritime dispute resolution, and state-led innovations highlight the commitment to sustainable and efficient maritime development in India.

## Decline in Jute Production Due to Natural Calamities

### Relevance: GS III - Agriculture

- **In News:** The National Jute Board has reported that jute production is projected to decline by 20% in FY 2024-25 due to natural calamities, particularly floods that have impacted major jute-growing regions in West Bengal and Assam. Both states play a crucial role in the cultivation of jute, often referred to as the "golden fibre."



### Overview of the Jute Industry:

#### Status of Jute Industry:

- ✓ India is the world's largest producer of jute goods, accounting for around 70% of the estimated global production.
- ✓ The eastern region of India, especially West Bengal, contributes significantly to jute production, with approximately 73% of the national output.
- ✓ A majority of the jute produced, about 90%, is consumed locally within India.

#### Opportunities in the Jute Sector:

- The jute industry provides direct employment to 0.37 million workers in organized mills.
- There is significant export potential for jute products, with Rs 4500 crore expected in annual exports (compared to Rs 3000 crore in 2023-24).

#### Challenges Facing the Jute Industry:

- **Declining Cultivation Area:** The area under jute cultivation has decreased by 1.7 lakh hectares between 2013-14 and 2021-22.
- **Availability of Low-Cost Alternatives:** Synthetic products serve as a cheaper alternative to jute, reducing its demand. Furthermore, there is limited state-level encouragement to procure jute products such as jute geo-textiles.
- **Quality Concerns:** A significant portion of raw jute, more than 80%, is of below-average or poor quality, affecting the overall output and competitiveness of the industry.

- **Other Issues:** Lack of modernization, shortage of skilled labor, and other systemic challenges are prevalent in the jute sector.

### Initiatives for Jute Industry Development:

- **National Jute Board (NJB):** Established under the National Jute Board Act, 2008, the NJB is responsible for the development of jute cultivation, manufacturing, and marketing of jute products.
- **National Jute Development Programme:** An umbrella scheme aimed at the overall development of the jute industry.
- **Production Linked Incentive (PLI) Scheme:** The PLI scheme aims to boost production and encourage investments in the jute sector.
- **Jute Corporation of India (JCI):** The JCI plays a critical role in procurement, price stabilization, and market support for jute growers.
- **Jute Packaging Materials Act, 1987:** This Act mandates the compulsory use of jute packaging materials for various commodities, reinforcing the demand for jute products.
- **Other Initiatives:**
  - ✓ **Jute Mark Logo:** A branding initiative to promote authentic jute products.
  - ✓ **Improved Cultivation and Advanced Retting Exercise (Jute ICARE) Scheme:** Focused on enhancing jute cultivation techniques to improve productivity and quality.

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## RBI Highlights Key Challenges in Financing for Sustainable Agriculture

### Relevance: GS III - Indian Economy

- **In News:** The Reserve Bank of India (RBI) recently brought attention to the challenges of financing sustainable agriculture during an international conference on Sustainable Financing for Food Security and Farm Income. Sustainable agriculture is critical for food security, combating climate change, and preserving natural resources, but financing remains a significant hurdle.



### Issues with Agro-Financing in India:

- **Regional Imbalances:** There are substantial regional disparities in agro-financing. For example, the Southern Region accounts for 47.13% of agricultural credit, whereas the Northeast Region only receives 0.76% of credit (2021-22).



- **Limited Access to Credit:** A significant proportion (around 23%) of agricultural credit comes from non-institutional sources, leaving many farmers without access to formal credit systems (2021-22).
- **Non-Integrated Value Chain Financing:** Fragmentation of land holdings and a lack of integrated value chain financing hinder smooth financial operations for farmers and other stakeholders.
- **Other Issues:** The high cost of finance, lack of collateral, and complicated procedures further exacerbate the difficulties in accessing credit for farmers.

### Solutions Suggested for Sustainable Financing:

- **Increased Role of Collectives:** Farmer Producer Organizations (FPOs) and Farmer Producer Companies (FPCs) can play a crucial role in enhancing farmers' bargaining power, improving access to technology, and securing assured marketing channels.
- **Value Chain Financing:** Integrating various stakeholders such as farmers, aggregators, traders, and processors into a coordinated value chain system can help streamline financing and ensure better financial flow throughout the supply chain.
- **Warehouse Financing:** Warehouse financing can stabilize the prices of agricultural commodities, ensuring better returns for farmers and reducing post-harvest losses.
- **Adoption of Financing Technology:** Expanding irrigation infrastructure, promoting micro-irrigation systems, and increasing farm mechanization through the adoption of advanced financing technology can improve agricultural productivity and sustainability.
- **Capital Formation:** Converging government schemes with interest subventions can help generate capital formation in the agricultural sector, boosting productivity and improving financial sustainability.
- **Leveraging Technology and Data-Driven Insights:** Collaboration with digital platforms to track crop yields and other critical data points can enhance financing models, making them more efficient and accessible to farmers.

### Steps Taken for Financing Agriculture:

- **Kisan Credit Card (KCC):** KCC scheme addresses the working capital needs of farmers by providing them with a flexible and easy credit system.
- **Agricultural Infrastructure Fund (AIF):** The AIF aims to develop farm-gate infrastructure, including processing units and storage facilities, thereby improving agricultural productivity and reducing post-harvest losses.
- **Agricultural Marketing Infrastructure (AMI) Scheme:** Designed for the construction and renovation of godowns and warehouses, providing better storage facilities for agricultural products and stabilizing prices.



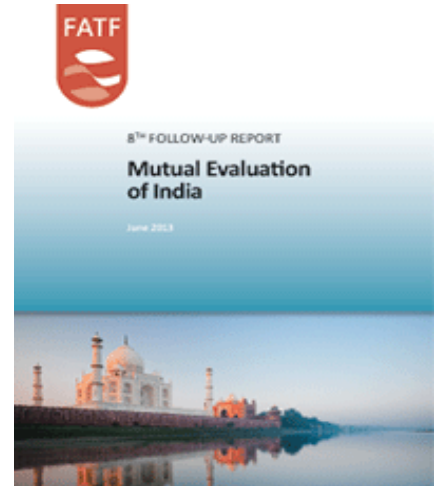


- **Mission Organic Value Chain Development for North Eastern Region (MOVCD-NER):** MOVCD-NER scheme focuses on creating a comprehensive value chain from inputs to consumer markets, boosting exports and ensuring sustainable agricultural practices in the Northeast region.

## FATF Launches Mutual Evaluation Report (MER) for India

### Relevance: GS III - Economy

- **In News:** The Financial Action Task Force (FATF) recently launched the Mutual Evaluation Report (MER) for India, focusing on the country's Anti-Money Laundering (AML) and Counter-Terrorist Financing (CFT) measures. India has been placed in the 'regular follow-up' category, reflecting its effective compliance with FATF standards.



### Key Highlights of the Report:

- **Key Areas of Improvement:** The report identifies several areas where India can enhance its AML and CFT efforts, including:
  - ✓ A deeper understanding of Money Laundering (ML) and Terror Financing (TF) risks.
  - ✓ Improved national coordination and cooperation among agencies.
  - ✓ More effective use of financial intelligence for ML-related investigations.
  - ✓ Better investigation of predicate offences and terror financing cases.
- **Main Sources of Money Laundering:** The report highlights that the primary sources of money laundering in India stem from illegal activities committed within the country, such as:
  - ✓ Cyber-enabled fraud.
  - ✓ Corruption.
  - ✓ Drug trafficking.
- **Security Threats:** Significant terror threats facing India include:
  - ✓ Islamic State and al-Qaeda linked groups operating in and around Jammu and Kashmir.
  - ✓ Regional insurgencies in the Northeast and North India.
  - ✓ Left-Wing Extremist groups also pose threats to national security.
- **Issues in Implementation of PMLA:**
  - ✓ Despite an increase in investigations under the Prevention of Money Laundering Act (PMLA), the report points out that the number of prosecution complaints and concluded trials has not increased proportionately.

**Key Recommendations from FATF:**

- **Targeted Financial Sanctions:** The report recommends implementing targeted financial sanctions to ensure the freezing of funds and assets without delay in cases of terror financing and money laundering.
- **Defining Domestic Politically Exposed Persons (PEPs):** FATF advises that domestic PEPs should be defined under the PMLA. Currently, the PMLA only defines foreign PEPs.
- **Protecting Non-Profit Organisations (NPOs):** The report highlights the need to protect NPOs from the risk of being abused for terrorist financing through risk-based enhanced measures.

**What is the Mutual Evaluation Report (MER)?**

- **Definition:** The MER is an assessment of a country's measures to combat money laundering, terror financing, and the proliferation of weapons of mass destruction.
- **India's Status:** India is placed in the top 'regular follow-up' category along with four other G20 countries (UK, France, Italy, and suspended Russia). This status means India will submit reports every three years. Most developing countries are placed in the 'enhanced follow-up' category, which requires annual reports.

**Work-Life Balance Concerns in India Emerge After Ernst & Young Employee's Death****Relevance: GS III - Employment**

- **In News:** The unfortunate passing of an employee from Ernst & Young has triggered widespread concern over the state of work-life balance in India.
- According to the International Labour Organization (ILO), India is now categorized among the most overburdened nations in terms of working hours globally.

**Key Observations by ILO:**

- India ranks second globally, following Bhutan, in terms of the percentage of workers clocking **49 or more hours per week**, with 51% of its workforce engaged for extended hours.
- Comparatively, Pacific Island nations such as Vanuatu, Kiribati, and Micronesia report much lower average working hours, around 24.7, 27.3, and 30.4 hours per week, respectively.

- On average, **Indian employees work 46.7 hours per week**, contributing to heightened stress and strain on the workforce.

### Underlying Causes of Poor Work-Life Balance:

- **Remote Work and Advancements in Technology:** The growth of technology coupled with the onset of the Covid-19 pandemic has given rise to remote working arrangements, leading to unregulated and extended working hours, eroding personal time.
- **Gender Disparities in Domestic Duties:** A mere 32% of women reported managing to maintain a healthy work-life balance, as revealed by IIM-Ahmedabad, showcasing the unequal distribution of household responsibilities and the added pressure on women.
- **Focus on Time Instead of Output:** In India's corporate culture, the focus remains on monitoring work hours rather than evaluating actual performance, driving the trend of excessively long working days.
- **Irregular Work Hours in the Informal Economy:** The informal sector faces even greater challenges, with unequal distribution of work hours, exacerbating the imbalance in work-life schedules for many workers.

### Consequences of Extended Working Hours:

- **Health Concerns:** Prolonged working hours increase the risk of health issues such as stroke, heightened stress levels, and overall detriments to mental well-being.
- **Reduced Productivity:** Overworked employees can lead to diminished productivity, resulting in increased absenteeism and ultimately, lower output for enterprises.
- **Social Isolation:** Long working hours also contribute to less participation in community and civic activities, reducing the time available for social engagement and personal fulfillment.

### Legal Framework Governing Working Hours:

- **ILO's Hours of Work (Industry) Convention, 1919**
  - ✓ As per this convention, the working hours for employees must not exceed 8 hours per day and 48 hours per week.
- **Indian Factories Act, 1948**
  - ✓ This law stipulates that no adult worker is permitted to work more than 48 hours in any given week.
- **Weekly Holidays Act, 1942**
  - ✓ This act ensures that employees are provided with mandatory weekly holidays to promote rest and recovery.



## ICAR-National Institute of Secondary Agriculture (NISA)

**Relevance: GS III - Agriculture**

- **In News:** 100 years of establishment of Indian Council of Agricultural Research (ICAR)-National Institute of Secondary Agriculture (NISA).

**Historical Context:**

- ICAR-NISA was originally founded in 1924 as the Indian Institute of Natural Resins and Gums in Ranchi, Jharkhand.
- It was renamed as ICAR-NISA in 2022 and operates under the Ministry of Agriculture and Farmers' Welfare.

**Understanding Secondary Agriculture:****Definition:**

- ✓ Secondary agriculture refers to the value addition of primary agricultural products and related activities such as beekeeping, poultry farming, and agricultural tourism.
- ✓ It encompasses all processes that convert agricultural produce, residues, and by-products into high-value commodities for uses in pharmaceuticals, industry, medicine, and specified food applications.

**Scope:**

- ✓ The term covers a wide range of activities, including both food and non-food processing.

**Examples include:**

- Extraction of vitamins from grains.
- Oil production from rice bran.
- Jaggery production from sugarcane.
- Cottage industries that manufacture jams, pickles, and other products.

**Growth Potential of Secondary Agriculture:**

- **Consumer Demand:** There is increasing demand for value-added products such as ready-to-eat and functional foods.
- **Utilization of Unconventional Resources:** The need for using unconventional renewable agro-bio resources is growing.
- **Abundance of Agricultural By-products:** Large quantities of agricultural residues offer significant potential for value addition.



**Significance of Secondary Agriculture:**

- **Environmental Sustainability:** Proper utilization of crop residues and agricultural waste helps to prevent burning or dumping, reducing environmental pollution.
- **Economic Benefits for Farmers:** Activities such as beekeeping and lac culture can provide better economic returns to farmers, boosting their income.
- **Value Addition:** Processing agricultural products increases shelf life and enhances total productivity, making these products more marketable.
- **Promotion of Cottage Industry:** Secondary agriculture supports rural and cottage industries by incorporating technology and promoting small-scale industries in rural areas.

**Challenges Faced by Secondary Agriculture:**

- **Nascent Stage of Industries:** Industries producing high-value products from agricultural residues, such as Active Pharmaceutical Ingredients (APIs), are still in their early stages of development.
- **Fragmented Land Holdings:** Small landholdings in India create challenges in the collection and aggregation of crop residues, limiting the efficiency of secondary agriculture processes.
- **Limited Research:** A significant challenge is the lack of research into appropriate technologies for processing agricultural by-products.
- **Lack of Farmer Awareness:** Farmers are often unaware of the potential for processing agricultural waste, which hinders the growth of secondary agriculture.

**Priority Sector Lending (PSL) & its Impact on Bank Asset Quality****Relevance: GS III - Economy**

- **In News:** A recent study conducted by RBI economists analyzing bank-level data between March 2006 and March 2023 has shown that lending to the priority sector improves the overall asset quality of banks.

**PRIORITY  
SECTOR  
LENDING  
(PSL)****Background of Priority Sector Lending (PSL):**

- PSL was established in 1972 with the **aim of facilitating the flow of credit to sectors that, despite being creditworthy, face difficulties in accessing formal financial institutions.**

### Key Findings of the RBI Study:

- **Improved Asset Quality:** The study reveals that PSL growth positively influences the asset quality of banks, suggesting that banks lending to priority sectors experience overall improvement in their asset quality.
- **Niche Development in PSL Segments:** Since the introduction of Priority Sector Lending Certificates (PSLCs), the share of PSL in total bank credit has risen. This enables certain banks to specialize in particular PSL segments, further strengthening their lending strategies.
- **Achievement of PSL Targets:** The lending targets set for priority sectors have been consistently met, with banks surpassing the 40% target across different periods and categories. Particularly, Public Sector Banks (PSBs) have consistently achieved their 18% target for agricultural lending.

### Overview of Priority Sector Lending (PSL):

- **Objective:** The core purpose of PSL is to ensure that the vulnerable sections of society and underdeveloped regions are granted access to credit, thereby promoting inclusive growth.
- **PSL Targets:** Banks are mandated to allocate a specific portion of their Adjusted Net Bank Credit (ANBC) or Credit Equivalent of Off-Balance Sheet Exposure (CEOBE), whichever is higher, towards PSL.
  - ✓ For Scheduled Commercial Banks and foreign banks with over 20 branches, the PSL target is 40%.
  - ✓ For Regional Rural Banks (RRBs) and Small Finance Banks (SFBs), the target is 75%.
  - ✓ Urban Cooperative Banks (UCBs) must allocate 65% to PSL in FY 2024-25, which will increase to 75% by FY 2025-26.

### Conclusion:

- Priority Sector Lending (PSL) plays a pivotal role in improving the asset quality of banks by channeling credit towards creditworthy but underserved sectors.
- By enabling banks to specialize in certain PSL segments and consistently meet lending targets, PSL ensures that vulnerable communities and underdeveloped regions gain access to essential financial resources, fostering inclusive growth in the economy.

## Make in India Initiative: A Decade of Transformation

### Relevance: GS III - Economy

- **In News:** The Make in India initiative recently marked the 10th anniversary of its launch, celebrating a decade of efforts to position India as a global manufacturing hub.
- Launched in 2014, the initiative aimed to boost India's manufacturing sector and attract foreign investments.



### About Make in India:

- **Objective** The primary goals of the Make in India initiative are to:
  - ✓ Facilitate investment, Foster innovation, Enhance skill development, Protect intellectual property, Develop world-class manufacturing infrastructure
- **Four Pillars of the Initiative:**
  - ✓ **New Processes:** Focuses on improving the ease of doing business to promote entrepreneurship.
  - ✓ **New Infrastructure:** Aims to provide state-of-the-art infrastructure to support manufacturing.
  - ✓ **New Sectors:** Identifies 27 sectors (under Make in India 2.0) across manufacturing, infrastructure, and service activities.
  - ✓ **New Mindset:** Encourages the government to act as a facilitator rather than a regulator.

### Impact of the Make in India Initiative:

- **Foreign Direct Investment (FDI):** The initiative has attracted an FDI inflow of \$667.4 billion between 2014-2024, marking a 119% increase compared to the previous decade (2004-2014).
- **Employment:** Employment in manufacturing sector has risen from 57 million in 2017-18 to 64.4 million in 2022-23, reflecting growth of sector.
- **Exports:** India's merchandise exports crossed the \$437 billion mark in the FY 2023-24, highlighting the initiative's success in boosting exports.
- **Ease of Doing Business:** India has seen a significant improvement in its World Bank Doing Business Report ranking, rising from 142nd in 2014 to 63rd in 2019.

### Sector-Wise Success Stories:

- **Transportation:** The Vande Bharat Express Train is a notable example of India's achievements in the transportation sector under Make in India.

- **Defence Manufacturing:** India's first domestically manufactured aircraft carrier, INS Vikrant, exemplifies the country's progress in the defence manufacturing sector.
- **Electronics:** The Samsung factory in Noida, the world's largest mobile factory, symbolizes the success of Make in India in the electronics sector.

### Key Reforms to Facilitate Implementation:

- **Semiconductor Ecosystem Development:** The Semicon India Program is an essential reform aimed at building a semiconductor ecosystem in India.
- **National Single Window System (NSWS):** A digital platform that streamlines investor clearances, enabling quicker approval processes.
- **PM Gati Shakti:** This GIS-based platform improves infrastructure planning and reduces logistics costs, supporting efficient manufacturing and distribution.
- **National Logistics Policy (NLP), 2022:** The policy aims to lower logistics costs and enhance efficiency across sectors, further boosting India's manufacturing capabilities.
- **Other Initiatives:** The One-District-One-Product (ODOP) scheme, Industrial Corridors, and other related projects support regional manufacturing and sectoral development.

## India's Growth Trajectory: A Multi-Sectoral Overview

### Relevance : GS III - Economy

- **In News:** The Ministry of Information & Broadcasting recently published a comprehensive report providing a detailed overview of the Indian economy's current state and multi-sectoral progress.



### Expansion of Financial Markets:

- **Unparalleled Growth in Financial Markets:** India's financial sector is witnessing remarkable growth, drawing significant attention from international investors. The nation's economic potential is closely linked to its market liquidity and valuation trends.
  - ✓ **Stock Market Growth:** India has now emerged as the 4th largest stock market globally, with daily cash-trading volumes tripling since the pre-pandemic period.
  - ✓ **Foreign Investment Surge:** The abundant liquidity in the retail sector is expected to attract additional international investments, enhancing India's financial position.



- ✓ **Foreign Portfolio Investment (FPI):** Despite a slight slowdown in recent FPI inflows, India's high-yielding markets and robust growth prospects continue to attract substantial investment. In FY 2023-24, FPI inflows totaled ₹3,39,066 crore.
- ✓ **Significance:** The continuous inflow of foreign capital underscores the resilience and appeal of India's financial markets.
- ✓ **IPOs on the Rise:** The number of Initial Public Offerings (IPOs) increased by 66% in FY24, growing from 164 in FY23 to 272 in FY24, demonstrating India's growing significance within the global financial landscape.
- ✓ **Collaborative Market Approach:** Global corporations are increasingly seeking partnerships with domestic enterprises to capitalize on India's unique business environment.

### Performance of Manufacturing and Services Sectors:

- **India's Dual Role: Global Service Leader and Manufacturing Powerhouse:** India, while renowned for its dominant service sector, is emerging as a formidable player in global manufacturing.
  - ✓ **Preferred Investment Hub:** Government-led reforms aimed at boosting domestic production capacity and attracting Foreign Direct Investment (FDI) have established India as a top choice for companies looking to diversify their global supply chains.
  - ✓ **Global Manufacturing Power:** The Make in India initiative has successfully positioned India as a manufacturing leader, strengthening industrial capabilities, driving innovation, and creating world-class infrastructure.
  - ✓ **PLI Schemes:** The Production Linked Incentive (PLI) schemes introduced in 14 strategic sectors have played a pivotal role in attracting investment in advanced technology and enhancing global competitiveness.
  - ✓ **FDI Inflows:** In FY 2023-24, total FDI inflows amounted to \$70.95 billion, with equity inflows reaching \$44.42 billion.
  - ✓ **Ease of Doing Business (EoDB):** India has made significant strides in improving its business environment, moving from 142nd in 2014 to 63rd in the World Bank's Doing Business Report (DBR) 2020. This progress reflects the government's consistent efforts to simplify regulations, minimize bureaucratic red tape, and create a more business-friendly landscape.
  - ✓ **Service Sector Excellence:** India continues to lead sectors such as Information Technology (IT), cloud computing, and data analytics, cementing its status as a global hub for knowledge-based services.

### Digital India and Technological Advancements:

- **India's Digital Transformation:** India's digital economy is among the fastest-growing worldwide, reshaping the nation's technological and economic



structure.

- ✓ **Impact of Digital India Initiative:** The Digital India initiative has expanded internet access and improved the country's digital infrastructure. The number of internet subscribers has grown from 25.1 crore in March 2014 to 95.4 crore in March 2024.
- ✓ **Surge in Digital Payments:** Digital transactions have skyrocketed, powered by the Unified Payments Interface (UPI) system. Currently, 46% of global real-time payment transactions are processed in India, with UPI facilitating transactions worth nearly ₹81 lakh crore between April and July 2024.
- ✓ **Sectoral Integration:** The adoption of digital technologies across key sectors like agriculture, healthcare, and education has boosted efficiency and improved service delivery.
- ✓ **Digital Investment Drivers:** India's advancements in fields such as Artificial Intelligence (AI), blockchain, and data science are driving economic expansion and attracting significant global investment.
- ✓ **IndiaAI Mission:** The IndiaAI Mission aims to build a robust AI ecosystem by democratizing computing power, improving data quality, and fostering local AI capabilities. Key initiatives like IndiaAI Compute Capacity, IndiaAI Innovation Centre, and AI Startup Funding are set to boost AI innovation over the next five years.

### Leveraging Demographic Dividend and Geopolitical Strength:

- **Harnessing the Demographic Dividend**
  - ✓ India's young population presents a tremendous opportunity for future growth. With 65% of the population under 35, the country's workforce can be leveraged for the next three decades.
- **Government Initiatives for Demographic Dividend:**
  - ✓ Pradhan Mantri Kaushal Vikas Yojana
  - ✓ Craftsmen Training Scheme
  - ✓ Jan Shikshan Sansthan
- **National Apprenticeship Promotion Scheme:**
  - ✓ **Aligning with Economic Reforms:** The integration of the demographic advantage with ongoing economic initiatives will be crucial to ensuring long-term prosperity.
- **Geopolitical Positioning and Strategic Importance:**
  - ✓ India's geopolitical role has become increasingly important in influencing its economic trajectory.
- **Regional Influence:** India's position as a stabilizing force in South Asia, coupled with its growing engagement with major world powers, has elevated its strategic importance.

- **Multilateral Influence:** India's active involvement in global forums such as the G20, Quad, and BRICS has bolstered its global standing on key issues such as climate change and international security.
- **G20 Presidency:** India's leadership of the G20 was marked by inclusivity, ambition, action-oriented policies, and decisiveness. These principles were reflected in the New Delhi Leaders' Declaration, which received unanimous approval from all G20 members.

### Conclusion:

- India's economic trajectory showcases its growing financial markets, manufacturing strength, digital transformation, and geopolitical significance.
- With a large youthful workforce and well-timed reforms, India is cementing its position as a global economic leader and an attractive destination for foreign investment and technological advancements.

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## India's Defense Diplomacy Intensifies with a Series of Exercises

**Relevance: GS III - Defence Sector**

- **In News:** India's defense diplomacy has gained considerable momentum recently, marked by a series of successive military exercises involving nations worldwide.
- These drills encompass all three branches of the Indian Armed Forces—Army, Navy, and Air Force.

**Understanding Defense Diplomacy:**

- **Definition:** Also termed as Military Diplomacy, this concept involves utilizing defense assets and capabilities to achieve foreign policy objectives peacefully.
- **India's Approach:** India leverages defense diplomacy through various means, such as participating in UN peacekeeping operations, offering humanitarian assistance, and conducting joint military exercises.

**Key Aspects of Defense Diplomacy:**

- **Building Trust and Confidence:**
  - ✓ Regular military dialogues and exchanges are crucial in reducing mutual suspicion among nations, thereby lowering the chances of conflicts.
- **Strengthening Alliances and Partnerships:**
  - ✓ Defense cooperation agreements, technology sharing, and joint exercises enhance bilateral and multilateral ties. For instance, the QUAD Security Dialogue fosters collaboration in the Indo-Pacific security framework.
- **Defense Modernization and Capability Enhancement:**
  - ✓ Defense diplomacy also supports technology transfers, knowledge sharing, and training programs. A notable example is the joint development of BrahMos missiles by India and Russia, highlighting technological cooperation.
- **Other Advantages:**



- ✓ Strategic balancing in geopolitically sensitive regions and bolstering soft power through humanitarian aid and disaster relief efforts.

### Challenges in India's Defense Diplomacy:

- **Balancing Strategic Alliances:** Managing relationships with major global powers like the United States and Russia demands a careful balancing act.
- **Perception Concerns:** India's influence in South Asia is sometimes viewed with suspicion, creating a "Big Brother" image among its neighbors.
- **Capability Constraints:** There is a need for further development in domestic manufacturing capabilities to support defense modernization and technological advancement.
- **India's Active Engagements:** India's recent endeavors, including military exercises, capacity-building measures, and peacekeeping missions, underscore its commitment to enhancing security cooperation. These activities are vital for shaping the future security landscape of the Indo-Pacific region and beyond.

### Recent and Upcoming Military Exercises:

- **Yudh Abhyas:** A bilateral Army exercise between India and the United States, scheduled to begin at the Mahajan field firing ranges in Rajasthan.
- **Tarang Shakti:** A multilateral Air Force exercise involving nations such as Australia, Greece, Sri Lanka, the UAE, Japan, Singapore, the US, and others.
- **Malabar Naval Exercise:** Planned to take place off the Visakhapatnam coast in October 2024, this naval drill includes India, Australia, Japan, and the US.
- **Indra:** A bilateral military exercise between the Indian & Russian armed forces.

## Indian Navy Enhances Anti-Submarine Warfare Capabilities with New Launches

### Relevance : GS III - Defence Sector

- **In News:** To bolster its anti-submarine warfare (ASW) capabilities, the Indian Navy has recently launched the fourth and fifth ships under its 8 Anti-Submarine Warfare Shallow Water Craft (ASW-SWC) project. Named INS Malpe and INS Mulki, these vessels were built by Cochin Shipyard Limited (CSL), Kochi.



## About Anti-Submarine Warfare Shallow Water Craft (ASW-SWC):

- **Capabilities:** The ASW-SWC vessels are designed to perform a range of tasks, including anti-submarine operations in coastal waters, low-intensity maritime operations (LIMO), and mine-laying operations.
- **Details on the Newly Launched ASW-SWC Ships:**
  - ✓ **Contract with Cochin Shipyard Limited (CSL):** The newly launched shallow water crafts are part of a contract with CSL for the construction of eight ASW-SWCs. These ships are intended to replace the aging Abhay-class ASW Corvettes currently in service with the Indian Navy.
  - ✓ **Mahe-Class Vessels:** INS Malpe and INS Mulki are the 4th and 5th ASW-SWC of the Mahe-class vessels being built by CSL. Earlier vessels in this class include INS Mahe, INS Malvan, and INS Mangrol.

## Understanding Anti-Submarine Warfare (ASW):

- ✓ **Definition:** ASW is a military strategy that involves the use of aircraft, surface warships, and submarines to locate, track, and neutralize enemy submarines.

## India's Anti-Submarine Warfare Capabilities:

- **Kamorta Class Ships:** These are frontline warships with stealth capabilities and a low signature of radiated underwater noise, enhancing ASW operations. Examples include INS Kamorta and INS Kadmatt.
- **Integrated ASW Defence Suites (IADS):** These suites are designed for underwater detection and protection against threats. The development is in partnership with Mahindra Defence Systems Limited.
- **Maritime Patrol and Reconnaissance Aircraft:** India employs the Boeing P-8I (Poseidon) aircraft for maritime patrol and reconnaissance missions, enhancing its ASW capabilities.
- **ASW Helicopters:** The Indian Navy uses MH-60R Seahawk multi-role helicopters, which are specially equipped for ASW operations.
- **SMART System:** The Supersonic Missile-Assisted Release of Torpedo (SMART) is a missile-based lightweight torpedo delivery system developed by the Defence Research and Development Organisation (DRDO).

## Significance of ASW Capabilities:

- **Geopolitical Context:** Given India's vast coastline, strategic location, and the presence of nuclear-armed submarines in the Indian Ocean region, enhancing

maritime security is crucial.

- **Emerging Threats:** The growing presence of extra-regional powers & advancements in submarine technology pose increasing threats to India's security.
- **Other Significances:**
  - ✓ **Promoting Atma Nirbharta (Self-Reliance) in Shipbuilding:** The development and commissioning of indigenous ASW vessels reflect India's commitment to self-reliance in defense production.
  - ✓ **Participation in Multilateral Naval Exercises:** Enhanced ASW capabilities allow for more meaningful participation in regional & global naval exercises.
  - ✓ **Strengthening Strategic Partnerships:** With improved naval capabilities, India can better support & strengthen its strategic partnerships with allied nations.

## Robotic Mule & Peak Pods: Enhancing Military Capabilities in Challenging Terrains

### Relevance : GS III - Defence Sector

- **In News:** The Indian Army has recently inducted robotic mules to enhance its logistical and operational capabilities.
- Additionally, drones and high-altitude tents are being evaluated for deployment in extreme conditions.



### Robotic Mule: Multi-Utility Legged Equipment (MULE):

- **Design:**
  - ✓ The robotic mule, referred to as Multi-Utility Legged Equipment (MULE), is a dog-shaped robot engineered to assist with surveillance and the transportation of light loads in difficult terrain.
  - ✓ **Mobility:** It can navigate obstacles such as stairs, steep hills, and other complex surfaces with ease.
- **Temperature Tolerance:**
  - The robotic mule is designed to operate in extreme temperature conditions:
    - ✓ **Range:** From  $-40^{\circ}\text{C}$  to  $+55^{\circ}\text{C}$ , ensuring functionality in both freezing and scorching environments.
- **Payload Capacity:**

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- ✓ **Load-Bearing:** The MULE can carry loads up to 15 kg, making it suitable for transporting essential supplies across rough terrain.
- **Endurance:**
  - ✓ **High Endurance:** Built for prolonged operations, the robotic mule exhibits remarkable endurance and is capable of lasting up to 3 years of continuous use.
  - ✓ **Agility and Durability:** Its design makes it an agile, all-weather ground robot, ideal for unpredictable environments.
- **Waterproof and Sensing Capabilities:**
  - ✓ **Waterproof:** The MULE is capable of traversing water bodies and crossing rivers, enhancing its utility in varied terrains.
  - ✓ **Sensing Technology:** Equipped with electro-optics and infrared sensors, it can detect and recognize objects around it, contributing to its effectiveness in surveillance tasks.
- **Control Mechanism:**
- The MULE offers flexibility in its control:
  - ✓ **Remote Control:** It can be operated with a user-friendly remote control.
  - ✓ **Wireless Control:** Additionally, it can function through Wi-Fi or Long-Term Evolution (LTE), offering versatility in communication.
- **Mission Programming:**
  - ✓ **Pre-Fed Missions:** The MULE can be programmed to follow pre-defined waypoints or recorded missions, making it efficient in executing pre-set tasks without constant monitoring.
- **Combat Integration:**
  - ✓ **Small Arms Integration:** The MULE can also be equipped with small arms, enhancing its role in combat operations.

### Peak Pods: Advanced High-Altitude Habitat:

- **Introduction:**
  - ✓ DTECH 360 Innovations has introduced Peak Pods, an advanced high-altitude habitat designed to provide shelter in sub-zero conditions.
- **Temperature Control:**
  - ✓ **Cutting-Edge Technology:** Even in extreme cold environments, where outside temperatures reach  $-40^{\circ}\text{C}$ , the Peak Pods can maintain an internal temperature of  $15^{\circ}\text{C}$ .



- **Fuel-Free Operation:**
  - ✓ **Energy Efficient:** The Peak Pods do not require any fuel or electricity, making them a self-sustained option for harsh environments.
- **In-Built Bio-Toilets:**
  - ✓ **Sanitation:** The Peak Pods are equipped with bio-toilet facilities, ensuring sanitation in remote areas, crucial for military personnel stationed in high altitudes.
- **Deployment and Mobility:**
  - ✓ **Rapid Deployment:** The Peak Pods are easily deployable, breaking down into 30 kg blocks, facilitating swift assembly and dismantling.
  - ✓ **Versatile Use:** These pods are ideal for military bases, research stations, disaster relief camps, adventure tourism, and even fast-track hospitals in challenging terrains.

### Conclusion:

- The induction of robotic mules and the introduction of Peak Pods mark significant strides in improving India's military efficiency and preparedness in high-altitude and extreme weather conditions.
- With enhanced mobility, endurance, and adaptability, these innovations ensure that military personnel are well-equipped to handle logistical challenges in the most demanding environments.

### Grenade-Bearing Drones Target Parts of Manipur

#### Relevance: GS III - Internal Security

- **In News:** The Manipur police have established a high-level committee to investigate the recent grenade bomb attacks carried out by drones and to develop effective countermeasures.



#### About Drone Technology:

- Drone technology involves the use of unmanned aerial vehicles (UAVs), commonly known as drones, which can be operated remotely or autonomously.

#### Security Implications of Drone Technology:

- **Drone Terrorism:**
  - ✓ **Attractiveness to Terrorists:** The affordability, maneuverability, and

payload capacity of drones make them appealing for use by terrorist organizations.

- **Surveillance and Intelligence Gathering:**
  - ✓ **Monitoring Capabilities:** Drones are employed to surveil military installations, border regions, and sensitive government facilities.
- **Disruption of Critical Infrastructure:**
  - ✓ **Cyber and Physical Attacks:** Drones can be used to execute cyber-attacks, electronic jamming, or physical assaults on infrastructure networks.
- **Cross-Border Smuggling and Trafficking:**
  - ✓ **Illegal Activities:** Drones facilitate the smuggling of contraband, narcotics, and weapons. For instance, Pakistan uses drones to smuggle improvised explosives, weapons, and drugs.
- **Privacy Concerns:**
  - ✓ **Surveillance Issues:** Drones equipped with cameras raise significant privacy and security concerns for individuals and sensitive facilities, including nuclear plants.

### Mitigating Drone-Related Threats:

- **Counter-Drone Technology:**
  - ✓ **Neutralization Measures:** Implement systems to neutralize unauthorized or malicious drones.
- **Enhance Capacity Building:**
  - ✓ **Security Training:** Focus on training security forces in drone detection, identification, and response.
- **Public-Private Partnerships:**
  - ✓ **Development of Indigenous Technology:** Foster partnerships to advance domestic drone technology and strengthen national capabilities.

### Drone Regulations & Initiatives in India:

- **Drone Rules 2021:**
  - ✓ **Airspace Classification:** The rules categorize Indian airspace into three zones—Green, Yellow, and Red—based on the acceptability of drone operations.
- **Drone Import Policy 2022:**
  - ✓ **Import Restrictions:** Bans the import of foreign drones while easing the import of drone components.

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### • Anti-Drone System:

- ✓ **Indrajaal:** India's first AI-powered anti-drone system designed to counter unauthorized drone activities.

### PLI Scheme for Drones and Drone Components:

- **Production Incentives:** A scheme to promote the production of drones and drone components domestically.

## Centre and Tripura Ink Agreement with Two Insurgent Groups

### Relevance : GS III - Internal Security

- **In News:** The Central Government, along with the Tripura state government, has recently signed a peace accord with two prominent insurgent groups, the National Liberation Front of Tripura (NLFT) and the All Tripura Tiger Force (ATTF), to bring an end to decades of conflict and violence in the state.



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### Overview of the Peace Accord:

- **Resolution of a 35-Year Conflict:** The accord aims to end a 35-year-long period of conflict in Tripura, with all parties agreeing to renounce violence and focus on the state's development and progress.

### Key Components of the Peace Accord:

- **Rehabilitation of Armed Members:** Over 328 armed members of the NLFT and ATTF will surrender their weapons and reintegrate into society.
- **Financial Assistance Package:** A special financial package of Rs 250 crore has been approved to facilitate the development of Tripura's tribal communities.
- **Part of a Larger Peace Effort:** This peace deal is a segment of a broader initiative aimed at ensuring stability in the Northeast region. Between 2014 and 2024, twelve significant agreements have been signed, three of which involve Tripura.

### Importance of the Peace Agreement:

- **Restoring Stability:** The commitment of the armed groups to cease violence represents a crucial move toward establishing peace and stability in Tripura,

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disrupting the cycle of violence and creating a safer environment for progress.

- **Mainstream Reintegration:** The accord provides a framework for former insurgents to join mainstream society, addressing issues of marginalization and exclusion among tribal communities and allowing them to contribute positively.
- **Development Focus:** The Central Government's approval of a special development package for Tripura's tribal communities highlights its focus on socio-economic growth as a strategy to prevent future conflicts.
- **Cultural Conservation:** The agreement stresses preserving the cultural traditions, languages, and identities of tribal groups in the Northeast, promoting a sense of inclusion and unity among these populations.

### Background on NLFT and ATTF:

- **National Liberation Front of Tripura (NLFT):** Formed in 1989 with the goal of establishing an 'independent' Tripura through armed conflict. It was banned in April 1997 under the Unlawful Activities (Prevention) Act, 1967, and later under the Prevention of Terrorism Act (POTA), 2002. The NLFT split into two factions in 2001, led by Biswamohan Debbarma and Nayanbasi Jamatiya, respectively.
- **All Tripura Tiger Force (ATTF):** Established in 1990, ATTF demands the removal of illegal migrants from electoral rolls and the implementation of the 1949 Tripura Merger Agreement. It operated in the North and South Tripura districts and was banned in April 1997 under the Unlawful Activities (Prevention) Act, 1967.

### Causes of Insurgency in Northeast India:

- **Inter-Tribal Disputes:** Changes in the religious demographics of tribal groups, particularly the Jamatias, have intensified inter-tribal conflicts, adding to existing tribal and non-tribal tensions.
- **Demographic Shifts:** Mass migration from East Pakistan (now Bangladesh) after 1947 transformed Tripura's demographic composition from a tribal-majority area to one dominated by Bengali-speaking people, causing unrest among indigenous tribes.
- **Impact of Mizoram Insurgency:** Tripura's proximity to Mizoram exposed it to the ripple effects of the insurgency, further aggravating local tensions.
- **Formation of Militant Groups:** Discontent over land rights and demographic changes led to the creation of insurgent groups like the Tripura Upajati Juba Samiti (TUJS) in 1971, Tripura National Volunteers (TNV) in 1981, and NLFT in 1989, escalating the insurgency.



- **Economic Challenges:** Limited economic opportunities and lack of development in the Northeast, especially for the youth, have led to widespread poverty and unemployment, driving recruitment by insurgent groups as a means of livelihood and social status.
- **Geographical Issues:** The Northeast region, including Tripura, shares 98% of its borders with neighboring countries, resulting in weak geographical ties with the rest of India. The region's population, which is only 3% of the national total, grew by over 200% from 1951 to 2001, straining livelihoods and land resources.
- **Loss of Tribal Land:** Tribal people lost their agricultural lands, often sold at minimal prices, pushing them into forests and leading to widespread resentment and tensions. This deprivation of land became a major driver of insurgency.
- **Political Exclusion:** The ethnic communities in Northeast India, including Tripura, often feel neglected by the Central Government due to geographic distance and limited political representation, fueling demands for autonomy or independence to safeguard their cultural identity and resources.

### Government Strategies to Foster Peace in Northeast India:

- The government has engaged in negotiations and signed several peace accords with insurgent groups, resulting in the disarmament of militants and the formation of autonomous councils. The recent peace deal with the NLFT and ATTF is a significant example.
- **Notable Agreements:**
  - ✓ Naga Peace Accord: The ceasefire between the Government of India and the National Socialist Council of Nagaland (NSCN-K)/Niki group has been extended for another year, from September 2024 to September 2025.
  - ✓ Assam-Meghalaya Boundary Agreement (2022): Resolves disputes in 6 sectors, allocating 18.51 sq. km to Assam and 18.28 sq. km to Meghalaya.
  - ✓ Karbi Anglong Agreement (2021)
  - ✓ Bodo Accord (2020)
  - ✓ Bru-Reang Agreement (2020)
  - ✓ NLFT-Tripura Agreement (2019)
- **Developmental Initiatives:** The government has concentrated on infrastructure, economic, and skill development in the Northeast region with projects like the Kaladan Multi-Modal Transit Project and various railway and highway initiatives to improve connectivity. Economic schemes, such as the North East Industrial Development Scheme and the Prime Minister's Development

Initiative for the North Eastern Region (PM-DevINE), are designed to boost growth. Initiatives like the North East Special Education Zone and Skill India Mission aim to enhance education and employment opportunities.

- **Cultural and Social Initiatives:** The government promotes regional languages, cultural festivals, and supports cultural centers to preserve heritage. Interstate cooperation is enhanced through the Northeastern Council, joint development projects, and improved connectivity, with cultural exchange programs fostering mutual understanding.

### Challenges to Restoring Peace in Northeast India:

- **Building Trust:** Establishing trust between the government and former insurgents is essential. Historical grievances and mistrust may hinder cooperation and reintegration efforts.
- **Monitoring Compliance:** Ensuring adherence to the agreement's terms, including disbanding armed groups and stopping violence, requires robust monitoring mechanisms.
- **Socio-Economic Reintegration:** Integrating former insurgents into society involves challenges, including providing adequate job opportunities, vocational training, and psychological support.
- **Political Dynamics:** The political landscape in the Northeast, including Tripura, is complex with various stakeholders involved. Navigating these dynamics while ensuring inclusive governance will be critical for sustainable peace.
- **Continued Militancy:** The risk of continued militancy remains, with splinter groups or other insurgent factions potentially refusing to comply with the peace agreement, leading to renewed violence and instability.

### Way Forward:

- **Effective Policing:** Effective law enforcement is essential to restore order and security. Community policing initiatives in Tripura involving local leaders can build trust and improve safety.
- **Dialogue and Engagement:** Continuous dialogue and negotiation with insurgent groups and civil society are necessary for a peaceful resolution, ensuring all voices, especially marginalized ones, are heard.
- **Economic Growth:** Investing in economic development & creating employment opportunities can address the root causes of insurgency by providing alternative livelihoods & reducing poverty. Expanding initiatives like the Tripura Bamboo Mission & improving infrastructure can help in this regard.



- **Political Inclusion:** Ensuring adequate political representation for ethnic communities can build trust and address their concerns. Including indigenous leaders in local governance and ensuring fair electoral processes empower communities and address disenfranchisement.
- **Cultural Respect:** Respecting and promoting the unique cultural heritage of the Northeast's ethnic communities can foster a sense of belonging and reduce feelings of marginalization.

### Conclusion:

- The recent peace accord in Tripura marks a promising step toward stability and development in the region. However, success will depend on addressing the fundamental issues that have fueled insurgency for decades.

## Fencing of India-Myanmar Border

### Relevance : GS III - Internal Security

- **In News:** The Cabinet Committee on Security (CCS) has recently sanctioned the construction of a fence along the 1,643 km India-Myanmar border, with an estimated budget of Rs 31,000 crore. Presently, only 30 km of this border is fenced.



### Understanding the Unprotected Border:

- **Definition:** An unprotected border refers to areas along a boundary where there are insufficient security measures to prevent unauthorized crossings. Such borders may either be open (unfenced) or partially closed (fenced).
- **Current Status:** Apart from Myanmar, India shares unfenced borders with Nepal and Bhutan. Similar border security challenges also arise with Pakistan, Bangladesh, and China.

### Security Threats from Unfenced Borders:

- Unprotected borders pose multiple national security risks, including:
  - ✓ Cross-border terrorism & insurgency, particularly in the northeastern region.
  - ✓ Smuggling of arms and human trafficking.
  - ✓ Drug trafficking, as Myanmar is part of the infamous Golden Triangle.
  - ✓ Refugee movements triggered by political unrest in neighboring countries.

### Challenges in Fencing the Border:

- **Difficult Terrain:** The rugged geographical features of the India-Myanmar border, such as marshes, riverine zones, and extreme climate conditions, create substantial technical and financial obstacles.
- **Lack of Clear Boundary Demarcation:** Certain portions of India's borders with neighboring countries remain disputed, making it challenging to clearly mark and fence these areas.
- **Ethnic and Cultural Ties:** Some ethnic groups on both sides of the border oppose fencing due to their shared cultural and familial connections. For instance, the Zo Reunification Organisation in Mizoram protested the government's move to fence the India-Myanmar border and suspend the Free Movement Regime (FMR), which allowed limited cross-border passage.

### Efforts for Enhanced Border Security:

- **Comprehensive Integrated Border Management System (CIBMS):** CIBMS is a multi-layered system combining personnel, sensors, networks, intelligence, and command-control solutions to boost border security.
- **Border Electronically Dominated QRT Interception Technique (BOLD-QIT):** Part of the CIBMS, BOLD-QIT deploys various intrusion detection devices like radars and electro-optical sensors to detect and prevent unauthorized crossings.
- **Border Infrastructure and Management (BIM) Scheme:** This scheme focuses on building border fences, installing floodlights, and developing other critical infrastructure necessary for securing India's borders.
- **Forest (Conservation) Amendment Act, 2023:** The Act provides exceptions for strategic projects related to national security within 100 km of international borders, the Line of Actual Control (LAC), and the Line of Control (LoC), allowing them to proceed without specific prior approvals.

### Conclusion:

- The CCS's decision to fence the India-Myanmar border is a crucial step toward mitigating security challenges posed by unprotected borders, such as insurgencies, drug trafficking, and cross-border terrorism.
- By addressing obstacles like challenging terrain, boundary disputes, & cultural concerns, the government aims to bolster India's border security with advanced systems like CIBMS & BOLD-QIT, supported by significant infrastructure projects under the BIM scheme.

