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November

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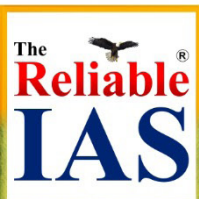
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## Union Cabinet Grants Classical Language Status to Five Languages

## Relevance : GS I - Art and Culture

- **In News:** The Union Cabinet has approved Classical Language status for five languages: Marathi, Pali, Prakrit, Assamese, and Bengali. This decision impacts various states, including Maharashtra (Marathi), Bihar, Uttar Pradesh, Madhya Pradesh (Pali and Prakrit), West Bengal (Bengali), and Assam (Assamese).



## About Classical Language:

- **Establishment:**
  - ✓ The concept of Classical Language was established in 2004.
- **Linguistic Experts Committee (LEC):**
  - ✓ Formed under the Ministry of Culture and Sahitya Akademi in 2004, the LEC is tasked with evaluating languages proposed for Classical Language status.
- **Criteria for Inclusion:**
  - ✓ In 2004, the eligibility criteria for classical language status were laid down, with revisions made in 2024. The key criteria include:
    - **Antiquity:** The language must have early texts or a recorded history spanning 1,500-2,000 years.
    - **Ancient Literature:** The language should have a significant body of ancient texts that are regarded as a cultural heritage.
    - **Diverse Texts:** Classical languages must include knowledge texts, particularly prose, alongside poetry, and should have epigraphical or inscriptional evidence.
    - **Evolution:** The language's classical literature could differ substantially from its modern form or from the later forms of its dialects.
- **Previously Recognized Classical Languages:**
  - ✓ Tamil (2004)

- ✓ Sanskrit (2005)
- ✓ Telugu (2008)
- ✓ Kannada (2008)
- ✓ Malayalam (2013)
- ✓ Odia (2014)

### About the Newly Accorded Classical Languages:

- **Marathi:**

- ✓ Earliest literary contributions in Marathi include Jnaneshwar's poetry and prose, particularly his commentary on the Bhagavad Gita.

- **Prakrit:**

- ✓ A colloquial language, Prakrit is featured in Ashoka's inscriptions, often alongside Pali. Gāthā Sattasai, an anthology of verses, is a significant work written in Prakrit.

- **Pali:**

- ✓ A crucial language for Buddhist philosophy, it encompasses texts like the Dhammapada and stories such as the Jātaka Tales.

- **Assamese:**

- ✓ Assamese literature boasts significant contributions from Shankardev, whose Vaishnavite poetry is widely revered.

- **Bengali:**

- ✓ Bengali has a rich literary tradition, with Sri Chaitanyadeva contributing to Vaishnavite poetry. Additionally, Rabindranath Tagore's Geetanjali, which earned him the Nobel Prize, remains an iconic work.

### Doddalathur Megalithic Site: Unraveling Ancient Heritage

#### Relevance: GS I - Ancient History

- **In News:** A group of historians and archaeology students from the University of Mysore has commenced excavations of megalithic burial sites situated in Chamarajanagar district, Karnataka.



#### About Doddalathur Megalithic Site:

- **Location:** The Doddalathur village is located in Hanur taluk within Chamarajanagar district, Karnataka, nestled within a small valley formed by the



Male Mahadeshwara Hill ranges.

- **Discovery:** The site was initially identified by C. Krishnamurti from the Archaeological Survey of India (ASI) in 1961.
- **Period:** The site is associated with the Iron Age, which is broadly estimated to have spanned from 1200 BC to 300 CE in South India.
- **Significance:** Doddalathur boasts hundreds of megalithic burials characterized by circular formations of large stones. Notably, many of these burials have remained undisturbed despite agricultural expansion and land development.
- **Current Excavation:** The excavation is being led by a collaborative team from the University of Mysore and the Mythic Society, Bengaluru, with the aim of deepening insights into megalithic-Iron Age culture and offering practical field training to archaeology students.

### Understanding Megalithic Sites:

- **Definition:** These are substantial stones utilized in prehistoric monuments or burial constructions.
- **Purpose:** Megaliths were primarily erected as burial sites or commemorative memorials, serving both sepulchral and non-sepulchral purposes.
- **Burial Types:** These encompass dolmenoid cists, cairn circles, capstones, and urns or sarcophagi crafted from terracotta.
- **Memorial Types:** This category includes memorials like menhirs, which are upright stones often commemorating significant events or figures.
- **Timeline:** Most megaliths in India are dated to the Iron Age (approximately 1500 BC to 500 BC), with some structures potentially predating this era, dating back to around 2000 BC.
- **Geographic Distribution:** Megalithic structures are widespread throughout Peninsular India, particularly in states such as Maharashtra, Karnataka, Tamil Nadu, Kerala, Andhra Pradesh, and Telangana.

### Types of Megalithic Structures:

- **Stone Circles (Cromlechs):** Circular configurations of stones, frequently serving as burial markers.
- **Dolmen:** Chambers created by positioning a large capstone atop supporting stones, commonly utilized as tombs.
- **Cist:** Compact, coffin-like constructions made of stone, designed to contain bodies and typically placed underground.
- **Monolith:** Singular upright stones, often used as markers or commemorative symbols.
- **Capstone Style:** This style features horizontal stones placed over burial chambers without additional support stones.

**Conclusion:**

- The ongoing excavations at the Doddalathur Megalithic Site provide a significant opportunity for researchers and students to delve into the cultural and historical importance of the Iron Age in South India.
- By unearthing these ancient burial sites, scholars aim to illuminate the societal practices and beliefs of past civilizations, contributing to a more comprehensive understanding of India's rich heritage.

## Cabinet Greenlights National Maritime Heritage Complex (NMHC) at Lothal, Gujarat

**Relevance: GS I - Art & Culture**

- **In News:** The Union Cabinet has given approval for the establishment of the National Maritime Heritage Complex (NMHC) at Lothal, Gujarat, under the Sagarmala Initiative, overseen by the Ministry of Ports, Shipping, and Waterways.

**About the National Maritime Heritage Complex (NMHC):**

- **Goal:** The NMHC is designed to display India's extensive and varied maritime history and aims to become the world's largest maritime heritage complex.
- **Significance of Lothal:**
  - ✓ Lothal is strategically positioned near the Gulf of Khambat, between the Bhogavo and Sabarmati rivers.
  - ✓ It was a crucial city of the Indus Valley Civilization (IVC) and houses the world's earliest artificial dry-dock, constructed around 2400 BC.
  - ✓ The discovery of the dry-dock at Lothal reveals ancient knowledge regarding tides, wind patterns, and other navigational aspects.
- **Main Attractions of NMHC:**
  - ✓ The complex will host notable features such as a state-of-the-art Lighthouse Museum, pavilions for coastal states, a maritime-themed eco-resort, among others.

**India's Maritime Heritage:**

- **Indus Valley Civilization (3000 – 2000 BC):**
  - ✓ The IVC had robust maritime trade connections with Mesopotamia,

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highlighting the early initiation of sea-based commerce.

- **Vedic Age (2000 – 500 BC):**
  - ✓ References to India's maritime activities can be traced back to the Rig Veda, showcasing the knowledge of sea travel.
- **Nanda and Maurya Dynasties (500 – 200 BC):**
  - ✓ The Mauryan empire is credited with establishing the world's earliest documented navy under the Magadh kingdom.
- **Satavahana Dynasty (200 BC – 220 AD):**
  - ✓ The Satavahanas were the first Indian rulers to mint coins with ship symbols, underscoring their seafaring pursuits.
- **Gupta Dynasty (320 – 500 AD):**
  - ✓ During the Gupta period, numerous ports were developed along the eastern and western coasts, greatly enhancing maritime trade with Europe and Africa.
- **Maratha Empire (17th Century):**
  - ✓ Under the leadership of Chhatrapati Shivaji Maharaj, the Maratha navy evolved into a dominant maritime force, with a fleet of over 500 vessels.
- **Southern Dynasties:**
  - ✓ The Cholas, Cheras, Pandyas, and the Vijayanagara Empire are celebrated for their advanced maritime prowess and seafaring capabilities, which further solidified India's historic ties to maritime trade.

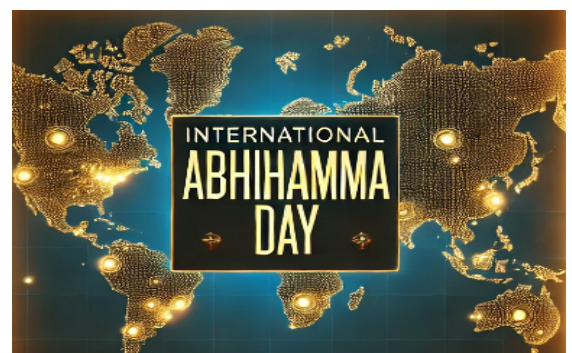
### Conclusion:

- The establishment of the National Maritime Heritage Complex at Lothal serves as a tribute to India's rich maritime legacy, reviving its ancient seafaring traditions and showcasing them on the global platform.

## International Abhidhamma Divas (IAD)

### Relevance : GS I - Art and Culture

- **In News:** The Ministry of Culture, in collaboration with the International Buddhist Confederation (IBC), observed the International Abhidhamma Divas (IAD). The event also celebrated the recent recognition of Pali as a classical language by the Cabinet.



### About International Abhidhamma Divas (IAD):

- **Commemoration:** IAD marks the day when Lord Buddha descended from the celestial realm of Tāvātimsa-devaloka to Sankassiya (modern-day Sankisa Basantapur in Uttar Pradesh).
- **Significance:** The Ashokan Elephant Pillar at Sankassiya commemorates this important event in Buddhist tradition.
- **Timing:** It coincides with the conclusion of the first Rainy Retreat (Vassa), a three-month period when Buddhist monks (bhikkhus) stay in one place. It also aligns with the Pavāraṇā festival, which celebrates the end of the Rainy Retreat.

### About Abhidhamma:

- **Definition:** The Abhidhamma is a collection of teachings (suttas) that represents one of the earliest compilations of Buddhist philosophy and psychology, detailing the fundamental doctrines of Buddhism.
- **Etymology:** The term “Abhidhamma” combines the words ‘abhi’ (meaning higher or further) and ‘dhamma’ (meaning teachings), translating to “Higher Dhamma” or “Further Truths.”
- **Tripitaka:** Abhidhamma forms the third section of the Tripitaka (Pali Canon), which is central to the Theravada Buddhist tradition.
- **Content:** Consisting of seven books, the Abhidhamma explores aspects of human experience such as consciousness, mental factors, and mindfulness cultivation. It develops a specialized Pali vocabulary that underpins Buddhist philosophy and psychology.
- **Key Concepts:**
  - ✓ “Citta” (consciousness)
  - ✓ “Cetasika” (mental factors)
  - ✓ “Rūpa” (materiality)
  - ✓ “Nibbāna” (final liberation)

### About Pali Language:

- **Recognition:** Recently recognized as a Classical Language, alongside Marathi, Prakrit, Assamese, and Bengali.
- **Historical Importance:** Pali is an ancient language in which key Buddhist and Jain scriptures are written, including the Tripitaka.
- **Tripitaka Components:**
  - ✓ **Vinaya Pitaka:** Ethical and monastic rules

- ✓ **Sutta Pitaka:** Discourses of the Buddha and his chief disciples
- ✓ **Abhidhamma Pitaka:** Philosophical and psychological teachings
- **Other Notable Works in Pali:** Notable works include the Jataka Kathas, Atthasālinī and Sammohavinodanī (which explain Abhidhamma philosophy), the Dhammapada, and the Dhammacakkapavattana Sutta.

### Conclusion:

- International Abhidhamma Divas (IAD) underscores the profound spiritual and intellectual heritage of Abhidhamma teachings within the broader Buddhist tradition.
- The recognition of Pali as a classical language further strengthens its cultural importance, ensuring the preservation and continued study of Buddhist philosophy and ancient Indian traditions.

## Uncovering Ancient Copper Plate Inscriptions

### Context:

- Recently, a remarkable archaeological finding occurred at the Sri Singeeswarar temple in Mappedu village, located in the Tiruvallur district of Tamil Nadu. A set of copper plate inscriptions from the 16th century was discovered, offering invaluable historical perspectives on King Krishnadevaraya's reign and the governance, culture, and influence of the Vijayanagara Empire across Southern India.



### Details of the Inscriptions

- **Physical Characteristics and Context**
  - The copper plates are linked by a ring featuring the emblem of the Vijayanagara Kingdom, validating the authenticity of the inscriptions and their connection to royal authority.
  - Dated to 1513 CE during the rule of King Krishnadevaraya, the inscriptions are inscribed in the Nandinagari script and Sanskrit, documenting a donation of land to Brahmins by the Raja of Chandragiri.
- **Cultural and Administrative Insight**
  - The inscriptions illuminate the practice of land grants (brahmadeya) to

Brahmins, highlighting the kingdom's patronage of religious institutions and intellectuals.

- This discovery emphasizes the administrative finesse of the Vijayanagara Empire and its support for scholarly communities, upholding the values of dharma and scholarship.

### Who Was King Krishnadevaraya?

- King Krishnadevaraya, one of the most celebrated rulers of the Vijayanagara Empire, reigned from 1509 CE to 1529 CE. Renowned for his military acumen, statesmanship, and patronage of the arts, Krishnadevaraya significantly shaped medieval South India.

#### ➤ Reign and Titles

- Krishnadevaraya's rule marked the peak of the Vijayanagara Empire, flourishing under his leadership in both territorial expansion and cultural achievements.
- He was referred to by titles such as "Kannadaraya" and "Kannada Rajya Ramaramana," reflecting his profound regional and cultural impact.

#### ➤ Literary and Scholarly Patronage

- An accomplished scholar, Krishnadevaraya authored several significant works, including Madalasa Charita, Satyavedu Parinaya, Rasamanjari, Jambavati Kalyana, and Amuktamalyada, showcasing his literary prowess.
- He supported poets and scholars across various languages, including Sanskrit, Telugu, Tamil, and Kannada, fostering a multicultural court renowned for its intellectual and artistic contributions.

#### ➤ The Ashtadiggajas and Literary Flourishing

- His court was home to the Ashtadiggajas, a group of eight esteemed scholars, including Allasani Peddana, honored as "Andhra-kavitapitamaha" for his magnum opus Manucharitamu.
- Notable Kannada poets such as Thimmanna, Mallanarya, and Chatu Vittalanatha thrived under Krishnadevaraya's sponsorship, each enriching the literary heritage of Southern India.

#### ➤ Promotion of Music and Dance

- Krishnadevaraya's patronage extended to classical music and dance, including Bharatanatyam and Kuchipudi, which continued to thrive as cultural staples in South India.
- His influence on the Carnatic music tradition underscores his commitment to nurturing performing arts as vital components of courtly and temple rituals.

### ➤ Architectural and Urban Contributions

- He is credited with constructing magnificent temples and enhancing existing South Indian temples with impressive gopurams.
- He founded Nagalapuram, a suburban township near Vijayanagar, named in honor of his mother, thereby cementing his legacy through infrastructural advancements.

### Overview of the Vijayanagara Empire

- The Vijayanagara Empire, established in 1336 by Harihara and Bukka Raya, evolved over time into a formidable force in the Indian subcontinent, recognized for its military strength, vibrant culture, and architectural masterpieces.

### ➤ Foundation and Dynastic Rule

- With Hampi as its capital (later designated a UNESCO World Heritage site in 1986), the empire was governed by four prominent dynasties: Sangama, Saluva, Tuluva, and Aravidu.
- The empire thrived until around 1660, gradually declining after a catastrophic defeat by the Deccan Sultanates in the Battle of Talikota (1565), which led to the capital's devastation.

### ➤ Economic and Military Relations with the Portuguese

- The empire maintained strategic trade and military partnerships with the Portuguese, who had seized Goa from the Sultan of Bijapur with Vijayanagara's assistance.
- In exchange for firearms and Arabian horses, Vijayanagara traded goods such as cotton, rice, sugar, spices, and indigo, highlighting its role in regional commerce and diplomacy.

### ➤ Cultural and Architectural Achievements

- The empire's artistic legacy reached its pinnacle under Krishnadevaraya, characterized by the construction of temples like the Hazara Rama, Krishna, and Vittala temples, renowned for their intricate carvings.
- The architectural grandeur of the Virupaksha and Vittala temples exemplifies the Vijayanagara style, reflecting a blend of Dravidian and Islamic influences.

### ➤ Strategic Defense and Territorial Dominance

- For over two centuries, the Vijayanagara Empire served as a bulwark against invasions from the Turkic Sultanates of the Indo-Gangetic Plain, maintaining its territorial integrity.

- Conflicts with the Bahmani Sultanate were particularly fierce, centered on the Raichur Doab, a resource-rich region, emphasizing competition driven by strategic needs rather than solely religious motives.
- **Expansive Reach of the Empire**
- At its zenith, the Vijayanagara Empire encompassed vast territories across Southern India, including parts of present-day Karnataka, Andhra Pradesh, Tamil Nadu, Kerala, and Telangana.
- The empire's domain stretched from the Krishna River in the north to the southernmost tip of India, bounded by the Arabian Sea on the west and the Bay of Bengal on the east.
- **The Nayaka System: A Unique Feudal Arrangement**
- The Nayakas, appointed as military commanders, were granted land (amaram) by the king to support and maintain troops.
- These leaders enjoyed significant autonomy in local governance, including tax collection and land distribution, fostering a feudal-like structure that balanced regional authority with allegiance to the central government.
- As the empire waned, some Nayakas gained substantial power, leading to tensions and a weakening of central control.

### Conclusion:

- The recent discovery of the copper plate inscriptions offers a tangible link to the illustrious Vijayanagara Empire and the remarkable achievements of King Krishnadevaraya. His reign represents a period of immense cultural, architectural, and intellectual growth, deeply woven into the fabric of South Indian history. The inscriptions not only illuminate the administrative practices of the time but also reflect a legacy of inclusivity, regional influence, and cultural patronage that defined Vijayanagara's prominence. The empire's decline following the Battle of Talikota marks a critical chapter in India's medieval history, underscoring the intricate socio-political and economic dynamics of the Deccan region.



## Reforming Bail Provisions

## Relevance : GS II - Governance

- **In News:** Recently, the Supreme Court (SC) expressed disapproval of employing the Prevention of Money Laundering Act (PMLA), 2002, as a mechanism to extend the imprisonment of an accused.
- The Court ruled that constitutional courts will not permit indefinite pretrial detention under this anti-money laundering legislation.



## Key Points of SC's Ruling on PMLA and Bail:

## • No Arbitrary Detention

- ✓ The SC emphasized that even if there is a prima facie case against an accused, the court has the authority to rule in favor of their release due to prolonged detention without a definitive timeline for the trial. The stringent provisions of the PMLA, particularly Section 45, should not lead to arbitrary confinement of the accused.

## • Bail Conditions Under PMLA

- ✓ According to Section 45 of the PMLA, bail may only be granted to an accused in a money laundering case if two conditions are met:
  1. The individual must demonstrate in court that they are prima facie innocent of the charge.
  2. The accused must convince the judge that they will not commit any offenses while on bail.

## • Bail Principles Affirmed

- ✓ The Court reaffirmed the principle that “bail is the rule, and jail is the exception” in India’s criminal jurisprudence. It was noted that the high threshold for granting bail under the PMLA must not result in the indefinite loss of personal liberty for the accused.

## • Judicial Concerns on Delayed Trials

- ✓ The ruling brought attention to the relationship between delayed trials and stringent bail provisions under special laws such as the PMLA, 2002; the Unlawful Activities (Prevention) Act (UAPA), 1967; and the Narcotic Drugs

and Psychotropic Substances Act, 1985 (NDPS). The expeditious resolution of trials is essential and should be integrated into the interpretation of these laws.

- **Judicial Authority to Grant Bail**

- ✓ The SC reiterated that stringent bail provisions do not preclude constitutional courts from intervening in cases where trials are excessively delayed. The Court referenced its 2021 judgment in the KA Najeeb case, which acknowledged that inordinate delays in trials could serve as grounds for granting bail in UAPA cases.

- **Impact on Fundamental Rights**

- ✓ The Court highlighted that excessive delays in trials may infringe upon the fundamental rights of individuals under Article 21 of the Constitution, which ensures the right to life and personal liberty. Prolonged detention without trial can lead to unjust deprivation of liberty, as evidenced by cases where individuals were acquitted after enduring years of confinement.

- **Potential Claims for Compensation**

- ✓ The SC proposed that individuals who endure wrongful imprisonment might have grounds for seeking compensation due to violations of their rights under Article 21.

### Concerns Regarding India's Bail System:

- **High Proportion of Undertrials**

- ✓ More than 75% of India's prison population consists of undertrials, with reported overcrowding in prisons at 118%. This scenario reflects systemic inefficiencies within the bail system that necessitate urgent reform. The Supreme Court of India, in *Satender Kumar Antil vs. CBI*, 2022, recognized the failings of the bail system in addressing the undertrial issue and granting bail.

- **Undermines Principle of 'Presumption of Innocence'**

- ✓ The overcrowding of jails with undertrial prisoners undermines the principle of 'presumption of innocence,' a legal doctrine asserting that individuals have the right to be presumed innocent until proven guilty.

- **Lack of Empirical Evidence**

- ✓ There is insufficient information regarding the demographics of undertrials, the categories of offenses, timelines for bail applications, the proportion of undertrials seeking bail, acceptance or rejection rates of bail applications, and challenges related to bail compliance.

- **Lack of Safeguards**

- ✓ Arrest is justified as 'necessary' if police have 'reasonable grounds' to believe that it is required to ensure the individual's presence in court.



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However, many arrested individuals, particularly from marginalized communities, remain unprotected.

- **Challenges in Bail Adjudication**

- ✓ The power to grant bail largely relies on the court's discretion and is contingent upon the specifics of each case. Bail is frequently denied based on the seriousness of the offense, the character of the accused, and the likelihood of the accused absconding or tampering with evidence.

- **Challenges in Bail Compliance**

- ✓ A significant number of undertrials remain imprisoned despite being granted bail due to challenges in fulfilling bail conditions. Requirements such as cash bonds, surety bonds, proof of property ownership, and solvency make it particularly difficult for economically disadvantaged individuals to secure their release.

- **Flawed Assumptions**

- ✓ The bail system operates on flawed assumptions that every arrested individual has property or access to influential social connections. It presupposes that financial penalties are necessary to ensure an accused person

### Supreme Court Judgments about the Bail System:

- **Babu Singh v. State of Uttar Pradesh Case, 1978:** The SC ruled that bail should generally be granted unless there are substantial grounds to believe that the accused will abscond or tamper with evidence.
- **State of Rajasthan v. Balchand Case, 1978:** The SC held that bail is the norm, while jail is an exception. The detention of an individual impacts their right to life and liberty, and the primary goal of detention is to ensure the accused's availability for trial without inconvenience.
- **Parvez Noordin Lokhandwalla v. State of Maharashtra Case, 2020:** It was emphasized that bail conditions should not be excessive relative to their intended purpose.
- **Satender Kumar Antil v. CBI Case, 2022:** The Court stated that strict bail conditions must not disproportionately impact the accused.

### Way Forward:

- **Simplification of Bail Conditions:** Reassess and simplify bail conditions to enhance accessibility, particularly for individuals from economically disadvantaged backgrounds. For example, community service could be considered as an alternative to cash and surety bonds.
- **Safeguards Against Arbitrary Arrests:** Establish strict guidelines and safeguards to prevent arbitrary arrests, especially for vulnerable populations. Police must provide clear justifications for arrests.



- **Community-Based Supervision Programs:** Create community-based supervision initiatives as alternatives to incarceration. These programs could involve monitoring undertrials through local organizations or social workers rather than relying solely on bail.
- **Alternative to Petty Criminals:** Petty offenders awaiting trial could be required to stay in reformatory facilities where they can engage in meaningful work, such as volunteer activities.
- **Speedy Trials:** The Supreme Court Committee on Prison Reforms, led by Justice (retd) Amitava Roy, emphasized that speedy trials can serve as an effective strategy to address jail overcrowding.
- **Adequate Infrastructure:** The report titled “Empirical Study to Evaluate the Delivery of Justice Through Improved Infrastructure,” published by the Ministry of Law and Justice, highlighted that enhancing courtroom space, providing basic furnishings, improving digital infrastructure, and ensuring skilled manpower can help reduce the number of undertrial prisoners.
- **Clear Legal Provisions:** Clearly defined laws can assist individuals in understanding their rights and responsibilities, thereby decreasing the likelihood of prolonged detention due to misunderstandings.

## Ministry of Housing & Urban Affairs (MoHUA) Unveils “Jal Hi AMRIT” Initiative

### Relevance: GS II - Governance

- **In News:** The Ministry of Housing and Urban Affairs (MoHUA) has recently introduced the “Jal Hi AMRIT” initiative, aimed at improving the quality of treated wastewater discharge and encouraging the reuse of recycled water in urban regions under the AMRUT 2.0 program.



### About the Jal Hi AMRIT Initiative:

- **Key Objective:**
  - ✓ The primary goal of this initiative is to incentivize States and Union Territories to efficiently manage Sewage Treatment Plants (STPs), ensuring the production of high-quality reusable water.
- **Key Components of the Initiative**
  - ✓ **Clean Water Credit System:** A competitive mechanism designed to foster competition among cities, enhance their capacities, and reward them for maintaining superior standards of recycled water quality.

- Clean Water Credits will be awarded to STPs based on their performance, with a Star-rating system (from 3 stars to 5 stars) that will be valid for six months.
- ✓ **Performance-Based Rewards:** STPs will receive incentives based on their star ratings or Clean Water Credits, encouraging the delivery of top-quality water treatment services.
- ✓ **Fostering Water Circularity:** The initiative promotes the recycling of treated water, aiming to establish a sustainable water economy in urban areas.

### About AMRUT 2.0:

- **Ministry:** The initiative is driven by the Ministry of Housing and Urban Affairs (MoHUA).
- **Duration:** Introduced in 2021, AMRUT 2.0 is a five-year program.
- **Aim:** AMRUT 2.0 aspires to achieve universal water supply coverage by installing functional water taps in every household across statutory towns. Additionally, it aims to ensure septage management in 500 cities that were covered under the first phase of the AMRUT program.
- ✓ AMRUT 1.0, launched in 2015, focused on delivering basic urban services (such as water supply, septage management, stormwater drainage, etc.) to selected towns and cities.

### Conclusion:

- The Jal Hi AMRIT initiative, in alignment with AMRUT 2.0, represents a strategic effort to improve the management of treated wastewater and promote a sustainable water recycling model in India's urban landscapes.
- By fostering a competitive, performance-driven approach, the program encourages cities to enhance their water treatment infrastructure, contributing to a circular water economy that emphasizes efficient resource use.

## Demand for Ladakh's Inclusion in the Sixth Schedule of the Constitution

### Relevance : GS II - Polity

- **In News:** There has been a rising call for the inclusion of Ladakh under the Sixth Schedule of the Indian Constitution, as the region seeks enhanced autonomy and acknowledgment of its tribal areas.



**Sixth Schedule:**

- The **Sixth Schedule**, under Article 244(2) of the Constitution, provides for the **governance of tribal areas in Assam, Meghalaya, Tripura, and Mizoram**. This special provision originated from the Bardoloi Committee's recommendations, **aimed at safeguarding the cultural and administrative rights of tribal communities in these regions**.

**Key Features:**

- Autonomous District Councils (ADCs):** These councils are established by the Governor to manage specific regions within these states. ADCs are composed of up to 30 members, of which 4 are appointed by the Governor and 26 are elected by the local populace.
  - ✓ Currently, there are 10 ADCs operational across the four states.
- Autonomous Regional Councils (ARCs):** These councils represent particular tribes within a designated autonomous district.
- Law-Making Authority:** Both ADCs and ARCs have the power to enact laws on various matters, including forest management, agriculture, inheritance, marriage, and social practices. They are also authorized to collect land revenue, levy taxes, and regulate trade, including collecting royalties from mineral extraction.

**Comparison between Fifth and Sixth Schedules:**

Aspect	Fifth Schedule	Sixth Schedule
<b>Scope</b>	Applies to certain Scheduled Areas as declared by the President in any state of India (currently in 10 states).	Applies to Tribal Areas in Assam, Meghalaya, Tripura, and Mizoram.
<b>Administrative Body</b>	Tribes Advisory Councils (TAC).	Autonomous District Councils (ADCs) & Autonomous Regional Councils (ARCs).
<b>Powers</b>	TACs possess limited authority, mainly executive, as they are created by the State Legislative Assemblies.	ADCs and ARCs have wide-ranging powers, including executive, legislative, and judicial authority, as granted by the Constitution.
<b>PESA Act, 1996</b>	Applicable	Not Applicable

**Conclusion:**

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- The demand for Ladakh's inclusion under the Sixth Schedule signifies the need for greater autonomy and formal recognition of its distinct tribal identity.
- By seeking similar administrative frameworks as other tribal regions in India, Ladakh aims to gain stronger legislative and governance capabilities to manage its own affairs.
- Comparing it with the Fifth Schedule highlights the broader scope of authority that the Sixth Schedule offers, particularly in terms of legislative and judicial powers.

## Swachh Bharat Mission Celebrates a Decade of Achievements

### Relevance: GS II - Governance

- **In News:** The Swachh Bharat Mission (SBM), initiated on October 2, 2014, in alignment with Mahatma Gandhi's birth anniversary, has completed ten years of efforts towards enhancing India's cleanliness and sanitation.



### Overview of Swachh Bharat Mission:

#### Two Major Components:

- ✓ **SBM (Gramin):** Aims to ensure sanitation in rural areas by promoting Solid and Liquid Waste Management and making India Open Defecation Free (ODF).
  - The current goal is to upgrade villages from ODF to ODF Plus status.
  - Implemented by the Ministry of Jal Shakti.
- ✓ **SBM (Urban) 2.0:** Seeks to make cities free from garbage, influence public behavior, and manage grey and black water.
  - Overseen by the Ministry of Housing and Urban Affairs.

### Significant Initiatives under SBM:

- **Swachh Bharat Kosh:** A fund to support sanitation efforts.
- **Swachh Survekshan:** An annual cleanliness survey to evaluate and rank cities.
- **Swachhta Hi Seva:** A campaign to instill cleanliness as a societal norm.
- **Swachh Vidyalaya Abhiyan:** A program aimed at improving sanitation in schools.

### SBM's Impact:

- **Health Benefits:** The mission has contributed to preventing 60,000–70,000 infant deaths annually by curbing waterborne illnesses.
- **Empowerment of Women:** Improved safety for women through better access

to sanitation facilities, while women-led Self Help Groups (SHGs) have taken prominent roles in waste management.

- **Economic Impact:** Achieving ODF status has saved households approximately ₹50,000 per year by reducing healthcare costs and the time spent traveling for open defecation.

### Challenges for SBM:

- **Inadequate Water Supply:** The lack of sufficient water availability, especially in rural regions, hinders regular toilet use.
- **Faecal Sludge Management Issues:** Inadequate management of faecal sludge, unsuitable toilet designs, and a lack of trained personnel pose threats to maintaining ODF status.
- **Legacy Landfills:** Addressing old municipal landfills remains a critical issue in urban waste management.

### Future Directions for SBM:

- **Sustaining ODF Status:** Develop systems for routine toilet maintenance with an emphasis on community engagement.
- **Integrating Waste Management:** Establish a plan that unifies sanitation and solid waste management, supported by investments in waste sorting infrastructure.
- **Technology Integration:** Leverage technology for data gathering on sanitation access and invest in innovative solutions, such as smart sanitation systems.

### Conclusion:

- As the Swachh Bharat Mission marks ten years, the focus must now be on preserving the progress made so far, enhancing sanitation systems, and overcoming remaining challenges, particularly in faecal sludge management and addressing legacy waste. Community participation, technological advancements, and comprehensive waste management are critical to ensuring that the mission's goals are sustained in the future.

## Dharti Aaba Janjatiya Gram Utkarsh Abhiyan (DAJGUA)

### Relevance: GS II - Welfare Schemes

- **In News:** The newly launched scheme is named after Birsa Munda, popularly known as Dharti Aaba, a tribal leader renowned for his resistance against the British Empire and leadership of the Ulgulan Movement.





**About DAJGUA:**

- **Background:** Initially introduced as PM Janjatiya Unnat Gram Abhiyan (PM-JUGA), this initiative is a comprehensive package designed to ensure saturation of basic schemes in tribal-majority villages.
- **Aim:** The primary objective is to address significant gaps in social infrastructure, including health, education, and livelihood development in approximately 63,000 tribal villages.
- **Beneficiaries:** The scheme is expected to benefit more than 5 crore tribal people across 30 states and Union Territories (UTs).
- **Collaborative Approach:** The program integrates 25 different interventions spread across 17 ministries and departments of the Government of India, demonstrating a coordinated approach to tribal development.
- **Funding:** The funding will be shared between the Centre and State governments.
- **Tenure:** The scheme is set to operate for a period of 5 years, from 2024-25 to 2028-29.
- **Monitoring:** The PM GatiShakti Portal will be employed for monitoring the progress and implementation of the scheme.

**Tribal Population in India:**

- **Current Population:** According to the 2011 Census, Scheduled Tribes (ST) constitute around 8.6% of India's total population.
- **Diversity:** India has over 730 Scheduled Tribes that are officially notified under Article 342 of the Constitution.
- **Challenges:** Some major challenges faced by the tribal population include low levels of education, poor health outcomes, and displacement due to development projects.
- **Initiatives for Empowerment:** Various initiatives have been introduced to uplift the tribal communities, including:
  - **Pradhan Mantri Adi Adarsh Gram Yojana:** Adivasi Mahila Sashaktikaran Yojana (Empowerment Scheme for Tribal Women)

**Initiatives under DAJGUA :**

- **Tribal Home Stays Initiative:** The Ministry of Tourism, under the Swadesh Darshan scheme, will promote around 1,000 homestays. Each household will receive ₹5 lakh to construct a new two-room homestay or ₹3 lakh to refurbish existing structures. Additionally, ₹5 lakh will be provided for "village community requirements."
- **Sustainable Livelihood for Forest Right Holders (FRA):** Special attention will be given to 22 lakh FRA patta holders (under the Forest Rights Act) living in forest areas, aiming to secure their rights and empower tribal communities.

- **Upgrading Infrastructure in Government Schools and Hostels:** The mission focuses on improving facilities in Ashram schools, hostels, tribal schools, and government residential schools to enhance local education resources, inspired by the PM-Shri Schools model.
- **Advanced Diagnosis for Sickle Cell Disease (SCD):** Affordable diagnostic and management facilities for SCD will be provided, with a particular focus on pre-natal diagnosis to reduce the prevalence of the disease by preventing future births with SCD.
- **Tribal Multipurpose Marketing Centres (TMMC):** Approximately 100 TMMCs will be established to ensure fair pricing for tribal producers and provide consumers with direct access to tribal products at fair prices.

## Prime Minister's Internship Scheme Unveiled to Boost Youth Employability

### Relevance: GS II - Welfare Schemes

- **In News:** The Union Finance Minister has recently launched the Prime Minister's Internship Scheme, an important initiative aimed at improving the employability of India's youth by offering them valuable practical experience in real-world business settings.



### Purpose of the PM Internship Scheme:

- **Primary Goal:** The scheme is intended to enhance employability among young individuals in India by providing them with direct exposure to professional environments.
- **Bridging the Skills Gap:** It presents an essential opportunity to address the skills shortage and contribute to India's sustainable development.
- **Execution:** This program will be conducted through an online platform developed by the Ministry of Corporate Affairs.

### Salient Features of the Scheme:

- **Target Audience**
  - ✓ The initiative seeks to offer internship opportunities to one crore young people over the next five years, primarily within the top 500 companies across India.
  - ✓ The scheme is being run in collaboration with BISAG-N, a government-owned entity that will oversee its implementation.
- **Duration of Internship**

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- ✓ The internship is scheduled for 12 months, providing participants with extensive practical exposure in professional environments.
- **Financial Assistance**
  - ✓ **Stipend:** Interns will receive financial support of Rs. 5,000 per month, with Rs. 4,500 provided by the government and Rs. 500 contributed by the company through its Corporate Social Responsibility (CSR) initiatives.
  - ✓ **One-time Allowance:** An additional Rs. 6,000 one-time grant will be provided to each intern upon joining, intended for incidental expenses.
- **Voluntary Participation of Companies**
  - ✓ The scheme encourages voluntary involvement of companies, with internships lasting one year.
  - ✓ At least half of the internship period must be spent in an actual work environment, ensuring that interns gain practical experience outside of classroom-based training.

### Eligibility Criteria for PM Internship Scheme:

- **Age Requirement:** Applicants should be between 21 and 24 years old and not engaged in full-time employment.
- **Educational Requirements:** Eligible candidates must have passed class 10 or higher.
- **Exclusions:**
  - ✓ Applicants with family members working in government jobs or households earning more than Rs. 8 lakh annually (during the financial year 2023-24) will be ineligible.
  - ✓ The scheme also excludes post-graduates, as well as individuals with qualifications from premier institutions like IITs, IIMs, and IISERs, or those with professional certifications such as CA or CMA.

### Conclusion:

- The Prime Minister's Internship Scheme is poised to significantly improve youth employability in India by offering practical work experience and financial aid.
- The initiative is expected to contribute to building a skilled workforce that can drive India's economic progress in the coming years.

## Shompen Tribes: Facing Challenges Amidst Development Projects

**Relevance: GS II - Social Justice**

- **In News:** Members of the Shompen community took part in the 2024 elections, amid growing concerns that a proposed development project on Great Nicobar Island might lead to the destruction of their ancestral forests.

**Overview of the Shompen Community:**

- **Classification:** The Shompen are categorized under Particularly Vulnerable Tribal Groups (PVTGs) and are indigenous to the Andaman and Nicobar Islands. Known for their isolation and being among the least studied tribes in the world, they possess a highly diverse population.
- **Geographical Distribution:** Based on their location on Great Nicobar Island, the Shompen can be divided into four distinct groups:
  - ✓ North-eastern, Western, Southern and Central

**Cultural and Linguistic Characteristics:**

- **Language:** The Shompen communicate using Shompenese, which belongs to the Austroasiatic language family. This language has numerous regional dialects, reflective of the tribe's diverse population.
- **Cultural Practices:** Primarily hunter-gatherers, the Shompen also practice limited horticulture and rear pigs. Traditional hunting involves species like wild pigs, monkeys, monitor lizards, and occasionally pythons.
- **Diet:** Their primary food source is the Pandanus plant, a tropical species whose fruits resemble woody pineapples.
- **Religion:** The Shompen adhere to Animism, a spiritual belief system that places significance on natural forces and spirits.

**Economic and Social Systems:**

- **Economy:** Different Shompen groups engage in a barter-based economy with the Great Nicobarese, developing varied levels of mutual exchange relationships for survival.
- **Social Structure:** The Shompen society follows a patriarchal framework, where the eldest male governs the family and community matters.
- **Mongoloid Features:** The Shompen are distinguished from other PVTGs in the Andaman and Nicobar Islands by their Mongoloid physical traits.

### Population and Vulnerability:

- **Population:** The 2011 Census records only 229 members of the Shompen community, highlighting their fragile existence and their status as one of India's most endangered tribal groups.

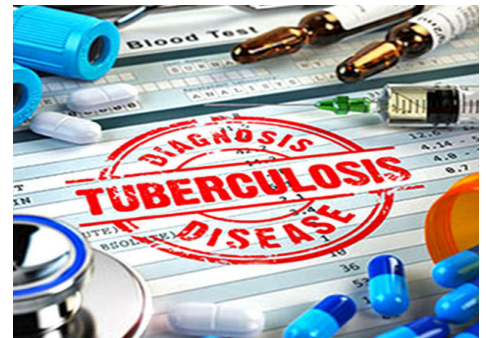
### Conclusion:

- The involvement of the Shompen tribe in the 2024 elections brings to light their fears of losing ancestral lands due to upcoming projects.
- This underscores the importance of balancing development with the preservation of indigenous rights, ensuring that the protection of vulnerable communities is a priority alongside progress.

## Nutritional Support Initiatives for Tb Patients & Their Families

### Relevance: GS II - Health Sector

- **In News:** The Union Health Minister has launched essential initiatives designed to enhance nutritional support for tuberculosis (TB) patients and their families.



### Key Initiatives:

- **Ni-Kshay Poshan Yojana (NPY)**
  - ✓ The monthly nutritional assistance under this scheme has been increased from ₹500 per month per patient to ₹1,000 per month per patient for the entire treatment period.
  - ✓ All TB patients will now receive total nutritional aid ranging from ₹3,000 to ₹6,000 under the NPY.
  - ✓ This initiative is projected to benefit approximately 25 lakh TB patients annually.
  - ✓ To date, ₹3,202 crores have been disbursed to 1.13 crore beneficiaries through Direct Benefit Transfer under this initiative.
- **Energy Dense Nutritional Supplementation (EDNS)**
  - ✓ EDNS will be provided to all eligible patients during the first two months of their treatment.
  - ✓ Patients with a Body Mass Index (BMI) below 18.5 kg/m<sup>2</sup> at the time of diagnosis qualify for this program.
  - ✓ The initiative is expected to cover around 12 lakh underweight patients.
  - ✓ The estimated additional expenditure for the Government of India will be approximately ₹1,040 crores, shared between the central and state governments on a 60:40 basis.

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### Ni-Kshay Mitras

- ✓ This initiative provides nutritional assistance to TB patients as part of the Pradhan Mantri TB Mukta Bharat Abhiyaan (PMTBMBA).
- ✓ Its scope has been broadened to offer nutritional support to the family members (household contacts) of TB patients.
- ✓ The program involves distributing food baskets aimed at boosting the immunity of family members of TB patients.
- ✓ This initiative is expected to significantly decrease the out-of-pocket expenses (OOPE) incurred by TB patients and their families.

### Significance of the Initiatives:

- These measures are anticipated to facilitate nutritional recovery, enhance treatment responses and outcomes, and lower mortality rates associated with TB in India.
- By addressing the nutritional needs of both patients and their families, these initiatives aim to establish a more comprehensive support system for combating tuberculosis.

## India Eradicates Trachoma as a Public Health Concern: WHO Achievement

### Relevance : GS II - Health Sector

- **In News:** India has successfully eradicated trachoma as a public health concern, becoming the third nation in the South-East Asia Region to achieve this milestone, following Nepal and Myanmar.
- This marks another important victory in India's fight against Neglected Tropical Diseases (NTDs). Previously, the World Health Organization (WHO) declared India free from Guinea Worm disease in 2000 and Yaws in 2016.



### About Trachoma:

- **Definition:** Trachoma is a contagious eye infection caused by the bacterium *Chlamydia trachomatis*. It spreads through contact with infected eye, nose, or throat secretions and, if untreated, can lead to irreversible blindness.
- **Situation in India:** In 1971, blindness due to trachoma affected around 5% of the population. Through extensive efforts, this figure has been reduced to under 1%.
- **Measures Taken:**
  - ✓ **National Programme for Control of Blindness & Visual Impairment (NPCBVI):** This initiative was instrumental in reducing preventable

blindness in India, including trachoma.

- ✓ **WHO SAFE Strategy:** India adopted this approach, focusing on Surgery, Antibiotics, Facial hygiene, and Environmental improvements to prevent trachoma.

### Understanding Neglected Tropical Diseases (NTDs):

- **Definition:** NTDs are a group of varied diseases caused by viruses, bacteria, parasites, fungi, and toxins. These ailments primarily affect impoverished populations living in poor environmental conditions in tropical regions.
- **Why “Neglected”?** These diseases are described as “neglected” because they are largely overlooked on the global health stage, receive insufficient funding, and are often linked with stigma and social exclusion.

### Global and National Efforts for Combating NTDs:

- **Global Initiatives:**
  - ✓ **Global NTD Annual Reporting Form (GNARF):** A tool for monitoring progress in combating NTDs worldwide.
  - ✓ **Global Vector Control Response (GVCR) 2017–2030:** A global strategy aimed at reducing the burden of vector-borne diseases, which includes certain NTDs.
  - ✓ **Kigali Declaration on NTDs (2022):** A declaration reaffirming the global commitment to eradicating NTDs.
- **India’s Initiatives:**
  - ✓ **National Vector Borne Diseases Control Programme (NVBDCP):** This program addresses the control of diseases transmitted by vectors, such as mosquitoes, which include certain NTDs.

### Categories of Neglected Tropical Diseases (NTDs):

- **Helminth NTDs:**
  - ✓ Taeniasis/Cysticercosis
  - ✓ Guinea Worm Disease
  - ✓ Echinococcosis
  - ✓ Foodborne Trematodiasis
  - ✓ Lymphatic Filariasis
  - ✓ Soil-Transmitted Helminthiasis
  - ✓ Schistosomiasis
  - ✓ Onchocerciasis
- **Protozoan NTDs:**
  - ✓ Chagas Disease
  - ✓ Leishmaniasis

- ✓ Human African Trypanosomiasis
- **Viral NTDs:**
  - ✓ Rabies
  - ✓ Dengue & Chikungunya
- **Non-Infectious NTDs:**
  - ✓ Snakebite Envenoming
- **Fungal NTDs:**
  - ✓ Mycetoma
  - ✓ Chromoblastomycosis
  - ✓ Other Deep Mycoses
- **Bacterial NTDs:**
  - ✓ Buruli Ulcer
  - ✓ Leprosy
  - ✓ Trachoma
  - ✓ Yaws
- **Ectoparasitic NTDs:**
  - ✓ Scabies and other parasitic skin infections.

### Conclusion:

- India's achievement in eradicating trachoma highlights the country's dedication to combating Neglected Tropical Diseases and improving health in vulnerable communities.
- With continued collaboration at both global and national levels, India strengthens its commitment to eliminating NTDs, reaffirming its leadership in the realm of global public health.

## SC Highlights Discrimination Against Elected Women Representatives in Rural Areas

### Relevance: GS II - Governance

- **In News:** In a recent judgment, the Supreme Court granted relief to a Woman Sarpanch who had been removed by the District Administration of a village in Maharashtra.
- The court underscored the obstacles encountered by Elected Women Representatives (EWRs) within rural Panchayats.





### Obstacles Faced by EWRs in Rural Areas:

- **Token Representation:** Frequently, EWRs serve as figurehead leaders, with genuine decision-making authority resting with their husbands or male relatives.
- **Gender Bias and Social Hurdles:** The combination of household responsibilities and patriarchal attitudes significantly restricts women's ability to effect meaningful social transformation in their communities.
- **State-Level Policy Barriers:** Certain states, like Rajasthan, implement restrictive policies, such as the two-child rule or minimum educational requirements, which impede women from running for office.
- **Seat Rotation:** Due to the rotation system, many EWRs must vacate their positions after a single term, limiting their chances for sustained public service.
- **Additional Challenges:** EWRs also confront issues such as the digital divide, insufficient knowledge, doubts about their competence, and cultural constraints.

### Measures to Empower EWRs:

- **Institutional Reforms**
  - ✓ Reforms are necessary to appoint more women to significant Panchayat roles like Panchayat Secretaries.
  - ✓ Institutional monitoring mechanisms should be established to minimize male interference in the duties of EWRs.
- **Empowering Collective Agency**
  - ✓ EWRs should be supported through the formation of women's federations and platforms such as Self-Help Groups (SHGs) to enhance their capacity to collaboratively address community issues.
- **Additional Initiatives**
  - ✓ Investments in capacity-building programs through education and training should be prioritized.
  - ✓ The government should maintain up-to-date and comprehensive data for an in-depth evaluation of EWR performance and progress.

### Elected Women Representatives in Rural Governance:

- **Current Status in India**
  - ✓ Approximately 1.4 million women representatives make up 46% of all elected members of Panchayati Raj Institutions (PRIs).
  - ✓ The 73rd Constitutional Amendment Act of 1992 mandated the reservation of at least one-third of seats for women.
  - ✓ Some states, such as Bihar and Chhattisgarh, have increased this reservation to 50%.
- **Importance of EWRs:** EWRs have been instrumental in enhancing service



delivery, reducing corruption, fostering inclusive governance, and advancing gender equality.

### Conclusion:

- The challenges encountered by EWRs in rural India stem from deeply entrenched social biases, policy obstacles, and structural inequities. Addressing these issues through institutional reforms, enhancing collective agency, and investing in capacity-building initiatives will empower women leaders in rural governance and fortify gender equality in the political framework of India.

## Government Prolongs Distribution of Fortified Rice Under Welfare

### Schemes Until 2028

#### Relevance : GS II - Welfare Schemes

- **In News:** The government has prolonged the distribution of complimentary fortified rice under the Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY) and other social welfare schemes until 2028.



#### Fortified Rice Distribution Details:

- Rice fortification is the method of blending Fortified Rice Kernels **enriched with essential micronutrients like Iron, Folic Acid, and Vitamin B12** with regular rice (Custom Milled Rice), adhering to standards established by the Food Safety and Standards Authority of India (FSSAI).
- Fortification involves adding essential vitamins and minerals to staple foods like rice, wheat, oil, milk, and salt to boost their nutritional value and tackle malnutrition.

#### Overview of the Fortified Rice Initiative:

- **Introduction:** This initiative was launched in 2022, and the three-phase implementation process concluded by March 2024.
- **Purpose:**
  - ✓ **Addressing Nutritional Deficiencies:** Fortification is a cost-effective and impactful solution for combating Anaemia and micronutrient deficiencies.
  - ✓ **Broad Reach:** Rice, being a staple food for 65% of India's population, is an ideal carrier for distributing these key micronutrients.
- **Schemes Involved:**
  - ✓ Targeted Public Distribution System (TPDS)

- ✓ Integrated Child Development Services (ICDS)
- ✓ PM POSHAN (formerly known as Mid-Day Meal Scheme)
- ✓ Other welfare programs across all states and Union Territories.
- **Funding Mechanism:**
  - ✓ This is a Central Sector Initiative fully financed by the Central Government, included in the food subsidy component of PMGKAY.
  - ✓ Under PMGKAY, free food grains have been supplied for five years to 81.35 crore beneficiaries under the National Food Security Act, 2013.

### About Anaemia:

- **Definition:** Anaemia refers to a condition where the number of red blood cells or the haemoglobin concentration in the blood is below normal, affecting the blood's oxygen-carrying capacity.
- **Prevalence**
  - ✓ As per the National Family Health Survey 5 (2019-21), the following groups are particularly affected by anaemia:
  - ✓ 57% of women (aged 15-49 years),
  - ✓ 59% of adolescent girls (aged 15-19 years), and
  - ✓ 67% of children (aged 6-59 months).
- **Government Measures:** The Anaemia Mukt Bharat strategy has been rolled out to reduce anaemia rates, especially among vulnerable groups.

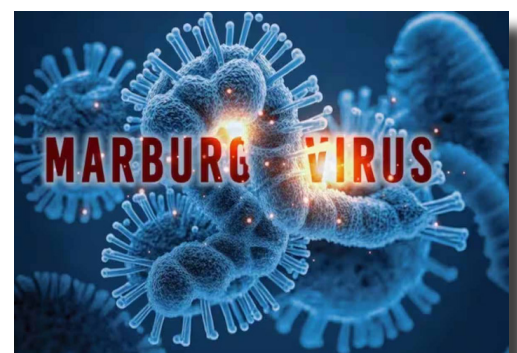
### Conclusion:

- The government's move to extend the supply of fortified rice through welfare schemes until 2028 demonstrates a sustained commitment to combating malnutrition and micronutrient deficiencies in India.
- With rice as a widely consumed staple, the initiative has the potential to benefit a large segment of the population, particularly those at risk of anaemia and related health issues.

## Marburg Virus Outbreak in Rwanda

### Relevance: GS II - Health Sector

- **In News:** Rwanda has recently disclosed that the Marburg virus has infected at least 46 individuals, leading to 12 fatalities attributed to Marburg disease.



### About Marburg Virus Disease:

- **Definition:**

- ✓ Marburg virus disease (MVD) is a rare yet severe hemorrhagic fever that can result in serious illness and death. It is recognized as one of the most lethal pathogens known to humankind.

- **Classification:**

- ✓ Marburg belongs to the filovirus family, which also includes the Ebola virus. Both pathogens exhibit clinical similarities and are infrequently encountered.

- **Historical Context:**

- ✓ The initial outbreak of the Marburg virus took place in 1967 in Marburg, Germany. Since then, subsequent outbreaks have primarily been reported across various regions in Africa.

### Causes and Transmission:

- Individuals infected with the Marburg virus typically display the following symptoms:
  - ✓ **High fever, Severe headache, Muscle pain, Profuse watery diarrhea, Abdominal discomfort and cramping, Vomiting.**
- Many patients may experience hemorrhagic symptoms, which include bleeding in multiple areas, such as the digestive system (where feces and vomit may contain fresh blood), the nose, gums, and vagina.
- Hemorrhaging is responsible for **the majority of fatalities associated with MVD**, with death occurring 8 to 9 days after the onset of symptoms, typically due to severe blood loss and shock.

### Treatment and Fatality Rates:

- **Current Treatment:**
  - ✓ As of now, there are no authorized vaccines or specific treatments available for Marburg virus disease.
- **Fatality Rates:**
  - ✓ The case fatality rates for Marburg virus disease have fluctuated from 24% to 88% in previous outbreaks, with the rates varying based on the specific virus strain and the quality of case management provided.

### Conclusion:

- The ongoing outbreak of the Marburg virus in Rwanda highlights the significant health risks posed by this pathogen.
- With its high fatality rates and lack of effective treatment options, it is essential for health authorities to implement stringent measures for containment and management of the disease, as well as to enhance awareness regarding its transmission and symptoms.

## India Ranked in 'Serious' Category in Global Hunger Index (GHI) 2024

### Relevance : GS II - Poverty & Hunger

- **In News:** India has been ranked in the 'serious' category in the Global Hunger Index (GHI) 2024, spotlighting the persistent issues of hunger and malnutrition in the country.



### Key Highlights of the GHI Report on India:

- **India's Ranking:** India holds the 105th position out of 127 nations and is classified under the "serious" category alongside 41 other countries, including Pakistan and Afghanistan.
- **Decline in GHI Score:** Although India's GHI score has shown improvement since 2000, the rates of child wasting (low weight for height) and stunting (low height for age) continue to be alarmingly high.
- **Maternal Malnutrition:** Maternal undernutrition remains a significant issue in India, perpetuating child malnutrition and creating an intergenerational cycle of poor nutritional outcomes.

### Overview of the Global Hunger Index (GHI):

- **Objective:**
  - ✓ The Global Hunger Index is designed to evaluate and monitor hunger levels across global, regional, and national scales.
- **Indicators:**
  - ✓ Each country's GHI score is calculated using four primary indicators:
    3. **Undernourishment:** Insufficient caloric intake among the population.
    4. **Child Stunting:** The percentage of children under five years with low height relative to their age.
    5. **Child Wasting:** The percentage of children under five with low weight relative to their height.
    6. **Child Mortality:** The rate at which children die before reaching five years of age.

### Concerns Regarding the GHI:

- **Methodology Issues:** Three out of the four indicators used in the GHI focus primarily on child health and may not provide a comprehensive reflection of the overall population's nutritional condition.

- **Questionable Metrics:** Some studies challenge the use of stunting as a reliable indicator of undernutrition, pointing out that it can occur in well-nourished populations.
- **Outdated Data:** The GHI relies on outdated data sources like the National Family Health Surveys, which do not offer annual updates on crucial indicators, reducing the index's accuracy.

### Conclusion:

- The Global Hunger Index 2024 highlights India's ongoing battle with hunger, especially concerning child malnutrition and maternal health. While progress has been made since 2000, there remain significant challenges that must be addressed to disrupt the cycle of undernutrition across generations.

## NRA of India Aligns with WHO Global Standards for Vaccine Regulation

### Relevance: GS II - Health Sector

- **In News:** India's vaccine regulatory framework, comprising the National Regulatory Authority (NRA) and associated bodies, has been declared "functional" across all critical regulatory functions. This evaluation is based on the World Health Organization's (WHO) Global Benchmarking Tool (GBT).
- In the latest reassessment, India's NRA maintained Maturity Level 3 in essential regulatory aspects, affirming a robust and well-functioning system that achieved high ratings in various domains of vaccine regulation.



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### Transition to Updated GBT Version VI:

- In 2017, India's NRA was evaluated using the older GBT version V. The recent evaluation, conducted with the newer GBT VI, reconfirmed India's compliance with global standards in vaccine regulation. Achieving Maturity Level 3 underscores India's ability to uphold a consistent and integrated regulatory structure.

### Overview of WHO's Global Benchmarking Tool (GBT):

- **Objective:** The GBT serves as a comprehensive assessment tool to evaluate national regulatory systems overseeing products like vaccines, medicines, blood components, and medical devices.
- **Maturity Levels:** GBT ranks regulatory systems on a four-point scale, where:

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- ✓ **Level 1:** Basic elements of a regulatory system are in place.
- ✓ **Level 4:** Reflects an advanced regulatory system with ongoing enhancement and high performance.

### National Regulatory Authority (NRA) of India: Key Bodies

- The NRA comprises various critical institutions responsible for regulating, monitoring, and testing vaccines to ensure they meet international standards of quality, safety, and efficacy.
- These include:
  - ✓ Central Drugs Standard Control Organization (CDSCO)
  - ✓ State Drug Regulatory Authorities
  - ✓ Central Drugs Laboratory
  - ✓ Immunization Division
  - ✓ Pharmacovigilance Programme of India (PvPI)

### Vaccine Regulatory Structure in India:

- **Import and Production:** The Drugs and Cosmetics Act, 1940 and its subsequent rules govern the importation and production of vaccines. A manufacturing license is issued following a joint assessment by the concerned State Licensing Authority and CDSCO.
- **Development of New Vaccines:** The New Drugs and Clinical Trials Rules, 2019 outline the necessary prerequisites for conducting clinical trials and obtaining approvals for new vaccines, ensuring that these vaccines adhere to stringent safety and efficacy criteria.
- **r-DNA Derived Vaccines:** In addition to other guidelines, vaccines developed using recombinant DNA (r-DNA) technology must adhere to regulations set by the Department of Biotechnology, which governs the research, development, and testing protocols for such vaccines.

### Conclusion:

- India's vaccine regulatory framework, as assessed by WHO's GBT, has attained a commendable level of functionality, making it an essential contributor to global vaccine regulation.
- By adhering to international standards, India continues to demonstrate its commitment to ensuring the safety, quality, and effectiveness of vaccines produced and used within the country.

## Guidelines for 'Innovative Projects' under PM-Surya Ghar: Muft Bijli Yojana

### Relevance: GS II - Government Schemes

- **In News:** The Ministry of New and Renewable Energy (MNRE) has recently released operational guidelines to promote advancements in rooftop solar technologies.
- These guidelines are aimed at encouraging the adoption of novel business models and integration techniques to further the nation's renewable energy goals. Previously, guidelines had been issued for other subcomponents like Model Solar Villages.



### About the 'Innovative Projects' Component:

- **Objective:**
  - ✓ The initiative seeks to offer support for startups, institutions, and industries in piloting new concepts within the renewable energy space. The focus is particularly on solutions such as blockchain-based peer-to-peer solar energy trading and other emerging innovations.
- **Eligibility/Target Group:**
  - ✓ This component is open to any entity or individual, including opportunities for international collaboration in research and development.
- **Duration:**
  - ✓ Projects under this initiative will have a maximum duration of 18 months.
- **Fund Allocation:**
  - ✓ A total of ₹500 crore has been allocated to facilitate advancements in rooftop solar technologies.
- **Funding Support:**
  - ✓ Eligible projects can receive up to 60% of the total project cost or ₹30 crore (whichever is lower) in financial assistance under this component.
- **Implementing Agency:**
  - ✓ The National Institute of Solar Energy (NISE) is the designated body responsible for implementing the Innovative Projects component.

### Overview of PM Surya Ghar: Muft Bijli Yojana (2024):

- **Nodal Ministry:**



- ✓ The Union Ministry of New and Renewable Energy (MNRE) is the lead ministry for this scheme.
- **Duration:**
  - ✓ The scheme is scheduled to be operational until the financial year 2026-27.
- **Objective:**
  - ✓ The scheme focuses on promoting the installation of rooftop solar (RTS) systems, ensuring free electricity for up to 300 units per month for 1 crore households.
- **Subsidy Provisions:**
  - ✓ Under the scheme, a 60% subsidy is provided for solar systems with a capacity of up to 2 kW, and a 40% subsidy is offered for systems ranging between 2 to 3 kW capacity.
  - ✓ This program not only aims to reduce the cost of electricity for households but also promotes a shift towards sustainable and clean energy throughout the country.

## Delhi HC Issues Guidelines to Enhance Treatment Accessibility for Rare Diseases

### Relevance: GS II - Health Sector

- **In News:** In the case of Master Arnesh Shaw v. Union of India & Anr., the Delhi High Court reiterated that the Right to Health, being a fundamental part of the Right to Life under Article 21, must be universally upheld, including for individuals suffering from both common and rare diseases.



DELHI HIGH COURT

### Key Court Directions:

- **For the Central Government:**
  - ✓ **Creation of National Rare Diseases Fund (NRDF):** The court instructed the establishment of a National Rare Diseases Fund (NRDF) to make treatments more cost-effective and widely accessible.
  - ✓ **CSR Inclusion:** Contributions towards rare disease treatments will be added to Schedule VII of the Companies Act, 2013, facilitating corporate donations under Corporate Social Responsibility (CSR) initiatives.
  - ✓ **Management of NRDF:** The NRDF will be managed by a National Rare Disease Cell, comprising one or more nodal officers from the Ministry of Health and Family Welfare (MoH&FW).

- ✓ **Centralized Information Portal:** A National Rare Disease Information Portal will be created and made operational within three months, providing a patient registry and comprehensive information on available treatments.
- ✓ **Accelerated Drug Approval Process:** The court directed the Drug Controller General of India (DCGI) and Central Drugs Standard Control Organization (CDSCO) to establish a special fast-track approval system for rare disease drugs and therapies within 60 days.
- **For Pharmaceutical Companies:**
  - ✓ **Ensure Drug Availability:** Pharmaceutical firms were instructed to ensure a steady supply of medications and therapies for rare diseases in India, either through production or importation.
  - ✓ **Local Manufacturing Plan:** Companies that import therapies for rare diseases are required to submit a comprehensive plan to the MoH&FW and the National Rare Disease Committee within 90 days to set up local manufacturing or distribution units in India.

### Understanding Rare Diseases (RD):

- **WHO's Definition:** According to the World Health Organization (WHO), a rare disease is a chronic, life-altering condition that affects 1 or fewer individuals per 1,000 population. Examples include Cystic Fibrosis and Pompe Disease.

### Government Measures for Rare Diseases:

- **National Policy for Rare Diseases, 2021:** This policy aims to reduce the prevalence of rare diseases through a holistic and comprehensive prevention strategy.
- **Rashtriya Arogya Nidhi:** This initiative offers financial support to patients from economically disadvantaged backgrounds suffering from rare diseases.

### Conclusion:

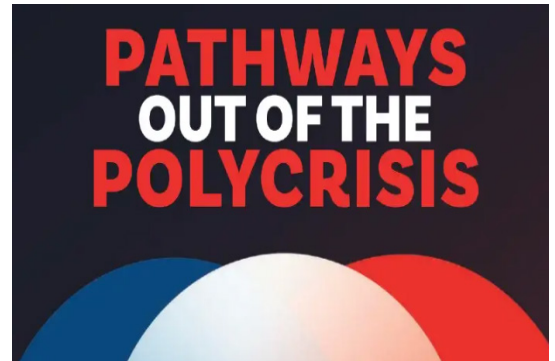
- These directives from the Delhi High Court represent a critical move toward ensuring broader access to rare disease treatments, solidifying the Right to Health as a fundamental right for all, irrespective of the rarity of the condition.

## Pathways Out of the Polycrisis: Poverty, Prosperity, &amp; Planet

Report 2024

## Relevance : GS II - Poverty &amp; Hunger

- **In News:** The World Bank Group has published its Pathways Out of the Polycrisis: Poverty, Prosperity, and Planet Report 2024, offering a framework to balance competing priorities and achieve optimal results in the areas of poverty, prosperity, and the planet's health.



## Key Insights from the Report:

• **Sluggish Global Poverty Alleviation:**

- ✓ Over the last five years, global poverty reduction has virtually stalled, primarily due to the effects of a polycrisis.

• **What is Polycrisis?**

- ✓ A polycrisis refers to the simultaneous occurrence of multiple crises—such as slow economic growth, increased instability, climate threats, and greater uncertainty—making national development plans and international collaboration more difficult.

• **Failure to Meet Goals:**

- ✓ The global population living in extreme poverty is expected to be 7.3% by 2030 (down from 8.5% in 2024), which significantly exceeds the World Bank's goal of 3% and remains distant from the UN SDG target of eradicating extreme poverty.

• **Widening Global Prosperity Gap:**

- ✓ The report notes a marked slowdown in equitable income growth following the pandemic, leading to a growing prosperity gap. The prosperity gap measures average increase in worldwide incomes needed to bring everyone to a prosperity standard of \$25 per person per day.

• **India's Achievement:**

- ✓ India has made significant progress, reducing its population living in extreme poverty from 431 million in 1990 to 129 million in 2024.

• **Defining Extreme Poverty:**

- ✓ According to the World Bank, extreme poverty refers to living on less than \$2.15 per day per person.

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### Recommended Pathways and Focus Areas:

- **Accelerating Inclusive Economic Growth:**
  - ✓ The report stresses the need to enhance labour productivity, income levels, and job creation to ensure faster and more inclusive economic expansion.
- **Strengthening Climate Resilience:**
  - ✓ The need to fortify climate risk management and mitigation efforts is emphasized to shield vulnerable communities from environmental shocks. Furthermore, the report advocates for synchronizing policies that strike a balance between economic growth and reduced emissions to address the climate crisis effectively.

### Global Priorities Categorized by Economic Status:

- **Low-Income Nations:**
  - ✓ These countries should prioritize poverty eradication by boosting investment in human development, physical infrastructure, and financial resources.
- **Middle-Income Nations:**
  - ✓ The focus for these nations should be on income growth that reduces vulnerability while aligning efforts to reduce air pollution and finding ways to link development and environmental preservation.
- **High-Income and Upper-Middle-Income Nations:**
  - ✓ These countries must accelerate climate mitigation strategies while carefully managing the costs of transitioning to a sustainable, low-carbon future.

### Guidelines for Prevention and Regulation of Greenwashing & False Environmental Claims, 2024 Issued by CCPA

#### Relevance: GS II - Government Schemes

- **In News:** The Central Consumer Protection Authority (CCPA) has introduced the Guidelines for Prevention and Regulation of Greenwashing and False Environmental Claims, 2024.
- These directives, issued under the Consumer Protection Act, 2019, aim to encourage honest practices, ensuring that environmental claims are both accurate and meaningful.



#### Context for the Guidelines:

- The guidelines have been created to address the growing issue of misleading advertisements promoting so-called 'green' products. Such deceptive marketing

tactics not only mislead well-intentioned consumers but also divert focus from more significant environmental efforts.

### Key Features of the Guidelines:

#### • Definition of Greenwashing

✓ The guidelines define greenwashing as any false or misleading practice, including the concealment or omission of key information. This includes exaggerated, vague, or unsubstantiated claims regarding a product's environmental benefits.

#### • Use of Symbols and Visuals

✓ The guidelines also address the inappropriate use of symbols and imagery that highlight the positive environmental attributes of a product while downplaying or hiding harmful aspects.

#### • Scope of Applicability

✓ These guidelines apply to all environmental claims, ensuring that businesses remain accountable for any misleading assertions about their products' environmental impact.

#### • Transparency Obligations

✓ The guidelines prohibit the use of general terms such as “eco-friendly,” “green,” and “sustainable” without adequate and accessible proof. Companies must also provide detailed information about the methodologies and data used to support these claims.

#### • Third-Party Validation

✓ Environmental claims such as compostable, degradable, recyclable, or climate-positive must be supported by independent third-party certification to ensure credibility.

#### • Aspirational or Future-Focused Claims

✓ Claims about future environmental benefits can only be made if there are specific and actionable plans in place detailing how these goals will be achieved.

### Importance of the Guidelines:

- These guidelines represent a crucial step toward tackling greenwashing and **ensuring that environmental claims are subject to higher standards of transparency and responsibility**. They safeguard consumers from misleading information and encourage companies to demonstrate a genuine commitment to sustainability in their operations.

### Conclusion:

- By defining greenwashing, enforcing strict transparency standards, and requiring independent verification, these guidelines aim to protect consumers and promote

genuine sustainability efforts.

- This initiative will foster consumer trust while encouraging ethical marketing practices, ultimately contributing to meaningful progress in addressing climate change and ecological challenges.

## Supreme Court Raises Concerns Over the Feasibility of Gram Nyayalayas

### Relevance : GS II - Polity

- **In News:** The Supreme Court has expressed reservations regarding the practicality of setting up Gram Nyayalayas (village courts) as required by the Gram Nyayalayas Act of 2008. These courts aim to guarantee that no citizen is deprived of access to justice due to social, economic, or other disadvantages.



### Major Concerns Raised by the Supreme Court:

- **Mandatory Establishment by States/UTs:** The Court questioned whether the formation of Gram Nyayalayas is obligatory, pointing to Section 3 of the Act, which uses the word “may” in reference to their creation by state governments.
- **Resource Constraints:** States, already grappling with budgetary constraints in running regular courts, may find it difficult to provide additional funding for Gram Nyayalayas.
- **Increasing Burden on Higher Courts:** The Supreme Court raised concerns that Gram Nyayalayas might overwhelm high courts with a surge in appeals and writ petitions.

### Key Characteristics of Gram Nyayalayas:

- **Location:** Gram Nyayalayas are to be established at the block-level Panchayat or for a cluster of neighboring Panchayats.
- **Appointment:** A ‘Nyayadhikari’ (Judge) is appointed for each Gram Nyayalaya by the state government in consultation with the high court.
- **Jurisdiction:** These courts are mobile in nature, with authority over both civil and criminal matters.
- **Dispute Resolution Mechanism:** Disputes are preferably settled through reconciliation efforts. Social workers can be appointed as Conciliators.
- **Legal Framework:** Gram Nyayalayas are not restricted by the Indian Evidence Act, 1872 (now replaced by the Bharatiya Sakshya Adhiniyam) but function based on the Principles of Natural Justice.

### Current Status of Gram Nyayalayas:

- Despite an initial goal of establishing around 2,500 Gram Nyayalayas, fewer than 500 have been set up, and only 314 are currently operational across the country. While **states like Maharashtra, Madhya Pradesh, and Rajasthan have made progress**, other major states such as **Uttar Pradesh and Bihar have seen minimal or no implementation**.

### Government Initiative to Promote Gram Nyayalayas:

- To support the establishment of Gram Nyayalayas, the Union Government provides financial aid to states under a Centrally Sponsored Scheme (CSS).

### Conclusion:

- The Supreme Court's concerns underscore the challenges in effectively implementing Gram Nyayalayas, including unclear mandates, resource constraints, and added pressure on higher courts.
- Despite their potential to improve rural justice delivery, slow and uneven progress indicates a need for stronger policy support and adequate resources. A coordinated effort between the Union and state governments is essential to ensure that Gram Nyayalayas can achieve their intended goals.

## HC Approves Posthumous Use of Cryopreserved Semen for Reproductive Purposes

### Relevance: GS II - Governance

- **In News:** The Delhi High Court has granted a 60-year-old couple the authorization to utilize the preserved sperm of their deceased son for surrogacy, setting a significant legal precedent in the realm of posthumous reproduction.



### Highlights of the Ruling:

- **Legal Framework:** Indian law does not prohibit posthumous reproduction in the absence of a spouse, provided there is clear consent from the egg or sperm owner.
- **Definition of Posthumous Reproduction:** This term refers to the process of conceiving a child using Assisted Reproductive Technology (ART) after the death of one or both biological parents. In such instances, the cryopreserved gametes of the deceased are employed to conceive a child.
- **Court Decision:** The court determined that a semen or ovum sample constitutes 'property,' as it is part of an individual's biological material and can be inherited by legal heirs.

### Assisted Reproductive Technology (ART):

- ART encompasses all techniques designed to achieve pregnancy by manipulating sperm or oocytes outside the human body and transferring the gamete or embryo into a woman's reproductive system.
- Key methods include:
  - ✓ In-Vitro Fertilization (IVF)
  - ✓ Surrogacy
  - ✓ Gamete Cryopreservation
  - ✓ Gamete Intra-Fallopian Transfer (GIFT)

### Regulation of ART in India:

- **ART (Regulation) Act, 2021:** This legislation establishes regulations and oversight for ART clinics and banks, aiming to prevent misuse and ensure safe and ethical practices in ART services.
- **Surrogacy (Regulation) Act, 2021:** This act prohibits and penalizes commercial surrogacy, allowing it only for altruistic purposes.

### Conclusion:

- The Delhi High Court's decision represents a pivotal advancement in reproductive rights and posthumous reproduction in India.
- By affirming the legality of utilizing cryopreserved gametes, the court has opened avenues for families to explore assisted reproductive technologies even after the passing of a parent.
- This ruling underscores the shifting landscape of reproductive rights & highlights the necessity for comprehensive regulations to ensure ethical and safe practices in assisted reproductive technologies.

## Supreme Court Upholds the Validity of Section 6A of Citizenship Act

### Relevance: GS II - Polity

- **In News:** A Constitutional Bench of the Supreme Court has upheld the validity of Section 6A of the Citizenship Act, 1955. This provision, added through the Citizenship Amendment Act of 1985, was a key outcome of the Assam Accord.



### About Section 6A:

- **Context:** Section 6A was introduced as part of the Assam Accord, a Memorandum of Settlement between the central government and leaders of the

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Assam Movement, aimed at addressing the issue of illegal immigration from East Pakistan (now Bangladesh) into Assam.

- **Citizenship Provision:** It grants citizenship to individuals who migrated from East Pakistan to Assam between January 1, 1966, and March 24, 1971, following a ten-year period after their detection as foreigners.

### Key Highlights of the Supreme Court Judgment:

- **Legislative Competence:** The court upheld that Parliament had the authority to enact Section 6A under Article 246 of the Constitution, which relates to Entry 17 in the Union List concerning citizenship, naturalization, and aliens.
- **Equality (Article 14):** The court ruled that Assam's special citizenship provisions do not violate the principle of equality since Assam faced a unique immigration situation, which was distinct from the rest of India.
- **Cultural Rights (Article 29(1)):** The court found no evidence that the influx of migrants had adversely impacted the cultural rights of the Assamese people.
- **Cut-off Date:** The March 24, 1971 cut-off for granting citizenship was deemed reasonable, given that the Pakistani military launched Operation Searchlight on March 26, 1971, to suppress the Bangladeshi nationalist movement. Migrants after this date were classified as war migrants rather than those fleeing partition.

### Citizenship Act, 1955:

- The Citizenship Act, 1955, outlines **five methods** by which Indian citizenship can be acquired:
  7. By Birth
  8. By Descent
  9. By Registration
  10. By Naturalisation
  11. By Incorporation of Territory
- **Dual Citizenship:** The Act does not allow for dual citizenship.

### Citizenship Amendment Act, 2019:

- **Provisions:** The Citizenship Amendment Act (CAA) of 2019 introduced a pathway for individuals from Hindu, Sikh, Buddhist, Jain, Parsi, or Christian communities from Afghanistan, Bangladesh, or Pakistan to gain citizenship, provided they entered India before December 31, 2014. Such individuals would not be classified as illegal migrants.

### Conclusion:

- The Supreme Court's ruling on Section 6A upholds the unique provisions of the Assam Accord, balancing the state's special concerns regarding immigration while maintaining national integrity.

- The decision reinforces the legislative powers of Parliament and affirms that distinct regional circumstances warrant special legal treatment, without compromising constitutional principles of equality and cultural preservation.

## Supreme Court to Reconsider 2022 Verdict on Benami Property Law

### Relevance: GS II - Governance

- In News:** The Supreme Court has decided to review its 2022 judgment related to the Prohibition of Benami Property Transactions Act (PBPTA), 1988, after the Union Government filed a petition challenging certain provisions of the ruling that were declared unconstitutional.



Prohibition of Benami Property Transaction Act, 1988

### About the PBPTA, 1988:

- The Prohibition of Benami Property Transactions Act (PBPTA) was enacted to eliminate benami transactions and enable the seizure of such properties.
  - ✓ **Benami Transaction:** This is a scenario where a property is owned or transferred in the name of one person, but the actual payment or financial support comes from another party.

### Key Points from the 2022 Supreme Court Verdict:

- Section 3(2) of PBPTA Ruled Unconstitutional:** The provision that imposed a prison sentence for engaging in benami transactions was invalidated by the Supreme Court. It was found to violate Article 20(1) of the Constitution, which protects individuals from arbitrary punishment and prosecution for offenses.
- Non-Retrospective Application:** The court ruled that the PBPTA could not be applied retrospectively. This meant authorities were prohibited from launching or continuing criminal prosecutions or property confiscation processes for transactions that occurred before the law was enacted.
- Benami Transactions (Prohibition) Amendment Act, 2016:** The court noted that the 2016 amendment did not explicitly provide for retrospective application, despite the Union Government's argument that it should apply to transactions that took place prior to the amendments.

### Challenges Related to Benami Transactions:

- Unaccounted Wealth:** Benami properties are often used to conceal undisclosed wealth, contributing to the proliferation of black money in the economy.
- Tax Avoidance:** Benami transactions facilitate tax avoidance, resulting in substantial revenue losses for the government.



- **Distortion of Real Estate Market:** These transactions distort the real estate market by artificially inflating property prices, making it difficult to assess the true value of assets.
- **Fraudulent Asset Diversion:** Benami transactions can aid in the deceptive diversion of assets, complicating ownership tracing and undermining the transparency and integrity of the financial ecosystem.

### Conclusion:

- The Supreme Court's decision to revisit the 2022 ruling underscores the ongoing legal and policy debates surrounding the Benami Property Law and its role in curbing unaccounted wealth and enhancing financial transparency.
- The outcome of this review may lead to crucial changes in India's regulatory framework concerning property and financial dealings.

## Implementation of Section 479 BNSS to Provide Relief for Undertrial Prisoners

### Relevance : GS II - Governance

- **In News:** The Ministry of Home Affairs (MHA) has issued an advisory to all states and union territories **concerning the prolonged detention of undertrial prisoners**, in light of a recent Supreme Court decision.
- The ruling emphasizes that Section 479 of the Bharatiya Nagarik Suraksha Sanhita (BNSS) is applicable to all undertrials, regardless of whether their case was registered before or after 1st July 2024, the date when BNSS became operative.



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### Bail Provisions under BNSS for Undertrial Detainees:

- **Regular Offenses:** Undertrials must be released if they have served half of the maximum imprisonment term for the offense they are accused of.
- **First-Time Offenders:** Undertrials can be freed if they have served one-third of the maximum sentence for their crime, except in cases where the punishment is life imprisonment or death penalty.

### Current Situation of Undertrial Prisoners in India:

- Data from the National Crime Records Bureau (NCRB) reveals that India's prisons, which fall under the State List (Seventh Schedule of the Constitution), have an **overcrowding rate of 131.4%**.



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- As of 2022, about 75% of inmates are undertrials. Undertrials are those held in judicial custody while their legal cases are being heard in court.

### Reasons for the High Number of Undertrial Prisoners:

- Widespread arrests by law enforcement.
- Lack of awareness of legal rights among detainees.
- Delays in court proceedings.
- Courts' hesitation to grant bail.
- Inability to afford bail or sureties.

### Steps Taken to Ease the Burden on Undertrial Prisoners:

- Support to Poor Prisoners Scheme:** Assists financially distressed prisoners who cannot pay fines or bail bonds.
- E-Prisons Portal:** A digital tool to swiftly access information about inmates eligible for release.
- Model Prison Manual 2016:** Sets out guidelines on the facilities that should be provided to undertrial detainees.
- State Legal Services Authorities:** Legal Service Clinics have been set up within prisons to provide free legal aid to undertrials.

### Conclusion:

- The MHA's advisory aims to ensure that the BNSS's provisions are thoroughly implemented, easing the pressure on India's overcrowded prison system and ensuring that undertrial detainees receive equitable treatment and timely legal relief.

## Delhi High Court Dismisses Contempt Case Against Wikipedia

### Relevance: GS II - Governance

- In News:** The Delhi High Court concluded contempt proceedings against Wikipedia after the platform removed an article titled "Asian News International v. Wikimedia Foundation."
- ANI initiated the lawsuit after a Wikipedia page depicted it as a government propaganda outlet and accused it of misreporting information.



### Court's Judgment:

- The court found that the article on Wikipedia violated the sub-judice principle, which restricts public commentary that may influence an active court case.

- The court pointed out that the content on the page constituted interference with court proceedings and had the potential to affect the case's outcome.

### Overview of Contempt of Court:

- The Contempt of Courts Act, 1971 classifies contempt into civil and criminal categories:
  - ✓ **Civil Contempt:** Intentional non-compliance with a court's judgment, direction, or other orders.
  - ✓ **Criminal Contempt:** Actions or publications that:
    - Undermine the authority of the court.
    - Prejudice or interfere with ongoing legal proceedings.
    - Disrupt the administration of justice.

### Constitutional Provisions Related to Contempt of Court:

- **Article 129:** Designates the Supreme Court as a "court of record" with the power to penalize for contempt.
- **Article 215:** Grants High Courts similar authority.
- **Article 142:** Allows the Supreme Court to issue orders necessary for delivering justice, including in contempt cases.

### Conclusion:

- This ruling reinforces the importance of judicial independence by limiting public discourse on active cases, ensuring unbiased judicial processes without external influences.

## SC Issues Guidelines for Ensuring Free & Prompt Legal Aid for Prisoners

### Relevance : GS II - Governance

- **In News:** A two-judge Supreme Court bench in *Suhas Chakma vs. Union of India* has recently issued procedural directions to ensure that legal aid schemes by legal service authorities effectively reach all intended recipients.



### Key Highlights of the Court's Directives:

- **Implementation by Legal Bodies**
  - ✓ The National Legal Services Authority (NALSA), in collaboration with State and District Legal Services Authorities, must ensure that Standard Operating Procedures (SOPs) to facilitate prisoners' access to legal aid are operationalized effectively.

- **Enhanced Awareness Efforts**
  - ✓ The court emphasized the use of accessible materials, including translations in local languages, to improve awareness among potential justice recipients.
- **Public Display of Legal Aid Resources**
  - ✓ Legal aid information must be prominently displayed at locations like police stations, post offices, bus stops, and railway stations, along with contact details for the nearest legal aid offices.

### Framework for Legal Aid:

- **Article 39A of the Constitution**
  - ✓ Mandates the State to ensure free legal aid, so no citizen is denied justice due to economic or other limitations.
- **Legal Services Authorities Act, 1987**
  - ✓ Provides a structured approach to deliver legal aid through:
    - Establishment of Legal Services Authorities at national, state, district, and taluka levels.
    - Formation of Legal Services Committees in the Supreme Court, High Courts, and subordinate courts.

### Eligibility for Legal Aid under the Legal Services Authorities Act, 1987:

- **Legal aid is available for:**
  - ✓ Women and children.
  - ✓ Members of Scheduled Castes and Scheduled Tribes.
  - ✓ Industrial laborers.
  - ✓ People with disabilities.
  - ✓ Victims of human trafficking or forced labor.
  - ✓ Survivors of natural or human-made calamities, violence, caste-related atrocities, and industrial accidents.
  - ✓ Individuals in protective custody, juvenile homes, or psychiatric facilities.

### States Empowered to Regulate Industrial Alcohol or Denatured Spirit

#### 🔑 **Relevance: GS II - Polity**

- **In News:** In State of Uttar Pradesh vs. M/S. Lalta Prasad Vaish, the Supreme Court ruled that the term “intoxicating liquor” in Entry 8 of List II (State List) under the Seventh Schedule of the Constitution also includes industrial alcohol.
- This ruling overturns a 1990 decision in the Synthetics & Chemicals Ltd.



vs. State of U.P. case, which held that “intoxicating liquor” referred only to drinkable alcohol, thus restricting states from taxing industrial alcohol.

### Brief Background:

- At present, the Union government regulates industrial alcohol under the Industries (Development and Regulation) Act, 1951. The Union defended this jurisdiction based on:
  - ✓ **Entry 52 (Union List)** - Pertaining to industries.
  - ✓ **Entry 33 (Concurrent List)** - Governing production, supply, and distribution of certain goods.
- States argued that the potential misuse of industrial alcohol for creating illegal drinkable alcohol necessitates regulatory powers to prevent unauthorized production and sale effectively.

### About Industrial Alcohol:

- Industrial alcohol is distinct from potable alcohol, which mainly refers to ethyl alcohol (ethanol) intended for human consumption. Industrial alcohol, typically isopropyl alcohol (isopropanol) or denatured ethanol, is altered with additives that render it unsuitable for drinking by making it toxic or unpleasant.

### Applications of Industrial Alcohol:

- Manufacturing:** Utilized as a solvent in paints, varnishes, and adhesives.
- Cleaning:** Commonly used for cleaning machinery and surfaces.
- Fuel:** Acts as a fuel source for stoves, lamps, and vehicles.
- Medical Use:** Serves as a disinfectant or preservative.

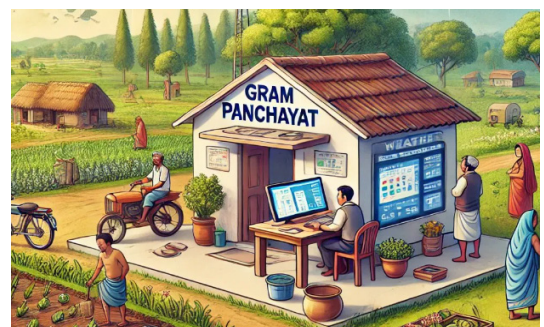
### Conclusion:

- This judgment affirms the states’ authority to legislate and control industrial alcohol, emphasizing the need for state oversight to prevent unauthorized use and ensure public safety.

## Gram Panchayat-Level Weather Forecasting Initiative

### Relevance : GS II - Polity

- In News:** For the first time, customized weather forecasts will be available at the Gram Panchayat level in India. Supported by the India Meteorological Department’s (IMD) expanded sensor network, this development will enable rural communities to access timely and accurate weather insights.



### About the Initiative:

- **Ministries Involved**
  - ✓ The initiative is a collaborative effort led by the Ministry of Panchayati Raj, the IMD, and the Ministry of Earth Sciences.
- **Core Features of the Initiative**
  - ✓ **Coverage Across 2.5 Lakh Gram Panchayats:** Rural governance bodies can now access real-time information on temperature, wind speed, cloud cover, rainfall, and relative humidity.
  - ✓ **Digital Platforms for Forecast Access:** Platforms like e-GramSwaraj, Gram Manchitra, and Meri Panchayat will offer 5-day and hourly weather forecasts, accessible directly by rural communities.
  - ✓ **SMS Alerts for Severe Weather Conditions:** Text alerts will be sent to panchayat representatives to notify them of extreme weather events, such as cyclones and intense rainfall, enhancing readiness and response.

### Importance of Localized Weather Forecasts:

- **Protection of Agricultural Livelihoods:**
  - ✓ Farmers will be empowered to optimize agricultural activities—such as planting, watering, and harvesting—based on precise weather data, improving productivity and mitigating losses due to unexpected weather.
- **Enhancement of Local Governance:**
  - ✓ This initiative equips rural communities with tools for climate resilience, enabling them to better tackle environmental challenges at the grassroots level.
- **Boosting Disaster Preparedness in Rural Areas:**
  - ✓ Localized weather forecasting will improve emergency readiness in rural regions, reducing the impact of extreme weather events on lives and infrastructure.
- **India's Global Leadership in Climate Resilience:**
  - ✓ IMD's advisory role under the UN's Early Warning for All initiative, serving five developing countries, reflects India's commitment to advancing global climate resilience.

### India's Enhanced Weather Forecasting Capabilities:

- **Precision in Forecasting:**
  - ✓ The IMD currently provides forecasts with a 12 km x 12 km resolution, representing a 40% improvement in accuracy over the last decade.
- **Future Enhancements:**
  - ✓ Efforts are underway to enable forecasting within a 3 km x 3 km grid, with





the ultimate aim of reaching hyper-local accuracy of 1 km x 1 km.

- **Weather Information Network and Data System (WINDS):**
  - ✓ The WINDS system has been launched to compile extensive hyper-local weather data, enhancing the accuracy of forecasts for rural areas.
- **Additional Initiatives to Support Rural Agriculture:**
  - ✓ Programs like Agro Advisory Services (AAS) and Gramin Krishi Mausam Sewa (GKMS) provide region-specific weather-based advisories, supporting rural farmers with targeted guidance.

## India Lack Minimum Dietary Diversity

### Relevance: GS II - Poverty & Hunger

- **In News:** Study Reveals 77% of Children Aged 6-23 Months in India Lack Minimum Dietary Diversity.



### About Minimum Dietary Diversity (MDD):

- The World Health Organization (WHO) defines Minimum Dietary Diversity (MDD) as a diet that includes at least five out of the following eight food groups:
  - breast milk, grains, legumes, dairy products, flesh foods, eggs, fruits, & vegetables.
- Failing to consume food from at least five groups is considered a Minimum Dietary Diversity Failure (MDDF).

### Key Findings from the Study on MDD in India (2019-21):

- **Regional Disparities:** In central India, particularly in states like Uttar Pradesh, Rajasthan, Gujarat, Maharashtra, and Madhya Pradesh, over 80% of children experience MDDF.
- **Age-Related Variations in MDDF:** The prevalence of MDDF is highest among children aged 6–11 months, with 87% of children in this age group failing to meet MDD standards, compared to older age groups.
- **Impact on Vulnerable Groups:** Children from Other Backward Classes (OBCs) have the highest MDDF at 79%, followed by Scheduled Castes (77%) and Scheduled Tribes (76%).
- **Additional Observations:** Children of mothers who are illiterate, young, rural-based, and lack exposure to mass media are at a higher risk of dietary deficiencies.

### Issues in Ensuring Dietary Diversity:

- **Nutritional Composition:** The intake of fruits, vegetables, and animal-based

products is minimal, impacting children's dietary quality.

- **Educational Disparities:** Illiterate mothers have a higher MDDF rate (81%) compared to educated mothers (75%), highlighting the link between maternal education and child nutrition.

### Recommendations:

- **Targeted Outreach:** Efforts should prioritize pregnant women, especially those at high risk, to improve dietary diversity among children.
- **Community Engagement:** Utilize local governance structures to promote nutrition awareness and encourage community-based nutrition activities.

### Initiatives by India to Combat Malnutrition:

- **POSHAN Abhiyan**
  - ✓ This campaign raises nutrition awareness through Jan Andolans, focusing on pregnant women, lactating mothers, and young children.
- **Rashtriya Poshan Mah**
  - ✓ This initiative fosters collaboration among ministries to engage communities in nutrition-related activities.
- **Integrated Child Development Services (ICDS) Scheme**
  - ✓ The ICDS scheme provides essential services for children aged 0-6 years, pregnant women, and lactating mothers.

### Conclusion:

- The study highlights significant gaps in dietary diversity among Indian children, particularly in vulnerable communities.
- Addressing these issues through targeted outreach, community engagement, and existing government initiatives like POSHAN Abhiyan and ICDS is crucial to improve childhood nutrition and health outcomes across India.

## Loan Limit under Pradhan Mantri Mudra Yojana (PMMY) Increased to ₹20 Lakh

### Relevance: GS II - Welfare Schemes

- **In News:** The loan ceiling under the Pradhan Mantri Mudra Yojana (PMMY) has been elevated to ₹20 lakh, in line with the Union Budget 2024-25 announcement by the Finance Minister.
- This adjustment is intended to support the goal



of “Empowering the Unbanked” and foster a conducive ecosystem for aspiring entrepreneur.

### Key Changes:

- **Introduction of ‘Tarun Plus’ Category**
  - ✓ A new category, ‘Tarun Plus,’ has been introduced to cover loans exceeding ₹10 lakh up to ₹20 lakh.
- **Eligibility**
  - ✓ Applicants for ‘Tarun Plus’ must have previously availed loans under the Tarun category and completed repayment successfully.
- **Guarantee Provision**
  - ✓ Loans up to ₹20 lakh will be backed by the Credit Guarantee Fund for Micro Units (CGFMU).
  - ✓ The Fund has the authority to approve specific institutions or schemes for which guarantee coverage will be provided.
  - ✓ Established in 2016, CGFMU is managed by the National Credit Guarantee Trustee Company Ltd., a wholly government-owned entity.

### About Pradhan Mantri Mudra Yojana (PMMY):

- **Launch Year:** 2015
- **Goal:** To ensure smooth access to unsecured micro-credit up to ₹10 lakh for non-corporate, non-farm businesses engaged in income-generating activities, such as manufacturing, processing, trading, or services.
- **Eligibility:** Any Indian citizen with a viable plan for non-corporate, non-farm business activities.
- **Source of Funding:** MUDRA (Micro Units Development & Refinance Agency Ltd.) provides refinancing to financial institutions like banks, Non-Banking Financial Companies (NBFCs), and Micro Finance Institutions (MFIs).
- **Loan Categories:**
  - ✓ **Shishu:** Covers loans up to ₹50,000
  - ✓ **Kishor:** Covers loans above ₹50,000 and up to ₹5 lakh
  - ✓ **Tarun:** Covers loans above ₹5 lakh and up to ₹10 lakh
- The addition of the ‘Tarun Plus’ category in PMMY reinforces the government’s commitment to broadening financial inclusion for small business owners and nurturing a robust and inclusive entrepreneurial environment.

## UN Women Publishes Global Report on Women's Role in Development

☛ **Relevance: GS I - Social Issue**

- **In News:** The United Nations Women has unveiled its World Survey on the Role of Women in Development Report. This year's theme centers on Leveraging Social Protection for Gender Equality, Resilience, and Transformation.



- The report offers an evaluation of progress, gaps, and challenges in establishing gender-inclusive social protection frameworks.

### Importance of Gender-Inclusive Social Protection (GISP):

- **Gender-Inclusive Social Protection systems** are designed to address gender-specific risks, vulnerabilities, & barriers. These frameworks consider factors like:
  - ✓ Women's restricted access to resources,
  - ✓ Disproportionate burden of unpaid care and household work,
  - ✓ Gender-based violence, and
  - ✓ Underrepresentation in decision-making.
- By acknowledging the gender-specific nature of these challenges, GISP ensures that social protection measures effectively tackle the unique issues faced by women.

### Key Insights from the Report:

- **Limited Access to Social Protection:** Approximately two billion women and girls worldwide lack access to any form of social protection, such as cash transfers, unemployment benefits, pensions, or health services.
- **Gap in Maternity Benefits:** More than 63% of women globally still give birth without receiving maternity benefits, underscoring the pressing need for stronger support systems for expectant and new mothers.
- **Increased Vulnerabilities:** Gender-specific risks and vulnerabilities are worsened by issues like conflict, climate change, and economic instability, further marginalizing women, especially in crisis scenarios.

## Key Recommendations:

- **Close Gender Gaps in Social Protection Systems:** The report advises eliminating gender biases in existing social protection systems, policies, and programs to ensure equitable access and participation for women and girls.
- **Strengthen Coordination with Employment and Public Services:** Enhanced coordination between gender-responsive employment policies & public services is essential to create more inclusive and effective social protection systems.
- **Tailor Social Protection for Crisis Situations:** Social protection frameworks should be adaptable to meet the specific needs of women and girls during sudden or prolonged crises, such as conflicts or economic shocks.
- **Implement a Rights-Based Framework:** Social protection delivery should adopt a rights-based approach, ensuring that women's rights to social protection are recognized and upheld universally.

## India's Efforts for Women's Social Protection:

- **Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), 2005:** Ensures 100 days of guaranteed wage employment annually, supporting rural families and promoting economic empowerment among women.
- **Pradhan Mantri Matru Vandana Yojana (PMMVY):** Provides financial assistance to pregnant and breastfeeding women to improve their health and well-being during crucial life phases.
- **Pradhan Mantri Ujjwala Yojana (PMUY):** Offers free LPG connections to Below Poverty Line (BPL) households, protecting women from health risks associated with traditional cooking methods.

## SC Issues Directives for Robust Implementation of Prohibition of Child Marriage Act (PCMA), 2006

## Relevance: GS I - Social Issue

- **In News:** In a pivotal ruling in the Society for Enlightenment and Voluntary Action v. Union of India case, the Supreme Court declared that the Prohibition of Child Marriage Act (PCMA) cannot be constrained by personal laws and traditions, laying down a strengthened



framework for tackling child marriages across India.

### Key Observations by the Supreme Court:

- The Supreme Court underscored the importance of prioritizing the **prevention of child marriages and the protection of minors**, with penalizing offenders being a secondary measure.
- The Court pointed out the necessity of addressing **underlying causes of child marriages, such as poverty, gender disparity, lack of education, and ingrained cultural practices**.
- It further asserted that child marriages infringe upon an individual's **right to freely choose their life partner**.
- The Parliament was urged to introduce a ban on **child betrothals** (promises of future marriages), calling for an amendment to the PCMA.

### Core Provisions of the Guidelines:

- **Legal Enforcement:**
  - ✓ State Governments and Union Territories (UTs) are mandated to appoint Child Marriage Prevention Officers (CMPOs).
  - ✓ Establishment of a Dedicated Police Unit and a State Special Child Marriage Prohibition Unit is required to enhance enforcement.
- **Judicial Actions:**
  - ✓ Magistrates are authorized to take suo motu action and issue preventive orders to block child marriages.
  - ✓ The Supreme Court proposed exploring the establishment of Special Fast-Track Courts for swift handling of child marriage cases.
- **Other Initiatives:**
  - ✓ Launching the Child Marriage Free Village Initiative, modeled after the successful "Open Defecation Free Village" strategy.
  - ✓ Implementing a technology-enabled tracking system to monitor school attendance of girls up to the 12th grade, ensuring continued education.

### About the Prohibition of Child Marriage Act (PCMA), 2006:

- The PCMA was enacted to replace the earlier Child Marriage Restraint Act (CMRA) of 1929, known as the Sharda Act, with the objective of eradicating child marriages in India. Under this Act:
  - ✓ A child is defined as a male under 21 years of age and a female under 18 years of age.

- The Prohibition of Child Marriage (Amendment) Bill, 2021 seeks to raise the minimum legal age for marriage of females from 18 to 21 years, based on recommendations from the Jaya Jaitly Committee.

### Current Status of Child Marriage in India:

- According to NFHS-5 data, 23% of women and 17.7% of men aged 20-24 were married before the legal age of 18.
- More than half of child marriages in India occur in five states: Uttar Pradesh (the highest contributor), Bihar, West Bengal, Maharashtra, and Madhya Pradesh (Source: UNICEF).

### Conclusion:

- These directives represent a significant advancement in the fight against child marriage in India, emphasizing stronger enforcement, judicial reforms, and grassroots initiatives aimed at safeguarding children from this harmful practice.

## Reforms in the Sati System

### Context:

- The recent exoneration of eight individuals involved in glorifying the practice of Sati through the construction of temples dedicated to a deceased widow has reignited discussions surrounding this historic custom. Sati, a tragic manifestation of ancient Indian culture, witnessed significant reform efforts, particularly following the Roop Kanwar incident in 1987, which prompted the establishment of the Commission of Sati (Prevention) Act, 1987. This article provides a thorough examination of the Sati system, the legislation designed to eradicate it, and the broader socio-legal context that influenced these reforms.



### Key Facts Regarding the Commission of Sati (Prevention) Act, 1987

#### ➤ Legal Framework Against Sati

- The Commission of Sati (Prevention) Act, 1987 represented a pivotal legislative measure aimed at combating the practice of Sati and its glorification. Noteworthy provisions include:
- Attempt to Commit Sati: Under Section 3, individuals attempting to perpetrate

Sati may face up to one year of incarceration, a fine, or both.

- **Abetment of Sati:** Section 4 stipulates that anyone who facilitates Sati, either directly or indirectly, could incur life imprisonment along with a fine. This encompasses actions such as persuading a widow that Sati would provide spiritual benefits or elevate the family's status.
- **Glorification of Sati:** Section 5 categorizes the glorification of Sati as punishable by one to seven years of incarceration and fines ranging from five to thirty thousand rupees.

### Historical Context of the Sati System

#### ➤ Definition and Origins

- Sati, also referred to as "suttee," was the practice where a widow self-immolated on her husband's funeral pyre. The custom was often celebrated with the erection of memorials, transforming the widow into a revered figure akin to a goddess. The earliest known reference to Sati can be traced back to the Eran Pillar Inscription of Bhanugupta from 510 AD.

#### ➤ Steps Taken to Abolish Sati

- Over the centuries, various rulers and empires endeavored to abolish or regulate the practice of Sati:
  - **Mughal Empire:** In 1582, Emperor Akbar mandated officials to prevent coerced immolations and offered rehabilitation to widows.
  - **Sikh Empire:** Guru Amar Das condemned Sati during the 15th-16th centuries.
  - **Maratha Empire:** The Marathas enacted a prohibition against the practice.
  - **Colonial Era:** European powers such as the Dutch, Portuguese, and French prohibited Sati in their territories. The Bengal Sati Regulation of 1829, enacted by British Governor-General William Bentinck, criminalized Sati and made it punishable in courts.

### Other Legal Initiatives to Improve Women's Rights

#### ➤ Female Infanticide

- The Bengal Regulations of 1795 and 1804 classified infanticide as murder, while an 1870 Act mandated birth registration, particularly in areas where female infanticide was prevalent.

#### ➤ Widow Remarriage

- The Hindu Widows' Remarriage Act of 1856, championed by Pandit Ishwar Chandra Vidyasagar, legalized widow remarriage and acknowledged children from such unions as legitimate.



## ➤ Child Marriage

- Several legislative measures aimed to curtail child marriage, including:
- The Age of Consent Act, 1891, which prohibited marriage for girls under 12.
- The Child Marriage Restraint Act, 1929 (Sarda Act), which established the marriage age at 18 for boys and 14 for girls.
- The Child Marriage Restraint (Amendment) Act, 1978, which raised the legal marriage age for girls from 15 to 18 years and for boys from 18 to 21 years.

## ➤ Education of Women

- The formation of the Calcutta Female Juvenile Society in 1819 marked the beginning of a movement for women's education, culminating in the establishment of the Bethune School in 1849, a crucial institution for female education.

### Raja Rammohan Roy's Role in Abolishing Sati

## ➤ Advocacy and Activism

- Raja Rammohan Roy emerged as a prominent figure in the 19th-century social reform movement, vigorously advocating against Sati:
- Initiation of Activism: Rammohan initiated his anti-Sati campaign in 1818, asserting the moral and ethical impropriety of the practice.
- Use of Religious Texts: He employed sacred texts to demonstrate that no religion condoned the immolation of widows.
- Appeal to Humanity: His arguments appealed to reason, compassion, and humanity, engaging both religious and secular audiences.
- Grassroots Activism: Rammohan actively participated in community engagement by visiting cremation grounds, organizing vigilance groups, and filing counter-petitions to the government.

## ➤ Impact of Efforts

- His relentless advocacy culminated in the Bengal Sati Regulation of 1829, which criminalized the practice of Sati, marking a significant victory for social reform in India.

### Other Reforms Undertaken by William Bentinck (1828-1835)

## ➤ Administrative Reforms

- William Bentinck introduced several administrative reforms to enhance governance:



- **Indianisation of Administration:** He appointed educated Indians as Deputy Magistrates and Deputy Collectors, signifying a shift from Cornwallis's exclusionary policies.
- **Land Revenue Settlement:** Bentinck reviewed the Mahalwari system in 1833, leading to more detailed surveys and negotiations, thereby increasing state revenue.
- **Administrative Divisions:** The reorganization of the Presidency of Bengal into twenty divisions improved administrative efficiency.

### ➤ **Judicial Reforms**

- Bentinck's judicial reforms aimed to make the legal system more accessible and humane:
- **Abolition of Provincial Courts:** He established a new hierarchy of courts, including a Supreme Court in Agra.
- **Judicial Empowerment:** He created separate Sadar Diwani Adalat and Sadr Nizamat Adalat at Allahabad, enhancing judicial accessibility.
- **Reduction of Punishments:** Bentinck abolished cruel practices such as flogging and mandated the use of vernacular languages in local courts.

### ➤ **Financial Reforms**

- To improve financial management, Bentinck implemented various cost-cutting measures:
- **Cost-Cutting Measures:** Forming committees to review expenditures led to significant reductions in salaries and allowances.
- **Revenue Recovery:** Investigations into land grants improved revenue collection by addressing issues with forged title deeds.

### ➤ **Educational Reforms**

- Bentinck, influenced by Macaulay, supported English as the medium of instruction, leading to the replacement of Persian with English in government communications through the English Education Act of 1835.

### ➤ **Social Reforms**

- His commitment to social reform extended to the suppression of criminal practices:
- **Suppression of Thuggee:** Bentinck took decisive action against the Thuggee system, effectively eliminating it by the end of 1834, thereby enhancing public safety.

### ➤ **Support from Reformers**

- Bentinck's reforms received backing from reformers like Raja Rammohan Roy, who campaigned for the abolition of Sati and advocated for broader social reform in India.

## Conclusion

- The movement to eradicate Sati exemplifies a significant chapter in India's pursuit of social reform. Ongoing efforts are essential to promote women's rights, enforce laws against regressive practices, and foster community involvement. Collaborating with grassroots organizations can amplify advocacy initiatives, ensuring meaningful change and empowerment for marginalized groups in society. The legacy of reformers like Raja Rammohan Roy and the legislative measures enacted serve as foundational pillars for ongoing efforts towards social equity in India.

## India's Ageing Population and Population Imbalance

### Context:

- Recently, politicians from a southern state in India expressed growing concerns over the ageing and declining population within the region. They emphasized the need for policies incentivizing residents to have more children to counteract this demographic trend.



### Understanding the Ageing Population Trend in India

- An ageing population typically includes a rising proportion of individuals aged 65 and above, leading to a demographic shift with significant economic and social implications. As this demographic increases, the working-age population (15–64 years) experiences proportionate reductions, impacting productivity and economic sustainability.

### Data Insights: Ageing and Population Growth Patterns in India

#### ► Population Growth and Distribution

- National Growth:** India's population is projected to grow by 311 million from 2011 to 2036.
- Regional Concentration:** Nearly half of this increase (170 million) will occur in five northern states: Bihar, Uttar Pradesh, Maharashtra, West Bengal, and Madhya Pradesh.
- Disparities Across Regions:** Uttar Pradesh alone is expected to contribute 19% of the nation's population growth, whereas southern states—Andhra Pradesh, Karnataka, Kerala, Telangana, and Tamil Nadu—are predicted to add only 29 million, comprising 9% of total growth.

## ➤ Ageing Population Trends

- Doubling of the Elderly: India's population aged 60 years and older is set to more than double, from 100 million in 2011 to 230 million by 2036. Their share of the total population is projected to grow from 8.4% to 14.9%.

POPULATION BY PERCENTAGE IN DIFFERENT AGE BRACKETS					
INDIA	2011		2036 (PROJECTED)		
0-14 years	30.9		20.1		
15-59 years	60.7		64.9		
60+ years	8.4		14.9		

Andhra Pradesh	2011	2036	Uttar Pradesh	2011	2036
0-14 years	25.2	15.7	0-14 years	36	22
15-59 years	64.8	65.3	15-59 years	56.7	66.1
60+ years	10.1	19	60+ years	7.3	11.9

Source: Population Projection by Ministry of Health and Family Welfare

- State Variations: In Kerala, for instance, nearly 23% of the population will be aged 60 or older by 2036, while Uttar Pradesh's 60+ demographic will rise to just 12% in the same period.
- North-South Demographic Divide: Northern states generally have younger populations due to higher fertility rates and later transitions to lower fertility, while southern states adopted lower fertility rates earlier. Uttar Pradesh is expected to achieve replacement fertility levels by 2025—two decades after Andhra Pradesh (2004).
- Note: These projections stem from a 2020 report by the Union Ministry of Health and Family Welfare's technical group.

## Causes of Ageing and Population Shrinkage

1. Family Planning and Contraception: Improved access to contraception and family planning resources has empowered individuals to make informed reproductive choices, reducing birth rates.
2. Women's Workforce Participation: As more women join the workforce, many choose to delay childbirth or have fewer children, influenced by career aspirations, financial considerations, and personal goals.
3. Reduced Child Mortality Rates: According to the World Health Organization (WHO), India's under-five mortality rate dropped to 34 per 1,000 live births in 2019 from 126 in 1990. This reduction encourages smaller family sizes since parents do not need to account for higher child mortality rates.
4. Urbanization: The shift to urban living often brings higher costs and different lifestyle choices, where career priorities may outweigh family expansion.
5. Migration: Emigration to countries like the UAE and the USA reduces India's potential population growth as more Indians choose to live abroad.

## Challenges Posed by an Ageing Population

### ➤ Reduced Representation in Parliament

- Southern states, with shrinking populations, fear potential reductions in parliamentary representation, which could benefit northern states with higher population growth, potentially skewing policy priorities away from southern interests.
- **Economic Slowdown**
  - An ageing population generally correlates with lower GDP growth rates due to a shrinking labor force. For example, the US growth rate for the 20–64 age group is expected to decline from 1.24% (1975–2015) to just 0.29% (2015–2055), leading to slower GDP and consumption growth.
- **Rising Dependency Ratio**
  - An increase in the elderly and dependent population places a heavier burden on working-age individuals. India's dependency ratio of 47% in 2023 is projected to climb, adding strain on the workforce.
- **Greater Public Expenditure**
  - Healthcare, pension, and elderly care costs will rise, requiring governments to either raise taxes or cut benefits to manage the financial strain.
- **Generational Equity Concerns**
  - An ageing population may lead to increased taxes on the younger generation to support the elderly, potentially creating societal divides over perceived fairness in resource distribution.
- **Need for Institutional Reforms**
  - A growing elderly population may drive reforms in retirement age policies, social security benefits, and healthcare systems to maintain economic stability.
- **Shifting from Population Boom to Decline**
  - India has successfully curtailed its population growth rate, especially in southern states. For example, Andhra Pradesh reached replacement fertility levels in 2004, following other states like Kerala (1988), Tamil Nadu (2000), Himachal Pradesh (2002), and West Bengal (2003). At the same time, while several states have achieved lower fertility rates, India remains the world's most populous country.

### Global Approaches to Ageing Populations

1. China's Multi-Child Policy: In 2016, China allowed two children per family, further expanding to three in 2021, to address an ageing population after decades of restrictive birth policies.
2. Japan's Parental Leave and Childcare Support: Japan provides twelve-month

parental leave, direct financial aid to families, and heavily subsidizes childcare to encourage population growth.

3. **Extended Retirement Age:** Countries like France and the Netherlands have increased the retirement age to mitigate pressures on pension funds.
4. **Immigration Policies:** Nations like Australia and Canada have adopted liberal immigration policies to counteract labor shortages and offset their ageing populations.

### Strategies to Counter Population Ageing in India

#### ➤ Pro-Natalist Policies

- Scandinavian countries demonstrate the effectiveness of policies supporting families, gender equality, and parental leave in maintaining higher fertility rates. India could adopt similar policies with a focus on child healthcare, education, and family support to encourage higher birth rates.

#### ➤ Leveraging Internal Migration

- Encouraging migration from northern states with higher populations to southern states with lower birth rates could balance the working-age population. This approach brings an immediate workforce without the need for significant investment in early childhood development.

#### ➤ Promoting Gender Equality

- Enhancing gender equality and promoting shared parental responsibilities can increase fertility rates, as seen in several developed nations.

### Conclusion

- India faces a shifting demographic landscape, moving from concerns about overpopulation to challenges surrounding an ageing and shrinking populace in specific regions. By employing balanced policies to incentivize family growth, support internal migration, and embrace equitable economic practices, India can mitigate the effects of an ageing population.

## India's New Diplomatic Mission in Albania

### Relevance: GS I & II - Geography & IR

- **In News:** India has recently opened a new diplomatic mission in Albania, aiming to enhance its diplomatic presence in the region.



### Political Features of Albania:

- **Location:** Albania is situated in Southern Europe, specifically on the western part of the Balkan Peninsula.
- The **Balkan Peninsula** is strategically located between the **Adriatic Sea, Mediterranean Sea, Aegean Sea, and the Black Sea.**
- **Bordering Areas**
  - ✓ Northwest: Montenegro
  - ✓ Northeast: Kosovo
  - ✓ East: North Macedonia
  - ✓ Southeast & South: Greece
- **Maritime Boundaries**
  - ✓ West: Adriatic Sea
  - ✓ Southwest: Ionian Sea

### Geographical Features of Albania:

- **Mountains:** The North Albanian Alps, an extension of the Dinaric Alps, dominate the region's topography.
- **Highest Point:** Mount Korab, the tallest peak in Albania.
- **Strait:** The Strait of Otranto, which connects the Adriatic Sea with the Ionian Sea, plays a significant geographical and maritime role.
- **Rivers:** Major rivers in Albania include the Drin and Seman, which are vital for the country's water resources.

### Conclusion:

- With the opening of a new mission in Albania, India has reinforced its diplomatic footprint in Southern Europe, further strengthening its ties with the region.

- Albania's strategic location in the Balkans and its unique geographical features make it an important country for enhancing regional cooperation and international relations.

## India & Israel Sign Circular Migration Labour Agreement

### Relevance: GS I - Geography

- In News:** India and Israel have recently entered into a circular migration labour agreement, a significant move aimed at facilitating labour mobility between the two nations.



### Concept of Circular Migration:

- Circular Migration is a recurring pattern of migration where individuals relocate to a new place (destination country) for employment and later return to their original country once work is completed.
- Key characteristics include:**
  - ✓ Migrants usually relocate for short-term employment.
  - ✓ It is primarily observed among lower-income groups who seek seasonal work opportunities in different countries, cities, or regions.
  - ✓ According to a report by the United Nations Economic Commission for Europe Task Force, an individual is considered a circular migrant if they complete at least two cycles of migration between the origin and destination countries.

### Features of Circular Migration:

- Temporary Residency:** Migrants only reside in the destination location for a limited duration.
- Multiple Relocations:** Migrants may move back and forth between countries several times.
- Freedom of Mobility:** Migrants enjoy free movement between their home country and the destination country during their stay.
- Legal Residency Rights:** Migrants have the legal authority to live in the destination country.
- Protection of Rights:** Safeguarding the rights and well-being of migrants is a key aspect..

### Factors Influencing Circular Migration:

- Modern Transportation and Communication:** Innovations in transport and communication systems make frequent movement feasible.
- Social Networks:** Migrants often rely on personal connections for support in the



destination country.

- **Expansion of Multinational Corporations:** Job opportunities offered by multinational firms drive this migration.
- **Aging Population in Developed Nations:** Countries like those in Western Europe and Japan are experiencing labour shortages due to aging populations, increasing the demand for migrant workers.

### Circular Migration within India:

- **Internal Migration:** In India, internal migration, which refers to migration within the country, has always exhibited circular traits, particularly between rural and urban areas.
- **Rural to Urban Shift:** With the availability of jobs in manufacturing, construction, and services, a large number of migrants are moving from rural regions to urban centers. Between 2004–2005 and 2011–2012, the construction sector witnessed one of the highest employment increases, especially for rural men.
- **Challenges:**
  - ✓ **Rural Depopulation:** The exodus from rural areas has led to a decline in rural populations and their economies.
  - ✓ **Urban Overload:** Urban regions, due to this migration influx, are under pressure to accommodate increasing populations, leading to housing shortages and infrastructural strain.
  - ✓ **Uneven Development:** Since liberalization, economic imbalances have triggered significant inter-State migration. States like West Bengal, Odisha, and Bihar have seen high rates of out-migration, with southern states now receiving more migrants.
  - ✓ **Occupational Shift:** Previously employed in agriculture, many rural migrants now take up low-skilled jobs in urban settings.

### Positive Aspects of Circular Migration:

- **Higher Earnings:** Migrants often receive better pay than they would in their home regions, improving household welfare through remittances.
- **Empowerment of Women:** With men migrating for work, women often gain greater decision-making authority within the household.
- **Increased Mobility:** Circular migration allows people to shift between rural and urban areas as economic circumstances demand.

### Challenges for Circular Migrants:

- **Language Barriers:** Many migrants, particularly those from rural areas, face difficulties due to their lack of knowledge of local languages.

- **Exploitation:** Migrants frequently depend on middlemen or brokers, which often results in exploitation. They are forced to work in unsafe and unsanitary conditions with minimal protection.
- **Tension with Local Workers:** Indigenous labour groups may resent migrants, accusing them of accepting lower wages and taking local jobs.
- **Job Insecurity:** Many migrant jobs are seasonal and unpredictable, leaving workers financially vulnerable and limiting their ability to save or build assets.

### Government Initiatives:

- **Aggregating Demand:** The National Skill Development Corporation (NSDC) has identified skill gaps in many partner countries.
- **State-Level Standard Operating Procedures (SOPs):** Maharashtra Institution for Transformation (MITRA) has worked with NSDC to develop SOPs to help skilled youth access higher-wage job markets.
- **Skill Development Mission:** Launched in 2015, this initiative aims to provide vocational training and skill development to increase the employability of Indian workers abroad.
- **Recognition of Prior Learning (RPL):** NSDC offers a four-day RPL course to improve existing skills.
- **International Cooperation:** India has signed multiple bilateral and multilateral agreements to facilitate labour migration and protect workers' rights.
- **Overseas Employment Cell (OEC):** The Ministry of Labour and Employment has established OECs in various states to assist migrants and their families.

### Way Forward:

- **Bilateral Agreements:** Establish comprehensive agreements that clearly define the rights and responsibilities of both migrants and host countries.
- **Simplify Visa Processes:** Streamline visa procedures to reduce costs and improve efficiency in obtaining work permits.
- **Skills Training:** Enhance vocational training programs to ensure migrants meet the qualifications for specific jobs.
- **Secure Remittance Channels:** Provide affordable and reliable channels for migrants to send money home.
- **Collaborate with Employers:** Partner with employers to identify skill gaps and develop customized training programs.

### Conclusion:

- India and Israel's circular migration labour agreement is a major development in strengthening the framework for migrant labour, ensuring better protection and opportunities for workers in both countries.



## Shale Gas Generation Potential Identified in South Karanpura Coalfield, Jharkhand

### Relevance : GS I - Geography

- **In News:** A recent study has highlighted the shale gas generation potential in the eastern South Karanpura coalfield of Jharkhand. This study was conducted by scientists from the Birbal Sahni Institute of Palaeosciences, Lucknow, an autonomous institution under the Department of Science and Technology.



### Key Findings of the Study::

- **Hydrocarbon Generation Potential:** The study indicates that the ability of a source rock to generate hydrocarbons is largely dependent on the organic matter concentration present in the rock. This is a significant factor in determining the potential for shale gas extraction in the region.

### About Shale Gas:

- **What is Shale Gas?**
  - ✓ Shale gas is a type of natural gas, primarily methane, that is trapped within shale rock formations underground.
- **Extraction Process:**
  - ✓ The gas is extracted using a technique known as hydraulic fracturing (fracking). This process involves injecting high-pressure water, sand, and chemicals into the shale formation, causing it to crack and release the trapped gas.
- **Use of Guar Gum:**
  - ✓ Guar gum, derived from the Cluster bean (Guar) seed, plays an essential role in the fracking process, where it is used as a thickening agent in the extraction of shale gas.
- **Formation of Shale:**
  - ✓ Shale is a fine-grained sedimentary rock, formed through the compression of clay, silt, mud, and organic material over time.
  - ✓ These shale formations were deposited in various ancient environments, such as seas, river deltas, lakes, and lagoons, and can be found both near the Earth's surface and deep underground.

## Government Measures for Shale Gas Development:

- **Hydrocarbon Exploration and Licensing Policy (HELP) 2016:**
  - ✓ The HELP policy introduced in 2016 provides a uniform licensing regime covering both conventional and unconventional energy resources, including shale gas.
- **Involvement of Public Sector Undertakings (PSUs):**
  - ✓ Public sector entities such as ONGC and Oil India Limited have been given authorization to explore shale gas in their existing oil and gas blocks.
- **Environmental Management Guidelines:**
  - ✓ The government has also set forth environmental management guidelines for shale gas/oil exploration and production to ensure responsible and sustainable practices.

## Conclusion:

- The study underscores the potential of shale gas in the South Karanpura coalfield of Jharkhand and highlights India's commitment to tapping into its unconventional energy resources.
- Supported by government initiatives like HELP and the involvement of PSUs, shale gas exploration could play a crucial role in enhancing the country's energy security while maintaining environmental responsibility.

## Auroras Captured at India's Highest Observatory in Hanle, Ladakh

### Relevance: GS I - Geography

- **In News:** Auroras, a rare and breathtaking phenomenon, were recently observed at India's Hanle Observatory in Ladakh, the country's highest astronomical facility. This occurrence is notable due to the rarity of such displays in this region.



### About Auroras:

- **Nature of Auroras:** Auroras are stunning multicoloured lights that illuminate the upper atmosphere (specifically, the ionosphere). These lights are commonly seen at high northern and southern latitudes, but they can sometimes be visible in mid-latitude regions. However, sightings near the equator are extremely rare.
- **Terminology:** In the Northern Hemisphere, these luminous displays are referred to as aurora borealis (or the Northern Lights), while in the Southern Hemisphere, they are known as aurora australis (Southern Lights).

- **Cause:** Auroras are created by the interaction between solar wind—charged particles emitted by the Sun—and oxygen and nitrogen gases in the Earth’s atmosphere. This interaction excites the gases, causing the vivid and dynamic light displays that characterize auroras.
- **Scientific Significance:** Auroras serve as a visual reminder that the Earth is electrically linked to the Sun through the solar wind and magnetic fields. They are a powerful symbol of the cosmic relationship between our planet and its star, demonstrating the influence of space weather on Earth’s atmospheric conditions.

## Mass Coral Bleaching Event: The Most Widespread on Record

### Relevance : GS I - Geography

- **In News:** The National Oceanic and Atmospheric Administration (NOAA) has reported that the ongoing mass coral bleaching event, which started in February 2023, is the most extensive ever recorded.
- This bleaching event has surpassed previous records by over 11% in half the time, affecting coral reefs on a global scale.



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### Key Findings of NOAA Report:

- **Global Extent:** The current bleaching event has impacted an alarming 77% of the world’s coral reef areas, spanning from the Atlantic to the Pacific and Indian Oceans.
- **Cause:** The primary driver of this bleaching is the rise in ocean temperatures, fueled by climate change, leading to record and near-record sea temperatures across the globe.

### About Coral Bleaching:

- **Coral-Algae Symbiosis:** Corals have a symbiotic relationship with microscopic algae called zooxanthellae, which live within coral tissues. These algae provide the corals with energy through photosynthesis, giving corals their vibrant colors.
- **What is Coral Bleaching?** Bleaching occurs when corals, under stress from environmental changes like temperature fluctuations, light, or nutrient availability, expel their algae. Without the algae, corals lose their color and are left vulnerable to disease.
- **Current Bleaching Event:** NOAA’s Coral Reef Authority declared the 4th global bleaching event in April 2024.
  - ✓ **Historical Context:** The first major global bleaching event occurred in 1998,

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leading to an 8% loss of the world's corals. Subsequent bleaching events between 2010 and 2017 caused the death of approximately 14% of remaining coral reefs.

### Impact of Coral Bleaching:

- **Ecological Consequences:** Coral bleaching significantly reduces marine biodiversity and disrupts oceanic food chains. Coral reefs serve as habitats for numerous marine species, and their decline impacts entire ecosystems.
- **Socio-economic Effects:** Coral reefs support fisheries and attract tourism, making them vital for coastal economies. Bleaching events cause significant declines in both sectors, leading to economic losses in communities dependent on these industries.

### Initiatives to Prevent Coral Bleaching:

- **India's Initiatives:**
  - ✓ **Legal Protection:** Coral species in India are listed under Schedule I of the Indian Wildlife (Protection) Act, 1972, providing them the highest level of protection.
  - ✓ **Coastal Regulation Zone (CRZ) Notification, 2019:** This regulation, along with the Integrated Island Management Plan, restricts developmental activities and waste disposal in fragile coastal ecosystems, helping to protect coral reefs.
  - ✓ **Technological Solutions:** The use of Biorock technology in regions like the Gulf of Kutch is helping to restore and enhance coral growth by applying low-voltage electricity to submerged structures.
- **Global Efforts:**
  - ✓ **Coral Research & Development Accelerator Platform (CRDAP):** Initiated by the G20, this platform seeks to advance coral research and develop strategies for coral conservation and restoration.
  - ✓ **International Coral Reef Initiative (ICRI):** A global partnership aimed at preserving coral reefs and related ecosystems, of which India is a member.

## Government Issues Offshore Areas Operating Right Rules, 2024

### Relevance : GS I - Geography

- **In News:** The government has notified the Offshore Areas Operating Right Rules, 2024 under the Offshore Areas Mineral (Development and Regulation) Act, 2002.



- These rules are intended to regulate the exploration and production of minerals in designated offshore regions.
- The move is particularly significant as it coincides with the upcoming first-ever offshore mineral auction of 10 blocks, which will feature minerals like sand, lime mud, and polymetallic nodules.

### Key Highlights of the Rules:

- **Scope:** The rules apply to all minerals in offshore regions except for mineral oils, hydrocarbons, and specified atomic minerals.
- **Lease Surrender:** Leaseholders can surrender their leases after 10 years if production operations are deemed uneconomical.
- **Priority Access:** Government and state-owned enterprises are given priority access to operating rights in reserved offshore zones.

### Offshore Mining and Its Importance:

- Also known as deep-sea mining, offshore mining involves the extraction of mineral deposits from the ocean floor, typically from depths beyond 200 meters.
  - ✓ **Meeting Growing Metal Demand:** Offshore mining is crucial in light of the depleting terrestrial mineral reserves and helps reduce dependence on imported minerals.

### Challenges in Offshore Mining:

- **Environmental Risks:** Offshore mining poses a threat to marine biodiversity through habitat destruction, noise pollution, and contamination of underwater ecosystems.
- **Impact on Fishing Communities:** Mining activities could deplete fish populations, adversely affecting the livelihoods of local fishing communities.
- **Technological Barriers:** The lack of adequate R&D and advanced technology for deep-sea mining hinders efficient extraction.

### Initiatives for Offshore Mining:

- **Offshore Areas Mineral (Development and Regulation) Act, 2002:** This legislation governs the development and regulation of offshore mineral resources.
- **Deep Ocean Mission:** Led by the Ministry of Earth Sciences, this initiative focuses on deep-sea mineral exploration, with key projects like the Samudrayaan Mission and MATSYA 6000.
- **International Seabed Authority (ISA):** In 2016, India was allotted 10,000 sq. km. in the Indian Ocean for exclusive exploration of polymetallic nodules.



## Conclusion:

- These regulations mark a significant step towards harnessing India's offshore mineral resources, helping the country meet its growing demand for metals while balancing the challenges of environmental conservation and technological advancements.

## Links Between Volcanic Eruptions & Ionospheric Disturbances Uncovered

### Relevance: GS I - Geography

- **In News:** A recent study by the Indian Institute of Geomagnetism has revealed how volcanic eruptions can significantly influence space weather, particularly by disturbing the ionosphere.



### Key Insights from the Study:

- **Ionospheric Disruptions:** Volcanic eruptions create intense atmospheric gravity waves, which contribute to the formation of Equatorial Plasma Bubbles (EPBs). These EPBs represent regions of reduced ionospheric plasma density, typically occurring in the equatorial ionosphere after sunset.
- **Impact on Satellite Systems and Navigation:** The EPBs generated by volcanic activity can disrupt satellite communications and affect satellite-based technologies, creating challenges for global navigation systems.

### Volcanic Activity and Its Effects:

- A volcano is an opening in the Earth's surface that releases magma, ash, and gases from below. Recent notable eruptions include Mount Ruang in Indonesia (2024) and Whakaari/White Island in New Zealand (2024).
- **Positive Effects of Volcanic Activity**
  - ✓ **Temporary Cooling of Earth's Atmosphere:** Particles released during eruptions can temporarily cool the atmosphere by blocking some of the incoming solar radiation.
  - ✓ **Geothermal Energy Source:** Volcanic regions provide access to geothermal energy, offering sustainable electricity for local communities.
  - ✓ **Increased Soil Fertility:** Volcanic ash enriches soil, boosting agricultural productivity.
  - ✓ **Mining Opportunities:** Eruptions bring valuable minerals to the surface, creating opportunities for resource extraction.



- ✓ **Tourism Potential:** Volcanic regions often become popular destinations, enhancing tourism revenue.
- **Negative Impacts of Volcanic Eruptions**
  - ✓ **Climate Disruption:** The release of ash, dust, and gases into the atmosphere can lead to climate changes.
  - ✓ **Natural Disasters:** Volcanic eruptions can trigger tsunamis, such as the Tonga eruption in 2022, causing extensive damage.
  - ✓ **Other Effects:** Volcanic activity can result in loss of life, destruction of property, and alterations to landscapes and habitats.

### Conclusion:

- This study highlights the significant relationship between volcanic activity and ionospheric disturbances, emphasizing the broad impact of eruptions on both Earth-bound and space-based systems.

## Study Reveals Origins of Space Rocks

### Relevance: GS I - Geography

- **In News:** A new study has shown that most space rocks reaching Earth originate from a single primary source.
- Although a small number of meteorites come from the Moon and Mars, the vast majority come from asteroids.



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### Meteorites and Their Types:

- When a fireball reaches Earth's surface, it becomes known as a meteorite. Meteorites fall into three major types:
  - ✓ **Stony Meteorites:** The most prevalent type, with two main subcategories:
    - **Chondrites:** These are characterized by round particles, believed to form from melt droplets, and make up 85% of meteorites on Earth. Known as "ordinary chondrites," they are divided into three categories (H, L, LL) based on iron content and the distribution of iron and magnesium within key minerals like olivine and pyroxene.
    - **Carbonaceous Chondrites:** A distinct subgroup, these contain significant water, clay minerals, & organic compounds, including amino acids. They are direct samples of the early solar system's dust and have not been melted.
    - **Achondrites:** These lack the spherical particles found in chondrites, having melted on larger planetary bodies.



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### Asteroid Belt as Primary Source:

- Most meteorites trace back to the asteroid belt between Mars and Jupiter, where gravitational interactions with Jupiter often disturb asteroid orbits, causing collisions. This debris then coalesces into what are known as rubble-pile asteroids.
  - ✓ **S-class Asteroids (resembling stony meteorites)** are generally located in the belt's inner regions.
  - ✓ **C-class Asteroids (similar to carbonaceous chondrites)** are commonly found in the outer asteroid belt.

### Key Findings from Recent Studies:

- The two new studies trace the origins of ordinary chondrite meteorites to specific asteroid families:
  - ✓ **Koronis and Massalia asteroid families** likely produce debris that frequently reaches Earth.
  - ✓ The Koronis and Karin asteroids are likely the main sources of H chondrites.
  - ✓ **The Massalia (L) and Flora (LL) families** primarily supply L- and LL-type meteorites.
- An additional study identified a close resemblance between L chondrites on Earth and the Massalia asteroid family, suggesting Massalia as a significant source.

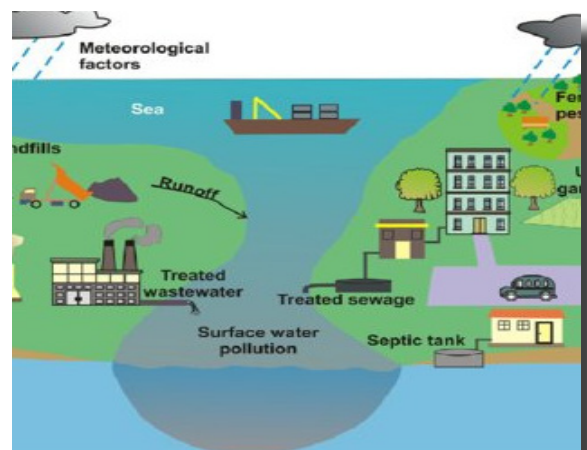
### Significance for Future Missions:

- These findings provide a basis for future space missions aimed at exploring the asteroids responsible for Earth's most common space rock arrivals, enhancing our understanding of the solar system's history & the composition of celestial bodies.

## Urbanization & Industrial Growth Depleting India's Groundwater Reserves in Key Zones

### Relevance: GS I - Urbanization

- **In News:** A recent study underscores how rapid urban growth and industrial activities are critically reducing groundwater reserves across five major zones in India.
- With India accounting for over a quarter of global groundwater usage, the consequences of this decline are far-reaching.



### Identified Groundwater Depletion Zones:

- Zone I: Punjab and Haryana
- Zone II: Uttar Pradesh
- Zone III: West Bengal
- Zone IV: Chhattisgarh
- Zone V: Kerala.

### Key Findings from the Study:

- **Zones I & II (Northern and Northwestern India)**
  - ✓ Punjab and Haryana have seen the most significant drop in groundwater levels, with these regions losing around 64.6 billion cubic meters over the last two decades. In Uttar Pradesh, urban expansion has shifted water consumption patterns from agricultural to residential needs.
- **Zone IV (Chhattisgarh)**
  - ✓ Groundwater depletion in Chhattisgarh is primarily driven by the combined demands of irrigation, household consumption, and industrial usage.
- **Zones III & V (West Bengal and Kerala)**
  - ✓ In these areas, household and industrial water usage has increased by 24% & 34% respectively, exerting substantial pressure on groundwater resources.

### Solutions to Combat Groundwater Depletion:

- **Establishing Groundwater Usage Rights**
  - ✓ Creating structured groundwater rights, separated from land ownership, would help regulate extraction and support sustainable use.
- **Community Ownership of Groundwater Resources**
  - ✓ Empowering communities with collective rights would encourage shared responsibility and balanced access, curbing the excessive extraction associated with individual ownership.

### Methods of Artificial Groundwater Recharge in India:

- **Surface Recharge Techniques**
  - ✓ These include methods such as surface flooding, recharge basins, percolation tanks, and stream enhancement to improve groundwater levels.
- **Subsurface Recharge Techniques**
  - ✓ Examples include injection wells, recharge wells, and recharge pits and shafts, which replenish aquifers directly.

### Government Initiatives to Address Groundwater Depletion:

- **Atal Bhujal Yojana (ATAL JAL)**



- ✓ This scheme promotes enhanced groundwater management in seven states, namely Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, and Uttar Pradesh.
- **Jal Shakti Abhiyan – “Catch the Rain”**
  - ✓ A national campaign to encourage rainwater harvesting and support water conservation efforts.
- **Master Plan for Artificial Recharge (2020)**
  - ✓ This comprehensive plan seeks to establish 1.42 crore rainwater harvesting structures to bolster groundwater reserves.
- **State-Level Financial Assistance**
  - ✓ Funds from the 15th Finance Commission tied grants are allocated to support rainwater harvesting and groundwater preservation across states.

### Conclusion:

- This study highlights the urgency of addressing groundwater depletion in India’s key regions, emphasizing the strain from urban and industrial expansion.
- By implementing regulated usage rights, promoting community stewardship, and accelerating recharge initiatives, India can move toward sustainable groundwater management, mitigating the risks associated with resource depletion.

## Caspian Sea: Shrinking at an Accelerated Rate

### Relevance: GS I - Geography

- **In News:** The Caspian Sea, recognized as the world’s largest inland water body, has experienced a continuous decline in size since the mid-1990s, with an intensified rate of shrinkage noted since 2005.

### About the Caspian Sea:

- **Location:** Situated between Europe and Asia, the Caspian Sea is classified as a lake but commonly referred to as a “sea.”
- **Geographical Placement:** Positioned to the east of the Caucasus Mountains and west of Central Asia’s expansive steppe.
- **Coastline:** The Caspian Sea boasts a coastline exceeding 4,000 miles.
- **Bordering Nations:** Five countries share its boundaries—Kazakhstan, Iran, Azerbaijan, Russia, and Turkmenistan.



**Key Features:**

- **Water Sources:** Approximately 130 rivers feed into the Caspian, with the Volga River, Europe's longest river flowing through Russia, accounting for 80% of its water.
- **Endorheic Nature:** The Caspian Sea is endorheic, meaning it lacks any natural outlets.

**Significance of the Caspian Sea:**

- **Economic Role:** Bordering nations rely on the Caspian for fishing, agriculture, tourism, and potable water, as well as for its valuable oil and gas deposits.
- **Climate Impact:** The Caspian Sea plays a crucial role in regulating the dry climate of Central Asia, providing essential rainfall and humidity to the region.

**Biodiversity:**

- **Notable Species:** The Caspian Sea is home to unique species, including the endangered Caspian seals and the critically endangered Beluga sturgeon, known for its valuable caviar.

**Threats to the Caspian Sea:**

- The sea faces a range of environmental challenges, such as dam construction, excessive water extraction, pollution, and the impacts of climate change driven by human activities, which are collectively accelerating its decline.

**Addressing India's Water Crisis: The Role of Water Reuse****Why in News?**

- The rapid depletion of freshwater resources, unpredictable rainfall, and increasing water shortages underscore the urgent need for innovative solutions in water management, particularly in the area of water reuse.

**The Imperative for Water Reuse in India**

- **Dwindling Freshwater Resources**
  - India's surface water reserves are being exploited at unsustainable rates, leading to environmental degradation and reduced water availability. Immediate action is required to preserve and restore these crucial water sources.
- **Water Contamination**
  - A significant contributor to water pollution in India is the unchecked discharge

of untreated domestic sewage from urban areas, which continues to degrade the quality of the nation's water bodies.

### ➤ Unstable Rainfall Patterns

- The impacts of climate change have led to erratic weather conditions across India, with some regions facing droughts while others experience excessive rainfall. These extreme variations further strain water availability, amplifying the need for effective water reuse solutions.

### ➤ Escalating Water Shortages

- According to a 2019 report from NITI Aayog, India's demand for water is expected to surpass supply by a factor of two by 2030. Despite being home to over 1.4 billion people, India holds just 4% of the world's freshwater resources, making water conservation and reuse critical.

### ➤ Urbanization and Population Growth

- By 2050, half of India's population is projected to live in urban areas, exacerbating the already significant challenges of wastewater management in cities.

### ➤ Underutilization of Investments

- India has invested substantially in sewage treatment plants (STPs), but a lack of focus on water reuse results in the underutilization of these facilities. Maximizing the use of treated wastewater would help optimize the benefits of these capital investments.

## Advantages of Water Reuse

### ➤ Enhancing Groundwater Reserves

- Recycling treated wastewater can contribute to replenishing groundwater supplies, improving both the quantity and quality of groundwater in regions facing acute shortages.

### ➤ Boosting Agricultural Productivity

- Treated wastewater can meet irrigation needs, particularly in water-scarce agricultural zones. This not only enhances crop productivity but also increases farmers' incomes by providing a reliable water source.

### ➤ Fostering Economic Development

- In addition to agriculture, treated water can be used in livestock farming and fish production, promoting economic activities in rural areas. Water reuse is also an essential component of the circular economy in India's water sector.

### ➤ Circular Economy Growth

- India's water sector is moving towards a circular economy, with the wastewater industry growing at a rate of 10-12% annually. By 2030, the industry is expected

to exceed \$4 billion, presenting significant economic opportunities.

### ➤ Cost and Water Savings in Power Plants

- Thermal power plants in India can save up to ₹300 million annually by recycling wastewater, while also conserving around 10 million cubic metres of water each year. These savings demonstrate the financial benefits of water reuse for industries.
- Nutrient Recovery for Agriculture
- Wastewater contains valuable nutrients like nitrogen, phosphorus, and potassium, which can be recovered and repurposed as fertilizers. This reduces reliance on synthetic fertilizers, benefiting both agriculture and the environment. For instance, sewage from Class I and II cities in India contains a nutrient load of approximately 2,500 tonnes per day.

### ➤ Revenue Generation for Local Bodies

- Local governments can generate additional revenue by selling treated wastewater, fostering financial independence and encouraging broader adoption of water reuse technologies.

## Challenges in Implementing Water Reuse

### ➤ Limited Treatment Capacity

- Only 28% of India's sewage is treated effectively, leaving a significant gap in sewage management. While Class I and II cities generate 29,129 MLD of sewage, the country's installed treatment capacity is only 6,190 MLD, indicating a shortfall of nearly 78.7%.

### ➤ Minimal Reuse of Treated Water

- Despite the potential for reuse, only 3% of treated wastewater is used for beneficial purposes. The majority is either discharged into water bodies or used for non-essential activities like watering public parks.

### ➤ Absence of Industry-Specific Standards

- The lack of sector-specific guidelines for water reuse hinders its widespread adoption. Different industries require varying levels of water treatment, ranging from basic biological treatment to more advanced processes like reverse osmosis or ultrafiltration.

### ➤ Research and Technology Gaps

- India lacks sufficient investment in research and development (R&D) related to wastewater treatment technologies. This shortfall prevents the development of innovative, cost-effective solutions for water reuse.

### ➤ Limited Private Sector Involvement

- Most of India's sewage treatment facilities are operated by government entities.



Encouraging private sector participation through Public-Private Partnerships (PPPs) could enhance efficiency, innovation, and scale in wastewater management.

### ➤ Shortage of Skilled Workforce

- The wastewater treatment sector faces a significant shortage of skilled professionals for the operation, maintenance, and research needed to drive advancements in water reuse.

### ➤ Cultural and Social Barriers

- Caste and class divisions, along with public misconceptions about the safety and utility of recycled water, often prevent its acceptance and use in Indian communities.

### ➤ High Initial Costs

- The high capital costs associated with establishing wastewater treatment plants, particularly advanced systems like Zero Liquid Discharge (ZLD), deter industries and municipalities from investing in wastewater reuse technologies.

## Recommendations to Improve Water Reuse

### ➤ Infrastructure Development

- India must invest in expanding its sewage treatment capacity and build the necessary infrastructure to support large-scale water reuse across urban and rural areas.

### ➤ Policy Frameworks

- A national framework for the safe reuse of treated water should be implemented to provide clear guidelines and ensure the widespread adoption of water recycling practices.

### ➤ Encourage Public-Private Partnerships

- Engaging the private sector through PPP models would drive technological advancements, increase funding, and improve the execution of water reuse projects.

### ➤ Set Industry Benchmarks

- Establishing benchmarks for wastewater reuse within industries will promote the recovery of valuable resources and ensure product quality without compromising environmental standards.

### ➤ Incentivize R&D and Innovation

- Policies should be enacted to incentivize industries, research institutions, and universities to invest in innovative water treatment technologies and water-efficient practices.



### ➤ Increase Tariffs for Non-Recycled Water

- Imposing higher tariffs on non-recycled water will encourage municipalities and housing societies to adopt treated wastewater for non-potable uses like landscaping and industrial cooling.

### ➤ Introduce Water Use Credits

- Similar to carbon credits, water-use credits can be introduced, allowing entities that reuse treated wastewater to trade or monetize these credits, fostering broader adoption of water reuse practices.

## Sewage Treatment Technologies

**India employs various technologies in its sewage treatment plants, including:**

- Activated Sludge Process (ASP)
- Sequencing Batch Reactors (SBR)
- Extended Aeration (EA)
- Upflow Anaerobic Sludge Blanket (UASB)
- Moving Bed Biofilm Reactor (MBBR)
- Fluidized Aerobic Bed Reactor (FAB)
- Waste Stabilization Ponds (WSP)
- Zero Liquid Discharge (ZLD)
- Other techniques such as Aerated Lagoons (AL), Bio-Towers, and Electro Coagulation (EC)

## Conclusion: A Path Forward for Water Reuse in India

- India faces a growing water crisis that demands immediate action. By prioritizing infrastructure development, enacting strong policy frameworks, and fostering private sector involvement, the country can significantly expand its water reuse capacity. This approach will not only alleviate water scarcity but also contribute to economic growth, agricultural productivity, and environmental sustainability.

## Artificial Intelligence (AI) & Its Role in Promoting Environmental Sustainability

### Relevance : GS III - AI and Environment

- **In News:** Recently, experts have emphasized the role of Artificial Intelligence (AI) in addressing environmental issues.

### What is Artificial Intelligence (AI)?:

- AI refers to a **collection of technologies that allow computers to perform a variety of complex tasks**, such as understanding and interpreting spoken and written language, processing large amounts of data, and more.



### How AI Can Address Environmental Issues:

- **Forecasting:** AI can analyze data to detect patterns and irregularities, using past information to forecast future trends.
- **Monitoring:**
  - ✓ AI is capable of tracking and mapping various environmental concerns such as air quality, deforestation, plastic pollution in oceans, and melting icebergs.
  - ✓ For instance, AI can measure changes in icebergs up to 10,000 times faster than a human can.
  - ✓ The United Nations Environment Programme (UNEP) utilizes AI through its Global Environment Monitoring System Air Pollution Monitoring platform to track air pollution.
- **Supporting Decarbonization:** AI helps businesses monitor and lower their carbon emissions by 20-30%, contributing to global decarbonization efforts.

### Negative Environmental Effects of AI:

- **High Energy Usage:** AI models, such as ChatGPT, use 10 times more electricity compared to a regular Google search (as reported by the International Energy Agency).

- **Generation of Electronic Waste:** The data centers that host AI technologies produce electronic waste (e-waste), which often contains harmful substances like mercury and lead.
- **Excessive Resource Consumption:** AI systems demand large amounts of water and rely on rare minerals, which are frequently extracted in unsustainable ways.

### UNEP's Suggestions for Efficient AI Use in Environmental Sustainability:

- **For Nations:**
  - ✓ Establish uniform methods for evaluating the environmental impact of AI technologies.
- **For Corporations:**
  - ✓ Encourage companies to adopt sustainable practices by powering data centers with renewable energy.
- **For Governments:**
  - ✓ Formulate regulations that require businesses to disclose the environmental effects of AI-based products and services.
- **For Tech Companies:**
  - ✓ Improve AI algorithms for greater efficiency to reduce energy demand.
  - ✓ Implement practices to recycle water and reuse components where possible to minimize the consumption of resources.

### Agroforestry: Untapped Potential for India

#### Relevance: GS III - Environment

- **In News:** A recent working paper titled 'Agroforestry: Missing Trees for the Forest', published by the Economic Advisory Council to the Prime Minister (EAC-PM), underscores the underexploited potential of agroforestry in India.



#### About Agroforestry:

- Agroforestry encompasses a comprehensive system of land use in which woody perennials, such as trees, shrubs, bamboo, palms, etc., are purposefully incorporated into the same land management units as crops and/or livestock.
  - ✓ **Current Status in India:** Only 17% of India's total agricultural land is designated for agroforestry (defined as tree cover exceeding 10% of total

agricultural land), significantly lower than the global average of 43%.

### Importance of Agroforestry in India:

- **Enhancing Farmers' Livelihoods:** It can help elevate farmers' incomes by cultivating high-value trees such as Teak.
- **Primary Timber Resource:** Agroforestry supplies approximately 65% of small timber, 70-80% of wood for furniture and construction, and about 60% of raw materials for paper and pulp production.
- **Improving Soil Organic Carbon (SOC):** Agroforestry contributes to boosting crop yields, carbon sequestration, and water-use efficiency.

### Challenges Facing Agroforestry in India:

- **Conservation-Oriented Policies:** Regulations such as the National Forest Policy of 1988 and the Godavarman Case (1996) have favored conservation over production, restricting tree felling, which has, in turn, decreased timber production.
- **Example:** These limitations have led to a four-fold increase in timber imports between 1996 and 2022 (FAO).
- **Complex Permits:** The intricate procedures required to obtain felling and transit permits discourage farmers from embracing agroforestry practices.
- **Underutilization of National Transit Pass System (NTPS):** The NTPS, which could streamline the transportation of timber, bamboo, and other forest products, remains underused.
- **Import Dependency:** India currently relies heavily on imports, with \$2.7 billion worth of timber being imported (ITTO, 2023).

### Key Recommendations by EAC-PM:

- **Deregulation of High-Value Timber Species:** The government should liberalize regulations on native timber species like Teak (*Tectona grandis*), Gurjan, and Meranti, which have significant economic value.
- **Ownership of Trees over Land:** Emphasizing tree ownership rather than land ownership could alleviate burdens related to proving land title through the use of technology-based tools, such as TiGram (Timber Traceability Tool).
- **Simplified Permit System:** A centralized system for issuing felling and transit permits through a single-window mechanism should be established to facilitate the easier adoption of agroforestry practices.

### Conclusion:

- India's agroforestry sector possesses vast potential to enhance farmers' livelihoods, improve the timber supply, and contribute to environmental sustainability.
- However, unlocking this potential requires regulatory reform, streamlined procedures, and the implementation of technology-driven solutions. The EAC-PM's recommendations aim to tackle these challenges, fostering a more conducive environment for agroforestry in India.

## Poumai Naga Tribe's Conservation Efforts

### Relevance: GS III - Environment

- **In News:** The Poumai Naga tribe of Purul village in Manipur's Senapati district has taken a notable initiative toward wildlife protection by imposing a ban on hunting, trapping, & killing wild animals & birds within their region.



### About the Poumai Naga Tribe:

- The Poumai Naga tribe is an indigenous ethnic group primarily residing in the Senapati district of Manipur, with some presence in parts of Nagaland.
- Approximately 95.7% of the Poumai population is concentrated in the Senapati district, making it one of the oldest and largest Naga tribes in Manipur.
- The tribe communicates in a language called "POULA."
- Christianity is the predominant faith practiced by the Poumai community.
- Traditional Skills:
  - ✓ Historically, the Poumai were well-known for their:
    - Pouli (Pottery)
    - Poutai (Pou salt) production
  - ✓ These crafts were highly regarded in tribal areas across Manipur and Nagaland.
- The main livelihood of the Poumai Naga tribe is agriculture, and the traditional practice of shifting cultivation is now rarely used in their villages.

### Popular Festivals of the Poumai Naga Tribe:

- The Poumai Naga tribe celebrates several traditional festivals, each with unique cultural significance:



- ✓ Paonii
- ✓ Donii
- ✓ Laonii
- ✓ Daonii
- ✓ Rounii
- ✓ Duhnii
- ✓ Loukanii
- ✓ Thounii
- ✓ Khiinii
- ✓ Taithounii

- Among these, Laonii is an important festival, celebrated across Poumai villages to mark the completion of rice transplantation.

### Conclusion:

- The Poumai Naga tribe stands out for its commitment to wildlife conservation, taking firm measures to protect the biodiversity of their region.
- Their cultural heritage, coupled with a deep connection to agriculture, further highlights their significance as one of the oldest and largest Naga tribes in Manipur.

## Indian Wild Ass (Khur) Overcomes Near-Extinction Event

### Relevance: GS III - Environment

- **In News:** The Indian Wild Ass (Khur) has recently rebounded from a near-extinction event, highlighting significant progress in its conservation efforts.



### About Khur:

- **Scientific Name:** Equus hemionus khur
- **Common Names:** Locally known as Ghudkhur or Indian Onager, it is one of the four remaining subspecies of the Asian Wild Ass.
- **Geographic Range**
  - ✓ Historically, the range of the Khur extended across southern India, southern Pakistan, Afghanistan, and south-eastern Iran.
  - ✓ Today, its population is limited solely to India.

### Key Characteristics

- ✓ **Size:** Comparable to that of a zebra, the Indian Wild Ass has a lifespan of about 21 years.
- ✓ **Social Structure:** The species tends to form stable groups, primarily consisting of females and their offspring. Male stallions, however, are typically solitary, especially during the breeding season.
- ✓ **Speed:** On the flat terrain of the Rann of Kutch, the Khur can sprint at speeds of up to 70 km per hour.
- ✓ **Reproductive Features:** The gestation period lasts between 11 to 12 months, and in some instances, lactation and pregnancy occur concurrently.

### Feeding Habits:

- **Diet:** Predominantly feeds on grasses.
  - ✓ During dry summer months, when grasses are scarce, they resort to feeding on Prosopis pods and leaves.
  - ✓ Their digestive systems are well-adapted to processing arid vegetation, allowing them to survive in harsh desert environments.

### Threats Facing Khur:

- **Human Activities:** Increased human presence due to salt farming, agriculture, and extensive cattle grazing has contributed to their habitat dispersal.
- **Environmental Changes:** The construction of irrigation canals bringing water to the Little Rann of Kutch has contributed to soil salinity, further threatening their habitat.

### Conservation Status:

- **IUCN Red List:** Classified as Endangered.
- **Wildlife Protection Act, 1972:** Listed under Schedule I, providing the highest level of protection.

### Conservation Efforts:

- **Wild Ass Sanctuary:** India established the Wild Ass Sanctuary in the Little Rann of Kutch in 1973, marking the largest sanctuary in Gujarat
- This sanctuary remains the sole habitat of the Indian Wild Ass, home to approximately 6,000 individuals.

### Survival Strategies of Khur:

- **Adaptability:** Like other members of the Asinus subgenus, the Khur has a

remarkable ability to locate food and water in harsh, desolate environments.

- Their digestive system is capable of efficiently processing even the most arid vegetation, enabling them to thrive despite harsh conditions.
- **Dietary Adaptation:** During periods of scarcity, such as the summer months, they rely on alternate food sources like Prosopis pods.
- **Overcoming Near-Extinction**
  - ✓ **Disease Resilience:** The Khur faced major setbacks due to diseases like Viral African Horse Sickness and Surra.
  - ✓ **Low Genetic Diversity:** A genetic bottleneck, caused by disease outbreaks, left a small number of survivors, leading to low levels of genetic diversity. Despite this, the Khur population has managed to recover.
  - ✓ **Predator Survival:** The Khur has outlasted its natural predators, such as the cheetah and the lion, which were last spotted in the region during the 1850s.

### Conclusion:

- The Indian Wild Ass or Khur, once on the brink of extinction, has made a remarkable recovery due to focused conservation efforts. By overcoming threats such as habitat loss, disease, and human encroachment, the species continues to thrive in its sole remaining habitat in the Little Rann of Kutch, symbolizing the resilience of wildlife in India's conservation story.

## Swallowtail Butterflies at Risk Due to Overuse of Host Plants in Assam

### Relevance: GS III - Environment

- **In News:** A new research study has indicated that the overuse of 25 species of host plants is posing a serious threat to swallowtail butterflies in specific forest regions of Assam, an area often referred to as the “citrus hub of the world.”



### About Swallowtail Butterflies:

- **Family: Papilionidae**
  - ✓ Swallowtail butterflies, part of the Papilionidae family, are distinguished by their prominent “tail-like” extensions on their hindwings, though not all species have these extensions.



- **Global Presence:** This butterfly family consists of more than 550 species distributed globally, with the exception of Arctic regions. India hosts 77 species out of the 573 identified worldwide, underscoring the nation's rich butterfly diversity.
- **Key Traits:**
  - ✓ Swallowtails are celebrated for their large size and vividly colorful patterns.
  - ✓ The tail-like extensions on their hindwings are a notable feature in many species.
  - ✓ These butterflies can imitate the appearance of unpleasant-tasting species to protect themselves from predators. They serve as ecological indicators, reflecting the condition of their natural habitats.
- **Feeding Habits:** Swallowtail butterflies primarily feed on nectar from a wide range of flowering plants, making them vital for pollination in their environments.
- **Prominent Species:** Among the well-known species of swallowtail butterflies are:
  - ✓ Blue-striped mime (*Papilio slateri*)
  - ✓ Bhutan glory (*Bhutanitis lidderdalii*)
  - ✓ Kaiser-i-Hind (*Teinopalpus imperialis*)
- Additionally, the Swallowtail butterfly is recognized as the state butterfly of Arunachal Pradesh, emphasizing its cultural and environmental significance.

### Conservation Initiatives:

- **Northeastern India's Swallowtail Conservation:** The International Union for Conservation of Nature (IUCN) has classified the northeastern part of India, where 69 species of swallowtails have been recorded, as a "swallowtail biodiversity zone." This designation is part of the Swallowtail Conservation Action Plan, which aims to preserve these butterflies and their habitats.

### Challenges Facing Swallowtail Butterflies:

- **Habitat Loss:** Natural habitats are being destroyed due to illegal farming, deforestation, and the expansion of agricultural activities.
- **Pesticide Exposure:** The extensive use of chemical pesticides in agriculture is another significant factor endangering their survival.

### Conclusion:

- This recent study highlights the urgent need to address the overexploitation of host plants in Assam's "citrus hub" to ensure the survival of swallowtail butterflies.
- As important ecological indicators and contributors to environmental balance, it is vital to strengthen conservation efforts in biodiversity-rich areas like northeast India, where these species play a crucial role.

## Halari Donkeys: Guardians of Tradition &amp; Livelihoods

☛ **Relevance: GS III - Environment**

- **In News:** The endangered Halari donkeys, native to Gujarat's Halar region, are recognized for their intelligence and their strong partnership with humans in daily work.



**About Halari Donkeys:**

- **Habitat:**
  - ✓ **Location:** Indigenous to the Halar region in Gujarat, predominantly found in the Jamnagar and Dwarka districts of Saurashtra.
- **Conservation Status:**
  - ✓ **At Risk:** With a population numbering fewer than 500, Halari donkeys are on the verge of extinction.
- **Physical Characteristics:**
  - ✓ **Unique Appearance:** These donkeys are generally white, larger, and more resilient than other donkey species.
- **Behavioral Traits:**
  - ✓ **Highly Intelligent and Social:** Known for their close interaction with humans, they are widely used for transportation purposes.

**Roles and Usage of Halari Donkeys:**

- **Construction:**
  - ✓ Historically instrumental in the building of dams, forts, hilltop temples, and rest houses due to their ability to carry heavy loads.
- **Usage by Communities:**
  - ✓ **Bharwad and Rabari Nomads:** Halari donkeys are used as pack animals during their seasonal migrations.
  - ✓ **Kumbhar Pottery Workers:** Employed in the pottery industry in the Jamnagar region to assist with transportation needs.

**Economic Significance of Halari Donkeys:**

- **Market Value:**
  - ✓ **Growing Demand:** Due to their increasing demand, the price of a Halari donkey has soared to over ₹1 lakh.

### Milk Production:

- ✓ **High-Value Milk:** Renowned for its sweetness, Halari donkey milk is highly sought after, especially in the cosmetics industry. Powdered donkey milk sells for over ₹7,000 per kg in the international market.

### Conservation Efforts:

- **Organizations Leading the Effort:** Sahjeevan Trust, Gujarat's Animal Husbandry Department, and the National Bureau of Animal Genetic Resources are working collaboratively to protect and revive the breed.
- **Steps Taken:** Identification of pure-bred males and females for breeding has begun in order to grow the Halari population.
- **Future Actions Required:** Experts recommend creating breeding farms in the Halar region, a task that will need greater State government backing and resources.

### Conclusion:

- The endangered Halari donkeys are vital to both the economy and cultural heritage of Gujarat. Although demand for their milk and services is increasing, urgent conservation efforts are necessary to ensure their continued survival.
- With government support, community involvement, and dedicated breeding initiatives, these intelligent animals can thrive once more, playing a vital role in sustaining the livelihoods of local communities.

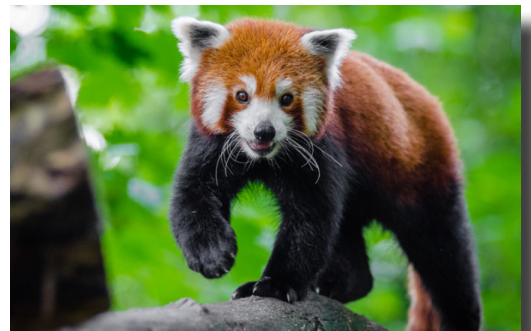
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## Padmaja Naidu Himalayan Zoological Park: A Vanguard in Red Panda Conservation

### Relevance: GS III - Environment

- **In News:** The Red Panda Initiative at Darjeeling's Padmaja Naidu Himalayan Zoological Park has been honored as a finalist for the World Association of Zoos and Aquariums (WAZA) Conservation Award 2024.



### About the Red Panda:

- **Diet:** The red panda is primarily herbivorous, mainly consuming bamboo, along with berries, acorns, and occasionally small mammals.

- **Behavior:** Renowned for its timid and reclusive nature, the red panda is an arboreal animal that employs its bushy tail for both balance and warmth during the winter months.
- **Habitat:** This species dwells in the mountainous forests across Bhutan, China, India, Myanmar, and Nepal, with nearly 50% of its habitat situated in the Eastern Himalayas.
- **Conservation Status:**
  - ✓ IUCN Red List: Endangered
  - ✓ CITES: Appendix I
  - ✓ Wildlife Protection Act of 1972 (India): Schedule I
- **Threats:** Significant threats to the red panda population include habitat degradation due to deforestation and a notable decline in bamboo forests.

### Padmaja Naidu Himalayan Zoological Park:

- **Location:** Positioned in Darjeeling, West Bengal, India.
- **Established:** Founded in 1958, the park is situated at an elevation of 7,000 feet (2,134 m).
- **Size:** Covering 67.56 acres (27.3 hectares), it is the largest high-altitude zoo in India.
- **Specialization:** The zoo focuses on breeding animals adapted to alpine environments and has successfully implemented programs for species such as snow leopards, Himalayan wolves, and red pandas.

### Conservation Efforts:

- The park plays a crucial role in India's red panda conservation and breeding programs.
- It includes a Biobanking and Genetic Resource Facility dedicated to preserving gametes, tissues, and DNA from endangered species.

### Recognition and Legacy:

- The zoo attracts around 300,000 visitors annually and is a distinguished member of the World Association of Zoos and Aquariums (WAZA).
- It is named in tribute to Padmaja Naidu, the daughter of Sarojini Naidu, honoring her substantial contributions to Indian society.



**Conclusion:**

- The Padmaja Naidu Himalayan Zoological Park serves as a leading example of conservation efforts for the endangered red panda, showcasing India's dedication to wildlife preservation and biodiversity. Its recent acknowledgment by WAZA highlights the significance of such initiatives in protecting vulnerable species and their ecosystems.

**2024 Forest Declaration Assessment: "Forests Under Fire" Report Published****Relevance: GS III - Environment**

- **In News:** The 2024 Forest Declaration Assessment, titled "Forests Under Fire," has been released, providing a comprehensive analysis of global efforts to tackle deforestation and forest degradation while aiming to restore degraded ecosystems by 2030.

**Global Forest Targets and Current Status:**

- **Halting Deforestation by 2030**
  - ✓ The goal to halt deforestation is far from achieved, with 6.37 million hectares of forest cleared in 2023, significantly higher than the goal of 4.38 million hectares.
  - ✓ The carbon emissions resulting from deforestation amounted to 3.8 billion metric tons of CO<sub>2</sub> in 2023, placing deforestation as the fourth-largest contributor to global emissions after China, the USA, and India.
- **Preventing Tree Cover Loss in Key Biodiversity Areas (KBAs)**
  - ✓ A total of 1.4 million hectares of tree cover within forested Key Biodiversity Areas (KBAs) were lost in 2023, highlighting the urgent need for better protection of these critical regions.
- **Mitigating Forest Fires**
  - ✓ Nearly one-third of the total area impacted by fires since 2001 was burned between 2019 and 2023, underscoring the increasing threat of forest fires.
- **Restoring 30% of Degraded Forests by 2030**
  - ✓ Progress toward restoring 30% of degraded landscapes remains insufficient, with only 18% of the Bonn Challenge's 2020 target of 150 million hectares

being restored from 2000 to 2019.

### Key Drivers of Deforestation:

- **Agricultural Commodity Production:** The production of agricultural goods has been the primary cause of forest loss, responsible for 57% of deforestation over the past two decades.
- **Shifting Agriculture in Primary Forests:** Shifting agricultural activities have led to the destruction of 15.9 million hectares of primary forests from 2015 to 2023.
- **Mining Operations:** Between 2000 and 2019, mining in tropical moist forest ecosystems doubled, further intensifying deforestation rates.

### Recommendations for Global Forest Conservation:

- **Prioritizing Protection of Primary and Intact Forests:** While all forests are important, primary and intact ecosystems should receive the highest priority in conservation strategies.
- **Scaling Up Restoration Efforts:** Large-scale restoration projects are essential to achieving the target of restoring 30% of degraded ecosystems, alongside the need for reliable monitoring and transparent progress reporting.
- **Addressing Altered Fire Patterns:** Governments must recognize that the increase in forest fires is largely driven by human activities and implement adaptive measures to counter these changes.
- **Focusing on Key Biodiversity Areas and High-Value Forests:** Key Biodiversity Areas (KBAs) and other regions with high ecological integrity should be prioritized in both global and national forest protection efforts.

### Conclusion:

- The 2024 Forest Declaration Assessment emphasizes the urgent need to accelerate global actions in addressing deforestation and forest degradation. To meet the ambitious goals set by international frameworks like the New York Declaration on Forests and the Kunming-Montreal Global Biodiversity Framework, governments, industries, and communities must collaborate in strengthening forest conservation efforts.

## Disappearance of Bird Species: An Escalating Issue

## Relevance : GS III - Environment

- **In News:** A recent analysis has documented the extinction of 610 bird species over the past 130,000 years, shedding light on disturbing trends, particularly concerning human-induced factors.



## Primary Causes of Bird Extinction:

- **Loss of Natural Habitat:**
  - ✓ The destruction of ecosystems is a leading factor driving the extinction of bird species around the world.
- **Excessive Hunting:**
  - ✓ Overhunting for consumption, recreation, and the exotic pet trade has significantly contributed to the depletion of bird populations.
- **Introduction of Alien Species:**
  - ✓ The arrival of non-native species, often facilitated by human activities, disrupts local ecosystems, pushing indigenous bird species toward extinction.
- **Trade of Songbirds:**
  - ✓ The illegal capture and trade of songbirds, especially in Southeast Asia, is a pressing concern, endangering their survival in the wild.
- **Avian Malaria:**
  - ✓ In places like Hawaii, diseases such as avian malaria—introduced by humans—have wiped out native bird populations, particularly the Hawaiian honeycreepers.

## Human Influence on Bird Disappearance:

- **Human-Induced Causes:**
  - ✓ Roughly 90% of the 610 extinct bird species were impacted, at least in part, by human activities. The global spread of Homo sapiens has coincided with increased extinction rates.
- **Recent Example of Extinction:**
  - ✓ In 2023, the Kaua'i 'ō'ō, a native Hawaiian songbird, was officially declared extinct, illustrating the ongoing threat posed by human-induced environmental changes.

**Environmental and Biodiversity Consequences:**

- **Environmental Repercussions:**
  - ✓ Birds are crucial for maintaining ecological balance through activities like seed dispersal, pollination, insect control, and recycling organic matter. Their extinction disrupts these roles, leading to widespread ecological consequences.
- **Loss of Biodiversity:**
  - ✓ The extinction of bird species often triggers secondary extinctions, particularly affecting fruit-bearing plants that depend on birds for seed propagation. This can set off a chain of extinctions within the ecosystem.
- **Public Health Implications:**
  - ✓ With fewer scavengers available to consume carrion, there has been an uptick in disease outbreaks. Birds play a vital role in maintaining ecological health, including controlling pests and supporting ecosystem functions.

**The Chain Reaction of Extinction:**

- The disappearance of one species can lead to a domino effect, resulting in a cascade of additional extinctions, termed secondary extinction. This phenomenon has lasting impacts on ecosystems, disrupting the delicate balance of species interactions.
  - ✓ **Frugivores:**
    - Birds that primarily feed on fruit, known as frugivores, are essential for seed dispersal. Their extinction not only threatens bird populations but also affects the survival of plant species that rely on them for reproduction. Roughly 20% of mammalian herbivores also rely heavily on fruits for their diet.

**Case Study: The Dodo's Demise:**

- **Species Overview:**
  - ✓ The Dodo, a flightless bird native to the island of Mauritius, was once perfectly adapted to the island's unique and isolated environment.
- **First Encounter:**
  - ✓ Dutch explorers first came across the Dodo in 1598.
- **Threats to Survival:**
  - ✓ Human exploitation, destruction of natural habitats, and the introduction of non-native species such as rats, pigs, and cats led to its rapid decline.



**Extinction Event:**

- ✓ Within just 80 years of its discovery, the Dodo was declared extinct by 1681, becoming one of the earliest and most iconic examples of human-driven extinction.

**Conclusion:**

- The disappearance of bird species represents more than just a loss of biodiversity; it is a threat to the stability of ecosystems and the health of the human population. The combined effects of habitat destruction, hunting, disease introduction, and invasive species highlight the urgency for conservation efforts.
- The case of the Dodo is a stark reminder of how quickly extinction can occur once it begins, often with irreversible consequences. Immediate action is required to halt ongoing extinctions & protect the delicate balance of our planet's ecosystems.

**Kaimur Wildlife Sanctuary (KWLS)****Relevance: GS III - Environment**

- **In News:** The central government has granted its preliminary approval to convert the Kaimur Wildlife Sanctuary (KWLS) into Bihar's second tiger reserve.

**About Kaimur Wildlife Sanctuary:**

- **Size and Location:** KWLS is the largest wildlife sanctuary in Bihar, located within the Kaimur hills range.
- **Establishment:** The sanctuary was founded in 1982.
- **Geographical Boundaries:** It is bordered to the north and west by Uttar Pradesh, to the south by Jharkhand, and to the east by Bihar.
- **Natural Features**
  - ✓ **Waterfalls:** The sanctuary features the Karkat and Telhar waterfalls.
  - ✓ **Plateau Description:** The KWLS is a plateau situated between the Son River, which separates Jharkhand to the south, and the Karmanasa River, delineating the boundary with Uttar Pradesh to the west.
- **Cultural Significance**
  - ✓ **Tribal Heritage:** The plateau is thought to be the ancestral home of the Oraon tribe.

## • Ecological Importance

- ✓ **Biodiversity:** The Kaimur Hills plateau is interconnected with the Bandhavgarh-Sanjay-Guru Ghasidas-Palamau tiger meta-population landscape.
- ✓ **Flora and Fauna:** The sanctuary is home to substantial populations of various species, including leopards, sloth bears, chital, sambar, wild pigs, nilgai, and chowsingha. Additionally, it hosts around 70 species of birds.

## SC Expresses Concern Over Inaction by Punjab & Haryana Regarding Stubble Burning

### Relevance: GS III - Environment

- **In News:** The Supreme Court has criticized the states of Punjab and Haryana for their lack of action against farmers involved in stubble burning, a practice that severely degrades air quality in the Delhi-National Capital Region (Delhi-NCR).



- The court pointed out that these states have failed to implement the directives issued by the Commission for Air Quality Management (CAQM) in the NCR in 2021 aimed at combating stubble burning.

### About Stubble Burning:

- **Definition:** Stubble, also known as parali, refers to the lowest segment of the rice crop that remains post-harvest. The act of igniting this leftover stubble is referred to as stubble burning.
- **Timing:** This method is frequently practiced between September and November, especially in fields where combine harvesters are employed, to swiftly remove paddy residue before planting wheat.
- **Contributing Factors:** The limited timeframe between rice harvesting and wheat sowing encourages this practice. Stubble burning is often regarded as the most economical method for clearing fields after the harvest season.

### Impacts of Stubble Burning:

- **Air Pollution:** It serves as a major source of significant air pollutants, including PM10, PM2.5, and NOx, leading to serious public health issues.
- **Greenhouse Gas Emissions:** This practice releases greenhouse gases, contributing to the rise in global temperatures.

- **Soil Degradation:** It results in the depletion of nutrients from crop residues into the atmosphere, adversely impacting soil fertility.

### Stubble Management Strategies:

- **Incorporation into Soil:** One effective approach is to integrate stubble into the soil, which enhances soil fertility & productivity while replenishing vital nutrients.
- **Utilization for Animal Feed:** Agricultural byproducts can be repurposed as animal feed or converted into nutrient-rich compost.
- **Alternative Products:** Stubble can also be processed to produce bran oil, bioethanol, and biogas.

### Initiatives to Prevent Stubble Burning:

- **Commission on Air Quality Management (CAQM):** This regulatory body was established under the CAQM in the NCR and Adjoining Areas Act, 2021, to oversee air quality management.
- **Graded Response Action Plan (GRAP):** This plan serves as an emergency response mechanism designed to combat air pollution in the Delhi-NCR region and is activated when the Air Quality Index (AQI) reaches “poor” levels.
- **Other Measures:** Additional efforts are underway to improve the affordability of Crop Residue Management (CRM) machinery, facilitating better management of agricultural leftovers.

### Conclusion:

- The inaction of these states reveals a significant deficiency in environmental governance. To tackle this pressing issue, it is imperative for the states to implement the CAQM directives and adopt sustainable agricultural practices.
- Increased collaboration among stakeholders, including farmers, policymakers, & regulatory bodies, is essential to ensure a comprehensive strategy for managing stubble & alleviating its harmful effects on both the environment and human health.

## Rocket & Satellite Emissions: An Increasing Environmental Challenge

### Relevance : GS III - Environment

- **In News:** The rising frequency of rocket launches and the rapid increase in orbiting satellites have sparked concerns about their escalating environmental impact.
- Over the past 15 years, the **number of rockets launched annually has almost tripled**, while



the number of satellites has surged by tenfold.

- Additionally, the **re-entry of space debris into the atmosphere has doubled in the last decade**, leading to toxic emissions as the debris burns upon re-entry.

### Atmospheric Impact:

- **Alumina (Al<sub>2</sub>O<sub>3</sub>) and Soot:** These materials, released during rocket launches, trap heat from the Earth's surface by absorbing long-wave radiation, contributing to global warming. This warming of the stratosphere accelerates the chemical processes responsible for ozone layer depletion.
- **Ozone Layer Depletion:** Rocket exhaust contains alumina, chlorine, and nitrogen oxides, all of which contribute to the depletion of the stratospheric ozone. Importantly, the Montreal Protocol, which was designed to protect the ozone layer, does not cover emissions from rockets.
- **Carbon Dioxide Emissions:** Each rocket launch emits between 50-75 tonnes of CO<sub>2</sub> per passenger, which is significantly higher than the emissions from commercial flights, which produce 1-3 tonnes of CO<sub>2</sub> per passenger.
- **Pollution in the Upper Atmosphere:** Approximately two-thirds of the exhaust from propellants is released into the stratosphere (12-50 km) and mesosphere (50-85 km), where it can remain for 2-3 years.
- **Greenhouse Gas Emissions:** Even "green rockets," which are powered by liquid hydrogen, emit water vapor, which acts as a greenhouse gas at higher altitudes.
- **Metallic Ash:** The release of metallic particles during rocket launches may disrupt Earth's magnetic field, allowing more harmful cosmic radiation to reach the Earth's surface.

### Measures to Mitigate Pollution:

- **Horizontal Launch of Small Satellites:** Launching small satellites from under the wing of a Boeing 747 consumes only about 1/20th of the fuel required for traditional ground-launched rockets.
- **Controlled Re-entry of Satellites:** New strategies focus on burning satellites at lower altitudes (12-18 miles), allowing metal oxides to settle back to Earth more quickly, thereby minimizing atmospheric pollution.
- **Alternative Fuels and Design Innovations:** There is increasing focus on developing bio-propane and creating reusable launch systems to reduce the waste and environmental impact of rocket launches.



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**Conclusion:**

- The growing number of rocket launches and satellite deployments pose a significant environmental challenge, particularly in terms of atmospheric pollution and ozone depletion.
- Moving forward, adopting sustainable technologies and alternative practices will be crucial to minimizing the ecological footprint of space exploration.

**New Assessment Highlights Wetlands' Key Role in National Biodiversity Strategies****Relevance: GS III - Environment**

- **In News:** A recent evaluation commissioned by Wetlands International and conducted by 35 per cent IITs highlights the crucial importance of wetlands in the National Biodiversity Strategies and Action Plans (NBSAP) submitted after the COP15 conference.

**Context of the Evaluation:**

- This evaluation was undertaken following COP15, the 15th session of the UN Convention on Biological Diversity, which urged nations to revise their NBSAPs in alignment with the Kunming-Montreal Global Biodiversity Framework (KMGBF).
- The KMGBF aims to halt and reverse the loss of biodiversity globally by 2030. The report advocates for establishing specific, measurable objectives for wetland restoration and conservation to enhance both regional and global ecological health.

**Key Findings of the Evaluation:**

- **Inclusion of Wetlands:**
  - ✓ 83% of the NBSAPs reference wetlands, inland waters, or freshwater ecosystems in their objectives.
  - ✓ 71% of NBSAPs in Asia specifically acknowledge wetlands.
  - ✓ The inclusion of various types of wetlands, such as mangroves, rivers, lakes, and peatlands, in national strategies indicates an increasing recognition of their significance in environmental targets.

### Underrepresentation of Critical Areas:

- ✓ Major wetland regions, such as the Amazon River Basin and the Hudson Bay Lowland, are frequently omitted from national biodiversity objectives.

### The Role of Wetlands in Biodiversity Conservation:

- **Biodiversity Hotspots:** Wetlands, which occupy only 6% of the Earth's surface, support approximately 40% of the planet's biodiversity.
- **Nutrient Cycling and Water Filtration:** The diverse plant communities in wetlands are integral to nutrient cycling and water filtration, significantly enhancing water quality and sustaining a wide array of species.
- **Carbon Sequestration:** Wetlands serve as important carbon reservoirs, capturing carbon in plant biomass and sediments, thereby aiding in climate change mitigation, flood control, and the resilience of ecosystems.

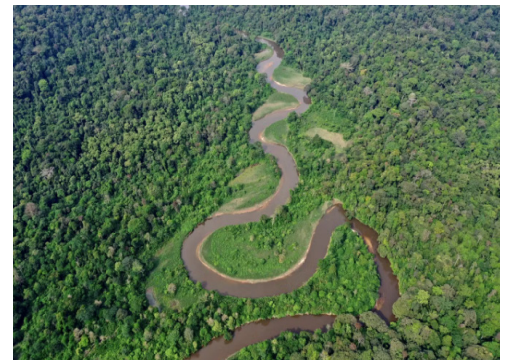
### Conclusion:

- This evaluation underscores the necessity for greater integration of wetlands in national and international biodiversity strategies, as they play a pivotal role in maintaining ecological balance and mitigating the impacts of climate change.

## Mapping Threats to Key Conservation Areas Across Pantropics

### Relevance : GS III - Environment

- **In News:** A new report unveiled at the Convention on Biological Diversity COP16 in Cali, Colombia, highlights concerning overlaps of oil, gas, and mining concessions with Key Biodiversity Areas (KBAs) across critical regions like the Amazon Basin, Congo Basin, and Southeast Asia. These areas are vital for global climate regulation and biodiversity preservation.



### Key Findings:

- **Extent of Overlap:** 518 KBAs (18% of KBAs by area) in the pantropics are subject to active or potential oil and gas concessions.
- **Impact on Amazon KBAs:** In the Amazon, oil and gas blocks intersect with 14% of KBAs and 12% of Indigenous Territories by area.
- **High-Integrity Forests:** Across the pantropics, over 180 million hectares of

high-quality forests are at risk from existing or planned fossil fuel extraction projects.

### About Key Biodiversity Areas (KBAs):

- **Definition:** KBAs are areas of global significance, crucial for maintaining biodiversity and the health of the planet.
- **Criteria:** Sites are designated as KBAs if they meet any of the 11 criteria across five main categories: Threatened biodiversity, Geographically restricted biodiversity, Ecological integrity, Biological processes, and Irreplaceability.

### Challenges in Conserving KBAs:

- **Resource Extraction vs. Conservation:** There is often a clash between conservation goals and resource extraction, driven by the growing need for minerals in renewable energy technologies (e.g., Nickel mining).
- **Vulnerability of Unprotected KBAs:** KBAs lacking protective status are especially prone to degradation due to spillover impacts from infrastructure linked to oil, gas, and mining activities.

### Recommendations:

- **Empowering Indigenous Communities:** Provide Indigenous communities with resources and authority for self-governance, respecting their rights over traditional lands.
- **Stronger Legal Protections:** Enforce legal frameworks to prevent new resource extraction in protected KBAs and phase out current operations.
- **Selective Green Resource Extraction:** Restrict extraction for green energy resources to non-critical habitats, maintaining strict environmental protections to safeguard vital ecosystems.

### Global Initiatives for KBA Protection:

- IUCN's Global Standard for identifying Key Biodiversity Areas (2016), which sets guidelines for recognizing and managing areas essential for biodiversity conservation.

### Conclusion:

- The findings emphasize the need for urgent, balanced approaches to conserve KBAs while addressing resource demands, preserving biodiversity, and mitigating climate impact.

## CAQM Directs Enactment of Stage II of Graded Response Action Plan (GRAP) in Delhi NCR

### Relevance : GS III - Environment

- In News:** The Sub-Committee under the Centre responsible for GRAP operations has instructed concerned agencies in the National Capital Region (NCR) to activate Stage II of GRAP to mitigate declining air quality.
- Stage II mandates restrictions on the usage of coal, firewood, and diesel generators, except for essential and emergency services.



### About GRAP:

- GRAP functions as an emergency intervention framework based on the Air Quality Index (AQI) readings in Delhi. It is structured into four stages, each linked to AQI levels:
  - ✓ **Stage 1:** Poor (AQI 201-300)
  - ✓ **Stage 2:** Very Poor (AQI 301-400)
  - ✓ **Stage 3:** Severe (AQI 401-450)
  - ✓ **Stage 4:** Severe+ (AQI 451+)
- The Commission for Air Quality Management (CAQM) in NCR and neighboring areas is responsible for enforcing GRAP.

### Factors Contributing to Seasonal Rise in Air Pollution in Delhi:

- Shift in Wind Patterns:** As the monsoon withdraws, northwesterly winds prevail, carrying dust from Rajasthan and occasionally from Pakistan and Afghanistan.
- Reduced Wind Speed During Winter:** High-speed winds help disperse pollutants, but as wind speed drops during winter, pollutants accumulate.
- Other Sources:** Stubble burning, dust, and vehicular emissions significantly contribute to winter pollution.

### Measures for Air Quality Control:

- 11-Point Action Plan by CAQM:** Encompasses mechanical street sweeping, use of dust suppressants, and more.



- **System of Air Quality and Weather Forecasting and Research (SAFAR):** Tracks and forecasts air quality to inform proactive steps.
- **PUSA Bio-Decomposer:** Applied to farmlands to manage crop residue without burning.

### About the Air Quality Index (AQI):

- The Air Quality Index (AQI), issued by government authorities, is a measure to communicate pollution levels and associated health risks to the public. It tracks eight primary pollutants: PM10, PM2.5, NO<sub>2</sub>, SO<sub>2</sub>, CO, O<sub>3</sub>, NH<sub>3</sub>, and Pb.

### About the Commission for Air Quality Management (CAQM):

- **Established Under:** The CAQM in NCR and Adjoining Areas Act, 2021.
- **Replaces:** The Environment Pollution (Prevention and Control) Authority.
- **Objective:** To facilitate improved coordination, research, and resolution of air quality issues in the NCR and adjoining areas.

### Conclusion:

- This directive underscores the importance of deploying structured intervention measures like GRAP to address the health and environmental impacts of severe air pollution in NCR, particularly in the colder months.

## India's First Great Indian Bustard Hatched via Artificial Insemination

### Relevance : GS III - Environment

- **In News:** India has successfully hatched its first-ever Great Indian Bustard (GIB) through artificial insemination at the National Breeding Centre in Jaisalmer, Rajasthan, as part of the Bustard Recovery Program.



### About the Bustard Recovery Project:

- **The Bustard Recovery Project was initially launched for a five-year period (2016–2021) and was extended until 2024.** The primary objectives include:
  - ✓ Conservation breeding efforts
  - ✓ Capacity building and awareness-raising to sensitize stakeholders and policymakers about bustard conservation



- ✓ Encouraging land-use practices that support bustard-friendly habitats.

### About Great Indian Bustard (Locally Known as Godawan in Rajasthan):

- ✓ **Appearance:** The Great Indian Bustard is large, with long legs and an upright posture. It has a brownish body with a black crown on the head.
- ✓ **Habitat:** The GIB is predominantly found in Rajasthan and Gujarat, with small populations also present in Maharashtra, Karnataka, and Andhra Pradesh.
- ✓ **Population:** The population has drastically declined, with estimates suggesting fewer than 150 individuals remaining in the wild, concentrated mainly in Rajasthan.

### Conservation Status

- **IUCN:** Critically Endangered
- **Wildlife Protection Act, 1972:** Listed under Schedule I and Appendix I of Schedule IV (CITES)
- **CITES:** Appendix I listing
- **Species Recovery:** Recognized under India's species recovery program
- **Current population** estimates suggest fewer than 150 GIBs remain in the wild, primarily in India.

### Characteristics and Behavior:

- A grassland bird native to the Indian subcontinent, the GIB is recognizable by its distinctive black crown. Males have notably larger crowns.
- ✓ **Gular Pouch:** Males possess a gular pouch they inflate, creating a distinctive humming sound to attract mates.
- ✓ **Diet:** Omnivorous, they consume grass seeds, insects (like grasshoppers and beetles), and occasionally small rodents and reptiles.

### Threats to Survival:

- Key threats include hunting, habitat degradation, collisions with power lines, and the spread of agriculture into grassland ecosystems.

### Conclusion

- The artificial insemination of the Great Indian Bustard marks a promising step in conserving this critically endangered species.
- The Bustard Recovery Project's focused conservation efforts aim to safeguard the GIB's dwindling population in India.

## UN COP16 Nature Summit to Discuss Global Framework for Digital Sequence Information

### Relevance : GS III - Environment

- In News:** The upcoming UN COP16 Nature Summit will address regulatory frameworks surrounding Digital Sequence Information (DSI), with an aim to establish a streamlined, multilateral system that will channel revenue generated from the use of DSI into conservation efforts.



### About Digital Sequence Information (DSI):

- Definition:** Digital Sequence Information (DSI) is a policy term that broadly encompasses genomic sequence data and associated digital data.
- Components of DSI:** It includes digital representations of genetic resources and biological data, such as DNA, RNA, and protein sequences.
- Scope and Interpretation:** There remains no consensus on the precise interpretation or extent of the term “DSI,” highlighting ongoing discussions over its legal and policy boundaries.

### Significance of Digital Sequence Information (DSI)

- Advancing Research:** DSI can support biological research, including studies on the evolution of life and bioprospecting, which is the systematic search for valuable products derived from biological resources.
  - ✓ **Example:** Virologists used DSI of SARS-CoV-2 to design diagnostic kits for COVID-19, illustrating its relevance in public health.
- Enhancing Agriculture and Food Security:** DSI aids in the development of pest-resistant, high-yield, and climate-resilient crop varieties, contributing to food security and agricultural advancement.
- Supporting Species Conservation:** DSI is instrumental in identifying and mitigating threats to endangered species, tracking illegal wildlife trade, and supporting conservation efforts for biodiversity protection.

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## Challenges Associated with Digital Sequence Information

- **Accountability Gaps:** Public databases sharing DSI, many of which were created before the Convention on Biological Diversity (CBD) was adopted in 1992, are not accountable to the CBD or its member countries.
- **Lack of Equitable Benefit Sharing:** Primary sectors linked to DSI generate annual revenues of \$1.6 trillion, but the benefits often exclude the countries and communities of origin, raising concerns over fair compensation.
- **Additional Issues:** Challenges with DSI include privacy concerns, data security risks, questions over ownership rights, and technological limitations.

## Initiatives for Digital Sequence Information (DSI)

- **Kunming-Montreal Global Biodiversity Framework:** Target 13 of the framework promotes the fair and equitable sharing of benefits from DSI on genetic resources.
- **Digital Sequencing Initiatives in India:** For instance, the Genome India Project aims to map the genetic diversity of India's population, exemplifying India's commitment to DSI advancements.

## Conclusion:

- The COP16 Nature Summit's focus on Digital Sequence Information (DSI) represents a pivotal step toward establishing equitable and accountable frameworks for the use of genetic data.
- By addressing challenges around benefit sharing, data security, and conservation funding, this global dialogue aims to balance scientific advancement with fair compensation to origin countries, ultimately supporting biodiversity and sustainability initiatives worldwide.

## UK Becomes First Country to Cease Coal-Based Electricity Generation

### Relevance : GS III - Environment

- **In News:** The United Kingdom has become the first country to entirely halt electricity production from coal, marking the closure of its last coal-powered plant and ending 142 years of coal-based electricity.



- In 2012, coal accounted for 40% of the UK's electricity needs.
- The world's first coal power plant opened in London in 1882, whereas India's first major thermal power plant, the Hussain Sagar Thermal Power Station, was established in Hyderabad in 1920.

### Reasons for Ending Coal-Based Electricity Production:

- **Pollution**
  - ✓ The energy sector accounts for approximately three-quarters of global greenhouse gas emissions (IEA).
- **Limits of Current Commitments**
  - ✓ According to the IEA, even full adherence to existing climate commitments may not suffice to achieve the Paris Agreement's goal of limiting global temperature rise to 1.5 °C.
- **Advancement of Renewable Technologies**
  - ✓ Renewable energy technologies have become more scalable with rapid growth in research, energy storage, and investments.

### Challenges in Phasing Out Coal-Based Power Plants:

- **Dependence on Coal**
  - ✓ Many low- and middle-income countries, as well as fast-developing nations like India and China, rely heavily on coal for energy and employment.
- **Economic Consequences**
  - ✓ In countries like China and India, coal power plants are relatively new; transitioning from coal could lead to significant financial losses.
- **Issues with Renewable Energy**
  - ✓ Renewable energy sources face challenges such as intermittency, high capital costs, and limited policy clarity.

### Status in India:

- **Current Scenario**
  - ✓ Coal currently accounts for approximately 70% of India's total electricity generation capacity (as of September 2024).
- **Net Zero Target**
  - ✓ India aims to achieve net-zero carbon emissions by 2070.

### Key Government Initiatives to Promote Renewable Energy:

- ✓ National Green Hydrogen Mission



- ✓ PMKUSUM (Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan)
- ✓ PM Surya Ghar
- ✓ Production-Linked Incentive (PLI) Schemes for Solar PV Modules

### Conclusion:

- The UK's complete cessation of coal-based electricity is a significant milestone in the global shift toward sustainable energy.
- As India aims for a net-zero target by 2070, the success of the UK serves as an example, despite challenges faced by coal-dependent economies, underscoring the need for targeted policies and investment in renewable energy.

## New Guidelines for Import of Live Seaweeds into India

### Relevance: GS III - Economy & Environment

- **In News:** The Ministry of Fisheries, Animal Husbandry, and Dairying has introduced new "Guidelines for Import of Live Seaweeds into India."
- The guidelines aim to facilitate the import of high-quality seed materials, promote seaweed-based ventures in coastal communities, ensure environmental safety, and address biosecurity risks associated with the sector.



### Need for the Guidelines:

- **Unique Characteristics of Seaweeds:** Seaweeds remain submerged and face varying environmental conditions, such as fluctuations in salinity and temperature.
- **Biosecurity Concerns:** Seaweeds can carry diseases, pests, and pathogens that may harm local ecosystems.
- **Biological Factors:** Variations in reproductive methods and genetic structures can result in the persistence of seaweed species in new environments, potentially disrupting native biodiversity.

### Key Provisions of the Guidelines:

- **Restrictions on Import:** Import of live seaweed material will be prohibited if it is known to carry pathogens, is listed under CITES, is in the IUCN threatened list, or is included in the threatened list of the exporting country unless certified

safe by the competent authority in that country.

- **Import Permit Requirements:** Importing live seaweed material will require a valid permit from the Department of Fisheries, Government of India, and approval from the National Committee on Introduction of Exotic Aquatic Species into Indian Waters.
- **Market Restrictions:** Direct sale of imported seaweed in the domestic or international market will not be permitted.
- **Intellectual Property Limitations:** Neither the importer nor the exporter can claim intellectual property rights over the imported material.

### About Seaweeds:

- **Definition:** Seaweeds are marine plants and algae that thrive in oceans, rivers, lakes, and other water bodies.
- **Examples:** Common types include *Kappaphycus alvarezii*, *Gelidiella acerosa* (Red Algae), and *Gracilaria edulis*.
- **Applications:** Seaweeds have diverse uses in laboratories, pharmaceuticals, cosmetics, and various industries like cardboard, paper, paint, and processed foods.
- **Current Seaweed Production in India:** India's seaweed production stands at 34,000 tonnes annually, with an estimated potential of 9.7 million tonnes per year.

### Government Initiative:

- **Pradhan Mantri Matsya Sampada Yojana (PMMSY):** This flagship scheme aims to increase India's seaweed production to over 1.12 million tonnes by 2025.

### Conclusion:

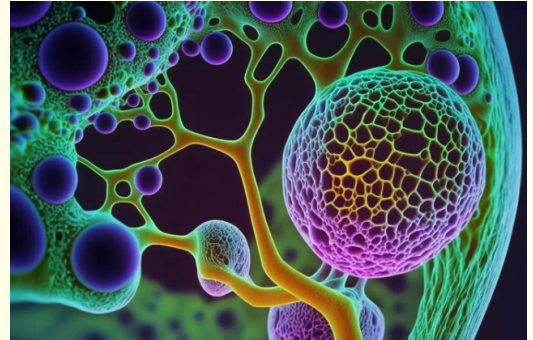
- The guidelines mark a strategic effort to enhance India's seaweed sector sustainably, balancing growth in coastal economies with the protection of marine ecosystems.
- The new framework will ensure safe practices in importing and cultivating seaweed varieties, leveraging India's potential in this growing industry.



## Stem Cell Therapy Breakthrough for Type 1 Diabetes

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

- **In News:** A woman with Type 1 diabetes was successfully treated using cells sourced from her own body, through a pioneering reprogrammed stem cell transplant.



## About Stem Cells:

- Stem cells are **primitive, unspecialized cells that possess the ability to self-replicate and transform into various cell types.**
  - ✓ Primary Sources of Stem Cells
  - ✓ Embryonic tissues and adult organs (adult stem cells) are the chief sources for obtaining stem cells.

## Classification of Stem Cells Based on Their Potency:

- Stem cells are categorized according to their ability to transform into specific cell types:
- **Totipotent Cells:**
  - ✓ These cells can differentiate into all cell types within an organism.
  - ✓ Example: Zygotes formed post-fertilization and asexual spores.
- **Pluripotent Cells:**
  - ✓ These cells can develop into most of the body's tissues but are not capable of forming every kind of tissue.
- **Multipotent Cells:**
  - ✓ These cells are limited in their ability to transform into a narrow range of tissues.

## Conclusion:

- The successful reprogrammed stem cell transplant for a woman with Type 1 diabetes underscores the immense potential of stem cell-based therapies.
- With their remarkable capacity for self-renewal & differentiation into various cell types, stem cells hold promising prospects for revolutionizing future medical treatments.



## India BioEconomy Report 2024: A Detailed Overview

### Relevance : GS III - Science & Technology

- **In News:** India BioEconomy Report 2024 was unveiled at the 4th Global Bio India Summit, presenting a comprehensive view of the remarkable growth & advancements in India's Bio-Economy sector.
- The report, released by the Department of Biotechnology and BIRAC (Biotechnology Industry Research Assistance Council), highlights key achievements and developments in the field.



### What is Bio-Economy?

- The Bio-economy refers to **the knowledge-driven production and utilization of biological resources to create products, processes, and services**, all within the framework of a sustainable economic model.

### Key Findings of the Report:

- India's Bio-Economy reached a valuation of \$151 billion in 2023, contributing 4.25% to the country's GDP and providing employment to over 3.3 million people.
- By 2030, the sector is projected to expand to \$300 billion.

### Key Sub-Sectors Contributing to India's Bio-Economy:

- **BioIndustrial (~48%):** This segment includes biofuels, biochemicals, bioplastics, and related industries.
- **BioAgri (~8%):** It focuses on genetically modified crops such as Bt Cotton.
- **BioPharma (~36%):** This sector revolves around pharmaceuticals, medical devices, diagnostics, etc.
- **BioIT/Research Services (~8%):** This includes contract research, clinical trials, and bioinformatics services.

### Major Achievements in India's Bio-Economy:

- **Global Vaccine Leadership:** India emerged as a global leader, providing 25% of WHO-procured vaccines and contributing 20% of vaccine exports to Africa.
- **Energy Independence:** India has become the third-largest producer and consumer of ethanol, marking a significant boost to energy independence.



- **Precision Healthcare Breakthroughs:** A major milestone was achieved with the approval of India's first gene therapy clinical trial for Hemophilia A.
- **Surge in Biotech Startups:** The number of biotech startups saw an impressive increase, reaching approximately 8,500 between 2021 and 2023, marking a 59% growth in this period.

### Government Initiatives to Propel India's Bio-Economy:

- **Bio-Manufacturing Initiative:** The Department of Biotechnology (DBT) launched the BioE3 Policy, a comprehensive initiative to foster bio-manufacturing.
- **Intellectual Property (IP) Guidelines:** In 2023, new IP guidelines were introduced to accelerate the commercialization of publicly funded research, facilitating the growth of innovation.
- **Governance and Structural Reforms:** A major restructuring was undertaken, consolidating 14 autonomous institutes into the Biotechnology Research and Innovation Council.
- **Regulatory Streamlining via BioRRAP:** Biological Research Regulatory Approval Portal (BioRRAP) was launched to simplify the approval process for biological research, making it more accessible and efficient.

### Conclusion:

- The India BioEconomy Report 2024 highlights India's growing prowess in the bio-economy, with strategic government initiatives, innovations in biotechnology, and rapid startup growth driving the sector forward. With an ambitious projection of reaching \$300 billion by 2030, India's bio-economy is poised to play a critical role in the country's future economic and sustainable development.

### Discovery of Rocky Planet Orbiting a White Dwarf

#### Relevance : GS III - Space Technology

- **In News:** A recent study using telescopes in Hawaii has uncovered the first-ever rocky planet orbiting a white dwarf.
- This white dwarf is located about 4,200 light years from our solar system, near the bulge at the center of the Milky Way galaxy.



## What is a White Dwarf?

- A white dwarf represents the **stellar core that remains after a star has depleted its nuclear fuel and has shed its outer layers, creating a planetary nebula**. This marks the final observable stage in the evolution of low- and medium-mass stars. In contrast, stars with a much greater mass might evolve into neutron stars or black holes after their end stages.
  - ✓ **Light Year:** A unit of distance, representing how far light travels in one year, approximately 5.9 trillion miles.
- **Conditions for Formation**
  - ✓ **Mass Requirement:** A white dwarf forms from stars with a mass less than eight times that of the Sun.

## Formation and Composition:

- A white dwarf is created when a low-mass star, similar to our Sun, exhausts most of its nuclear fuel.
  - ✓ **Composition:** White dwarfs share a similar carbon and oxygen mass compared to our Sun, but they are considerably smaller in size.
  - ✓ **Size and Density:** Despite being as massive as the Sun, a white dwarf is only slightly larger than Earth. It is among the densest forms of matter, with only neutron stars and black holes surpassing it in density.

## Features and Characteristics:

- **Temperature:** White dwarfs can reach temperatures exceeding 100,000 Kelvin, as reported by NASA.
- **Energy Generation:** Although they no longer engage in nuclear fusion reactions, they remain extremely hot.
- **Cooling Process:** Over time, white dwarfs gradually cool, and it is predicted they will eventually turn into black dwarfs. However, the Universe is likely not old enough for any black dwarfs to have formed yet.
- **Luminosity**
  - ✓ Despite their high temperatures, white dwarfs exhibit low luminosity due to their small size. This luminosity allows astronomers to estimate the age of star formation in a given region.
    - **Astronomical Observation:** The Hubble Space Telescope was the first to directly observe white dwarfs in globular star clusters in 2003. Astronomers noted them as the dimmest stars ever seen in such a cluster.



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**Conclusion:**

- The discovery of a rocky planet orbiting a white dwarf near the Milky Way's center marks a significant advancement in astronomical research.
- White dwarfs, as one of the most fascinating remnants of stellar evolution, provide vital insights into the life cycle of stars and the age of the Universe.

## India Aims for March 2028 Launch of Venus Orbiter Mission (VOM)

### Relevance: GS III - Space Technology

- **In News:** The Union Cabinet has recently given its nod for India's first-ever mission to Venus, called the Venus Orbiter Mission (VOM). This mission is set to explore various facets of Venus' atmosphere and surface.



### About the Venus Orbiter Mission (VOM):

- **Scheduled Launch:** The mission is planned for March 2028, with an expected journey time of 112 days to reach Venus.
- **Launch Vehicle:** The mission will be launched using the Launch Vehicle Mark-3 (LVM-3), India's most advanced and powerful rocket.
- **Mission Goals:**
  - ✓ To analyze the dust particles in the Venusian atmosphere and observe its airglow.
  - ✓ To conduct surface mapping of Venus' topography.
  - ✓ To examine the solar X-ray spectrum and investigate sub-surface properties of Venus.
  - ✓ The mission will also test advanced technologies such as aerobraking and thermal control systems in the challenging environment of Venus.
- **Scientific Payloads on the VOM**
  - ✓ A total of 19 payloads have been selected for the mission:
  - ✓ 16 payloads will be from Indian institutions.
  - ✓ 2 payloads will involve collaboration between Indian and international teams.
  - ✓ 1 international payload will also be on board.

### Key Scientific Instruments and Experiments for VOM:

- **Venus Thermal Camera:** This instrument will help study atmospheric dynamics and the structure of Venusian clouds.
- **NAVA (Narrow Band Oxygen Airglow Detection):** This device will measure airglow emissions in the Venusian atmosphere.
- **VARTISS (Venus Advanced Radar for Topside Ionosphere and Subsurface Sounding):** This radar system aims to:
  - ✓ Study the structure of the ionosphere.
  - ✓ Identify active volcanic hotspots.
  - ✓ Detect subsurface features buried beneath the Venusian landscape.
- **VODEX (Venus Orbit Dust Experiment):** Designed to examine Interplanetary Dust Particles (IDPs) around Venus' orbit.
- **Additional Payloads:**
  - ✓ **VISWAS (Venus Ionospheric and Solar Wind Particle Analyser):** To explore the interaction between solar wind and Venus' ionosphere.
  - ✓ **RAVI (Radio Anatomy of Venus Ionosphere):** Focused on examining the anatomy of Venus' ionosphere.
  - ✓ **VIRAL (Venus InfraRed Atmospheric Gases Linker):** Developed in partnership with Russia, this tool will study the interaction of atmospheric gases on Venus.

### Past and Upcoming Venusian Missions:

- **Pioneer Venus (1978) by NASA and Vega (1985) by the USSR:** These missions greatly enhanced our understanding of Venus' atmospheric conditions.
- **Venus Express (2005) by ESA and Akatsuki (2015) by Japan:** Both missions contributed significantly to research on atmospheric dynamics, climate evolution, and surface features of Venus.
- **Future Missions:**
  - ✓ **NASA's DAVINCI (2029):** Set to study the composition of Venus' atmosphere.
  - ✓ **NASA's VERITAS (2031):** This mission will provide high-resolution maps of Venus' surface.
  - ✓ **EnVision (2031) by ESA:** Focused on investigating the geology and climate of Venus.



## Nobel Prize in Physiology or Medicine for Unveiling microRNAs

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

- **In News:** The Nobel Prize in Physiology or Medicine has been awarded jointly to Victor Ambros and Gary Ruvkun for their remarkable discovery of microRNAs and their crucial involvement in post-transcriptional gene regulation.



**Gene Regulation: Key Discovery:**

- Gene regulation refers to the process through which a **cell manages which genes, among the multitude in its genome, are expressed, thereby influencing the production of specific proteins.**
- Genetic data moves from DNA to messenger RNA (mRNA) through a process known as transcription, followed by translation in the cellular machinery for protein synthesis.
  - ✓ Human organs and tissues comprise different types of cells, all containing identical genetic material stored within DNA.
  - ✓ Due to gene regulation, these diverse cell types (such as muscle and nerve cells) produce unique sets of proteins, which enable them to carry out specialized roles.

**About microRNAs:**

- microRNAs (miRNAs) are **small, non-coding RNA molecules that play a critical role in regulating gene expression.** They assist in controlling gene expression by attaching to mRNA and preventing it from being converted into proteins or by initiating the breakdown of mRNA.
  - ✓ microRNAs are essential players in turning DNA instructions into proteins.
  - ✓ In humans, there are over a thousand genes responsible for encoding different microRNAs, and this type of gene regulation is prevalent across multicellular organisms.

**Broader Functions of microRNAs:**

- **Cell Development**
  - ✓ microRNAs are key in the differentiation of stem cells and play an essential role in tissue and organ development.

- **Immune System Regulation**
  - ✓ microRNAs control both innate and adaptive immune responses, playing a critical role in the body's defense mechanisms.
- **Cancer Development**
  - ✓ The misregulation of microRNAs is linked to cancer progression, and certain microRNAs also act as tumor suppressors.
- **Disease Diagnosis**
  - ✓ microRNAs are used as biomarkers in identifying diseases such as cancer and Parkinson's disease, aiding in early detection and tailored treatments.

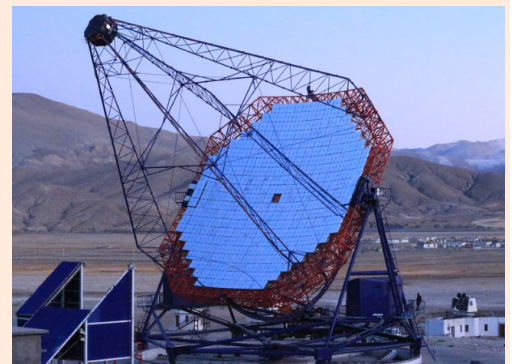
### Conclusion:

- The groundbreaking discovery of microRNAs by Victor Ambros and Gary Ruvkun has revolutionized our understanding of gene regulation at the post-transcriptional level. Their work highlights the intricate mechanisms by which cells control protein production, influencing critical processes like cellular development, immune responses, and cancer progression.
- This discovery not only enhances our comprehension of biological functions but also opens up new possibilities for diagnosing and treating complex diseases, underscoring the transformative impact of microRNAs in modern medicine and molecular biology.

### Cancer Detection Using Ultrasound Technology

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

- **In News:** Scientists are exploring a new approach to cancer detection using sound waves, presenting a potentially transformative method for diagnosis.



#### Conventional Method: Biopsy:

- **Current Standard Practice:** The traditional technique for detecting cancer is through a biopsy, where a small tissue or cell sample is extracted from the suspected area using a large needle.
- **Lab-Based Testing:** After extraction, the sample undergoes testing to confirm if cancer is present and to determine the specific type of cancer.

## Ultrasound Approach for Cancer Identification:

- **Innovative Detection:** Researchers are investigating the use of ultrasound waves in blood samples as a tool to detect the presence of cancer in the body.
- **Mechanism of Action:**
  - ✓ **Ultrasound Imaging:** Typically, ultrasound machines are used to generate images of internal organs by converting reflected sound waves into visuals, much like how bats utilize ultrasound to navigate their environment.
  - ✓ **High-Energy Ultrasound Principle:** At higher frequencies, ultrasound waves can break off small fragments of cancerous tissue, releasing their contents into the bloodstream.
  - ✓ **Detection through Biomarkers:** These fragments release biomarkers, such as DNA, RNA, or proteins specific to cancer, which can then be identified in blood samples to confirm the presence of cancer.

## Benefits of Ultrasound in Cancer Detection:

- **Increased Sensitivity:** Ultrasound can enhance the concentration of genetic and vesicle biomarkers in blood samples by more than 100-fold.
- **Enhanced Precision:** This method can identify both specific cancer types and the mutations they carry, which current blood tests are unable to detect.
- **Non-Invasive Nature:** One of the key benefits is that this method is non-invasive, avoiding the discomfort and complications associated with biopsies.
- **Reduction in Biopsies:** This approach has the potential to reduce the need for biopsies by nearly 50%, offering a less painful alternative for patients.
- **Broader Applications:** In addition to detection, this technique may be used to monitor cancer progression and evaluate a patient's response to treatment.

## What are Biomarker?

- **Definition:** A biomarker is a biological feature that can be measured to indicate either a normal or abnormal biological process or a response to a medical treatment.
- **Where Found:** Biomarkers are present in blood, urine, tissues, or other body fluids.
- **Uses:** They are crucial for diagnosing diseases, identifying possible treatments, and monitoring the progression of diseases.

## Conclusion:

- This ultrasound-based method of detecting cancer holds significant promise for early diagnosis, minimizing patient discomfort, and enhancing cancer treatment monitoring.



- By offering a non-invasive and highly sensitive way to detect cancer biomarkers, it could reduce the reliance on biopsies and improve clinical outcomes for cancer patients.
- The potential to expand this method to monitor cancer progression and treatment response further underscores its relevance in improving patient care.

## National Space Panel Approves India's Fifth Lunar Mission-LUPEX

### Relevance : GS III - Space Technology

- **In News:** The National Space Panel has given the go-ahead for India's fifth lunar mission, referred to as the Lunar Polar Exploration Mission (LUPEX).



### About LUPEX Mission:

#### Objective

- ✓ The LUPEX mission is aimed at investigating the presence and characteristics of water on the Moon, with a focus on the far side of the lunar surface.
- ✓ This mission will act as a precursor to India's future lunar sample return mission and serves as a foundation for sending the first Indian astronaut to the Moon by 2040.

#### Exploring the Far Side of the Moon

- ✓ The far side of the Moon refers to the part that is permanently hidden from Earth due to tidal locking, which causes only one side of the Moon to face the Earth.

#### International Partnership

- ✓ LUPEX is a collaborative project between India and Japan:
- ✓ ISRO is responsible for developing the lunar rover.
- ✓ JAXA (Japan's space agency) will construct the lander.
- ✓ The rover will also be equipped with instruments provided by NASA and ESA (European Space Agency) for further observations.

#### Landing Site

- ✓ The mission plans to land near the Moon's South Pole, a region thought to hold significant water resources.
- ✓ Landing in this area presents a technical challenge due to the scarcity of flat,

well-lit locations with favorable communication conditions.

### • Milestone Set by Chandrayaan 3

- ✓ India made history with the successful landing of the Vikram Lander (part of the Chandrayaan 3 mission), becoming the first country to land on the Moon's South Pole, and the fourth nation to achieve a lunar landing after the United States, Russia, and China.

### Conclusion:

- The LUPEX Mission represents a significant leap forward in India's space exploration ambitions, fostering international cooperation with JAXA, NASA, and ESA. Its goal of exploring water on the Moon's far side aligns with India's long-term plans for lunar sample return missions and future manned space exploration.
- Success in this mission will cement India's position as a leader in space technology in the coming years.

## China's JUNO Set to Begin Neutrino Data Collection

### Relevance : GS III - Space Technology

- **In News:** The Jiangmen Underground Neutrino Observatory (JUNO) in China is set to play a pivotal role in addressing unresolved questions about neutrinos, such as their source and interactions with other particles.



### What Are Neutrinos?

- Neutrinos are fundamental subatomic particles with a mass much smaller than that of other elementary particles.
  - ✓ **Types of Neutrinos:** There are three varieties—Electron, Muon, and Tauon neutrinos.
  - ✓ **Neutrino Oscillation:** Neutrinos transition between these types during their travel, a process known as neutrino oscillation.
- **Key Properties of Neutrinos:**
  - ✓ **Spin and Charge:** Neutrinos have a spin of  $1/2$  and are electrically neutral.
  - ✓ **Speed and Path:** They travel nearly at the speed of light in straight trajectories from their source.

- ✓ **Interaction with Matter:** Neutrinos seldom interact with matter, earning them the nickname “ghost particles.”
- ✓ **Prevalence:** Neutrinos are the most abundant particles in the universe that possess mass.
- ✓ **Interaction Forces:** They interact only through gravitational and weak nuclear forces.

### JUNO’s Role in Neutrino Research and Its Importance:

- **Solar Neutrinos:** JUNO will enable the observation of solar neutrinos, offering real-time insights into solar activity.
- **Geoneutrinos:** It will study neutrinos produced from the radioactive decay of elements like uranium and thorium in Earth’s mantle, enhancing our understanding of mantle convection and plate tectonics.
- **Astrophysical Phenomena:** JUNO could also provide critical data on violent cosmic events such as supernovae and gamma-ray bursts.

### Prominent Neutrino Observatories:

- **India-Based Neutrino Observatory (INO):** This observatory, funded jointly by the Department of Atomic Energy (DAE) and the Department of Science and Technology (DST), is located in the Bodi West Hills of Theni District, Tamil Nadu.
- **IceCube Neutrino Observatory:** The first detector of its kind, designed to explore the cosmos from deep within the South Pole’s ice.
- **Other Notable Observatories:**
  - ✓ China’s TRIDENT (Tropical Deep-Sea Neutrino Telescope)
  - ✓ US’s DUNE (Deep Underground Neutrino Experiment)

### Conclusion:

- JUNO’s groundbreaking role in neutrino research will enhance our understanding of both cosmic and terrestrial processes, from solar activity to Earth’s tectonics.
- By studying these elusive particles, JUNO and other neutrino observatories like INO and IceCube will provide valuable insights into fundamental astrophysical phenomena, helping unravel the mysteries of the universe.

## Venture Capital Fund for Space Sector

### Relevance: GS III - Space Sector

- **In News:** The Union Cabinet has approved the establishment of a ₹1,000 crore Venture Capital (VC) Fund for the space sector under IN-SPACe.
- A Venture Capital Fund is a specialized type of private equity financing focused on early-stage startups with high growth potential.



### About the VC Fund for the Space Sector:

- **Purpose of the Fund:** The proposed VC Fund aims to support startups across the full space supply chain—covering upstream, midstream, and downstream segments.
- **Financial Structure:** The fund will operate over a span of five years, deploying between ₹150-250 crore annually.
- **Investment Per Startup:** Each startup can receive funding between ₹10-60 crore.
- **Targeted Support:** The fund plans to support approximately 40 startups.

### Strategic Goals of the Fund:

- **Capital Infusion:** The fund aims to create a multiplier effect by attracting additional funding for the later stages of startup development
- **Accelerating Private Sector Growth:** The initiative seeks to achieve a fivefold increase in the Indian space economy over the next decade
- **Driving Innovation:** The fund is designed to foster advancements in space technology, enhancing India's global leadership through private sector participation.

### Benefits of the Fund:

- **Retention of Domestic Space Companies:** The fund will encourage space companies to remain domiciled within India.
- **Job Creation:** The initiative is expected to generate employment in engineering, software development, data analysis, manufacturing, and related sectors.
- **Enhanced Innovation Ecosystem:** The fund will promote a vibrant innovation

ecosystem, thereby boosting India's global competitiveness in the space sector.

- **India's Space Sector Overview:** India currently ranks 5th globally in the space economy, contributing around 2-3% to the global space market. Valued at \$8.4 billion, the Indian space sector is targeting a growth trajectory to reach \$44 billion by 2033.

### About Indian National Space Promotion & Authorisation Centre (IN-SPACe):

- **Established:** 2020
- **Role and Functions:**
  - ✓ IN-SPACe operates as a single-window, autonomous agency within the Department of Space (DOS). Acting as a liaison between ISRO and Non-Governmental Entities (NGEs), IN-SPACe facilitates private sector engagement in various space activities, such as:
    - ✓ Authorizing and overseeing the development of launch vehicles and satellites.
    - ✓ Sharing space infrastructure and promoting innovation in the private space sector.

### Private Sector Initiatives in India's Space Sector

- One notable example is India's first private launch vehicle, Vikram-1, developed by Skyroot Aerospace, demonstrating the expanding role of private companies in India's space advancements.

### Conclusion:

- By fostering private sector involvement, promoting innovation, and ensuring the retention of Indian space enterprises, this initiative is set to accelerate growth and technological advancement in the space industry, positioning India as a key leader in space technology by 2033.

## Regulating Social Media for Children: Global & Indian Perspectives

### Context:

- Recently, the Australian Prime Minister unveiled a plan to introduce a minimum age requirement for social media usage. This measure seeks to safeguard children from potential online hazards, which have become more pressing since the COVID-19 pandemic due to increased screen time



among the younger population.

- Sharenting: This term is a blend of "sharing" and "parenting," referring to the growing trend of parents sharing photos, videos, and details about their children on social media platforms.

## Global Initiatives to Regulate Social Media for Children

### ➤ What is Social Media?

- Social media includes digital platforms (websites and applications) that facilitate interaction between individuals, enabling them to create, share, and exchange information, ideas, and content within virtual communities and networks. Common examples include Facebook, Instagram, and LinkedIn.
- Traditional print media, such as newspapers, magazines, and newsletters, do not fall under social media, as they represent conventional forms of communication.

### ➤ Regulatory Framework in India

- India has implemented various measures to control children's engagement with social media. The Digital Personal Data Protection Act (DPDPA) 2023 introduces several stipulations:
  1. Parental Consent: Platforms are required to obtain verifiable consent from a parent or legal guardian before processing a child's personal data.
  2. Child's Welfare Focus: All data processing activities must align with the well-being of the child.
  3. Limits on Targeted Advertising: The law prohibits behavioural tracking, monitoring, and targeted ads directed at children.
- Additionally, in 2023, the Karnataka High Court suggested that the Indian government impose a minimum age of 21 for social media usage, raising concerns over the negative impact of digital addiction among students.

## Global Context

### ➤ South Korea:

- The Cinderella Law (also known as the Shutdown Law) prohibited children under 16 from engaging in online gaming between midnight and 6 AM.
- This law, enacted to address internet addiction, was repealed in 2021 due to enforcement challenges.

### ➤ United States:

- The Children's Online Privacy Protection Act (COPPA), 1998, requires websites to secure parental consent before collecting information from children under 13.



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- The Children's Internet Protection Act (CIPA), 2000, mandates that schools and libraries receiving federal funds install filters to block harmful online content.
- **European Union:**
  - In 2015, the EU introduced a regulation mandating parental approval for internet access for children below 16.
  - The General Data Protection Regulation (GDPR), 2018, sets comprehensive data protection standards, offering individuals greater control over their personal data and serving as a global model.
- **United Kingdom:**
  - The UK established the minimum age for parental consent at 13, and in 2024, a government panel suggested increasing it to 16.
  - The Age-Appropriate Design Code requires digital platforms to prioritise children's safety by incorporating robust privacy protections and minimising risks.
- **France:**
  - In July 2023, France enacted legislation requiring social media platforms to block children under 15 from accessing their services without parental approval, with financial penalties for non-compliance.
  - Additionally, if a child influencer under 16 earns income, their parents are prohibited from accessing those earnings until the child reaches the age of 16.
- **China:**
  - In August 2023, China introduced strict limits on children's internet use, including daily time caps:
    - Ages 16-18: two hours
    - Ages 8-15: one hour
    - Under 8: 40 minutes
  - Access is restricted between 10 PM and 6 AM, with exceptions for educational applications.
- **Brazil:**
  - In April 2023, Brazil passed legislation on child data protection, restricting how digital platforms handle children's data as part of wider efforts across Latin America to enhance online safety for minors.

### Digital Literacy in India: Current Status

- Despite efforts to regulate social media usage, India faces challenges due to low

levels of digital literacy. Data from a 2021 survey conducted by the National Sample Survey Office (NSSO) revealed that only 40% of Indians are proficient in basic computer operations.

- In smaller cities (Tier 2 and Tier 3), 80% of children assist their parents in navigating online platforms, demonstrating the digital gap.
- Additionally, India's linguistic diversity and the practice of sharing devices within families make it difficult to implement uniform digital safety protocols across the country.

### Why is Regulating Social Media for Children Important?

#### ➤ Safety Issues:

- Children are susceptible to harmful content, cyberbullying, and exploitation by online predators, all of which may lead to mental health problems like anxiety and depression.

#### ➤ Exposure to Explicit Material:

- The proliferation of inappropriate content on social media exposes young users to material that is not age-appropriate, potentially affecting their understanding of relationships and sexuality.

#### ➤ Misinformation:

- Children are particularly vulnerable to false information circulated on social media and may be influenced by misleading propaganda.

#### ➤ Encouraging Face-to-Face Interaction:

- Limiting social media usage encourages children to participate in real-life social interactions, which are crucial for building social skills and emotional development.

#### ➤ Technological Responsibility:

- There is growing support for holding technology companies accountable for ensuring a safer online environment for children, rather than relying solely on parental controls.

### Challenges to Enforcing Social Media Restrictions for Children

#### ➤ Difficulties in Enforcement:

- In the digital age, enforcing social media bans is challenging, as children often find ways to bypass age restrictions, as demonstrated by the failure of South Korea's Cinderella Law.



**➤ Increased Parental Responsibility:**

- Imposing age restrictions places an additional burden on parents, particularly in regions with limited digital literacy. Many parents may not have the necessary skills to monitor their children's online activities.

**➤ Loss of Positive Digital Engagement:**

- Social media offers children valuable opportunities for learning, creativity, and socialisation. A complete ban would deprive them of these benefits and limit their exposure to essential digital skills needed for future careers.

**➤ Freedom of Expression:**

- Young people have the right to express themselves and access information. Restricting their social media usage could infringe on these rights and prevent them from interacting with diverse perspectives and communities.

**➤ Fostering Community Support:**

- Social media enables children to build supportive online communities, stay informed about global issues, and connect with networks that affirm their identity.

**Way Forward****➤ Education and Awareness:**

- Schools should introduce digital literacy programs focused on safe online navigation, privacy protection, and recognising potential risks.
- Social media apps should feature warning labels to inform users about the mental health risks associated with excessive usage, similar to health warnings on cigarette packaging.

**➤ Safe Platform Design:**

- Technology companies must take responsibility for protecting children by developing secure features and easy-to-use privacy settings.

**➤ Collaborative Regulation:**

- Governments, educators, and tech companies should collaborate to create regulations that strike a balance between safety and meaningful digital engagement, adopting models like the UK's Age-Appropriate Design Code.

**➤ Continuous Monitoring and Assessment:**

- Regulations and platform features should be regularly reviewed and updated to ensure transparency and accountability from tech companies regarding child safety measures.

### ➤ Parental Engagement:

- Parents should be encouraged to model healthy online behaviours and discuss their children's digital activities. Providing resources to help parents understand digital platforms is crucial for fostering a safer online environment for children.

### Conclusion:

- Regulating social media usage for children requires a balanced approach, incorporating education, platform design, and collaborative regulation. India and global regulatory efforts aim to ensure that children can engage with digital platforms safely, while also fostering digital literacy and personal development.

## US-India Nuclear Collaboration and Small Modular Reactors

### Context:

- Recent advancements indicate a revitalization of the civil nuclear agreement between India and the United States (US), with Holtec International's Small Modular Reactor (SMR-300) emerging as a prominent element in this renewed cooperation.
- Holtec plans to collaborate with India to address its energy requirements and advance clean energy objectives by repurposing existing coal plant locations for SMR deployment. Additionally, the exploration of joint manufacturing aligns with India's transition towards a cleaner energy framework.



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### What is the SMR-300?

- Overview: The SMR-300 is an advanced pressurized light-water reactor that uses low-enriched uranium fuel to generate at least 300 megawatts (MWe) of electrical energy via fission.
- Compact Structure: The SMR-300 requires significantly less land compared to conventional reactors, making it a suitable option for installation at coal plant sites in India.
- Support for Clean Energy Transition: This technology is integral to India's clean energy ambitions, providing a competitive alternative to fossil fuels, particularly in meeting the increasing energy demands of sectors such as Artificial Intelligence and data centres.
- India seeks to position itself as a strong competitor in the global nuclear market by developing SMRs, aiming to rival established players like Russia and China.

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## Challenges in Implementing SMR-300 in India

- **Civil Liability for Nuclear Damage Act, 2010:** This legislation poses difficulties for foreign nuclear suppliers, as it holds equipment manufacturers liable in the event of accidents, discouraging potential partners from investing in India's nuclear sector due to the risk of financial responsibility.
  - **Export Regulations:** The US Atomic Energy Act of 1954 prevents US companies, such as Holtec, from manufacturing nuclear equipment in India, complicating efforts to locally produce SMR components.
  - **Legislative Constraints:** India's legal framework currently lacks the flexibility to modify liability laws, impeding smoother partnerships with foreign entities.
- **Future Prospects for SMR-300 in India**
- Collaborating on SMR technology could enhance US-India relations, addressing the technological limitations and cost challenges both nations face.

## India-US Nuclear Agreement

- **Overview:** The India-US Nuclear Agreement, also known as the US-India Civil Nuclear Agreement, was signed in 2008 following a joint statement by then Indian Prime Minister Manmohan Singh and US President George W. Bush in 2005.
- **Purpose:** The agreement aimed at promoting civil nuclear cooperation between India and the US, marking a significant shift in US policy. Previously, nuclear trade with India was restricted due to its non-signatory status to the Nuclear Non-Proliferation Treaty (NPT).
- **Key Provisions:** The 123 Agreement permits US companies to supply nuclear fuel and technology for India's civilian nuclear energy program.
- **India's Commitment:** As part of the agreement, India allowed inspections by the International Atomic Energy Agency (IAEA) for its civilian nuclear activities.
- **Advantages for India:** India gained access to US dual-use nuclear technologies, including materials and equipment for uranium enrichment and plutonium reprocessing. This agreement was expected to strengthen India's energy security and meet its growing power demands through nuclear energy.

## What are Small Modular Reactors (SMRs)?

- **Overview:** As per the IAEA, Small Modular Reactors (SMRs) are advanced nuclear reactors designed to enhance safety and efficiency. Their power output ranges from less than 30 MWe to over 300 MWe.

### Key Characteristics:

- **Small:** These reactors are physically smaller than conventional nuclear reactors, allowing flexible installation in diverse environments.
- **Modular:** They are designed for factory assembly, which enables transportation as complete units for easier setup.
- **Reactors:** SMRs use nuclear fission to generate heat for electricity production or other applications.
- **Global Status of SMR Technology:** Currently, there are over 80 SMR designs at various stages of development and approval worldwide, with some already in operation. These designs include:
  1. **Land-based Water-Cooled SMRs:** Such as integral pressurized water reactors (PWRs) and boiling water reactors (BWRs), which use established technologies.
  2. **Marine-Based Water-Cooled SMRs:** Designed for use in marine settings, such as floating units mounted on barges or ships.
  3. **High-Temperature Gas-Cooled SMRs (HTGRs):** These reactors produce heat exceeding 750°C, making them highly efficient for electricity generation and industrial applications.
  4. **Liquid Metal-Cooled Fast Neutron Spectrum SMRs (LMFRs):** They employ fast neutron technology with coolants like sodium or lead.
  5. **Molten Salt Reactor SMRs (MSRs):** These use molten fluoride or chloride salts as coolants, allowing longer fuel cycles and in-situ refuelling.
  6. **Microreactors (MRs):** These extremely small reactors are designed to generate up to 10 MWe of power using various cooling systems.

### Challenges in India's SMR Development Ambitions

- **Technological Disparities:** India's current nuclear technology, largely based on heavy water and natural uranium, is falling behind globally dominant light water reactors (LWRs). Transitioning to SMRs will require significant technological upgrades and expertise development.
- **High External Costs:** While SMRs are designed to be cost-effective, the financial burden of building safe reactors and managing nuclear waste can drive up project costs, affecting their economic feasibility.
- **Regulatory Challenges:** India's nuclear regulatory frameworks, designed for large reactors, need updates to cater to SMRs. A comprehensive framework addressing the varied SMR designs is essential.
- **Public Acceptance and Safety Concerns:** Public unfamiliarity with SMRs could

result in resistance due to concerns about nuclear accidents like the Chernobyl disaster.

- **Human Resource Development:** Considerable investment is needed to establish the infrastructure and manufacturing facilities for SMRs. Moreover, India currently lacks a workforce skilled in SMR operations, which is vital for successful implementation.

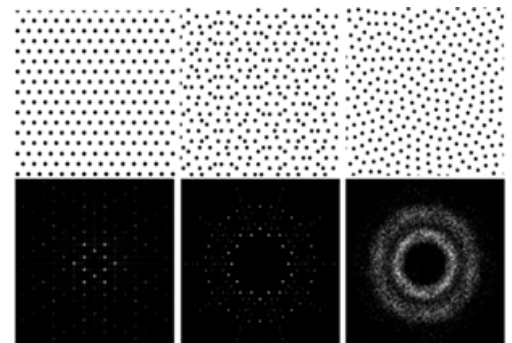
### Way Forward

1. **SMR Prototypes:** India should develop SMR prototypes to test designs and ensure operational reliability, targeting the early 2030s for first-of-a-kind SMR units to assist in the energy transition.
2. **Update Nuclear Regulations:** Review and revise existing nuclear regulations to accommodate innovative SMR designs. A comprehensive regulatory framework under the Atomic Energy Regulatory Board is needed to ensure safety standards.
3. **Innovative Financing Models:** Develop financing solutions, including green finance options, to attract private investments and reduce project risks.
4. **Skill Development Programs:** Address skill gaps by implementing training programs for SMR operations through institutes like Bhabha Atomic Research Centre (BARC).
5. **Strengthen Nuclear Supply Chains:** Form strategies to enhance the nuclear supply chain for consistent SMR production. Collaborate with the IAEA and other countries to incorporate non-proliferation safeguards into SMR designs.

## Hyperuniformity: A New Frontier in Material Science

### Why in News?

- Recent research has uncovered the underlying mechanisms of a newly identified exotic disordered state of matter, termed hyperuniformity. This discovery has garnered attention due to its unique properties and potential practical uses across various fields.



### What is Hyperuniformity?

#### Key Characteristics:

- **Definition:** Hyperuniformity is a distinctive property found in certain disordered materials, where long-range density fluctuations diminish to zero. Unlike

traditional disordered systems, hyperuniform materials maintain an unusual form of uniformity at large scales.

- **Real-World Occurrences:** Hyperuniform disordered structures are found in a diverse range of systems, including quasicrystals, large-scale cosmic structures, biological emulsions, and colloidal systems. Despite their disordered appearance, these materials exhibit a surprising level of uniform arrangement.

### How Hyperuniformity Works

#### ➤ Particle Mobility and System Constraints:

- The mechanism behind hyperuniformity is governed by a conservation principle that limits particle movement within the system. This restriction on mobility effectively reduces mass density fluctuations, even as the system grows larger.
- This suppression of density variations is the hallmark of hyperuniform materials, distinguishing them from other types of disordered matter.

### Comparison to Liquid Critical Points

#### ➤ Contrasting Behavior:

- **Liquid Critical Points:** At the critical point in a liquid, mass density fluctuations increase significantly, resulting in critical opalescence—a phenomenon where the liquid scatters light due to large-scale fluctuations.
- **Hyperuniformity:** In stark contrast, hyperuniform materials experience a suppression of mass density fluctuations as the system size increases. This places them in a unique state, intermediate between crystalline solids, amorphous materials, and liquids. Unlike liquids at their critical point, hyperuniform materials balance long-range order and disorder in a way that results in this remarkable uniformity.

### Applications of Hyperuniform Materials

- The distinctive properties of hyperuniform materials make them attractive for a range of innovative applications. Below are some areas where they show great potential:
- **Photonic Technologies:**
  - Hyperuniform materials could revolutionize energy-efficient photonic devices by enabling the precise control of light. These materials hold potential for advancing data transmission systems, where the manipulation of light is critical for improving efficiency and performance.

➤ **Biological Systems:**

- In biology, hyperuniform materials could be used to regulate cellular functions and drive innovations in biotechnology. The ability to control these materials at a microscopic level could lead to breakthroughs in manipulating biological systems or designing synthetic analogs with desired properties.

### Conclusion

- The exploration of hyperuniformity represents a significant advancement in the understanding of disordered materials. By bridging the gap between crystalline structures, amorphous solids, and liquids, hyperuniform materials offer new opportunities for scientific and technological innovation. With potential applications in photonics, biology, and beyond, the continued study of this emerging state of matter could lead to groundbreaking developments across multiple fields.



## India and Uzbekistan Sign Bilateral Investment Treaty (BIT)

## Relevance : GS II - Bilateral Relations

- **In News:** The signing of the Bilateral Investment Treaty (BIT) between India and Uzbekistan is expected to enhance economic cooperation & foster a stronger, more resilient investment environment.
- This move will improve investor confidence & promote mutual trust in investment opportunities between the two nations.



## About the Bilateral Investment Treaty (BIT):

- A Bilateral Investment Treaty is a reciprocal agreement that provides protection to investments made by nationals and companies of one country in the territory of another.
- **India's New Model BIT (2015):** In 2015, India adopted a revised Model BIT text, which replaced the earlier version from 1993. This new model is used in the renegotiation of BITs and investment chapters in Free Trade Agreements (FTAs) and Economic Partnership Agreements.

## Key Features of India's Model BIT:

- **National Treatment:** The agreement ensures that foreign investors receive the same treatment as domestic investors.
- **Protection Against Expropriation:** Limits the ability of either country to seize foreign investments within its borders.
- **Dispute Resolution Mechanism:** Investors are required to exhaust local legal remedies before pursuing international arbitration.
- **Other Features:** The treaty includes an enterprise-based definition of investment, among other provisions.

## India-Uzbekistan Relations:

- Uzbekistan holds a strategic position as one of India's key partners in Central Asia. Their relationship spans multiple dimensions, including economic, security, and people-to-people engagement.



- ✓ **Economic Ties:** India ranks among Uzbekistan's top 10 trading partners for the fiscal year 2023-24.
- ✓ **Security and Defense Cooperation:** The two nations conduct joint military exercises, such as "DUSTLIK", aimed at enhancing defense collaboration.
- ✓ **Multilateral Engagement:** Both countries actively participate in international platforms like the United Nations (UN), G20, BRICS, and the Shanghai Cooperation Organisation (SCO).
- ✓ **Energy Security:** India and Uzbekistan have signed agreements related to uranium ore concentrate supplies, strengthening cooperation in the energy sector.
- ✓ **People-to-People Connections:** Uzbekistan hosts a significant Indian community of approximately 14,000 members, fostering cultural and social ties between the two countries.

## India Reinforces Commitment to Social Determinants of Health

### Relevance: GS II - Global Groups

**In News:** India reaffirmed its dedication to **enhancing Social Determinants of Health (SDH)** during the G20 Joint Finance-Health Task Force High-Level Meeting, held in conjunction with the 79th session of the UN General Assembly.



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### About Social Determinants of Health (SDH):

- Social Determinants of Health (SDH) represent the non-clinical elements that influence overall health outcomes. These determinants are associated with the conditions in which individuals are born, grow, reside, work, and age. Additionally, they involve the broader systems and structures that shape everyday life.
  - ✓ **Forces and Systems Included:** Economic frameworks, development policies, cultural norms, governance structures, and social strategies.
  - ✓ **Illustrations of SDH:** Elements such as education, income security, social protection mechanisms, job security, employment conditions, food security, housing, early childhood development, and social integration fall under SDH.

### WHO's Commission on SDH - Goals for 2040:

- The World Health Organization (WHO) Commission on SDH has outlined three primary goals for achievement by 2040:
  - ✓ **Narrowing the Life Expectancy Gap:** Reduce the disparity in life

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expectancy between countries and social groups by half.

- ✓ **Lowering Adult Mortality:** Achieve a 50% reduction in adult mortality across all nations.
- ✓ **Decreasing Child and Maternal Mortality:** Aim for a 90-95% reduction in child and maternal mortality rates globally.

### The Impact of SDH on Health Outcomes:

- Research consistently shows that SDH contribute to 30-55% of all health outcomes. These determinants are crucial in shaping health inequalities, which are unjust and preventable differences in health status across individuals and nations.
- ✓ **Health Inequalities:** Irrespective of a country's income level, health follows a social gradient—the lower a person's socioeconomic status, the poorer their health.

### India's Strategy on Social Determinants of Health:

- India has adopted an integrated whole-of-government and One Health framework to address SDH. Key components of India's approach include:
  - ✓ **Debt-for-Health Swaps:** India is exploring debt-for-health swaps as a strategy to relieve financial burdens while investing in health equity.
  - ✓ **Standardized Data Collection:** During the G20 meeting, India called for a unified strategy for gathering and analyzing data to strengthen global health systems.
  - ✓ **Key National Initiatives:** India has implemented various flagship programs aimed at tackling SDH, such as:
    - Ayushman Bharat (healthcare access),
    - Swachh Bharat Mission (sanitation),
    - Jal Jeevan Mission (clean water),
    - Pradhan Mantri Awas Yojana (affordable housing).

### Conclusion:

- India's renewed emphasis on Social Determinants of Health underscores its commitment to advancing health equity and addressing the broader societal and economic influences on health outcomes.
- Through flagship initiatives like Ayushman Bharat and Swachh Bharat, and by promoting global cooperation, India is working towards reducing health disparities both domestically and internationally.

## Bhutan Endorses India's Bid for Permanent Seat in United Nations Security Council (UNSC)

### Relevance: GS II - Global Groups

- In News:** Bhutan has recently reaffirmed its support for India's aspiration to secure a permanent seat in the United Nations Security Council (UNSC). This endorsement follows similar backing from the United States, France, and the United Kingdom.



UN Security Council

- ✓ The restructuring of the UNSC necessitates amendments to the UN Charter.
- ✓ Any such amendment requires approval from two-thirds of the UN General Assembly (UNGA) and ratification by two-thirds of the UN Member States, including all the permanent members of the UNSC.

### About United Nations Security Council (UNSC):

- The UNSC was founded under the **UN Charter in 1945** and is one of the six primary bodies of the United Nations, entrusted with the responsibility of preserving international peace and security.
- It is **composed of 15 members, including five permanent members** who hold veto powers (China, France, Russia, the UK, and the USA) and ten non-permanent members elected for two-year terms (see infographic).
- The UNSC has the power to make binding decisions, which must be implemented by all UN Member States under the UN Charter.

### Factors Supporting India's Candidature for Permanent Membership:

- Voice of Developing Nations:** India plays a leading role as a key representative of the Global South.
- Economic Powerhouse:** India ranks as the 5th largest economy globally, reflecting its significant economic influence.
- Population Dominance:** India has surpassed other nations to become the most populous country in the world.
- Global Peacekeeping Contributions:** India is one of the leading contributors to the United Nations Peacekeeping Forces, playing a crucial role in international peace efforts.

### Obstacles to India's Permanent Membership:

- China's Resistance:** While other permanent members back India's bid, China

continues to oppose its inclusion.

- **Opposition from Interest Groups:** Certain coalitions, like the Uniting for Consensus Group (also called the Coffee Club), resist expanding permanent seats within the UNSC.
- **Reluctance of Current Permanent Members:** The existing permanent members may hesitate to relinquish some of their veto privileges, preferring to maintain the current structure.

### Structure of UNSC Members:

- **Permanent Members with Veto Powers (5):**
  - ✓ China, France, Russia, the United Kingdom, and the United States
- **Non-Permanent Members (10), Serving Two-Year Terms:**
  - ✓ Africa: 3 seats, Asia: 2 seats, Latin America: 2 seats, Western Europe and Others: 2 seats, Eastern Europe: 1 seat.

### Conclusion:

- India's pursuit of a permanent seat in the UNSC has garnered increasing support from influential countries like the US, France, the UK, and Bhutan. While challenges remain, particularly from China and the Uniting for Consensus Group, India's expanding economic influence, leadership in global peacekeeping efforts, and its role in representing developing nations strengthen its claim for a permanent role in global governance and decision-making within the UNSC.

## ILO Publishes Regional Companion Report for Asia & the Pacific

### Relevance: GS II - International Institution

- **In News:** The International Labour Organization (ILO) recently unveiled the Regional Companion Report for Asia and the Pacific, which serves as a supplement to the ILO's World Social Protection Report 2024-26, titled Universal Social Protection for Climate Action and a Just Transition.
- This report sheds light on notable advancements, ongoing challenges, and strategic priorities for social protection within the region.



International  
Labour  
Organization

### Key Insights:

- **Social Protection Reach:** Around 53.6% of the population across Asia and the Pacific is covered by at least one form of social protection benefit.

- **Climate Adaptation Support:** Social protection programs like India's MGNREGA are instrumental in helping individuals adapt to climate change by securing their livelihoods and job opportunities.

### India-Specific Highlights:

- **Social Protection Coverage:** In India, about 48.8% of the population receives at least one form of social protection.
- **Spending on Social Protection:** Total expenditure on social protection, including health, constitutes 5.1% of India's GDP.
- **Challenges for Universal Coverage:** Several hurdles impede universal social protection in India, including the large informal sector, aging demographics, fiscal gaps, and emerging environmental issues.

### Recommendations from the Report:

- **Enhance Social Protection Systems:** Strengthen social protection structures to improve resilience, climate adaptation, and mitigation strategies.
- **Broaden Coverage:** Extend social protection to all forms of employment, particularly within the informal workforce.
- **Reform Subsidies:** Restructure fossil fuel subsidies to free up fiscal resources for social protection initiatives.
- **Utilize Digital Solutions:** Adopt technological advancements to streamline the administration and efficacy of social protection schemes.

### India's Key Social Protection Schemes:

- **Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) 2005:** Guarantees 100 days of wage employment to rural households, ensuring economic stability.
- **National Food Security Act, 2013:** Provides subsidized food grains to approximately two-thirds of the population, promoting food security.
- **National Social Assistance Programme (NSAP):** A welfare initiative offering support to the elderly, widows, and other marginalized groups.
- **Pradhan Mantri Jan Arogya Yojana (PMJAY):** Delivers health coverage of Rs. 5 lakhs per family annually for secondary and tertiary hospitalization, targeting the economically vulnerable.

### Conclusion:

- The ILO's Regional Companion Report for Asia and the Pacific underscores both the achievements and obstacles related to social protection coverage in the region, particularly for India.
- Through policy reforms, expanding protection to all employment sectors, and the use of technology, countries can better align their social protection frameworks

with the goals of climate action and just transition.

## Cross-Border Electricity Trade Agreement Between Nepal, India, & Bangladesh

### Relevance : GS II - Multilateral Relations

- **In News:** Nepal, India, and Bangladesh have recently entered into an agreement to facilitate the transfer of hydroelectric power from Nepal to Bangladesh through Indian transmission lines.
- This agreement signifies a growing trend of regional energy cooperation in South Asia.



### South Asian Initiatives for Cross-Border Energy Collaboration:

- **Electricity Trade Across Borders**
  - ✓ **India-Bangladesh:** A new electricity corridor is being established, linking Katihar in Bihar to Bornagar in Assam.
  - ✓ **India-Nepal:** Collaborative hydropower projects like Arun III and Upper Karnali Hydropower Project (UKHP).
  - ✓ **India-Bhutan:** Notable examples include hydropower projects such as Kurichu, Tala, Chukha, and Mangdechhu.
- **Energy Pipelines**
  - ✓ **TAPI Gas Pipeline:** A multinational project to transport natural gas.
  - ✓ **India-Bangladesh Energy Pipeline:** Enhances bilateral energy exchange.
  - ✓ **Motihari-Amlekhganj Pipeline:** A crucial connection between India and Nepal for energy transportation.
- **Renewable Energy Initiatives**
  - ✓ **International Solar Alliance (ISA):** South Asia's involvement in the Green Grids Initiative and One Sun, One World, One Grid (OSOWOG) exemplifies its commitment to fostering renewable energy cooperation.

### Importance of Regional Energy Cooperation:

- **Countering China's Expanding Influence:** China's increasing role in constructing energy infrastructure in South Asia poses a strategic challenge. This energy cooperation between India and its neighbors helps balance China's growing presence.
- **Fostering Economic Integration:** Cross-border energy trade acts as a key driver of regional economic unification, enhancing resource flow and economic ties among South Asian nations.

- **Energy Reliability:** Cross-border energy trade improves security of supply and reduces energy shortages.
- **Environmental Protection:** Hydropower and renewable energy projects contribute to sustainable practices, reducing the region's carbon footprint.

### Challenges to Regional Energy Collaboration:

- **Environmental Impact:** Projects such as the Upper Karnali Hydropower Project (UKHP) in Nepal face opposition due to concerns over their potential harm to the Himalayan environment.
- **Cost Barriers:** Hurdle rates refer to the financial costs created by structural barriers in national power grids, which need to be addressed for seamless electricity trade across borders.
- **Regional Tensions:** Conflicts, especially between India and Pakistan, can disrupt energy cooperation.
- **Limited Feasibility of Hydropower Projects:** Geographic and environmental factors may restrict the full utility of hydropower as a long-term solution.

### Institutional Support for Energy Cooperation:

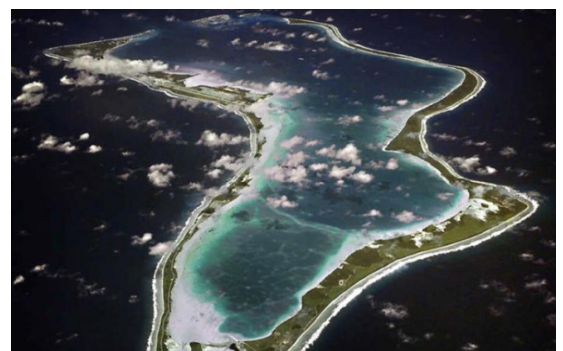
- **SAARC Energy Centre:** Works to advance energy cooperation across South Asia.
- **South Asia Sub-Regional Economic Cooperation (SASEC):** Aims to develop infrastructure and energy projects for regional benefit.
- **BIMSTEC Energy Centre:** Facilitates energy collaboration in the Bay of Bengal region.
- **South Asia Regional Initiative for Energy Integration (SARI/EI):** Promotes electricity trade and integration across the South Asian region.

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## United Kingdom Transfers Sovereignty of Chagos Islands to Mauritius

### Relevance : GS II - International Relations

- **In News:** The United Kingdom and Mauritius have reached a historic political understanding to transfer the sovereignty of the Chagos Islands to Mauritius.
- Although pending the formalization of a treaty, this agreement represents a significant diplomatic milestone.



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- The US-UK military base on Diego Garcia atoll, however, will remain operational.

### About the Chagos Archipelago:

- **Location:** The Chagos Archipelago is located around 500 kilometers south of the Maldives in the Indian Ocean Region (IOR).
- **Historical Context:** These islands were uninhabited until the 18th century, after which they were colonized by the French. In 1814, the French handed over the islands to the British.
- **British Indian Ocean Territory (BIOT):** Established by the UK in 1965, the Chagos Archipelago became a key component of BIOT. Some of the BIOT islands were transferred to Seychelles in 1976. The UK separated the archipelago from Mauritius in 1965, just three years before Mauritius gained independence.

### Importance of the Agreement:

- **Resolving Colonial Disputes:** This agreement brings to an end a longstanding dispute over one of the few remaining British colonial territories in Africa, marking a key step toward addressing the legacies of colonialism.
- **Effect on Regional Security:** With the Chagos Islands returning to Mauritius' sovereignty, the country may seek to strengthen its diplomatic ties with major global powers, which could have implications for regional security dynamics.
- **Strategic Importance of Diego Garcia:** The Diego Garcia military base holds immense strategic significance, especially for the US, enabling it to monitor vital maritime routes such as the Malacca Strait, crucial for international trade, and maintain a strong presence in the Indian Ocean.
- **Compliance with International Law:** The handover complies with the 2019 ruling of the International Court of Justice (ICJ) and the subsequent United Nations General Assembly (UNGA) resolution, both of which called for the decolonization of the Chagos Islands.

### India's Position on the Chagos Islands Issue:

- **India's Support for Mauritius:** India has consistently backed Mauritius' claim over the Chagos Islands, voting in favor of the 2019 UNGA resolution.
- **Principled Stance:** This support aligns with India's long-held commitment to decolonization and its advocacy for the sovereignty and territorial integrity of independent nations.

### Conclusion:

- The agreement between the UK and Mauritius regarding the transfer of the Chagos Islands is a pivotal development in the region's geopolitical sphere.

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While it addresses colonial-era issues, the continued operation of the US-UK military base on Diego Garcia ensures that the strategic interests of global powers in the Indian Ocean Region (IOR) remain intact.

- India's backing of Mauritius reflects its broader principles of promoting decolonization and defending the territorial integrity of sovereign states.

## India-UAE Bilateral Investment Treaty (BIT) Comes Into Effect

### Relevance : GS II - Bilateral Relations

- **In News:** The India-UAE Bilateral Investment Treaty (BIT), which was signed in Abu Dhabi in February 2024, officially came into force on August 31, 2024.
- The previous Bilateral Investment Promotion and Protection Agreement between India and the UAE, signed in 2013, expired in September 2024.



### About Bilateral Investment Treaties (BITs):

- **Bilateral Investment Treaties (BITs) are reciprocal pacts between two nations designed to encourage and safeguard foreign private investments within each other's territories.** These treaties ensure baseline protections for foreign investments, provide fairness under international law, and offer safeguards against expropriation by host nations.
- India adopted a **new Model BIT framework in 2015**, replacing the earlier version that had been in place since 1993.

### Key Provisions of India-UAE BIT:

- **Investor-State Dispute Settlement (ISDS):** Allows disputes to be resolved through arbitration, but requires that local remedies be pursued for three years before arbitration can commence.
- **Investment Definition:** Utilizes a restricted, asset-based definition of investment, including portfolio investments.
- **Fair Treatment Standards:** Includes clauses ensuring protection against denial of justice and maintaining due process.
- **Investment Protection:** Provides safeguards against expropriation, guarantees transparency, allows for transfers, and ensures compensation for any losses sustained.



### Importance of India-UAE BIT 2024:

- The UAE is the seventh-largest source of Foreign Direct Investment (FDI) for India, contributing 3% (\$19 billion) of India's total FDI inflow from April 2000 to June 2024.
- The treaty will bolster investor confidence by providing a minimum standard of treatment, promoting non-discrimination, and offering an independent platform for dispute resolution through arbitration.

### India-UAE Bilateral Relations:

- **Trade:** The UAE is India's third-largest trading partner, following the US and China.
- **Defense Cooperation:** Both countries conduct joint military exercises, including Desert Cyclone.
- **Energy Partnership:** The UAE is a key supplier of crude oil, LNG, and LPG to India. India is the third-largest importer of crude oil and fourth-largest importer of LNG globally.

### India-Maldives bilateral talks

#### Relevance: GS II - Bilateral Relations

- **In News:** Indian Prime Minister Holds Bilateral Discussions with Maldives President in New Delhi.



#### Key Results of the Maldives President's Visit to India:

- During the talks, both countries announced a shared vision for a comprehensive partnership in economic and maritime security, covering the following areas:
  - ✓ **Development Cooperation:** Both nations pledged to support the timely completion of key projects, including the Greater Malé Connectivity Project.
  - ✓ **Trade and Economic Engagement:** The two sides initiated discussions on a potential Bilateral Free Trade Agreement and agreed to operationalize trade transactions in local currencies to reduce dependence on foreign currencies.
  - ✓ **Digital and Financial Collaborations:** The introduction of the RuPay card in the Maldives aims to simplify payment processes for Indian tourists, boosting tourism and economic ties.
  - ✓ **Healthcare Cooperation:** Both countries agreed to work toward the recognition of Indian pharmacopoeia by the Maldives government, with plans to set up India-Maldives Jan Aushadhi Kendras across the Maldives to

provide affordable medicines.

- In addition, both nations signed a Currency Swap Agreement (CSA) worth USD 400 million and INR 30 billion, aimed at supporting the Maldives in managing its foreign exchange reserves. The agreement is part of the SAARC Currency Swap Framework 2024-27.
- ✓ **Understanding the CSA:** A currency swap agreement is an arrangement where two parties agree to exchange two currencies at a predetermined rate, with a mutual agreement to reverse the exchange at a later date. India has previously signed similar agreements with countries like Sri Lanka and Japan.

### Strategic Importance of the Maldives to India:

- **Neighbourhood First Policy (NFP):** The Maldives plays a pivotal role in India's Neighbourhood First Policy (NFP) and SAGAR (Security and Growth for All in the Region) initiative due to its strategic location.
- **Geostrategic Significance:** The Maldives occupies a critical position as a gateway between important chokepoints in the western Indian Ocean, such as the Gulf of Aden and the Strait of Hormuz, as well as the eastern Indian Ocean's Strait of Malacca.

### India-Maldives Bilateral Relations:

- The Maldives was the first country to receive COVID-19 vaccines from India, marking a significant step in India's global health diplomacy.
- In 2023, India emerged as the Maldives' largest trading partner, further solidifying economic relations.
- India provided crucial aid during the water crisis in Malé under Operation NEER, demonstrating its continued commitment to supporting the Maldives in times of need.

### Conclusion:

- The signing of key agreements, including the Currency Swap Agreement, reflects India's commitment to supporting the Maldives in managing its economic challenges.
- Moreover, the strategic importance of the Maldives in India's Neighbourhood First Policy and SAGAR initiative highlights its crucial role in regional stability and security.
- As both nations move forward, their deepening ties are expected to contribute positively to mutual growth and regional collaboration.

## What is Anaconda Strategy?

### Relevance: GS II - International Issue

- In News:** Taiwan's navy recently expressed concerns over China's strategic actions, noting that China is employing an 'Anaconda Strategy' to encircle and suppress the island nation.



### Exploring the Anaconda Strategy:

#### Historical Background:

- ✓ The term Anaconda Strategy was originally introduced during the American Civil War by Union General Winfield Scott.
- ✓ This strategy aimed to economically and militarily isolate the Confederate states, much like an anaconda constricts its prey to the point of suffocation.

#### China's Adaptation of the Strategy:

- ✓ China's version involves a combination of military maneuvers, psychological tactics, and cyber warfare to surround Taiwan.
- ✓ The aim is to gradually force Taiwan to submit, avoiding a full-scale military confrontation through a slow, calculated approach.

### Conclusion:

- The Anaconda Strategy illustrates a step-by-step, multifaceted tactic designed to pressure Taiwan, drawing parallels to historical approaches that use economic and military leverage to achieve goals without direct conflict.

## 21st ASEAN-India Summit in Lao PDR

### Relevance: GS II - Regional Group

- In News:** The Prime Minister (PM) participated in the 21st ASEAN-India Summit held in Lao PDR, where he conferred with ASEAN leaders to evaluate the progress made in the ASEAN-India Comprehensive Strategic Partnership and to delineate future pathways for cooperation.



### Key Outcomes of the Summit:

- New ASEAN-India Plan of Action (2026-2030):** The leaders reached an

agreement to develop a new ASEAN-India Plan of Action for 2026-2030, aimed at realizing the complete potential of the ASEAN-India partnership. Additionally, they adopted two significant joint statements during the summit.

- **PM's 10-Point Plan:** In line with the summit's theme of "Enhancing Connectivity and Resilience," the PM introduced a comprehensive 10-point strategy focusing on various aspects of collaboration and development.

### Joint Statements Issued:

- Joint Statement on Strengthening ASEAN-India Comprehensive Strategic Partnership
  - ✓ **Accelerate Review of AITIGA:** The leaders agreed to expedite the assessment of the ASEAN-India Trade in Goods Agreement (AITIGA) to foster trade, streamline procedures, and enhance cooperation among member states.
  - ✓ **Launch of ASEAN-India Fund for Digital Future:** The summit welcomed the creation of the ASEAN-India Fund for Digital Future to support collaborative initiatives aimed at digital transformation.
- **Joint Statement on Advancing Digital Transformation**
  - ✓ **Digital Public Infrastructure (DPI):** The leaders committed to sharing best practices in the development of DPI, executing joint initiatives for regional integration, and addressing challenges in health and other sectors.
  - ✓ **Financial Technology:** They explored potential collaborations on cross-border payment systems utilizing innovative digital solutions to enhance financial connectivity.
  - ✓ **Cybersecurity:** The summit emphasized the necessity of strengthening cybersecurity cooperation for the digital economy and welcomed the establishment of the ASEAN-India Track 1 Cyber Policy Dialogue..

### Major Points Announced in the 10-Point Plan:

- **Celebrating ASEAN-India Year of Tourism 2025:** The PM proposed that the year 2025 be recognized as the ASEAN-India Year of Tourism and celebrated the decade of the Act East Policy through various people-oriented initiatives.
- **Review of AITIGA by 2025:** A commitment was made to conduct a comprehensive assessment of the ASEAN-India Trade in Goods Agreement by the year 2025.

### Conclusion:

- The Prime Minister's engagement in the 21st ASEAN-India Summit highlights India's commitment to bolstering its relationships with Southeast Asia.
- The agreements and strategies outlined during the summit underscore the significance of collaborative efforts in enhancing connectivity, digital



transformation, and economic cooperation, positioning India as a pivotal player in both the regional and global landscape.

## Diplomatic Rift Deepens Between India and Canada

### Relevance : GS II - Bilateral Relations

- In News:** India has recalled its High Commissioner and expelled Canadian diplomats, following escalating tensions in a diplomatic dispute. This action was triggered by Canada's request for India to waive diplomatic immunity for certain officials, alleging their involvement in an investigative matter—a demand India found unjustifiable.



### Diplomatic Immunity and Its Importance:

- Diplomatic Immunity:** Diplomatic immunity is a fundamental principle of international law, ensuring foreign officials are protected from the jurisdiction of local courts for both their official and private activities. This safeguard is crucial to facilitate smooth diplomatic relations and ensure the unhindered functioning of diplomatic missions.
- Vienna Convention on Diplomatic Relations (1961):** The Vienna Convention extends special privileges and legal protections to diplomatic staff. India signed this convention in 1965 and ratified it in 1972 through the Diplomatic Relations (Vienna Convention) Act.

### Recent Developments in India-Canada Diplomatic Relations:

- Khalistani Separatist Movements:** One of the significant factors leading to tensions between India and Canada is the backing of Sikh separatist movements by certain factions in Canada. These groups, advocating for an independent Khalistan, have long been a source of diplomatic discord between the two nations.
- Threat to Indian Sovereignty:** India has consistently raised concerns over Canada's support for Khalistani activities, such as the unofficial referendum on an independent Sikh state in 2023. India sees these actions as a direct challenge to its sovereignty, issuing multiple warnings to the Canadian government.
- Cooperation on Security Issues:** India has made several extradition requests related to terrorists and organized crime figures who have sought refuge in Canada. However, these requests have gone unanswered, contributing to the



increasing strain between the two countries.

- **Stagnant Agreements:** Important agreements such as the Comprehensive Economic Partnership Agreement and the Foreign Investment Promotion and Protection Agreement have remained stalled, indicating a broader deterioration in both economic and diplomatic cooperation.
- **Domestic Political Considerations:** The Sikh population in Canada, particularly in provinces like Ontario and British Columbia, represents an important electoral group for political parties, particularly the Liberal Party. This has influenced Canada's stance on Khalistani-related issues, complicating diplomatic relations.

### Overview of India-Canada Relations:

- **Bilateral Trade:** Trade between India and Canada has shown a downward trend in 2023, with the total trade in goods dropping to USD 7.65 billion, a decline from USD 10.50 billion in 2022.
- **Legal Cooperation:** India and Canada signed a Mutual Legal Assistance Treaty in 1994 and an Extradition Treaty in 1987, facilitating cooperation in legal matters, particularly related to criminal cases.
- **Nuclear Energy Cooperation:** In 2010, India and Canada signed a Nuclear Cooperation Agreement, which led to the establishment of a Joint Committee on Civil Nuclear Cooperation aimed at enhancing collaboration in the peaceful use of nuclear energy.
- **Space Cooperation:** India's space agency, ISRO, achieved a significant milestone in 2018 by launching its 100th satellite from the Polar Satellite Launch Vehicle (PSLV), which also carried Canada's first Low Earth Orbit (LEO) satellite.

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## 23<sup>rd</sup> Meeting of SCO Council of Heads of Government Held in Islamabad

### Relevance : GS II - Regional Group

- **In News:** Islamabad hosted the 23rd meeting of the Shanghai Cooperation Organization (SCO) Council of Heads of Government, where eight significant agreements were signed. These agreements covered a range of topics, including the SCO budget, secretariat operations, and counterterrorism efforts.



### Key Takeaways from the Summit:

- **India's Focus:** India emphasized the importance of combating the “three evils” - terrorism, extremism, & separatism - to promote regional peace & development.
- **Belt and Road Initiative:** India reiterated its refusal to endorse China's Belt and Road Initiative, citing concerns over territorial integrity and sovereignty.
- **Sanctions Criticism:** The meeting featured criticism of the unilateral sanctions imposed by Western nations, particularly those targeting Russia.
- **Advancing India's Digital Agenda:** India took a significant step forward by incorporating its Digital Public Infrastructure (DPI) and promoting digital inclusion as part of the SCO's cooperation framework.

### Significance of SCO for India:

- **Countering Terrorism:** The Regional Anti-Terrorist Structure (RATS) provides India with critical intelligence and information on terrorist movements and drug trafficking.
- **Central Asia Cooperation:** SCO offers India a platform to strengthen ties with Central Asian countries, aligning with its Connect Central Asia policy.
- **Indo-Russian Cooperation:** SCO serves as an important forum for deepening India-Russia relations.
- **Energy Security:** The region is home to approximately 4% of the world's natural gas reserves and 3% of its oil reserves, which are crucial for India's energy needs.
- **Balancing Chinese Influence:** Through initiatives like the Chabahar Port and the International North-South Transport Corridor (INSTC), India can counterbalance China's dominance in the region.

### Challenges within SCO:

- **Disputes Among Members:** Tensions exist between various member countries.
- **China-Russia Rivalry:** Both nations compete for influence within the organization.
- **Divergent Interests:** Member states often have conflicting political and economic priorities.

### About the Shanghai Cooperation Organization (SCO):

- **Headquarters:** Beijing, China.
- **Formation:** Established in 2001 in Shanghai by Kazakhstan, China, Kyrgyzstan, Russia, Tajikistan, and Uzbekistan.
- **Current Members:** India, Iran, Kazakhstan, China, Kyrgyzstan, Pakistan, Russia, Tajikistan, Uzbekistan, & Belarus. Afghanistan & Mongolia hold observer status.



- **Goal:** The SCO aims to strengthen mutual trust, friendship, and good neighborly relations among member states while promoting cooperation in political, economic, and cultural areas.

### Conclusion:

- For India, the SCO remains a vital forum to advance its interests in combating terrorism, engaging with Central Asia, and balancing China's influence while fostering its digital and energy agendas. However, internal challenges such as disputes and competition between major powers within the organization pose ongoing concerns.

## India & China Finalize Patrolling Arrangement Along Disputed Line of Actual Control

### Relevance : GS II - Bilateral Relations

- **In News:** India and China have reached a consensus on patrolling protocols along the contested Line of Actual Control (LAC) to resolve the ongoing military standoff that began in April 2020.
- The agreement addresses key friction points along the Indo-China western frontier, specifically in regions such as Demchok and Depsang in eastern Ladakh.



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### Genesis of the Conflict:

- The 2020 confrontation arose primarily due to China's concerns over India's infrastructure development, particularly a road in the Galwan Valley (Ladakh) that provides access to a strategic airbase.

### Overview of India-China Border Dispute:

- **Undefined Boundary:** The 3,488-km boundary between India and China is not clearly delineated, with no consensus on the LAC in several areas.
- **Divisions Along the Border:**
  - ✓ **Western Sector (Ladakh):** The conflict here revolves around the Johnson Line (from the 1860s), which places Aksai Chin in India's territory, while China claims the MacCartney-MacDonald Line as the border.
  - ✓ **Middle Sector (Himachal Pradesh and Uttarakhand):** Disputes in this region are relatively minor.

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- ✓ **Eastern Sector (Arunachal Pradesh and Sikkim):** The issue stems from the McMahon Line, defined during the 1914 Simla Convention, which China disputes.

### Agreements to Manage Border Disputes:

- India and China have entered into several agreements to manage and defuse tensions along the LAC:
  - ✓ **1993 Agreement:** Focused on maintaining peace & stability along the LAC.
  - ✓ **1996 Agreement:** Introduced confidence-building mechanisms in military engagement.
  - ✓ **2005 Protocol:** Provided guidelines for the execution of military confidence-building measures.
  - ✓ **2012 Agreement:** Set up the Working Mechanism for Consultation and Coordination (WMCC) on India-China Border Affairs.
  - ✓ **2013 Agreement:** Further enhanced border defense collaboration between both nations.

### Conclusion:

- This latest agreement marks an essential diplomatic breakthrough in efforts to ease Indo-China border tensions. It reflects continued dialogue to address long-standing territorial issues while adhering to established frameworks to maintain peace and prevent future conflicts along the LAC.

## 16th BRICS Summit Concludes with Kazan Declaration

### Relevance: GS II - Global Groups

- **In News:** The 16th BRICS Summit, held in Kazan, Russia, concluded with the adoption of the Kazan Declaration.
- The Kazan Declaration is a comprehensive document outlining the bloc's **primary areas of collaboration and collective position on significant global matters.**
- **Theme of the Summit:** “Strengthening Multilateralism for Equitable Global Development and Security”



### Key Highlights of the Kazan Declaration:

- **Global Governance and Multilateralism:** The BRICS nations reaffirmed their commitment to working together towards reforming the International Financial Architecture.

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### Economic Cooperation:

- **BRICS Cross-Border Payment System:** Aimed at reducing trade barriers and ensuring equitable access, with a focus on utilizing local currencies.
- **BRICS Clear Depository:** Establishes an independent cross-border settlement and depository infrastructure.
- **BRICS Interbank Cooperation Mechanism (ICM):** Promotes innovative financial methods for funding projects and initiatives, including options for financing in local currencies.
- **BRICS Grain Exchange:** A Russian-initiated platform for trading grains and other commodities within the BRICS framework.

### Other Initiatives:

- **BRICS R&D Vaccine Center & BRICS Integrated Early Warning System:** Established to mitigate the risks of widespread infectious diseases.
- **International Big Cats Alliance:** Recognized as an initiative from India aimed at biodiversity conservation.
- **BRICS Partner Country:** Endorsed the creation of a BRICS Partner Country category, incorporating 13 partner nations, including Cuba, Turkey, and Vietnam.

### About BRICS:

- **Origin:** The acronym BRICs was introduced by British economist Jim O'Neill in 2001.
- **Formalization:** BRIC was formalized in 2006 and expanded to BRICS with South Africa's inclusion in 2010.
- **Members:** Ten nations currently comprise BRICS, including Brazil, China, Egypt, Ethiopia, India, Iran, Russia, South Africa, United Arab Emirates, and Saudi Arabia (pending final confirmation).

### Conclusion:

- The Kazan Declaration highlights BRICS' ongoing commitment to multilateralism, economic cooperation, and sustainable development through collaborative frameworks that address evolving global challenges.



## Seventh India-Germany Inter-Governmental Consultations (IGC)

**Relevance : GS II - Bilateral Relations**

- **In News:** The seventh session of India-Germany Inter-Governmental Consultations (IGC) recently concluded, co-chaired by the Prime Minister of India and the Federal Chancellor of Germany, who visited India. The discussions followed the theme “Growing Together with Innovation, Mobility, and Sustainability.”

**Major Outcomes of the IGC:**

- **Advocacy for UN Security Council Reforms**
  - ✓ India and Germany jointly called for comprehensive reforms to the UN Security Council, pressing for time-bound, text-based negotiations at the Intergovernmental Negotiations (IGN) forum.
- **Endorsement of UN Charter Values**
  - ✓ Both nations underscored the importance of respecting the UN Charter and condemned any actions threatening national sovereignty or territorial integrity.
- **Mutual Legal Assistance Treaty (MLAT) in Criminal Matters**
  - ✓ The treaty will facilitate sharing of information and evidence in criminal cases, promote joint capacity building, and exchange best practices between the two countries.
- **Agreement on Classified Information Protection**
  - ✓ A new accord was signed to set up a legal framework governing the handling, protection, and transmission of classified information between India and Germany.
- **Regional Consultations on West Asia and North Africa (WANA)**
  - ✓ Foreign Ministries of both countries will now engage in regular consultations on WANA, complementing existing dialogue mechanisms on Africa & East Asia.
- **Commitment to a Shared Indo-Pacific Vision**
  - ✓ Both countries committed to fostering a free, open, inclusive, peaceful, and prosperous Indo-Pacific region based on principles of international law.
- **Migration and Mobility Partnership Agreement (MMPA)**
  - ✓ India and Germany pledged to fully implement the MMPA to enhance mobility and employment prospects while addressing concerns related to irregular migration and human trafficking.

## India-Germany Bilateral Relations:

- **Strategic Partnership**
  - ✓ India and Germany established a “Strategic Partnership” in 2000, which was further strengthened through the launch of the IGC in 2011.
- **Areas of Collaboration**
  - ✓ **Global Cooperation:** India and Germany support each other’s ambitions for reform in the UN Security Council under the G4 framework.
  - ✓ **Economic Relations:** Germany was India’s 12th largest trading partner in 2022-23, with India representing around 1% of Germany’s total foreign trade in the same period.
  - ✓ **Sustainability and Energy Partnerships:** Through the Indo-German Energy Forum (IGEF), both nations promote cooperation in energy security, efficiency, and renewable resources.

## Conclusion:

- The seventh IGC has strengthened India-Germany ties through significant new agreements and reaffirmed commitments in core areas, enhancing the framework for future collaboration. This renewed partnership supports common objectives for a stable and inclusive Indo-Pacific and a reformed global governance system, promoting growth in multilateral, security, sustainability, and economic spheres.

## The Israel-Iran Conflict

### Context:

- The ongoing conflict between Israel and Iran has entered a precarious phase, causing rising concern across several sectors, especially in trade and economics. As tensions continue to mount, the implications for India, a growing force in the global market, have become increasingly significant.



## Impact of the Israel-Iran Conflict on India

- **Disruption of Key Trade Routes**
  - The Israel-Iran conflict has elevated the risk of disruptions along crucial maritime routes essential for India’s trade with Europe, the U.S., Africa, & West Asia.
    - Red Sea and Suez Canal: These trade corridors are particularly important, facilitating the movement of goods valued at over USD 400 billion annually.
    - The instability surrounding these routes not only threatens the shipping lanes but also the security of global maritime trade.

### ➤ Economic Effects on Exports

- The escalation of tensions has already impacted Indian exports significantly. For example, exports dropped by 9% in August 2024, primarily driven by a 38% decline in petroleum product exports, largely due to the Red Sea crisis.
  - Europe receives 21% of India's total petroleum exports, highlighting the scale of potential disruption.
  - The tea industry is also at risk, with Iran being a major importer of Indian tea. India exported 4.91 million kg of tea to Iran in early 2024, sparking concerns over the potential fallout of the conflict.

### ➤ Increased Shipping Costs

- Due to conflict-related diversions, shipping routes have become longer, causing a 15-20% increase in costs.
  - Indian exporters dealing in low-margin goods, such as engineering products, textiles, and garments, have faced heightened pressure on their profit margins due to these inflated shipping costs.
  - Exporters are reconsidering pricing strategies and operational efficiencies to offset rising logistics expenses.

### ➤ India-Middle East-Europe Economic Corridor (IMEC)

- During India's G20 presidency, the India-Middle East-Europe Economic Corridor (IMEC) was launched to create a more efficient trade route, reducing dependency on the Suez Canal and providing a counterbalance to China's Belt and Road Initiative.
  - However, the ongoing conflict has jeopardized the progress and viability of this corridor, potentially affecting bilateral trade and economic stability in the region.

### ➤ Crude Oil Prices

- The conflict has led to a sharp increase in global crude oil prices, with Brent crude approaching USD 75 a barrel.
- As Iran is a significant oil producer, any military escalation could disrupt global oil supplies, driving prices even higher.
- Rising oil prices may obstruct central banks from lowering interest rates, complicating economic recovery efforts globally.

### ➤ Implications on Indian Markets

- India, which imports over 80% of its oil, is highly susceptible to oil price fluctuations.
- Sustained high prices may prompt investors to move away from Indian equities, favoring safer assets like bonds and gold.
- India's stock markets have already reacted, with key indices like the Sensex and Nifty opening lower amid fears of prolonged conflict.

### ➤ Gold as a Safe Haven

- Gold prices have surged amid the escalating geopolitical tensions, as investors seek refuge in traditionally safe assets during uncertain times.

### ➤ Logistical Challenges

- Indian exporters are adopting a "wait and watch" approach. Many are advocating for the establishment of a dedicated Indian shipping line to reduce dependence on foreign companies, which tend to impose steep transportation costs.

## India's Trade Status with Israel and Iran

### ➤ India-Israel Trade

- Significant Growth: Trade between India and Israel has doubled in the last five years, rising from USD 5.56 billion in 2018-19 to USD 10.7 billion in 2022-23. However, in FY 2023-24, bilateral trade amounted to USD 6.53 billion, reflecting a dip due to regional security concerns and trade route disruptions.
- India as Israel's Key Partner: India is Israel's second-largest trading partner in Asia, and Israel ranks as India's 32nd largest trading partner globally.
- Key Exports: India's primary exports to Israel include diesel, diamonds, aviation turbine fuel, and Basmati rice, with diesel and diamonds making up 78% of exports in 2022-23.
- Imports: India mainly imports space equipment, diamonds, potassium chloride, and mechanical appliances from Israel.

### ➤ India-Iran Trade

- Declining Trade Volumes: Trade with Iran has seen a significant reduction over the past five years, with bilateral trade amounting to just USD 2.33 billion in 2022-23.
- Trade Surplus: India maintains a trade surplus with Iran, exporting USD 1.66 billion in goods (mostly agricultural products) in 2022-23 while importing goods worth USD 0.67 billion.
- Major Exports: India's key exports to Iran include Basmati rice, tea, pharmaceuticals, and meat products.
- Major Imports: Iran's key exports to India include methanol, petroleum bitumen, liquefied propane, dry dates, and organic chemicals.

## Reasons Behind the Israel-Iran Conflict

### ➤ Formation of Israel (1948)

- The establishment of Israel led to the Arab-Israeli War. Although Iran initially opposed Israel's creation and voted against the Partition Plan in 1947, it recognized Israel in 1950 under the Pahlavi regime, fostering friendly relations.
- The Iranian Revolution in 1979 marked a turning point in bilateral ties, ending



Pahlavi rule and souring Iran-Israel relations.

### ➤ Religious and Ideological Divergence

- Iran, governed by Shia Islam, and Israel, a Jewish state, have fundamental religious and ideological differences that have fueled ongoing distrust and hostility.

### ➤ Post-1979 Revolution Relations

- After the Iranian Revolution, diplomatic ties between Iran and Israel were severed.
- The Islamic Republic labeled Israel "Little Satan," with Iranian clerics opposing Israeli control of Jerusalem, advocating instead for a Palestinian state.
- Iran's support for groups like Hamas and Hezbollah further intensified tensions.

### ➤ Nuclear Program

- Israel views Iran's nuclear ambitions as an existential threat, fearing the development of nuclear weapons.
- Israel has openly criticized the Joint Comprehensive Plan of Action (Iran nuclear deal) and has carried out covert operations to disrupt Iran's nuclear activities.

### ➤ Proxy Conflicts

- The Israel-Iran conflict has expanded into proxy warfare, with Iran backing Hezbollah in Lebanon and the Houthis in Yemen, who have targeted Israeli ships in the Red Sea.
- Iranian-backed Shia militias in Iraq have also engaged in retaliatory attacks on U.S. forces and resisted Israeli actions in the region.

### ➤ Regional Power Struggles

- The competition between Iran and its allies versus Israel and its partners continues to perpetuate regional tensions and conflicts.

## Global Repercussions of the Israel-Iran Conflict

### ➤ Energy Supply and Pricing

- Iran, a major oil producer and OPEC member, produces about 3.2 million barrels of oil daily, accounting for 3% of the global supply.
- Despite U.S. sanctions, Iran's oil exports have surged due to demand from China.
- OPEC's Spare Capacity: Saudi Arabia and the UAE could ramp up production to counter any disruptions from Iran, but the situation remains precarious.

### ➤ Long-term Energy Security

- The diversification of global oil supply, particularly due to increased U.S. production (13% of global output), has provided some insulation against price shocks stemming from Middle Eastern conflicts.



**➤ Potential Escalation**

- While Israel has not yet attacked Iranian oil facilities, any future strike, particularly on key installations like Kharg Island, could trigger a significant military response from Iran.

**➤ Geopolitical Ramifications**

- The U.S. is likely to exert pressure on Israel to avoid military escalation, seeking to maintain regional stability while balancing its support for Israel with broader economic interests.
- China, a key energy partner of Iran, will closely monitor developments, and the conflict may influence future international energy strategies and alliances.

**➤ Humanitarian Crisis**

- A wider conflict could lead to large-scale refugee movements, impacting Mediterranean nations like Italy and Greece, and straining global humanitarian efforts.

**Potential Solutions to De-escalate the Conflict****➤ Immediate Ceasefire**

- A ceasefire agreement between Israel and Iran could serve as the foundation for reducing tensions and facilitating dialogue.
- Global powers like the U.S. and China should use their diplomatic influence to push for a ceasefire and engage in negotiations.

**➤ Regional Cooperation**

- Engaging Gulf Arab states in discussions can help form a more comprehensive approach to easing tensions and addressing shared regional concerns about Iran's influence.

**➤ Humanitarian Aid**

- Providing humanitarian assistance to conflict-affected regions may help alleviate suffering and foster goodwill, potentially aiding in reducing hostilities.
- Mediation by International Organisations
- Institutions like the United Nations could offer neutral ground for mediation and conflict resolution efforts, helping to facilitate dialogue between the parties involved.

**➤ Long-term Peace Initiatives**

- A comprehensive security framework in the region, including arms control and confidence-building measures, could help resolve underlying issues such as territorial disputes and religious tensions, creating an environment conducive to lasting peace.

## India-Canada Relations: Emerging Challenges and Strategic Path Forward

### Introduction

- Historically marked by cooperation across political, economic, and social domains, India-Canada relations have entered a challenging phase due to recent diplomatic tensions. These issues, driven by complex geopolitical dynamics, require careful analysis to navigate the future of bilateral ties.



### Recent Tensions in India-Canada Relations

#### ➤ Accusations and the Nijjar Assassination

- The current diplomatic standoff was sparked by the assassination of Hardeep Singh Nijjar, a key Khalistani leader, in British Columbia. Canadian Prime Minister Justin Trudeau accused Indian authorities of involvement, claims which India has firmly dismissed as "ridiculous." This accusation has triggered a sharp deterioration in relations between the two countries.

#### ➤ Diplomatic Retaliation

- In response, both nations have expelled each other's diplomats, significantly hindering diplomatic communication. Additionally, consular services have been suspended, affecting visa processing and other bilateral engagements.

#### ➤ Backing from the Five Eyes Alliance

- Canada has sought backing from the Five Eyes alliance—an intelligence-sharing partnership between the US, UK, Australia, New Zealand, and Canada—aiming to internationalize its dispute with India and gain support from key global powers.

### Five Eyes Alliance: Structure and Function

#### ➤ Overview of the Five Eyes Alliance

- The Five Eyes is a comprehensive intelligence-sharing network rooted in the UK-USA Agreement, initially established for sharing signals intelligence. Over time, its cooperation has expanded, covering areas like counter-terrorism and global security.

#### ➤ Expanded Networks

- The Five Eyes alliance has grown to include the "Nine Eyes" and "14 Eyes" groups, incorporating additional countries such as Germany, France, and Spain.

This expansion makes Canada's engagement with the alliance significant in its diplomatic conflict with India, extending the geopolitical dimensions of the issue.

### Core Aspects of India-Canada Bilateral Relations

#### ➤ Political Cooperation

- India and Canada established formal diplomatic relations in 1947, grounded in shared values like democracy, human rights, and pluralism. These common principles have facilitated collaboration in global forums like the Commonwealth, G20, and the United Nations, where both nations address critical global concerns such as climate change and sustainable development.

#### ➤ Economic Partnership

- Trade between India and Canada reached USD 9.36 billion in 2023, while Canadian investments in India amount to approximately USD 3.3 billion. The two nations are also negotiating a Comprehensive Economic Partnership Agreement (CEPA) to further deepen economic engagement.

#### ➤ Diaspora Relations

- Canada is home to one of the largest Indian-origin populations globally, with over 5.75 million individuals of Indian descent, including nearly 1 million Non-Resident Indians (NRIs). This vibrant diaspora plays a crucial role in fostering economic ties, cultural exchanges, and strengthening social connections between the two countries.

#### ➤ Educational and Technological Collaborations

- Indian students represent about 40% of the total international student population in Canada, contributing to Canada's cultural diversity. Additionally, joint research initiatives in fields like healthcare and agricultural biotechnology, along with collaborations between ISRO and the Canadian Space Agency, highlight the strength of scientific partnerships between the two nations.

### Strategic Importance of the India-Canada Relationship

#### ➤ Role in the Indo-Pacific

- India holds a vital position in Canada's Indo-Pacific strategy, particularly in the areas of economic diversification and security cooperation. Both countries collaborate on maritime security and counter-terrorism efforts, which are essential for maintaining stability in the Indo-Pacific region.

### Key Challenges in India-Canada Relations

#### ➤ Diplomatic Immunity and Vienna Conventions

- Canada has invoked the Vienna Conventions, highlighting the importance of safeguarding its diplomats during the ongoing crisis. The conventions, which regulate diplomatic immunity, underscore the significance of diplomatic

protections in the current context.

### ➤ **Khalistan Movement**

- India has long expressed concern over Canada's tolerance of Khalistani separatists, viewing it as a threat to its sovereignty. This issue has further escalated due to Canada's investigation into India's alleged role in Nijjar's assassination, damaging trust between the two governments.

### ➤ **Economic and Trade Disruptions**

- The diplomatic fallout has hindered progress on the Comprehensive Economic Partnership Agreement (CEPA), while bilateral trade has slowed. Canadian investments in India are also facing uncertainty, hampering economic cooperation.

### ➤ **Visa and Immigration Delays**

- Reduced Canadian diplomatic personnel in India have led to delays in visa processing, particularly affecting Indian students seeking admission to Canadian universities. This has potential long-term implications for educational exchanges and people-to-people ties.

### ➤ **Broader Geopolitical Consequences**

- The diplomatic rift between India and Canada could have repercussions on India's global standing, particularly within the G20. Moreover, Canada's G7 membership and its strategic alliance with the Five Eyes complicate India's relations with other key partners, such as the US, UK, and Australia. The dispute could also impact Canada's Indo-Pacific strategy, restricting cooperation on economic and security matters.

## Vienna Convention on Diplomatic Immunity

### ➤ **Provisions and Relevance**

- The Vienna Conventions on Diplomatic and Consular Relations establish a framework for diplomatic immunity and the protection of consular staff. These international treaties ensure the safety and inviolability of diplomats and their premises, emphasizing the need for adherence to diplomatic norms in resolving the ongoing crisis.

## Strategic Roadmap for India-Canada Relations

### ➤ **Resolving the Khalistan Issue**

- Dialogue between the two governments is essential to address concerns regarding the Khalistani movement and the Indian diaspora. Both nations must respect each other's legal systems and sovereignty to find a peaceful resolution to this sensitive issue.

### ➤ **Strengthening Economic Cooperation**

- Efforts should be made to revive negotiations on the CEPA, with a focus on areas such as technology, renewable energy, and infrastructure. Building a robust

trade framework will be critical for ensuring long-term economic growth and collaboration.

### ➤ **Balancing Geopolitical Alignments**

- India and Canada must carefully manage their relations with global powers such as the US, China, and Russia. A balanced approach to these relationships will help avoid further tensions and support the development of strategic partnerships.

### ➤ **Utilizing Multilateral Platforms**

- Both nations should leverage multilateral forums like the G7, Five Eyes, and the Commonwealth to address global challenges and promote shared values. Engaging through these platforms can help rebuild trust and strengthen bilateral ties over time.

## Conclusion

- The current impasse between India and Canada is a result of a complex interplay of geopolitical, economic, and domestic issues. Despite the significant challenges, both nations have a strong foundation for cooperation. Through constructive dialogue, revived economic negotiations, and strategic engagement in multilateral forums, India and Canada can overcome their differences and rebuild a stronger, mutually beneficial relationship.

## Enhancing India-Bhutan Relations

### Context:

- The recent visit of Bhutan's Prime Minister, Tshering Tobgay, to India has reinforced the close diplomatic bond and cooperative spirit between the two nations. This visit featured key discussions and events that highlighted the commitment of both countries toward sustainability, clean energy, and strengthening their partnership.



## Overview of India-Bhutan Bilateral Partnership

### ➤ **Bhutan's Unique Achievements**

- Bhutan is renowned as the world's first carbon-neutral nation.
- It is widely known for prioritizing Gross National Happiness (GNH) over traditional economic indicators like Gross Domestic Product (GDP), showcasing an innovative approach to national prosperity.

## Major Takeaways from the Bilateral Engagement

### ➤ India's Advancements in Green Hydrogen Technology

- India presented a hydrogen-powered bus to Bhutan's delegation, reflecting its progress in eco-friendly transportation and green energy solutions.
- India underscored its dedication to sustainable energy practices and expressed enthusiasm for partnering with Bhutan to advance clean energy initiatives.

### ➤ Exploring Opportunities for Energy Collaboration

- Discussions during the visit emphasized expanding partnerships in the energy sector to support sustainable development goals.
- Bhutan showed significant interest in adopting green hydrogen technology, aligning with its dedication to environmental sustainability.
- Importance: India's leadership in green hydrogen production is a strategic goal, and engaging Bhutan as a key partner could bolster mutual benefits in this emerging area.

## Historical and Cultural Aspects of India-Bhutan Relations

### ➤ Diplomatic History

- Longstanding Partnership: Diplomatic relations between India and Bhutan were formalized in 1968 under the 1949 Treaty of Friendship, updated in 2007 to align with contemporary priorities.
- Cultural Connections: The India-Bhutan Foundation, established in 2003, promotes exchanges in fields like education, culture, and science, fostering a deep cultural connection.
- Recognitions: India's Prime Minister received the Order of the Druk Gyalpo, Bhutan's highest civilian award, on Bhutan's 114th National Day as a testament to the strength of the India-Bhutan partnership.

### ➤ Development Cooperation

- India has consistently supported Bhutan's development goals by funding its Five-Year Plans since 1971.
- Under Bhutan's 12th Five-Year Plan (2018-2023), India contributed ₹5,000 crore toward developmental projects, reflecting continued dedication to Bhutan's growth.

### ➤ Hydropower Collaboration

- Central Pillar: Hydropower cooperation is a key element of India-Bhutan relations, with India actively supporting major hydroelectric projects in Bhutan.
- Bhutan is also allowed to sell electricity from the 64 MW Basochhu Hydroelectric Project (HEP) in India's Day-Ahead Market (DAM), enhancing economic cooperation.

## Emerging Areas of Cooperation

### ➤ Space Exploration

- A milestone in 2022 was the successful launch of the India-Bhutan SAT, contributing to natural resource management and supporting amateur radio communications through a digital repeater.

### ➤ Financial Technology (Fintech)

- The two nations have introduced the RuPay Card (phases in 2019 and 2020) and the BHIM app (2021) to support digital payments and financial interoperability, strengthening cross-border financial ties.

### ➤ Trade and Economic Cooperation

- India remains Bhutan's largest trading partner, with trade volumes growing significantly, from USD 484 million in 2014-15 to USD 1,615 million in 2022-23.
- Trade Facilitation: The 2007 India-Bhutan Friendship Treaty and the 2016 Trade, Commerce, and Transit Agreement establish a preferential trade framework, allowing for duty-free transit of Bhutanese goods.
- Investment in Key Sectors: Indian investments make up 50% of Bhutan's Foreign Direct Investment (FDI), covering areas like banking, hospitality, education, and manufacturing.
- Bhutan's initiative to develop the Gelephu region as a regional economic hub is a significant step toward regional connectivity, with India as a crucial economic partner.

### ➤ Healthcare Cooperation

- India extended vital support to Bhutan during the Covid-19 pandemic through Covishield vaccines and other medical supplies.
- India has also contributed to building hospitals and supplying essential medical equipment in Bhutan.

### ➤ Indian Diaspora

- Nearly 50,000 Indians are employed in Bhutan, contributing across multiple sectors. In recognition of his contributions to education in Bhutan, Indian scholar Sanjeev Mehta received the Pravasi Bharatiya Samman in 2023.

## Importance of Bhutan to India

### ➤ Strategic Location

- Bhutan's position between India and China is critical to India's regional security as it acts as a buffer state, helping to maintain geopolitical balance and prevent direct Chinese access to Indian territory.



### ➤ Cultural and Environmental Significance

- India and Bhutan share strong cultural links, especially through Buddhism, which fosters a unique cultural understanding.
- Bhutan's rich biodiversity and commitment to conservation contribute to regional environmental goals, and India's collaboration supports these ecological efforts.

### Challenges in India-Bhutan Relations

#### ➤ Territorial Disputes with China

- China's infrastructure developments in contested areas near the Doklam plateau, close to Indian borders, pose strategic challenges for India, particularly concerning the sensitive Siliguri corridor.
- China and Bhutan have initiated a three-stage roadmap for resolving these territorial disputes, though India remains vigilant to protect its strategic interests.

#### ➤ Hydropower Sector Concerns

- Hydropower is integral to Bhutan's economy, with India being a significant partner. However, there are rising concerns within Bhutan over some conditions in hydropower projects, leading to local dissent over the terms of Indian collaboration.

#### ➤ BBIN Motor Vehicles Agreement

- Bhutan opted out of the BBIN (Bangladesh, Bhutan, India, and Nepal) Motor Vehicles Agreement due to environmental and sustainability concerns, prompting India, Bangladesh, and Nepal to move forward with a modified BIN-MVA initiative.

### Future Pathways

#### ➤ Balancing Economic Relations

- Ensuring that trade and hydropower partnerships are fair will be essential for addressing concerns about dependency and perceived imbalances.
- Diversifying Indian investments in Bhutan can reduce Bhutan's reliance on hydropower and support growth in other economic sectors.

#### ➤ Adapting to Geopolitical Shifts

- India should respect Bhutan's foreign policy choices while staying vigilant about China's growing regional presence.
- Fostering regional stability and cooperation through multilateral platforms can help India and Bhutan navigate external pressures and bolster mutual security.

#### ➤ Strengthening Cultural and Tourism Links

- Collaborative tourism initiatives, such as joint cultural festivals, can enhance



people-to-people connections and economically benefit both nations.

## Conclusion

- The India-Bhutan partnership holds substantial potential for deeper cooperation, built on shared respect, cultural ties, and strategic interests. As both countries look toward the future, maintaining a balanced approach that prioritizes fair economic practices, cultural exchanges, and mutual trust will be essential. Addressing concerns related to boundary disputes and collaboration dynamics will help ensure a robust and harmonious relationship, fostering stability and prosperity for both nations in an evolving regional environment.



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November - 2024

## CASA: Current Account &amp; Savings Account

## Relevance: GS III - Economy

- **In News:** Amid recent **liquidity pressures caused by loan growth outpacing deposit growth, regulators** and the government have emphasized the need to enhance overall bank deposits, with a particular focus on the CASA component.



## What is CASA?

- CASA refers to Current Account and Savings Account, a concept predominantly used in regions like West Asia and Southeast Asia.
- ✓ **CASA Deposits:** These are the funds placed by customers into their current and savings accounts at a bank.

## Key Features of CASA Deposits:

- **Lower Interest Rates:** Compared to fixed deposits, the interest rates on CASA deposits are comparatively lower, making them a more cost-effective funding source for banks.
- **Savings Accounts vs. Current Accounts:** Savings accounts generally offer higher interest rates compared to current accounts.

## CASA Ratio:

- The CASA ratio is a measure of the percentage of a bank's total deposits that are held in Current and Savings Accounts. This metric is vital for evaluating a bank's liquidity position and its access to stable funds.
- ✓ **Higher CASA Ratio:** A higher ratio signifies that a bank has a larger proportion of stable and low-cost deposits available for lending purposes, reducing its need for expensive borrowing.
- ✓ **Importance:** A strong CASA ratio reflects a bank's financial robustness and its ability to secure funds at reduced borrowing costs.

## Types of Bank Accounts:

- **Term Deposits:**
  - ✓ These include fixed-term deposits and recurring deposits.

- ✓ They are valid for a specified time period, with banks offering a fixed interest rate. Funds cannot be withdrawn during this period without penalties.
- ✓ **Example:** A customer deposits ₹10,000 into a fixed deposit for 7 years, earning a 12% annual interest rate.
- **Non-Term Deposits:**
  - ✓ Include current accounts and savings accounts.
  - ✓ Used for daily transactions and remain valid as long as the customer maintains the account.
  - ✓ Interest rates are typically lower than those offered on term deposits.
  - ✓ **Example:** In urban areas, ICICI Bank offers a 4.0% interest rate on savings accounts with a cheque book, subject to maintaining a minimum balance of ₹10,000.

### Conclusion:

- CASA deposits are critical for banks due to their lower interest commitments, helping to reduce overall funding costs.
- A thorough understanding of the CASA ratio and the distinctions between term and non-term deposits enables both banks and customers to make informed financial decisions.

## Cruise Bharat Mission (CBM): Propelling India Towards Global Cruise Tourism Leadership

### Relevance : GS III - Tourism

- **In News:** The Cruise Bharat Mission (CBM) was recently introduced by the Ministry of Ports, Shipping, and Waterways to position India as a premier global cruise tourism destination and enhance the country's cruise sector.



### About Cruise Bharat Mission:

- **Objective**
  - ✓ The mission aspires to elevate India into a global hub for cruise tourism by:
    - Doubling cruise passenger numbers over the next five years, starting from 4.6 lakh passengers in 2024 and significantly increasing by 2029.
    - Doubling the number of cruise ship calls from 254 in 2024 to 500 by 2030.
- **Phased Approach**
- The Cruise Bharat Mission will unfold in three stages:

- ✓ **Phase 1 (2024 to 2025):** Emphasis on building cruise partnerships with neighboring nations.
- ✓ **Phase 2 (2025 to 2027):** Focus on developing new cruise terminals and expanding cruise destinations across India.
- ✓ **Phase 3 (2027 to 2029):** Integration of cruise circuits throughout the Indian subcontinent, establishing a connected cruise network.

### Key Segments in Cruise Tourism:

- **Ocean & Harbour Cruise Segment:** Encompasses oceanic journeys, including deep-sea & coastal cruises, along with harbour-based sailing & yachting activities.
- **River & Inland Cruise Segment:** Targets cruises along rivers, canals, backwaters, creeks, & lakes, enhancing inland waterways as a distinct tourism product.
- **Island Cruise Segment:** Includes inter-island cruises, lighthouse explorations, and other island-based tourism offerings.

### Importance of the Mission:

- **Job Creation:** The mission is expected to generate 4 lakh employment opportunities within the cruise sector as it undergoes transformation.
- **Showcasing Cultural and Natural Heritage:** By promoting India's cultural, historical, and natural circuits, the mission aims to position the nation as a well-rounded cruise destination.
- **Infrastructure Development:** The development of world-class facilities will not only enhance the cruise industry but also support maritime trade and other economic ventures.

### Five Strategic Pillars of the Cruise Bharat Mission:

1. **Sustainable Infrastructure & Investment:** This pillar focuses on addressing infrastructure deficiencies, ensuring India has the capacity to accommodate rising cruise tourism demand.
2. **Operations & Technological Advancements:** The goal is to optimize cruise operations by implementing technological innovations for smoother management and enhanced customer experience.
3. **Regulatory, Fiscal & Financial Framework:** The establishment of a National Cruise Tourism Policy will create a comprehensive regulatory structure, fostering growth in the cruise industry.
4. **Cruise Promotion & Circuit Integration:** This pillar emphasizes international marketing efforts and investment promotion, ensuring India is recognized as a competitive and attractive cruise destination worldwide.
5. **Capacity Building and Economic Research:** Highlights the importance of skill development and research, laying the foundation for a well-trained workforce and a deeper understanding of the cruise economy to ensure long-term success.

## World Bank Unveils First Edition of the Business-Ready Index

## Relevance: GS III - Economy

- **In News:** The World Bank (WB) has introduced the inaugural edition of its Business-Ready (B-Ready) Index, which evaluates the business environment in 50 nations (excluding India) and aims to extend its assessment to 180 economies by 2026.



## Shift from Ease of Doing Business Rankings to B-Ready Index:

- The Business-Ready (B-Ready) Index succeeds the Ease of Doing Business (EoDB) rankings, which were previously the cornerstone of the World Bank's reports.
- EoDB analyzed the ease of initiating and operating businesses across countries but was discontinued in 2021 due to ethical concerns.

## Overview of the Business-Ready (B-Ready) Index:

- B-Ready offers a detailed **quantitative analysis of the business environment, focusing on advancing private sector growth.**
- Published annually, the index is **designed to encompass the majority of global economies by 2026.**
- This index contributes to the World Bank Group's twin objectives of **reducing poverty and enhancing shared prosperity.**

## Key Features of B-Ready Compared to EoDB:

- **Broader Evaluation**
  - ✓ B-Ready examines the business environment not just from the viewpoint of individual firms but also in the larger context of private sector development.
  - ✓ On the other hand, EoDB primarily centered on small and medium-sized businesses (SMEs).
- **Qualitative Examination**
  - ✓ B-Ready assesses both the regulatory pressure on businesses and the effectiveness of those regulations.
  - ✓ EoDB primarily focused on the burden of regulations without evaluating their quality.
- **Balanced Information Collection**
  - ✓ B-Ready gathers both de jure (laws on paper) and de facto (practical implementation) data regarding business regulations.

- ✓ In EoDB, certain metrics focused only on de facto practices, while others addressed only de jure aspects.
- **Wider Scope:** B-Ready covers a broad array of topics relevant to businesses, unlike EoDB, which omitted significant issues such as labor employment.

### Foundational Pillars of the B-Ready Index:

- The Business-Ready (B-Ready) Index is structured around three core pillars:
  - ✓ **Regulatory Framework:** This pillar evaluates the laws and regulations businesses must adhere to from the time of establishment through operations and eventual closure.
  - ✓ **Public Services:** It assesses the infrastructure and facilities provided by governments to support businesses in complying with regulatory requirements.
  - ✓ **Operational Efficiency:** This pillar examines the ease with which businesses adhere to regulations and effectively utilize Public Services.

### Conclusion:

- This new index offers a more comprehensive and qualitative review of regulatory environments and public services, aligned with the World Bank Group's mission to alleviate poverty and promote shared prosperity.

## World Bank Group Publishes 'Benchmarking Infrastructure Development' Report

### Relevance : GS III - Economy

- **In News:** The World Bank Group recently unveiled its 'Benchmarking Infrastructure Development' report, which assesses Public-Private Partnership (PPP) regulatory frameworks across 140 nations.
- The report emphasizes a strong correlation between reforms in regulatory frameworks related to PPPs and increased investments in PPP infrastructure projects.



### Key Findings of the Report:

- **Public-Private Partnership (PPP) Overview:** A PPP is a model where private sector organizations (both for-profit and non-profit) deliver public services, while the government remains responsible for allocating resources.

## Report Highlights:

- **Public Fiscal Management System (PFMS):**
  - ✓ Only 19 countries have implemented specific measures for budgeting, reporting, and accounting for PPPs, while just 18 countries publicly disclose PPP-related financial liabilities.
  - ✓ A well-established PFMS plays a key role in mitigating the financial risks posed by failed or canceled PPP projects, ensuring long-term financial sustainability.
- **Monitoring and Evaluation:**
  - ✓ Only 37% of countries mandate that PPP payments be tied to performance outcomes, highlighting the need for greater accountability mechanisms.
- **Renegotiation of PPP Contracts:**
  - ✓ Around 90% of surveyed nations have clear regulations for renegotiating PPP contracts. However, only 19% of these countries address the issue of risk reallocation during the renegotiation process.

## Challenges of PPP in India:

- **Financial Issues:**
  - ✓ Over-competitive bidding and underestimation of project costs frequently lead to project delays, causing budget overruns and financial strain.
- **Capacity and Procedural Constraints:**
  - ✓ The public sector faces limitations in management capacity when handling PPP projects.
  - ✓ Delays in obtaining essential approvals, such as Environmental Impact Assessments (EIAs), further hinder the successful execution of projects.
- **Regulatory and Institutional Deficiencies:**
  - ✓ India lacks a comprehensive National PPP policy, which creates gaps in the framework.
  - ✓ There is also a lack of reliable and accessible information about private sector service providers, hindering smooth PPP implementation.

## India's Current PPP Regulatory Framework:

- **Private Investment Unit under the Department of Economic Affairs (Union Ministry of Finance):**
  - ✓ This unit is tasked with managing policy-related matters concerning PPPs, ensuring effective oversight and implementation.
- **PPP Vertical under NITI Aayog:**
  - ✓ This unit develops policy recommendations aimed at standardizing PPP documentation.
  - ✓ It also supervises the recycling and monetization of key infrastructure assets,

promoting 'creative disruption' by encouraging innovation through structured market reforms.

### Kelkar Committee (2015) Recommendations on PPP:

- **Establish Independent Sectoral Regulators:**
  - ✓ To ensure consistent performance across sectors adopting PPP models, it is recommended to create independent regulatory bodies.
- **Limit Unsolicited Proposals (Swiss Challenge):**
  - ✓ Reducing information imbalances and increasing transparency is crucial. Limiting unsolicited proposals can help achieve these goals.
- **Form a National Facilitation Committee:**
  - ✓ A dedicated committee should be established to ensure the timely resolution of challenges, such as securing clearances & overcoming project bottlenecks.

### Conclusion:

- The 'Benchmarking Infrastructure Development' report provides crucial insights into the strengths and weaknesses of PPP regulatory frameworks worldwide. It highlights the importance of regulatory reforms, financial management, and project accountability for successful infrastructure development.
- In India, addressing issues related to financial discipline, institutional capacity, and regulatory gaps is critical to optimizing the effectiveness of PPP models for future infrastructure projects.

### Balanced Strategy Needed to Protect Workers' & Manufacturers'

Interests: GTRI

#### Relevance : GS III - Industry

- **In News:** In its recent flagship publication, the Global Trade Research Initiative (GTRI) has highlighted concerns regarding the ongoing Samsung workers' strike in Tamil Nadu.
- The report cautions that the situation bears **similarities to the Nokia plant closure from a decade ago.**
- GTRI stresses the importance of balancing labour rights with industrial stability to avert a similar outcome.

### Nokia's Exit from India:

- A decade ago, Nokia, once a dominant player in India's mobile phone manufacturing sector, ceased operations at its Tamil Nadu plant in 2013.



- This decision was driven by a **combination of tax disputes** with the Tamil Nadu government and mounting union demands, leading to the plant's shutdown.
- The closure significantly affected India's standing in mobile manufacturing, shifting the industry's dominance to China.

### Current Situation: Samsung Workers' Strikes:

- The ongoing Samsung workers' strikes in Tamil Nadu stem from various demands, including:
  - ✓ Immediate approval of the proposal to form a workers' union.
  - ✓ A demand for a wage increase.
  - ✓ Enforcement of an 8-hour work shift.
- These demands reflect the workers' focus on improving their working conditions and securing their rights.

### Impact of Strikes on India's Economic Landscape:

- **Impact on the Manufacturing Sector:**
  - ✓ The strikes could severely disrupt India's aspirations to become a global hub for electronics manufacturing.
  - ✓ As seen with the Nokia shutdown, prolonged instability may result in the shift of manufacturing to China, reducing India's role in the global electronics market.
- **Impact on Businesses and Investors:**
  - ✓ Strikes can lead to significant financial losses for companies and disrupt supply chains, making India less attractive to potential investors.
  - ✓ Continuous instability may deter multinational corporations (MNCs) from investing in India, which could lead to relocation of manufacturing plants to more stable regions.
- **Impact on Workers:**
  - ✓ Workers face the possibility of lost wages during the strike period and are likely to experience increased job uncertainty.
  - ✓ Extended labour unrest could also have long-term consequences on future employment opportunities for the striking workers.
- **Impact on Government Policies:** India is currently in the process of renegotiating Free Trade Agreements (FTAs) with South Korea and ASEAN nations. Any escalation in the strike could negatively influence these trade negotiations and hinder India's diplomatic and economic relations with these countries.



### Proposed Solutions for Resolving the Strike:

- **Creation of Clear Legislation and Standard Operating Procedures (SOPs):**
  - ✓ It is essential to establish clear laws and SOPs that address the concerns of both workers and employers, ensuring fair and transparent processes in handling labour disputes.
- **State Government's Role:**
  - ✓ The Tamil Nadu state government should facilitate policy discussions that include stakeholders from both the workforce and industry. These discussions should cover issues such as wage benchmarks, workplace safety, and welfare measures, promoting a comprehensive approach to resolving industrial disputes.
- **Responsibility of the Industry:**
  - ✓ Samsung should address the workers' genuine grievances by forming a formal worker representation committee. This would foster improved communication between workers and management, reducing the likelihood of escalations.
- **Fast-Track Mechanism for Dispute Resolution:**
  - ✓ Establishing a fast-track framework for resolving labour disputes is crucial. A proactive and efficient dispute resolution process can help prevent smaller issues from spiraling into larger strikes, thereby ensuring continued industrial harmony.



### Conclusion:

- The Samsung strike highlights the urgent need for a balanced strategy that considers both labour rights and manufacturers' concerns.
- By addressing the root causes of the strikes and implementing an efficient dispute resolution mechanism, India can strengthen its position in global electronics manufacturing while safeguarding its workforce's well-being.

**India's Textile Sector Set to Reach USD 350 Billion by 2030**

### Relevance: GS III - Economy

- **In News:** India's textile industry is on the path to remarkable growth, showcasing an annual increase of 11% in Ready-Made Garments (RMG) exports across all textile segments.
- According to recent trade figures, the sector is projected to expand to USD 350 billion by 2030, supported by a thriving domestic market, a robust raw material foundation, and an extensive export presence.

## Key Drivers of India's Textile Industry Growth:

- **Comprehensive Value Chain Capability**
  - ✓ India's textile sector possesses a fully integrated value chain, from raw material sourcing to finished garments. This seamless integration promotes efficiency and cost-effectiveness, enhancing the sector's competitive advantage in the global arena.
- **Solid Raw Material Foundation**
  - ✓ As one of the leading producers of raw materials such as cotton, India strengthens its textile sector by maintaining a reliable supply chain. This foundation supports both domestic manufacturing and international exports, fueling the sector's overall expansion.
- **Significant Export Presence**
  - ✓ India plays a prominent role in global textile and apparel trade, contributing 4% to the worldwide market. It ranks as the third-largest exporter in the world, underscoring its competitiveness and extensive reach in international markets.
- **Growing Domestic Market**
  - ✓ India's fast-growing domestic market is another key contributor to the textile industry's growth. With a burgeoning middle class and rising demand for affordable, fashionable apparel, domestic consumption remains a driving force behind the industry's development.



## Textile Sector's Contribution to the Indian Economy:

- The textile and apparel industry holds a crucial place in the Indian economy:
  - ✓ **GDP Contribution:** The sector accounts for around 2.3% of India's Gross Domestic Product (GDP).
  - ✓ **Industrial Output:** Textiles constitute 13% of the nation's industrial output, demonstrating its centrality to the manufacturing sector.
  - ✓ **Export Share:** Textiles and apparel make up 12% of India's overall exports, reflecting the industry's importance in global trade.
- **Employment Generation:** India's textile industry is the second-largest employer in the nation, offering direct employment to approximately 45 million individuals. Furthermore, it supports around 100 million people in associated industries, making it a crucial sector for job creation and income generation.

## Challenges Confronting India's Textile Sector:

- **Pressure from Low-Cost Producers**
  - ✓ India faces intense competition from nations like China and Vietnam, where lower production costs and greater efficiency pose a challenge to Indian manufacturers in maintaining market share.
- **Deficiency of Skilled Labor**
  - ✓ The textile sector faces a shortage of skilled workers in critical areas such as design, technology, and management. This lack of expertise hinders innovation and limits the industry's ability to compete globally.
- **Limited Access to Affordable Capital**
  - ✓ Small and medium-sized enterprises (SMEs) within the textile sector often face difficulties in securing affordable financing. This challenge impedes their ability to invest in new technologies and modernize their operations.
- **Insufficient Infrastructure**
  - ✓ Inadequate infrastructure, including unreliable power supply and inefficient transportation networks, reduces the operational efficiency of India's textile industry, particularly impacting smaller enterprises..

### Government Measures to Support the Textile Industry:

- **Amended Technology Upgradation Fund Scheme (ATUFS):** This scheme provides credit-linked subsidies to support the modernization and technological enhancement of the textile industry, helping it to become more competitive and efficient.
- **National Handloom Development Programme:** This initiative promotes the sustainable growth of handloom weavers, both within and outside designated handloom clusters, safeguarding traditional crafts and improving the livelihoods of artisans.
- **100% Foreign Direct Investment (FDI) in Textile and Apparel:** To attract overseas investment, the Government of India allows 100% Foreign Direct Investment (FDI) through the automatic route in the textile and apparel sector. This policy is designed to encourage international players to invest in the industry, fostering growth and technological upgrades.
- **PM Mega Integrated Textile Region and Apparel (PM MITRA) Park:** The PM MITRA scheme seeks to develop world-class infrastructure for the textile industry, creating integrated textile manufacturing hubs that will enhance production capacity, boost exports, and generate employment.
- **National Technical Textiles Mission:** This mission focuses on advancing technical textiles, which are used in specialized applications such as medical, industrial, and protective uses. The goal is to increase India's presence in this high-growth segment of the textile market.

### Conclusion:

- Despite facing challenges such as competition, labor shortages, and infrastructure deficiencies, government initiatives like ATUFS, PM MITRA, and the National Handloom Development Programme are vital for modernization and growth.
- With a solid raw material base, significant export potential, and a dynamic domestic market, the textile industry is set to play a key role in India's economic development and job creation.

## PM GatiShakti National Master Plan for Multi-Modal Connectivity Completes 3 Years

### Relevance : GS III - Infrastructure

- **In News:** The PM GatiShakti National Master Plan (PMGS-NMP), inaugurated in 2021, seeks to establish multi-modal connectivity infrastructure for various economic regions, fostering synergy across different sectors.

### Key Accomplishments of PMGS-NMP:

- **Government-Wide Integration:** The plan has effectively brought together 44 Central Ministries and 36 States/Union Territories for the coordinated planning and execution of infrastructure projects. This holistic governmental approach ensures unified development efforts across the country.
- **Infrastructure Development Highlights:** Under PMGS-NMP, projects covering 8,891 km of roadways, 27,000 km of railway tracks, and 300 km of coastal corridors in Gujarat have been strategically planned, underscoring the initiative's contribution to infrastructure growth nationwide.
- **Impact on Social Sector:** The plan has significantly enhanced infrastructure planning in critical sectors such as primary healthcare, education, and tribal welfare, particularly in isolated and underdeveloped regions. A notable example is the Pahunch Portal, which has assisted in pinpointing new school locations in underserved areas of Uttar Pradesh.
- **State-Level Master Plans:** PM GatiShakti State Master Plan portals have been established across all States and Union Territories, facilitating the mapping of 533+ projects, thus optimizing capital investments. For instance, Goa used the NMP to formulate a Disaster Management Plan for flood-prone regions along the Amona River.
- **Enhanced Trade and Logistics:** The plan has significantly contributed to trade facilitation by reducing logistics expenses and boosting India's ranking in the Logistics Performance Index from 44 to 38 globally.
- **Data-Driven Infrastructure Development:** Utilizing GIS-based technology

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and real-time tracking, PMGS-NMP enables data-driven decision-making, ensuring that infrastructure projects align with national goals and contribute to strategic, evidence-based development.

- **Planning at the District Level:** Beyond state-level initiatives, the plan emphasizes district-level collaboration through the development of the PMGS - District Master Plan portal, promoting more localized, effective infrastructure planning.



### PM GatiShakti National Master Plan Overview:

- **Objective:** The primary goal of the PM GatiShakti NMP is to build next-generation infrastructure by incorporating lessons from previous experiences, ensuring a progressive and integrated approach to connectivity development.
- **Digital Master Planning Tool:** The PMGS-NMP has been crafted as a Digital Master Planning Tool by BISAG-N (Bhaskaracharya National Institute for Space Applications and Geoinformatics). It provides an all-encompassing database of both ongoing and prospective projects from various ministries and states working on Economic Zones.
- **Seven Key Drivers of PMGS-NMP:**
  - ✓ The plan is driven by seven critical sectors:
    6. Railways
    7. Roads
    8. Ports
    9. Waterways
    10. Airports
    11. Mass Transit
    12. Logistics Infrastructure

### Union Ministry of Power Unveils National Electricity Plan (Transmission)

- **Relevance: GS III - Energy Sector**
- **In News:** The Union Ministry of Power has introduced the National Electricity Plan (NEP) - Transmission, crafted by the Central Electricity Authority (CEA) as mandated by the Electricity Act, 2003. The transmission system is essential for linking power generation sources with distribution networks that supply electricity to consumers.

### Major Highlights of National Electricity Plan (Transmission):

- **Renewable Energy Transmission Goals:** The plan targets the transmission of 500 GW of Renewable Energy Installed Capacity by 2030 and aims to exceed 600 GW by 2032.
- **Projected Peak Demand:** The NEP aims to meet a peak power requirement of 458 GW by 2032, with plans to expand the transmission network from the current 4.85 lakh ckm (circuit kilometers) in 2024 to 6.48 lakh ckm by 2032.
- **Enhancement of Inter-Regional Transmission Capacity:** The plan seeks to elevate inter-regional transmission capacity from 119 GW to 168 GW by 2032.
- **Integration of Advanced Technologies:** The transmission sector will incorporate modern technologies, including:
  - ✓ 10 GW offshore wind energy projects
  - ✓ 47 GW battery energy storage systems
  - ✓ 30 GW pumped storage schemes
- **Support for Green Hydrogen and Ammonia Production:** The NEP will address the energy requirements of Green Hydrogen and Green Ammonia production centers, particularly in coastal areas.
- **Cross-Border Transmission Links:** It emphasizes the development of transmission connections with neighboring countries such as Nepal, Bhutan, Myanmar, Bangladesh, Sri Lanka, and potential linkages with Saudi Arabia, UAE, and others.



### Challenges in India's Transmission Network:

- **Transmission Inefficiencies:** Minimizing transmission losses is a significant challenge.
- **Integration of Renewable Sources:** The integration of renewable energy into the grid presents technological and operational challenges.
- **Outdated Infrastructure:** Many regions are still dependent on outdated technology, which hampers the efficiency and dependability of the transmission network.
- **Regulatory Priorities:** There has been a disproportionate focus by regulatory bodies on generation, often neglecting the transmission sector.
- **Cybersecurity Issues:** With grid modernization, cybersecurity becomes a key concern, necessitating strong measures to safeguard critical infrastructure.

### Central Electricity Authority (CEA):

- **Foundation:** The CEA was originally established under the Electricity (Supply) Act, 1948, later replaced by the Electricity Act, 2003.
- **Composition:** The CEA comprises up to 14 members, including the Chairperson, with 8 members serving full-time, all appointed by the Central

Government.

- **Primary Functions:**
  - ✓ Provides counsel to the Central Government on the National Electricity Policy.
  - ✓ Establishes technical standards for building electric plants, transmission lines, and ensuring grid connectivity.

## AI Reliance in the Financial Sector Could Present Risks: RBI Governor

### Relevance : GS III - Economy & AI

- **In News:** During the 90th High-Level Conference convened by the Reserve Bank of India (RBI) in New Delhi, the RBI Governor voiced concerns regarding the increasing dependency on Artificial Intelligence (AI) within the financial sector.
- The Governor warned that the dominance of AI-driven services by a limited number of technology providers could create significant vulnerabilities in the financial ecosystem.

### AI Applications in the Financial Sector:

- **Algorithmic and High-Frequency Trading:** AI-based trading strategies enable the execution of large volumes of transactions at rapid speeds.
- **Credit Scoring and Loan Approvals:** AI algorithms are used to assess individuals' and businesses' creditworthiness.
- **Customer Services:** AI-driven tools like chatbots assist in handling customer queries, thereby improving user interactions.
- **Predictive Analytics:** AI systems are employed to forecast market trends and support risk management decisions, allowing institutions to make more informed choices.

### Risks of AI in Banking and Financial Services:

- **Concentration Risk:** Heavy reliance on a small number of AI models across financial institutions can lead to systemic disruptions. A failure or misstep in these AI-driven systems could trigger widespread consequences across international financial markets.
  - ✓ **Example:** AI-powered trading systems may intensify market fluctuations by initiating mass sell-offs during economic downturns.
- **Algorithmic Bias:** AI models trained on historical data may perpetuate existing biases, leading to discriminatory practices in areas such as lending





or credit evaluations.

- ✓ **Example:** An AI-based loan approval system may inadvertently reject loan applications from certain demographic groups.
- **Data Security and Privacy Issues:** The large quantities of data required for AI operations raise concerns about data breaches or misuse, which could lead to identity theft, fraud, & substantial financial losses for both institutions & customers.
- **Additional Concerns**
  - ✓ **Lack of Transparency (Black Box Problem):** The complexity of AI models often makes it difficult to understand how specific decisions are made.
  - ✓ **AI Hallucinations:** AI systems can sometimes generate inaccurate or misleading information, leading to faulty decision-making.

### Strategies to Mitigate AI Risks in Financial Systems:

- **Comprehensive AI Regulation:** It is essential to develop a regulatory framework through cooperation with industry professionals, researchers, security specialists, and policymakers to effectively address the risks associated with AI in the financial domain.
- **Global Best Practices:** For instance, the Algorithmic Accountability Act of 2023 in the United States serves as a model for ensuring accountability and monitoring AI algorithms.
- **Enhanced Security Measures:** A ‘Security by Design’ methodology should be implemented to ensure that strong security features are embedded at every stage of AI development. This proactive approach would safeguard the integrity of AI systems from conception to execution.
- **Continuous Learning and Adaptation:** AI tools should incorporate advanced capabilities for threat detection by analyzing extensive data sets in real-time. This would allow for the early identification of patterns and anomalies that indicate potential cyber threats, preventing breaches before they occur.

### IUCN Publishes Key Report Entitled “Agriculture & Conservation”

- ☛ **Relevance: GS III - Agriculture**
- **In News:** The IUCN has unveiled a comprehensive flagship report that examines the intricate relationship between agriculture and conservation, emphasizing the impacts of agricultural practices on biodiversity and ecosystems.

#### Impact of Agriculture on Biodiversity:

- **Negative Effects**
  - ✓ **Threat to Species:** Agriculture poses a direct risk to 34% of the species assessed in the IUCN Red List of Threatened Species.

- ✓ **Direct Risks:** These dangers stem from the transformation of natural habitats into croplands, pasturelands, plantations, and through irrigation practices.
- ✓ **Indirect Risks:** Agriculture also adversely affects biodiversity through the introduction of invasive alien species, nutrient enrichment, soil degradation, the use of agrochemicals, and climate change.
- **Positive Effects**
  - ✓ **Habitat for Species:** Approximately 17% of the species on the IUCN Red List are documented to inhabit agricultural landscapes.

### Impact of Biodiversity on Agriculture:

- **Positive Effects**
- Ecosystems provide significant support to agriculture through two main categories:
  - ✓ **Provisioning Services:** These include the generation of biomass & genetic resources.
  - ✓ **Regulating and Maintenance Services:** These encompass climate regulation, sediment retention, nutrient cycling, water flow management, and pollination.
- **Negative Effects**
  - ✓ **Ecosystem Disservices:** These refer to detrimental effects such as crop predation, pests, and pathogens that can threaten agricultural productivity.



### Recommendations for Harmonizing Agriculture with Conservation:

- **Sustainable Agriculture:** Protect areas and species that cannot coexist with agricultural practices without jeopardizing food security or economic performance.
- **Maintain Ecosystem Services:** Ensure the preservation of natural conditions of climate, soil, and water to support sustainable agriculture.
- **Policy Alignment:** Align agricultural and economic policies with the conservation of living ecosystems, noting that globally, less than 5% of agricultural subsidies are directed toward environmentally sustainable practices.
- **Reform Food Policy:** Highlight the necessity of reducing food waste and encouraging dietary changes that promote lower meat consumption.

### Conclusion:

- The IUCN's report highlights the urgent need to harmonize agricultural practices with conservation efforts to protect biodiversity.
- By adopting sustainable agricultural methods & reforming policies, it is possible to safeguard ecosystems while ensuring food security & economic stability.

- This integrated approach is vital for cultivating a sustainable relationship between agriculture & the environment, ultimately benefiting both nature and humanity.

## Reserve Bank of India (RBI) Prohibits Four NBFCs from Extending Loans

### Relevance: GS III - Economy

- **In News:** The Reserve Bank of India (RBI) has instructed four Non-Banking Financial Companies (NBFCs) to stop extending loans.
- This directive was issued under the authority granted by Section 45L(1)(b) of the Reserve Bank of India Act, 1934.
- The RBI's action is based on serious supervisory **concerns related to the companies' pricing strategies, particularly regarding their weighted average lending rate (WALR) and the interest differentials imposed over their cost of funds.**

### About Non-Banking Financial Company (NBFC):

- A Non-Banking Financial Company (NBFC) is defined as an entity registered under the Companies Act, 1956, **primarily focused on lending activities.** However, it does not encompass institutions **predominantly involved in agriculture, industrial functions, trading of goods (excluding securities), or offering services related to the sale, purchase, or construction of immovable properties.**

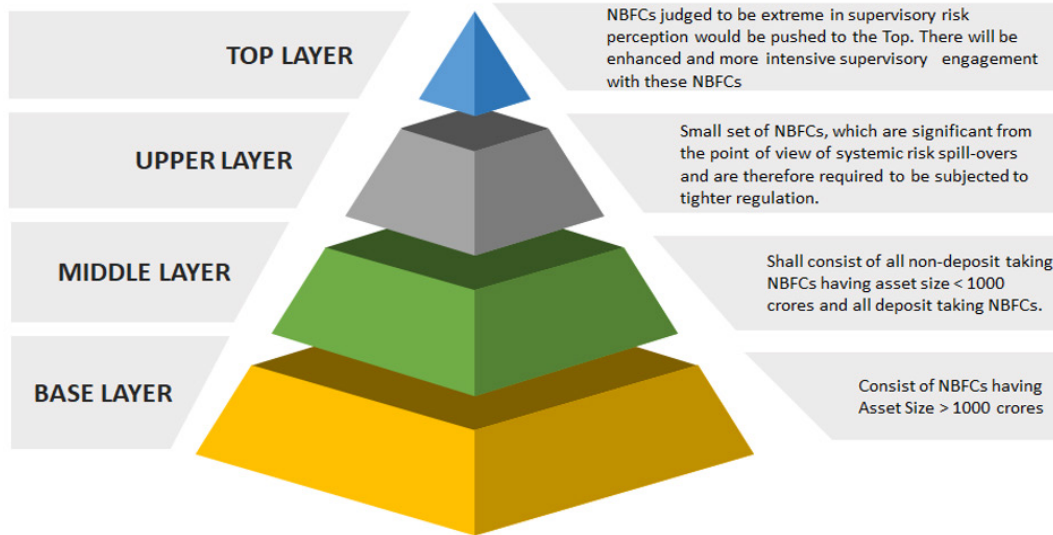
### Regulatory Framework:

- The RBI oversees NBFCs through a multi-tiered structure based on their size, operational activities, and perceived risk levels.

### Key Differences Between NBFCs and Banks:

- **Demand Deposits:** NBFCs are not authorized to accept demand deposits.
- **Payment and Settlement Systems:** They do not participate in the payment and settlement framework and cannot issue cheques drawn on themselves.
- **Deposit Insurance:** The deposit insurance protection provided by the Deposit Insurance and Credit Guarantee Corporation does not extend to depositors of NBFCs.





### Challenges Faced by NBFCs:

- Several issues confront NBFCs, including:
  - ✓ **Multiple Regulatory Authorities:** Oversight from various bodies such as SEBI and IRDAI.
  - ✓ **Mismatch of Funds:** Often borrowing short-term while lending is typically for longer durations.
  - ✓ The prevalence of NPAs poses significant threats to financial stability.

### The Economics of Water

#### Relevance: GS III - Economy

- In News:** A recent report titled “The Economics of Water: Valuing the Hydrological Cycle as a Global Common Good” from the Global Commission on the Economics of Water emphasizes the worsening global water crisis and its uneven economic impact, particularly on lower-income nations.

#### Key Findings of the Report:

- Economic Loss:** Lower-income countries are projected to suffer an average GDP decline of up to 15% by 2050, which is nearly double the global average decrease of 8% expected for 2024.
- Impact on India:** The impending water crisis is forecasted to cost India about 14.34% of its GDP by 2050.
- Factors Contributing to the Crisis:** The report attributes this escalating crisis to inadequate economic practices, unsustainable land management, and poor water governance, all intensified by climate change.
- Anthropogenic Influence:** For the first time, human activities are disrupting the natural water cycle, thereby threatening economic stability and human welfare.

- **Basic Needs vs. Dignified Life Needs:** The report highlights that each individual requires approximately 4,000 liters of water daily to maintain a dignified existence, which includes essential consumption and food security. This demand significantly exceeds the conventional range of 50-100 liters necessary for basic health.
- **Green and Blue Water:** The report distinguishes between “green water” (soil moisture) & “blue water” (surface and groundwater), emphasizing the vital role of green water in fostering rainfall, climate stability, and economic resilience.



### Suggested Measures to Overcome the Crisis:

- **Economics of Water**
  - ✓ **Water as a Public Good:** The Commission advocates rethinking water governance, suggesting that water should be recognized as a global public good rather than a personal commodity.
  - ✓ **Need for Collaborative Efforts:** The report stresses the importance of cooperative action among nations to confront this critical crisis.
  - ✓ **Five-Point Agenda:** The Commission proposes a five-point agenda, which includes:
    13. Transforming food systems to reduce water consumption in agriculture.
    14. Preserving natural habitats and restoring degraded ecosystems.
    15. Establishing a circular water economy to reclaim freshwater from wastewater.
    16. Encouraging sustainable innovations.
    17. Ensuring fair access to clean water.

### About Global Commission on the Economics of Water (GCEW):

- **Objective:** The Commission seeks to make a meaningful & ambitious contribution to the global effort aimed at altering the governance, utilization, & valuation of water.
- **Ultimate Goal:** Its primary aim is to establish a “Global Water Pact” to secure funding and enhance water governance worldwide, recognizing that the water crisis threatens nearly all Sustainable Development Goals (SDGs).
- **Establishment:** The Commission was initiated in May 2022 with a two-year mandate. It presented evidence and strategies for policy alterations, business practices, and global collaborations to support climate and water justice, sustainability, and food-energy-water security.
- **Convening Bodies:** It is convened by the Government of the Netherlands and

facilitated by the Organisation for Economic Co-operation and Development (OECD).

- **Working Partners:** The GCEW is executed by an independent and diverse group of distinguished policymakers and researchers from institutions such as:
  - ✓ OECD
  - ✓ Potsdam Institute for Climate Impact Research
  - ✓ Indian Institute for Human Settlements
  - ✓ University College London
  - ✓ Australian National University
  - ✓ University of Amsterdam

## Union Finance Minister Advocates for Responsible Capitalism in Major Economies

### Relevance: GS III - Economy

- **In News:** At the Tech Leaders Roundtable in Mexico, the Union Finance Minister underscored the significance of embracing responsible capitalism, especially in large economies.
- The challenge extends beyond mere economic growth to addressing disparities and creating opportunities for all members of society.

### About Responsible Capitalism:

- **Responsible capitalism is an economic framework that integrates ethical values into business operations.** It focuses on striking a balance between profit generation and social accountability, ensuring that enterprises **contribute positively to societal welfare, foster equity, and maintain environmental sustainability**, rather than concentrating exclusively on maximizing returns for shareholders.

### Importance of Responsible Capitalism:

- **Tackling Global Challenges:** This approach can assist both corporations and governments in addressing issues such as sustainability, inequality, and social exclusion.
- **Promoting Long-Term Business Viability:** Strategies driven solely by profit may not be sustainable in the long run; responsible capitalism can also facilitate better adaptation to technological disruptions, such as artificial intelligence.
- **Ethical Governance and Stakeholder**



**Capitalism:** It encourages fairness in decision-making processes, ensuring that all stakeholders are treated equitably, and that business practices comply with both legal and ethical standards.

### Initiatives to Promote Responsible Capitalism in India:

- **Corporate Social Responsibility (CSR):** Mandated under Section 135 of the Companies Act, 2013, certain firms are required to allocate a portion of their profits to social development initiatives.
- **Environmental Regulations:** The enforcement of Plastic Waste Management Rules and the establishment of stricter emission standards under BS-VI for vehicles aim to promote ecological sustainability.
- **Labor Reforms:** Measures such as the Code on Wages and the Occupational Safety, Health, and Working Conditions Code, 2020 are designed to enhance worker rights and improve working conditions.
- **Financial Sector Initiatives:** The Reserve Bank of India's Priority Sector Lending norms and SEBI's Green Bond guidelines represent efforts to promote sustainable financing and support responsible economic advancement.

### Conclusion:

- This emphasis on responsible capitalism highlights the increasing necessity for ethical business practices that not only drive economic advancement but also ensure social equity, environmental protection, and sustainable development in India and around the world.

### Concerns Raised Over Misuse of PILS

#### Relevance: GS III - Economy

- **In News:** The Chief Justice of India (CJI) voiced concerns about the **increasing misuse of Public Interest Litigations (PILs), following the dismissal of a PIL that called for establishing an independent body to regulate OTT platform content.**
- The CJI emphasized that many PILs now focus on policy issues, causing real public interest matters to be neglected.

### About Public Interest Litigation (PIL):

- **Definition:** PIL refers to a form of legal action filed by an individual or group who may not be directly affected but aims to protect the collective public interest.
- **Origin:**
  - ✓ The Supreme Court first relaxed the requirement for locus standi (direct

involvement) in the *Mumbai Kamgar Sabha v. Abdulbhai Faizullabhai* (1976) case, marking the emergence of PIL.

- ✓ The first acknowledged PIL case was *Hussainara Khatoon v. State of Bihar*, filed to address the inhumane conditions of prisoners.
- **Importance:** PILs have historically served as a vital mechanism for extending justice to marginalized communities, including those who are economically disadvantaged, unaware of their rights, or illiterate.



### Misuse of PILs:

- **Lack of Clear Definition:** As PILs are not defined under any specific statute, they have occasionally been misused for self-interest or private agendas.
- In *State of Uttaranchal vs. Balwant Singh Chaufal & Ors. (2010)*, the Supreme Court introduced eight directives for High Courts to uphold the purity and principles of PILs (refer to directives below).

### High Court Guidelines to Prevent PIL Misuse:

18. Levy significant costs on baseless petitions to discourage frivolous cases.
19. Ensure that PILs are free from self-serving interests or hidden agendas.
20. Give preference to petitions involving critical public issues, urgency, and seriousness.
21. Only entertain cases that demonstrate genuine public interest.
22. Confirm the accuracy and truthfulness of the petition's content.
23. Assess the credibility of the petitioner to prevent PIL misuse.
24. Establish procedures that promote authentic PILs and discourage those filed with questionable intentions.
25. Foster PILs that are sincere and aimed at benefiting the public good.

### Conclusion:

- In summary, while PILs have been instrumental in promoting judicial intervention on significant public matters, their increased misuse has raised red flags.
- The judiciary aims to refocus PILs on their core purpose—serving the greater public interest—while mitigating cases filed for ulterior motives.

**India Chem 2024: A Significant Event Showcasing India's  
Chemical and Petrochemical Sector**



### Relevance: GS III - Economy

- **In News:** The Department of Chemicals & Petrochemicals, in partnership with FICCI, hosted the 13th Edition of India Chem 2024 in Mumbai.
- India Chem is one of the largest industrial events in the Asia-Pacific region, featuring an international conference and exhibition dedicated to chemicals and petrochemicals.

### Overview of India's Chemical and Petrochemical Sector:

- The chemical and petrochemical industry in India is an essential component of the expanding manufacturing sector.
- **Market Categories:**
  - ✓ **Bulk Chemicals:** These are substances produced in significant quantities but possess lower value. This category includes alkaline, organic, and inorganic chemicals, which serve as vital inputs for various downstream industries.
  - ✓ **Petrochemicals:** Derived from crude oil and natural gas through refining processes, these substances include polymers, synthetic fibers, performance plastics, among others. India has faced a consistent gap between production and consumption in this area.
  - ✓ **Specialty Chemicals:** These are high-value substances produced in smaller volumes, including surfactants, textile chemicals, paints and coatings, dyes, agrochemicals, etc.
- **Economic Significance:**
  - ✓ The sector contributes over 9% to India's manufacturing gross value added (GVA) and 7% to total exports.
  - ✓ Valued at approximately \$178 billion, the industry is anticipated to surpass \$300 billion by 2028, with a long-term goal of reaching \$1 trillion by 2040.



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### Initiatives to Foster Growth in the Chemical and Petrochemical Sector:

- **100% Foreign Direct Investment (FDI) in Manufacturing via the Automatic Route:** Over the past decade, this sector has attracted investments totaling \$12.48 billion.
- **Petroleum, Chemical and Petrochemical Investment Regions (PCPIRs):** These areas provide state-of-the-art infrastructure, creating a conducive environment for establishing new enterprises.
- **Plastic Parks:** Aimed at enhancing investment, increasing production, and boosting exports in the plastics industry.

### Conclusion:

- India Chem 2024 underscores the ongoing development and growth prospects of India's chemical and petrochemical sector, highlighting its role in promoting economic advancement and global trade expansion.

## Lighthouse Tourism Conclave 2024

### Relevance: GS III - Tourism

- **In News:** The 2nd National Lighthouse Festival, featuring the inaugural Lighthouse Tourism Conclave 2024, has commenced in Puri, Odisha.
- This initiative, launched by the Ministry of Ports, Shipping, and Waterways, aims to harness the extensive potential of lighthouse tourism in India.

### About Lighthouse Tourism:

- **Leveraging India's Maritime Heritage:** For centuries, lighthouses have served an essential function in ensuring the safe passage of vessels through hazardous waters, contributing significantly to maritime navigation.
- **Alignment with Maritime India Vision 2030:** This initiative seeks to transform lighthouses into multifunctional facilities that include maritime museums and cultural centers, thereby enriching the tourism experience.
- **Current Developments:** Presently, 75 iconic lighthouses have been developed across 10 coastal states and one Union Territory, highlighting the commitment to enhance the country's maritime infrastructure and tourism landscape.

### Conclusion:

- The 2nd National Lighthouse Festival and the Lighthouse Tourism Conclave 2024 exemplify India's efforts to promote its maritime heritage while fostering sustainable tourism through innovative initiatives.



## India's Solar Imports Could Reach \$30 Billion Annually by 2030: GTRI Report

### Relevance: GS III - Energy Sector

- **In News:** A recent report by the Global Trade Research Initiative (GTRI) highlights the potential rise in India's solar imports, which could touch \$30 billion annually by 2030.
- The report underscores China's dominance in the global solar market and its

impact on local manufacturing sectors in countries like India.

### Current Scenario in the Global Solar Industry:

- China currently controls over 80% of global solar production and exports, making it the primary supplier of solar components worldwide. This dependency on China has created significant challenges for India's domestic solar manufacturing sector.

### Challenges in India's Solar Manufacturing Sector:

- **Heavy Reliance on Imports:** The Indian solar sector depends heavily on Chinese imports, which limits the development of its domestic manufacturing capacity.
- **Limited Raw Material Supply:** India lacks the capability to produce key inputs like high-purity polysilicon and wafers, which are essential in the solar manufacturing value chain.
- **Technology and R&D Deficit:** India trails behind in adopting advanced solar technologies such as PERC (Passivated Emitter Rear Contact), bifacial cells, and thin-film technologies.
- **High Capital Costs:** Significant financial barriers make it challenging to expand domestic solar manufacturing.



### Key Recommendations from the Report:

- **Expansion of the PLI Scheme:** The Production Linked Incentive (PLI) Scheme should be extended to cover early-stage solar manufacturing and upstream production to strengthen local manufacturing capabilities.
- **Investment in R&D and Advanced Technology:** Enhancing research and development efforts, along with investing in advanced manufacturing technologies, will support a fully integrated solar supply chain.
- **Reevaluation of Import Duties:** Revisiting current import duties on solar modules and cells is crucial to promoting domestic manufacturing while balancing affordability.
- **Global Collaboration:** Strengthening partnerships with countries like the U.S., European Union, and Japan can help reduce global dependence on China in the solar industry.

### India's Initiatives to Boost Solar Manufacturing:

- **Approved List of Models and Manufacturers (ALMM):** Government-backed solar projects must utilize BIS-standard solar PV modules, promoting quality

control.

- **Production Linked Incentive (PLI) Scheme:** Aimed at encouraging the establishment of fully integrated solar PV manufacturing units, this scheme supports domestic solar production.
- **PM-KUSUM Scheme:** Focuses on using domestically sourced solar cells and modules for agricultural solar pumps and other applications, promoting local manufacturing.

### Conclusion:

- These challenges and recommendations emphasize the need for India to enhance its solar manufacturing capabilities and reduce dependence on imports, particularly from China, to meet its growing energy demands and transition toward a sustainable future.

## RISE Mission: A Step Towards Circular Economy in Space

### Relevance: GS III - Economy

- **In News:** The Remove Debris In-Orbit Servicing (RISE) Mission by the European Space Agency (ESA) marks a pioneering move in space sustainability by enabling in-orbit refueling, repair, and assembly—key elements for advancing a circular economy in space.
- Set to launch in 2028, RISE will have capabilities to dock with and control the orbit of geostationary satellites, extending their operational life. This mission will also venture to the geostationary graveyard, an orbit about 100 km higher, where satellites are stored after completing their missions.

### Circular Space Economy:

- The circular space economy follows principles of the broader circular economy model, focusing on reducing waste and optimizing resource use in space.
- **Key Components:**
  - ✓ **Satellite Maintenance:** Repair and refurbishment of satellites.
  - ✓ **Space Debris Removal:** Clearing out-of-service or non-operational objects from orbit.
  - ✓ **Resource Utilization:** Leveraging materials extracted from asteroids or the Moon to reduce Earth-based dependency.

### Importance of a Circular Space Economy:

- **Mitigates Space Debris:** Reduces the risk of collisions & additional debris formation.



- **Resource Efficiency:** Maximizes resource use through recycling and reusing materials in space.
- **Cost Reduction:** Extends satellite lifespans, reducing launch & replacement costs.
- **Accelerated Development:** Enables faster construction and manufacturing in orbit, reducing time for space system readiness.

### Challenges to Implementing Circular Economy in Space:

- **Technological Constraints:** The need for advanced technologies in in-orbit servicing, recycling, and resource extraction.
- **Funding:** High costs associated with specialized equipment and research.
- **Regulatory Issues:** Developing international standards for sustainable space practices.

### Global and National Initiatives for Circular Space Economy:

- **International Efforts**
  - ✓ **ESA:** Aims for a Circular Economy in Space by 2050 and debris neutrality by 2030.
  - ✓ **NASA:** Leads the COSMIC program (Consortium for Space Mobility and ISAM) to advance in-space servicing, assembly, and manufacturing.
  - ✓ **Reusable Launch Vehicles:** Innovations like SpaceX's Falcon 9 reduce waste by reusing rockets.

### India's Contributions:

- **ISRO's Reusable Launch Vehicle Technology Demonstrator:** Aims to create reusable rocket technology.
- **Debris-Free Space Commitment:** All Indian space entities are committed to debris-free missions by 2030.

### Conclusion:

- The RISE mission signals a meaningful advance toward a sustainable space future, aligning with the broader goals of a circular economy to foster resource-efficient and environmentally responsible space exploration.

## Commitment to Reducing Inequality (CRI) Index 2024 Published

- **Relevance: GS III - Economy**
- **In News:** Commitment to Reducing Inequality (CRI) is released by Oxfam and Development Finance International.

### Overview of the CRI Index:

- The CRI Index, created by Oxfam and Development Finance International, evaluates the dedication of 164 countries and territories toward addressing inequality. It aligns with Sustainable Development Goal (SDG) 10, which targets a reduction in inequality within and between nations. The index assesses nations based on three main criteria:
  - ✓ Public Service Investments
  - ✓ Equitable Tax Policies
  - ✓ Labor Rights and Fair Wages

### Key Findings of the Index:

- **Rankings:**

- ✓ **Top Countries:** Norway, Canada, and Australia are among the highest-ranked.
- ✓ **Lowest-Ranked Countries:** South Sudan and Nigeria occupy the bottom ranks.
- ✓ **India's Standing:** India ranks 127th, trailing other South Asian countries like Nepal (115) and Sri Lanka (118).



- **Increasing Inequality:**

- ✓ The **divide between the Global South and the Global North** is widening at an alarming rate, with disparities nearing levels not seen since World War II.
- ✓ **Rising inflation and food costs** have forced millions into extreme hardship, while the number of billionaires has surged in the past decade.
- ✓ **Key Contributing Factors:** Conflicts, escalating debt, and climate-related shocks are limiting essential public expenditure in low- and lower-middle-income countries.
- ✓ **Cuts in Public Funding:** About 84% of countries assessed have reduced their budgets for critical sectors such as education, health, and social security.

### Key Recommendations to Reduce Inequality

- **Implement National Inequality Reduction Plans (NIRPs):** Formulate clear, time-bound NIRPs with ongoing monitoring of progress.
- **Set Higher Spending Goals for Public Services:** Countries should allocate at least 15% of public budgets to healthcare and 20% to education.
- **Strengthen Progressive Tax Systems:** It is recommended that governments increase taxes on the wealthiest 1% to close income gaps.

### Actions Taken to Address Inequality in India

- **Employment Generation:** Programs like the Mahatma Gandhi National Rural Employment Guarantee Act aim to expand job opportunities.

- **Financial Inclusion Initiatives:** Schemes like the PM Jan Dhan Yojana provide financial access for disadvantaged populations.
- **Educational Access and Skills Development:** The Right to Education Act, 2009, along with skill-development programs, seeks to enhance educational opportunities.
- **Other Programs:** Initiatives such as Startup India support entrepreneurship and broaden economic participation.

### Conclusion:

- The recommendations call for realistic, time-bound goals that, if adopted globally, could help create a more balanced and inclusive world where economic disparity is minimized. For India, continued focus on inclusive job creation, financial accessibility, and educational reforms remains essential to improve its standing in future indices and foster social equity.

## Ultra-Processed and Fast Foods: A Trigger for Diabetes in India

### Topic: Agriculture

### Why in the Spotlight?

- A recent investigation published in the International Journal of Food Sciences and Nutrition has illuminated the role of advanced glycation end products (AGEs) present in ultra-processed and fast foods in the escalating diabetes epidemic in India. This clinical trial marks the first of its kind in the nation and received financial backing from the Department of Biotechnology under the Ministry of Science and Technology.

### Key Findings of the Research

### Significance of AGEs:

- ✓ The excessive consumption of foods abundant in AGEs is a significant contributor to India's reputation as the "diabetic capital" of the globe, with over 101 million individuals affected. AGEs are detrimental compounds formed through glycation, a process where sugars interact with proteins or fats during high-temperature cooking methods, such as frying or roasting. These compounds lead to oxidative stress, resulting in an imbalance between free radicals and antioxidants, ultimately causing inflammation and cellular



damage.

### Vulnerability to Diabetes:

- Ultra-processed foods (UPFs) are associated with swift increases in blood sugar levels and insulin resistance over time. These foods are typically low in fiber and high in calories, contributing to weight gain and obesity, which are significant risk factors for diabetes.

### Influence on Insulin Sensitivity:

- Diets low in AGEs, primarily comprising foods prepared by boiling or steaming, have shown enhanced insulin sensitivity and reduced levels of inflammation compared to high-AGE diets. Reducing AGEs in one's diet may serve as an effective strategy to lower the risk of diabetes, especially for individuals at heightened risk of developing type 2 diabetes.

### Diabetes Prevalence in India:

- In 2021, the diabetes prevalence in India stood at 11.4%, translating to approximately 101 million individuals affected by the disease. The swift nutritional transition in India, characterized by increased intake of refined carbohydrates, fats, and animal products, combined with sedentary lifestyles, has exacerbated the prevalence of obesity and diabetes.

### Why are Ultra-Processed Foods Detrimental to Health?

1. **Saturated Fats, Sodium, and Sugars:** Ultra-processed foods are often loaded with saturated fats, sodium, and sugars, which contribute to various health issues, including cardiovascular disease, hypertension, and diabetes.
2. **Adverse Effects of Additives:** These products frequently contain additives such as preservatives, artificial colors, sweeteners, and emulsifiers. These substances are believed to adversely affect health, potentially leading to inflammation, gut imbalances, and metabolic disorders.
3. **Altered Nutrient Absorption:** The processing of food can significantly influence how the body responds to it. For example, consuming nuts in their whole form results in less fat absorption compared to processed nuts, which release oils that modify the nutrient profile and caloric intake.
4. **Effects on Gut Health:** High levels of sugars, unhealthy fats, and additives commonly found in ultra-processed foods can disrupt the gut microbiome, which is vital for digestion and immunity.
5. **Overall Lifestyle Impact:** Individuals consuming a large quantity of ultra-processed foods may also engage in other unhealthy habits, such as physical inactivity and erratic eating patterns.

### What are the Categories of Food Processing?



- **Understanding Food Processing:**
- Food processing involves transforming raw agricultural products—such as grains, meats, vegetables, and fruits—into more valuable and convenient food items with minimal waste.
- **Categories of Food Processing:**
- **Minimally Processed:** Comprises fruits, vegetables, milk, fish, pulses, eggs, nuts, and seeds with no added ingredients and minimal alterations from their natural form.
- **Processed Ingredients:** These are incorporated into other foods rather than consumed independently, including salt, sugar, and oils.
- **Processed Foods:** Formed by combining minimally processed and processed ingredients, examples include jam, pickles, and cheese.
- **Ultra-Processed Foods:** Industrially manufactured products containing ingredients not typically found in home kitchens. These foods often have additives like preservatives, colorings, flavorings, emulsifiers, and sweeteners. They tend to be high in sugars, unhealthy fats, and sodium while being low in fiber, vitamins, and minerals. Common examples include sugary drinks, packaged snacks, instant noodles, and ready-to-eat meals.

### Factors Contributing to the Rise of Ultra-Processed Foods in India

1. **Urbanization:** The fast-paced lifestyle in urban areas often necessitates quick and convenient food options. Ultra-processed foods are readily available and require minimal preparation, making them appealing to busy individuals and families.
2. **Cultural Shifts in Dietary Choices:** There has been a cultural transition toward Western-style diets, characterized by higher consumption of fast food, sugary snacks, and ready-to-eat meals.
3. **Increasing Number of Working Women:** Ultra-processed foods are regarded as time-saving alternatives to traditional meal preparation, facilitating a better balance between professional and personal life for working individuals.
4. **Limited Fresh Food Availability:** In urban settings, access to fresh foods may be constrained. Ultra-processed foods can fill this gap by providing readily available alternatives for those struggling to find healthier options.
5. **Aggressive Marketing and Accessibility:** UPFs are heavily promoted, often with misleading health claims that attract consumers. Celebrity endorsements and targeted marketing, particularly aimed at children, further promote these products.
6. **Status Symbol:** There is a growing perception that consuming processed and packaged foods signifies a higher social status.

### Government Initiatives to Encourage Healthy Eating Habits

- World Food Safety Day

- Eat Right India
- State Food Safety Index
- RUCO (Repurpose Used Cooking Oil)
- Food Safety Mitra

### Recommendations to Reduce UPF Consumption

- **Low-AGE Diet:** Adopting a diet low in AGEs is advised, comprising fruits, vegetables, whole grains, and low-fat dairy products. It is suggested to limit baked goods and sugary foods while including non-starchy vegetables in meals.
- **Preferred Cooking Methods:** Foods prepared through low-temperature methods, such as boiling or steaming, should replace those cooked through high-temperature methods like frying or roasting.
- **Clear Definition of HFSS Foods:** The Food Safety and Standards Authority of India (FSSAI) should establish a clear definition of High in Fat, Sugar, and Salt (HFSS) foods to aid in identifying harmful products and guiding regulations on their sale and consumption.
- **Nutrient-Based Taxation:** Implementing a higher tax on products excessive in fat, sugar, and salt would incentivize manufacturers to reformulate their offerings and make healthier options more affordable.
- **Revising PLI Scheme:** Modifying the Production Linked Incentive (PLI) scheme to support nutrition-linked production can provide healthier food products with a competitive market advantage.
- **Restricting Promotions:** Strengthening marketing regulations to limit the promotion of HFSS foods, especially in media aimed at children, is necessary.
- **Enhancing Policies and Programs:** Existing initiatives such as Saksham Anganwadi and Poshan 2.0 should be expanded to explicitly address the dual challenges of inadequate nutrition and diet-related diseases.

November - 2024

### Floriculture in India

#### Context:

- The Jujumara area in Odisha's Sambalpur district has recently garnered attention for hosting one of the first Farmer Producer Organizations (FPO) in the state dedicated exclusively to floriculture. This shift from traditional paddy cultivation signifies a major transformation in agricultural practices, aided by support from the National Botanical Research Institute (NBRI). Local cultivators are embracing flower farming, leading to remarkable economic advancements in the region.

### Impact of Floriculture on Jujumara's Economy

### ➤ Diversification of Income Streams

- Farmers in Jujumara are transitioning from conventional paddy farming to flower cultivation. This transition facilitates the diversification of income sources, lessening their reliance on a single crop. Consequently, farmers are experiencing enhanced income stability and improved economic resilience.



### ➤ Economic Advantages

- The financial benefits of flower farming are substantial. Earnings from flower cultivation can exceed ₹1 lakh per acre, significantly higher than the ₹40,000 per acre typically generated from paddy cultivation. This considerable boost in income enables farmers to improve their livelihoods and contribute positively to the local economy.

### ➤ Adaptation to Market Dynamics

- Farmers are leveraging contemporary communication tools, such as WhatsApp groups, to receive timely updates on market trends. This access to information empowers them to make informed choices regarding production and sales, thereby maximizing profits and minimizing losses.

### ➤ Sustainable Practices

- Integrating beekeeping with floriculture enhances biodiversity and creates an additional revenue stream for farmers. This combination not only benefits farmers economically but also supports the ecological health of the region.

## Understanding Floriculture

### ➤ Definition and Scope

- Floriculture pertains to the cultivation of flowering and ornamental plants for various applications, including direct sales, cosmetics, perfumes, and the pharmaceutical sector. The industry encompasses the production of seeds and plant materials through methods such as cutting, grafting, and budding.

### ➤ Nodal Organizations

- The Agricultural and Processed Food Products Export Development Authority (APEDA) serves as the primary agency responsible for promoting agri-exports, including flowers. This organization plays a pivotal role in enhancing the global competitiveness of the floriculture sector.

### ➤ Market Potential

- The Government of India recognizes floriculture as a "sunrise industry." In the

2023-24 fiscal year, around 297,000 hectares were allocated to floriculture. India exported approximately 20,000 metric tonnes of floriculture products valued at ₹717.83 crores during the same period, with key importing nations including the United States, the Netherlands, the United Arab Emirates, the United Kingdom, Canada, and Malaysia. The sector is anticipated to grow to USD 5.9 billion by 2030, reflecting a Compounded Annual Growth Rate (CAGR) of 7.4% from 2021 to 2030.

### ➤ **Diversity of Varieties**

- India's floriculture industry encompasses a diverse range of products, such as cut flowers, pot plants, bulbs, tubers, and dried flowers. Prominent floricultural crops in the international cut flower market include roses, carnations, chrysanthemums, gladiolus, orchids, and lilies. Certain floriculture crops, like gerberas and carnations, are cultivated in greenhouses, while others, such as chrysanthemums and marigolds, thrive in open fields. Greenhouses offer controlled environmental conditions that optimize crop yields.

### ➤ **Leading Regions in Floriculture**

- Key regions for floriculture production in India include Karnataka, Tamil Nadu, Madhya Pradesh, West Bengal, Chhattisgarh, Andhra Pradesh, Gujarat, Uttar Pradesh, Assam, and Maharashtra. These areas have developed robust centers for floriculture, contributing to the overall growth of the industry.

## Challenges Facing India's Floriculture Industry

### ➤ **Limited Knowledge Base**

- Floriculture is a relatively novel concept in India, resulting in a limited understanding of scientific and commercial practices. This knowledge gap leads to inefficiencies in both production and marketing, hindering the industry's potential for growth.

### ➤ **Small Land Holdings**

- Many floriculture farmers operate on small plots of land, which restricts their ability to invest in large-scale, modern cultivation practices. This limitation can impede their competitive edge in the market.

### ➤ **Fragmented Marketing**

- The marketing landscape for floriculture is disjointed, lacking organized platforms such as auction yards and controlled storage facilities. This fragmentation complicates farmers' efforts to secure fair prices for their products. Despite a significant domestic market, India lacks modern marketing systems to manage surplus production and meet rising quality demands.

### ➤ **Inadequate Infrastructure**

- Subpar post-harvest management and insufficient cold storage facilities

contribute to quality deterioration, particularly for flowers intended for domestic markets. Addressing these infrastructural deficiencies is crucial for enhancing the overall quality of floriculture products.

### ➤ **Biotic and Abiotic Stresses**

- Open-field flower production exposes crops to various biotic and abiotic challenges, diminishing their suitability for high-quality export markets. Mitigating these stresses is essential for improving the competitiveness of Indian floriculture products.

### ➤ **High Initial Investments**

- Commercial floriculture requires substantial investments in infrastructure, presenting challenges for farmers to access affordable financing options. Initiatives, such as the soft loan program by the National Horticulture Board, are necessary to support farmers in overcoming financial hurdles.

### ➤ **Export Barriers**

- Elevated air freight costs and limited cargo capacity diminish the global competitiveness of Indian floriculture products. Addressing these challenges is vital for enhancing India's standing in the international floriculture market.

## Government Initiatives for Floriculture

### ➤ **APEDA Support**

- The Agricultural and Processed Food Products Export Development Authority (APEDA) plays a crucial role in supporting floriculture exporters. APEDA provides assistance with cold storage, freight subsidies, and infrastructure development, facilitating the growth of the sector.

### ➤ **CSIR Floriculture Mission**

- The Council of Scientific & Industrial Research (CSIR) has initiated a nationwide Floriculture Mission, implemented across 22 states. This mission aims to enhance farmers' incomes and foster entrepreneurship through high-value floriculture utilizing CSIR technologies.

### ➤ **Foreign Direct Investment (FDI) in Floriculture**

- India permits 100% foreign direct investment (FDI) under the automatic route in the floriculture sector, simplifying the investment process for foreign investors and promoting international collaboration.

### ➤ **Integrated Development of Commercial Floriculture Scheme**

- This scheme provides access to quality planting materials, promotes off-season cultivation, and enhances post-harvest management practices. These initiatives are essential for bolstering the floriculture industry's growth.

## Future Directions

### ➤ Essential Service Classification and Market Modernization

- Classifying flowers as essential services, similar to fruits and vegetables, can ensure their uninterrupted supply and sales during crises, such as lockdowns. Modernizing floriculture markets through solar-powered air-cooled pushcarts and improved packaging techniques will enhance market efficiency.

### ➤ Micro-Irrigation and Mulching

- Expanding the "Per Drop More Crop" initiative to floriculture by implementing micro-irrigation practices will optimize water use and crop yields. Promoting mulching techniques can reduce labor costs, improve water efficiency, and minimize weed growth.

### ➤ Skill Development Initiatives

- Training programs for tribal women and unemployed youth in dry flower production under initiatives like "Skilling India" and "Standup India" can create employment opportunities while enhancing the floriculture workforce.

### ➤ Support for Quality Planting Materials

- Promoting certified nurseries and tissue culture laboratories will ensure the availability of virus-free planting materials. Strengthening biosecurity standards will contribute to developing a robust commercial floriculture sector.

### ➤ Flori-Malls and Value Addition

- Establishing integrated "Flori-Malls" equipped with cold chains, essential oil extraction units, pigment extraction facilities, and vermicomposting units can assist farmers in adding value to their products. This infrastructure will enable farmers to transform surplus flowers into products like dyes, gulkand (rose petal preserve), and dried flowers, thereby reducing waste and increasing profitability.

## GDP Base Year Revision: A Comprehensive Analysis

### ☛ Context:

- Recently, the Ministry of Statistics and Programme Implementation (MoSPI) convened a gathering of economists and forecasters to deliberate on the revision of India's Gross Domestic Product (GDP) base year. This initiative demonstrates MoSPI's commitment to extensive consultation, particularly in response to earlier criticisms and discussions regarding past base year revisions.

### Background on Prior Base Year Revisions

- The most recent base year revision occurred in 2015, shifting the base year from 2004-05 to 2011-12. However, this revision encountered scrutiny due to perceived methodological shortcomings, highlighting the necessity for a thorough reassessment.



### Controversies Related to Prior Revisions

1. **Methodological Concerns:** The previous revision modified the computation approach for the GDP of the private corporate sector (PCS). The new methodology relied directly on audited balance sheets from the Ministry of Corporate Affairs (MCA) database, significantly diminishing the use of the Index of Industrial Production (IIP) and Annual Survey of Industries (ASI) data.
2. **Critique of Single Deflator:** Analysts raised concerns about employing a single deflator for calculating real GDP growth from nominal GDP growth. Instead of using the internationally recognized double deflation technique, which considers output and input prices separately, the prior method applied a single deflator involving various price indices, such as the Consumer Price Index (CPI) and the Wholesale Price Index (WPI).
3. **Discrepancies in GDP Estimates:** Although the overall GDP growth rate appeared strong, weak consumption patterns indicated significant measurement challenges. The inconsistency between production and expenditure methods for GDP calculations complicated the economic landscape.
4. **Under-reporting of Data:** The rise in registered companies over the past three decades, particularly in the services sector, has resulted in unclear contributions to domestic output, as many do not submit their audited balance sheets to the Registrar of Companies (RoC).
5. **Underestimation of the Informal Sector:** The 2015 base year revision faced backlash for relying on balance sheets from the unorganized sector for GDP calculations rather than utilizing value-added figures from production units, resulting in a diminished representation of informal sector contributions.
6. **Averaging Issues:** The averaging of production and expenditure components of GDP is acceptable in developed economies but problematic in developing nations like India, where independent measurement of these two components is lacking. Moreover, the quality of data on the expenditure side, particularly consumption, is inadequate.

### Understanding the Concept of Base Year

#### ► Definition of a Base Year

- A base year is a specific reference year utilized to compute GDP figures for both subsequent and prior years.
- **Significance of a Base Year**
- **Stability:** It serves as a reliable reference point for assessing economic performance and facilitates time-based comparisons.
- **Analytical Benchmark:** By anchoring GDP figures to a specific year, analysts can accurately evaluate trends and fluctuations in economic performance.

### Characteristics of an Ideal Base Year

- The optimal base year should be a standard year free from extraordinary events like natural disasters or pandemics. Additionally, it should not be excessively distant in the past to maintain relevance.
- **Rationale for Revising the Base Year**
- 1. **Dynamic Nature of Indicators:** Economic indicators evolve over time due to shifts in consumer behavior, economic structure, and commodity composition. Revisions are essential to accurately reflect the contemporary economic landscape.
- 2. **Impact on Economic Indicators:** Incorporating new data sets during base year revisions can lead to adjustments in GDP levels, influencing various economic indicators such as public expenditure, taxation, and public sector debt.
- 3. **Adherence to International Standards:** According to the United Nations-System of National Accounts 1993, countries are encouraged to periodically revise their computation practices.
- 4. **Frequency of Revisions:** Ideally, the base year should be updated every 5 to 10 years to align national accounts with the latest available data.

### Historical Overview of Base Year Revisions in India

- Since the first publication of national income estimates in 1956, which used FY 1949 as the base year, India has revised its base year seven times. The most recent update transitioned the base year from FY 2005 to FY 2012.

### Considerations for the New Base Year

- **Formation of the Advisory Committee**
- In June 2024, MoSPI established a 26-member Advisory Committee on National Accounts Statistics (ACNAS), chaired by Biswanath Goldar. This committee will determine the base year for GDP data and ensure alignment with macro indicators such as WPI, CPI, and IIP.
- **Potential Base Years**
- The committee is considering 2022-23 as the new base year for GDP, with 2023-24 also under review. Previous years marked by significant economic



disruptions—such as 2016 (demonetization), 2017-18 (effects of GST), and 2019-21 (COVID-19)—are excluded from consideration due to abnormal economic conditions.

### ➤ Incorporating GST Data

- Discussions are ongoing regarding the integration of the Goods and Services Tax (GST) database into GDP calculations. This inclusion aims to enhance the accuracy and comprehensiveness of economic representation.

### ➤ Methodological Enhancements

- The advisory committee is exploring changes in index compositions, such as the inclusion of the Annual Survey of Unincorporated Sector Enterprises (ASUSE), and considering the adoption of the double deflation method to refine GDP measurement accuracy.

## Conclusion

- The initiative by MoSPI to engage experts and form an advisory committee emphasizes the critical need for a transparent and methodologically sound approach to GDP base year revisions. By integrating updated data sources and rigorous methodologies, the goal is to enhance the precision and reliability of GDP estimates.

## WWF 2024 Living Planet Report: India's Sustainable Food Practices

### Introduction

- The WWF 2024 Living Planet Report showcases India's food practices as a global benchmark for sustainability. According to the report, if the world embraced India's consumption patterns, only 0.84 of an Earth would be required by 2050 to sustain food production. India's emphasis on plant-based diets and

climate-resilient agriculture sets an exemplary standard for other nations.

## Key Insights into the Global Food System

### ➤ Biodiversity Depletion

- The global food system is a leading contributor to biodiversity depletion, with 71% of habitable land used for livestock grazing. This practice encroaches upon natural ecosystems, leading to species endangerment and a loss of ecological balance. The large-scale conversion of forests into grazing lands disrupts local habitats and diminishes biodiversity.



### ➤ Food Waste

- A significant 30-40% of global food production goes to waste, resulting in increased greenhouse gas emissions and resource wastage. Food is lost at various stages, from post-harvest losses to consumer-level wastage. This inefficiency not only deepens food insecurity but also accelerates climate change as decomposing food releases methane.

### ➤ Nutritional Imbalance and Obesity

- Despite substantial food production, the world faces a dual burden of malnutrition and obesity. This paradox highlights the global food system's inefficiency in ensuring balanced nutrition for all, as unhealthy food choices have led to widespread health challenges in various populations.

### ➤ Freshwater Overuse

- Agriculture consumes 70% of global freshwater resources, causing freshwater depletion and threatening future water availability. Intensive irrigation of water-demanding crops in arid regions exacerbates this issue, leading to over-extraction and a decline in freshwater reserves.

### ➤ Overfishing

- 37.7% of marine fish stocks are being overexploited, posing a severe risk to marine biodiversity. Overfishing disrupts marine ecosystems, reducing fish populations and endangering species that rely on these habitats, thereby impacting global food security and local economies.

### ➤ Species Endangerment

- The global food system is the primary driver of species endangerment, with 80% of terrestrial bird and mammal species threatened. Unsustainable agricultural practices, such as monoculture farming and deforestation, lead to habitat destruction and increase species extinction rates.

## The Indian Thali: A Template for Sustainability

### ➤ Predominantly Plant-Based Diet

- The traditional Indian thali, characterized by its reliance on grains, pulses, and vegetables, reflects a plant-based diet that is both nutritionally balanced and environmentally sustainable. Compared to animal-based consumption patterns, plant-based diets have a smaller environmental footprint and contribute to lower greenhouse gas emissions.

### ➤ Global Recognition of Indian Consumption Habits

- As per the WWF 2024 Living Planet Report, adopting India's consumption habits globally would require only 0.84 of an Earth to sustain food production by 2050. India's plant-based diet helps conserve natural resources and minimize greenhouse gas emissions, offering a model for environmentally responsible food consumption.

### ➤ Reduced Dependency on Fossil Fuels

- India's dietary habits, which rely more on plant-based foods, reduce dependency on fossil fuels. Animal-based farming, which demands vast amounts of energy, land, and water, is minimized in India, making its food system less resource-intensive and more ecologically balanced.

## Shree Anna (Millets) and Sustainable Nutrition

### ➤ Promotion of Millets

- India has elevated millets, or Shree Anna, to a prominent position in its strategy for sustainable nutrition. The government's initiatives, including the National Millet Campaign and the International Year of Millets 2023, have significantly boosted millet cultivation and consumption.

### ➤ Millets' Environmental and Nutritional Value

- Millets are highly resilient and require minimal water, making them an ideal choice for climate-resilient farming. These crops offer high nutritional value, being rich in fiber, protein, and essential micronutrients, thus supporting both food security and environmental sustainability.

## India's Journey Toward Sustainable Agriculture

### ➤ National Mission for Sustainable Agriculture (NMSA)

- The National Mission for Sustainable Agriculture (NMSA) prioritizes the adoption of climate-resilient farming techniques, focusing on water conservation, soil health improvement, and the promotion of climate-adaptive crop varieties.

### ➤ Organic Farming Initiatives

- India's organic farming movement, spearheaded by initiatives like the

Paramparagat Krishi Vikas Yojana (PKVY) and the Jaivik Kheti portal, encourages sustainable agricultural practices. Organic farming promotes biodiversity, reduces chemical inputs, and improves soil fertility, fostering a healthier ecosystem.

### ➤ **Climate-Resilient Crop Varieties**

- India has developed over 2,000 climate-resilient crop varieties, which can withstand extreme environmental conditions such as droughts and floods. These crops ensure stable food production even under climate stress, making them essential for future food security.

### **Namami Gange Programme**

- The Namami Gange Programme integrates sustainable agricultural practices with efforts to restore the Ganga River. Organic farming initiatives under this program help reduce chemical runoff into the river, promoting both agricultural and ecological health.

### ➤ **Centre of Excellence for Millets**

- The Indian Institute of Millets Research (IIMR) in Hyderabad has emerged as a Centre of Excellence for promoting millet farming globally. Through research and education, the IIMR advocates best practices in millet cultivation and consumption, contributing to India's leadership in sustainable agriculture.

### **Conclusion**

- The WWF Living Planet Report 2024 commends India for its integrated, eco-friendly approach to food production, positioning the nation as a leader in sustainable food systems. As India continues to advocate for plant-based diets and climate-adaptive farming, it sets a global standard for balancing food security with environmental stewardship. Other nations can look to India's model for inspiration in developing sustainable food practices that protect both people and the planet.

## **Indian Railways: Addressing Critical Stress Factors for Enhanced Safety**

### ☛ **Why in News?**

- Recent railway incidents, including the derailling of eight coaches of the Agartala-Lokmanya Tilak Express in Assam on October 17 and a rear-end collision near Chennai on October 11, have highlighted the urgent safety

challenges and operational difficulties faced by Indian Railways. Fortunately, these events did not result in any fatalities, but they have raised substantial concerns regarding the current state of railway safety and infrastructure.

## Major Stress Factors Affecting Indian Railways



### ➤ Accidents and Safety Issues

- Although the frequency of accidents has significantly declined from 1,390 annually in the 1960s to just 40 in 2023-24, recent high-profile incidents like the Balasore crash bring serious safety concerns to the forefront. Alarmingly, human error accounts for 55.8% of these accidents, while equipment malfunctions contribute a mere 6.2%. This data underscores the pressing need for improved safety measures and technological interventions.

### ➤ Slow Deployment of 'Kavach' Technology

- The 'Kavach' system, designed to avert train collisions, is currently operational on only 2% of the railway network. While this technology is critical for enhancing safety, its high implementation costs and slow adoption hinder its broader deployment, leaving large sections of the railway system vulnerable.

### ➤ Financial Challenges and Operating Ratio

- For the fiscal year 2024-25, Indian Railways anticipates an operating ratio of 98.2%. This figure suggests that nearly every rupee earned is spent on operations, leaving little room for infrastructure improvements and maintenance. Moreover, there is an increasing reliance on extra-budgetary resources, which adds fiscal pressure and complicates financial planning.

### ➤ Revenue Discrepancy in Freight Services

- Freight services contribute approximately 65% of Indian Railways' income; however, inefficiencies and sluggish freight movement—averaging just 26 km/hr in 2016—hamper overall growth. The decline in coal freight, which constitutes 45% of freight volume due to a transition toward renewable energy sources, exacerbates this issue.

### ➤ Underinvestment in Infrastructure

- Inadequate capital allocation for track renewal and a dramatic 96% reduction in depreciation reserves have significantly compromised the ability of Indian Railways to maintain its infrastructure and rolling stock, raising serious concerns about long-term operational sustainability.

### ➤ Losses in Passenger Services

- In the fiscal year 2021-22, passenger services reported losses amounting to ₹68,269 crore. While initiatives such as the introduction of Vande Bharat trains show promise, it is crucial to rationalize fares to align operational expenses with revenue generation.

### About the Kavach System

- The Kavach system is a domestically developed Automatic Train Protection (ATP) technology created by the Research Design and Standards Organisation (RDSO) in partnership with Medha Servo Drives Pvt Ltd, HBL Power Systems Ltd, and Kernex Microsystems.
- **Functionality**
- **Communication:** Utilizes electronic devices and Radio Frequency Identification (RFID) technology installed in locomotives, signaling systems, and tracks to facilitate communication using ultra-high radio frequencies.
  - **Collision Prevention:** The system can automatically apply brakes if another train is detected within a predetermined distance and provides timely alerts to the loco pilot, particularly in low-visibility conditions.
  - **Safety Features:** Kavach also prevents Signal Passing at Danger (SPAD) and overspeeding, automatically regulates train speed, and assists in operation during adverse weather conditions such as dense fog.

### Field Testing

- Field trials of the Kavach system commenced in 2016, yielding encouraging results in enhancing safety and preventing collisions. However, broader implementation remains essential.

### Potential Solutions for Mitigating Stress Factors

- **Enhancing Safety with Kavach and Upgraded Signaling**
- Expediting the rollout of the Kavach system across high-density routes, in conjunction with upgraded signaling systems, could significantly mitigate the likelihood of accidents and enhance overall operational safety.
- **Strengthening Financial Health**
- To rectify financial imbalances, establishing a better equilibrium between passenger fares and freight rates is vital. Rationalizing fares and expanding premium services can help bridge financial gaps while reducing losses from subsidized services.
- **Infrastructure Upgradation**
- Increasing investments in track renewal, wagon replacement, and completing Dedicated Freight Corridor (DFC) projects is essential for enhancing operational efficiency and minimizing accidents. Additional funding in these areas will



fortify the rail network.

### ➤ Leveraging Technology and Data

- Implementing AI-based systems for real-time track monitoring, enhancing training programs, and improving staff management can significantly bolster both safety and operational efficiency within Indian Railways.

## Conclusion

- Tackling the various stress factors impacting Indian Railways necessitates a comprehensive approach that includes investments in advanced technology, enhancements in safety protocols, financial reforms, and sustainable growth strategies. Achieving a well-balanced strategy that considers both affordability for passengers and profitability for the railways is crucial for securing the future of India's vital public transportation system. As India continues to modernize its railway network, prioritizing safety and efficiency will be key to maintaining its role as a cornerstone of the country's infrastructure.

## Enhancing Financial Inclusion

### Context:

- Recently, the Financial Services Secretary emphasized the essential role of microfinance institutions (MFIs) in advancing financial inclusion. However, he cautioned that these entities must refrain from imprudent lending practices, even as they contribute significantly to empowering underserved communities. This call for responsible lending comes amid scrutiny of many MFIs for imposing high-interest rates and inadequate assessments of borrowers' financial situations, which undermine the very financial inclusion they seek to promote.

## Defining Microfinance Institutions (MFIs)

### ➤ Overview and Objectives

- Microfinance Institutions are specialized financial entities that provide small loans and a range of financial services to individuals lacking access to conventional banking facilities. The primary objective of microfinance is to assist low-income and unemployed individuals in attaining self-reliance. By offering financial resources, MFIs serve as a vital mechanism for promoting financial inclusion, particularly among marginalized groups and women, thereby fostering social equity and empowerment.



### ➤ Regulatory Framework

- The Reserve Bank of India (RBI) governs MFIs under the Non-Banking

Financial Company-Micro Finance Institution (NBFC-MFI) framework established in 2014. This regulatory structure emphasizes client protection, borrower safeguards, privacy, and equitable credit pricing, ensuring that MFIs operate within established norms.

### ➤ **Current Landscape of MFIs in India**

- The microfinance sector in India has experienced substantial expansion, with 168 MFIs operating across 29 states, 4 union territories, and 563 districts. These institutions collectively serve over 30 million clients, underscoring their critical role in the economic upliftment of low-income households.

### **Business Models in Microfinance**

#### ➤ **Self-Help Groups (SHGs)**

- Self-Help Groups consist of informal associations, typically composed of 10-20 members, primarily women, who save collectively to gain access to bank loans through the SHG-Bank Linkage Programme. This model promotes savings and encourages collective accountability among members.

#### ➤ **Microfinance Institutions**

- MFIs offer microcredit and additional financial services such as savings accounts, insurance, and remittances. They commonly extend loans through Joint Lending Groups (JLGs), consisting of 4-10 individuals engaged in similar income-generating activities, who collectively repay the loans. This collaborative approach enhances accountability and reduces the risk of default.

### **Challenges Confronting Microfinance Institutions (MFIs)**

#### ➤ **Regulatory Action and Compliance Issues**

- Due to exorbitant interest rates averaging around 24% per annum, certain MFIs have faced restrictions from the RBI, limiting their capacity to issue new loans. The RBI has mandated MFIs to reevaluate their lending practices and prioritize affordability in credit offerings, underscoring the importance of sustainable borrowing.

#### ➤ **Low Financial Literacy Among Borrowers**

- A significant hurdle is the inadequate financial literacy among borrowers, which hampers their comprehension of loan terms and elevates the risk of defaults. This deficiency perpetuates cycles of poverty, as borrowers may not fully grasp their financial responsibilities.

#### ➤ **Over-Indebtedness Risks**

- Many borrowers take loans from multiple MFIs, resulting in unsustainable debt levels. As of March 2024, over 12% of microfinance clients held four or more active loans, with figures reaching 18% in certain states. This trend jeopardizes



borrowers' financial stability and risks tarnishing the reputation of MFIs.

### ► Dependency on External Funding

- MFIs often rely heavily on external funding sources, such as banks and investors, rendering them susceptible during economic downturns. This dependence can destabilize their operations and limit their ability to extend loans to deserving clients.

## RBI Guidelines Related to Microfinance Lending (2022)

**To enhance the microfinance landscape, the RBI introduced several guidelines, including:**

- Collateral-Free Loans: Microfinance loans for households with incomes up to ₹3 lakh are to be collateral-free.
- Flexible Repayment Policies: MFIs must establish policies that facilitate flexible repayment terms and conduct thorough assessments of household income.
- Capping on Lenders: While previously there was a cap on the number of lenders per borrower, this restriction has been lifted, although repayments must not exceed 50% of the borrower's monthly income.
- Microfinance Loan Qualification: The requirement for 75% of NBFC-MFI loans to qualify as microfinance has been reduced from 85%.
- Reporting Income Discrepancies: MFIs must report any discrepancies in borrower income.
- No Pre-Payment Penalties: There are no penalties for pre-payment of microfinance loans, and late fees can only apply to overdue amounts.

## Government Schemes Supporting Microfinance

**The government has launched several initiatives to bolster the microfinance sector, including:**

- Pradhan Mantri Mudra Yojana (PMMY): A scheme aimed at providing financial support to small businesses.
- Self-Help Group (SHG) - Bank Linkage Program: This initiative links SHGs with formal banking channels to facilitate access to credit.
- National Rural Livelihoods Mission (NRLM): Focused on reducing poverty by promoting self-employment and wage employment in rural areas.
- Deen Dayal Upadhyaya Antyodaya Yojana: Aimed at promoting self-reliance among the poor.
- Credit Guarantee Fund for Micro and Small Enterprises (CGTMSE): Provides guarantees for loans to micro and small enterprises.

## Future Directions: Strengthening the Microfinance Sector

- Responsible Lending Practices: MFIs should prioritize responsible lending

to avoid excessive interest rates and thoroughly assess borrowers' repayment capacities. This approach can significantly mitigate the risks of over-indebtedness.

- **Financial Literacy Initiatives:** Enhancing financial literacy among borrowers is vital to empower them to make informed financial decisions. This education can reduce default risks and foster financial independence.
- **Implementing Malegam Committee Recommendations:** Adopting recommendations from the Malegam Committee (2010) can streamline operations in the microfinance sector. This includes capping interest rates, establishing a specific category for NBFC-MFIs, tracking multiple loans, and enhancing transparency in lending practices.
- **Establishing Grievance Redressal Mechanisms:** MFIs should create effective grievance redressal systems and formulate a code of conduct for ethical lending. Such measures can enhance trust and accountability within the sector.
- **Adhering to Regulatory Frameworks:** Strict compliance with the regulatory guidelines set forth by the RBI will bolster the sector's credibility and improve its reputation.
- **Diversifying Funding Sources:** Reducing reliance on external capital through diversified funding sources can enhance stability. Additionally, providing robust support systems, including advisory services, will assist borrowers in managing their loans effectively.

### Conclusion:

- Microfinance institutions play an indispensable role in promoting financial inclusion and empowering underserved communities. While challenges persist, a concerted effort by MFIs, regulatory bodies, and the government can pave the way for a sustainable and equitable microfinance ecosystem. By prioritizing responsible lending, enhancing borrower education, and adhering to regulatory frameworks, the microfinance sector can continue to uplift millions, fostering economic growth and social equity in India.

## Army Chief Emphasizes Threat of China's "Grey Zone" Warfare Tactics

### Relevance: GS III - Security Challenges

- In News:** The Army Chief issued a caution during an assessment of the current situation along the Line of Actual Control (LAC) in eastern Ladakh concerning China's strategic activities.



### Concept of Grey Zone Warfare:

- Grey Zone Warfare involves the use of unconventional strategies that exist between peace and open conflict, focusing on tactics that do not escalate into traditional warfare but aim to weaken an adversary. The goal is to achieve objectives without triggering a full-blown reaction from the target nation.

### Key Features of Grey Zone Warfare:

- Non-conventional Strategies:** These tactics include cyber attacks, support to non-state actors, economic manipulation, and propaganda.
- Covert Operations:** Such tactics create incremental advantages without the adversary realizing they are under direct attack.
- Example:** China's "Salami Slicing" technique, which involves gradual and deliberate territorial expansion, has reportedly been applied in the South China Sea disputes.

### Why Nations Opt for Grey Zone Warfare:

- Hard to Counteract:** Traditional defense systems struggle to respond to grey zone tactics, making it difficult to mount an effective counter or gather international support for intervention.
- Exploits Legal Ambiguities:** Grey zone warfare takes advantage of gaps in the international legal framework, creating confusion over how to respond.
- High Cost of Traditional Warfare:** The financial and strategic costs of

conventional conflicts, especially in the nuclear age, have become prohibitive, and the risk of escalation remains a serious concern.

- **Example:** The annexation of Crimea by Russia is a prominent instance where grey zone strategies were employed to gain territory without resorting to full-scale war.

### India's Strategy to Address Grey Zone Warfare (GZW):

- **Chief of Defence Staff (CDS):** The CDS has enhanced coordination between the Army, Navy, and Air Force, improving inter-service collaboration and combat readiness.
- **Military Modernization:** India is advancing its military capabilities by integrating cutting-edge technology into its defense systems and encouraging innovation through the iDEX (Innovations for Defence Excellence) initiative.
- **Promoting Indigenous Defense Production:** Through policies like the Defence Procurement Procedure (DAP) 2020, India is aiming to achieve self-sufficiency in defense manufacturing and reduce reliance on foreign imports.
- **Strategic Collaborations with Global Partners:** India has signed key defense agreements with allies like the U.S., including the General Security of Military Information Agreement (GSOMIA), to enhance strategic defense partnerships.
- **Other Protective Measures:**
  - ✓ **Cybersecurity Framework:** India has established CERT-In (Indian Computer Emergency Response Team) to counter cyber threats.
  - ✓ **Regulating Foreign Influence:** Measures like the Foreign Contribution (Regulation) Act (FCRA) are in place to monitor and control the funding of foreign NGOs to prevent external interference.

### Conclusion:

- Grey Zone Warfare presents a subtle yet formidable challenge by operating below the threshold of open conflict, targeting vulnerabilities through indirect means. India has taken significant steps to strengthen its defensive capabilities and strategic coordination to address and mitigate such threats. Through military modernization, defense collaborations, and cybersecurity initiatives, India continues to build resilience against these emerging tactics.

## Development Trials Completed for Very Short Range Air Defence System (VSHORAD)

### Relevance: GS III - Defence Sector

- In News:** The Defence Research and Development Organisation (DRDO) recently concluded the development trials of the indigenously built 4th Generation miniaturized VSHORAD, showcasing a significant advancement in India's defense technology.



### About VSHORAD:

- Type:** The VSHORAD is a Man-Portable Air Defence System (MANPADS), designed to provide reliable defense against low-altitude aerial threats at short ranges.
- Development:** The system was developed by DRDO's Research Centre Imarat (RCI), in partnership with other DRDO laboratories and Development cum Production Partners (DcPPs).

### Key Specifications:

- Operational Range:**
  - ✓ The VSHORAD system is capable of neutralizing threats within a range of 1 to 15 kilometers.
- Engagement Altitude:**
  - ✓ It can effectively target aerial threats at altitudes of up to 3,000 meters.

### Advanced Technologies in VSHORAD:

- Innovative Features:** The missile is fitted with state-of-the-art technology, including a miniaturized Reaction Control System (RCS) and integrated avionics, improving its agility and accuracy in combat situations.
- Propulsion Mechanism:** The VSHORAD missile is driven by a dual-thrust solid motor, allowing it to effectively engage low-altitude threats at short distances.
- Multiple Target Capability:** The system is designed to engage multiple aerial targets simultaneously, enhancing its effectiveness in complex combat scenarios.

### Importance and Strategic Role:

- **Defense Against Aerial Threats:** The VSHORAD system offers crucial protection for ground forces and essential installations, shielding them from low-flying threats such as drones, helicopters, and fast aircraft.
- **Bridging Defense Gaps:** Positioned between short-range and close-in defense systems, the VSHORAD system provides a rapid response to immediate aerial threats, ensuring quick action in high-stakes situations.
- **Successful Trials:** Following multiple flight tests, the VSHORAD system has demonstrated its operational readiness, validating its capability in real-world environments.

### Deployment and Flexibility:

- **Mobile Deployment:** The VSHORAD system is typically mounted on mobile platforms such as vehicles or trailers, enabling it to be repositioned quickly in response to changing battlefield dynamics.

### Conclusion:

- The completion of development trials for the 4th Generation VSHORAD system marks a significant step forward in India's self-reliance in defense.
- With its cutting-edge technology, mobility, and ability to engage multiple targets, this system is expected to play a pivotal role in safeguarding key assets and bolstering military operations against low-altitude threats.

## Acquisition of MQ-9B Drones & Indigenous Nuclear-Powered Attack Submarines

### Relevance : GS III - Defence Sector

- **In News:** The Cabinet Committee on Security (CCS) has recently sanctioned the procurement of 31 MQ-9B drones from the United States and the development of two indigenous nuclear-powered attack submarines (SSNs). This strategic move is set to bolster India's military strength.



## MQ-9B Drones: Key Information and Features:

- **Overview:**
  - ✓ The MQ-9B drones are High Altitude Long Endurance (HALE) Unmanned Aerial Vehicles (UAVs), tailored for intelligence gathering, reconnaissance, and precision strike operations.
- **Salient Features:**
  - ✓ **Extended Operational Range:** These drones can remain airborne for up to 40 hours and use satellite-based communication systems to operate beyond visual range.
  - ✓ **Multi-Domain Targeting:** They are equipped to engage land, maritime, and airborne targets.
  - ✓ **Two Variants:** The drones come in two configurations:
    - **SkyGuardian:** Optimized for land-based missions.
    - **SeaGuardian:** Designed specifically for maritime operations.
- **Procurement Details:**
  - ✓ The acquisition includes 16 SkyGuardian and 15 SeaGuardian variants, with eight drones each allocated to the Indian Army and Air Force.

## Importance of the MQ-9B Drone Acquisition:

- **Enhanced Intelligence and Surveillance:**
  - ✓ The procurement of these drones will sharpen India's intelligence-gathering and surveillance capabilities, especially in strategically significant regions like the Line of Actual Control (LAC) with China.
- **Defense Modernization Effort:**
  - ✓ This purchase is part of India's broader strategy for defense modernization, aimed at improving operational preparedness in the Indo-Pacific region by incorporating advanced technologies.
- **Strengthened Indo-U.S. Defense Relations:**
  - ✓ The acquisition will also deepen defense cooperation between India and the U.S., furthering bilateral collaboration in defense innovation.

## Indigenous Nuclear-Powered Attack Submarines (SSNs):

- **Overview:**
  - ✓ The nuclear-powered attack submarines (SSNs) are built to conduct anti-submarine warfare, surface ship engagements, and intelligence missions.

- **Notable Features:**

- ✓ **Armament:** These submarines are armed with torpedoes and sometimes cruise missiles, although they do not carry ballistic missiles.
- ✓ **Stealth and Endurance:** The SSNs are faster, quieter, and more difficult to detect, with the ability to remain submerged for extended periods, providing a significant tactical advantage.

### Significance of the Indigenous SSN Development:

- **Enhanced Strategic Deterrence and Combat Capabilities:**

- ✓ The construction of these submarines will significantly augment India's underwater combat abilities, providing a critical edge in submarine warfare and intelligence collection.

- **Boost to Indigenous Defense Production:**

- ✓ The indigenous development of SSNs will further promote self-reliance in defense manufacturing under the Make in India initiative, fostering growth in domestic defense capabilities.

### India's Submarine Leases:

- **INS Chakra (1988):**

- ✓ Leased from the Soviet Union for three years, this Charlie-class submarine was equipped with cruise missiles.

- **INS Chakra II (2012):**

- ✓ India leased this Akula-class submarine from Russia for 10 years, armed with anti-ship and land-attack cruise missiles. It was returned in 2021 due to maintenance issues.

- **INS Chakra III:**

- ✓ India has signed a \$3 billion deal with Russia to upgrade the Chakra-3 submarine, expecting its induction by 2026.

### Conclusion:

- The CCS's approval of the MQ-9B drones and indigenous SSNs marks a pivotal step in India's ongoing defense modernization efforts.
- These acquisitions will not only fortify India's surveillance and combat capabilities but also contribute to strengthening its strategic position in the Indo-Pacific region while enhancing the country's indigenous defense industry.





## Dragon Drones: An Emerging Threat in Modern Warfare

### Relevance: GS III - Security

- **In News:** Dragon drones have been employed in the ongoing Russia-Ukraine conflict, drawing attention due to their devastating incendiary capabilities.



### About Dragon Drones:

- Dragon drones are unmanned aerial vehicles (UAVs) designed to release thermite, a highly reactive incendiary material made from aluminium & iron oxide.
- Thermite is one of several incendiary weapons, alongside napalm & white phosphorus.

### Characteristics and Mechanism of Thermite:

- **Ignition Process:**
  - ✓ Thermite is ignited using an electronic fuse, initiating a reaction that is self-sustaining and challenging to extinguish once it starts.
- **Extreme Heat Generation:**
  - ✓ Upon ignition, thermite emits molten metal that burns at a staggering temperature of 2,427°C (4,000°F), with the ability to burn underwater.
- **Visual Impact:**
  - ✓ As it falls from the drone, the molten material resembles the fire breath of a dragon, giving the drones their name.

### Discovery and Historical Use:

- **Initial Discovery:**
  - ✓ Thermite was first discovered in the 1890s by a German scientist and was primarily used in industrial applications like welding railway tracks.
- **Effect on Humans:**
  - ✓ When in contact with humans, thermite can cause severe burns, which may be fatal and result in bone damage.
- **Destructive Capability:**
  - ✓ Thermite's intense heat allows it to burn through nearly any substance, including metals, making it highly difficult to defend against.

### Tactical Employment of Dragon Drones:

- **Low-Flying Operation:**

- ✓ Dragon drones are typically operated at low altitudes to ensure maximum effectiveness, as thermite is more destructive when applied directly to the target.

### Legal Implications Under International Law

- Although the use of thermite is not prohibited in military operations, international law forbids its application on civilian areas due to its indiscriminate and harmful effects.

### Conclusion:

- The integration of Dragon drones in contemporary conflicts highlights the rapid evolution of military technology and raises ethical concerns about the impact on non-combatants.
- Ensuring compliance with international legal standards is essential to reducing civilian harm in future conflicts.

## India's Readiness for Non-Kinetic Warfare: Defence Committee to Examine Preparedness

### Relevance : GS III - Defence Sector

- **In News:** Following recent Pager bombings in Lebanon and similar strategies observed during conflicts like Russia-Ukraine and Israel-Palestine, the Parliamentary Standing Committee on Defence has decided to assess India's capacity to confront non-kinetic warfare threats.



### What is Non-Kinetic or Hybrid Warfare?

- **Non-Kinetic Warfare, also referred to as Hybrid Warfare,** is a modern military concept that extends beyond traditional combat techniques. It includes a variety of non-conventional strategies such as:
  - ✓ **Electronic Warfare:** Disrupting or disabling enemy communication networks.
  - ✓ **Cyber Warfare:** Targeting critical infrastructure, including power grids, financial systems, and healthcare networks, through cyberattacks.

- ✓ **Information Warfare:** Manipulating public opinion or morale through disinformation campaigns.
- ✓ **Psychological and Economic Warfare:** Using tools like sanctions, trade blockades, or psychological operations to weaken adversaries.
- Unlike conventional warfare that relies on physical weapons like tanks and artillery, non-kinetic warfare can be even more devastating as it aims to cripple a nation's essential systems without the need for physical violence.
- For instance, a comprehensive cyberattack could take down vital infrastructures such as power stations or hospitals, leading to widespread disruption.

### Emerging Threats Necessitating Non-Kinetic Warfare Preparedness:

- **Hostile Neighbours:**
  - ✓ India faces strategic challenges from Pakistan to its west and China to the north and northeast. China's "Three Warfares" strategy—focusing on psychological, political, and legal maneuvers—serves its broader geopolitical objectives.
- **Role of Non-State Actors:**
  - ✓ Organizations like Hezbollah have increasingly embraced non-kinetic techniques to challenge national security.
- **Internal Threats:**
  - ✓ India's domestic security concerns, including Naxalite insurgencies and the risks posed by emerging technologies like Artificial Intelligence (AI), emphasize the need for enhanced readiness.

### India's Efforts to Strengthen Non-Kinetic Warfare Capabilities:

- **Advancing Weaponry Development:**
  - ✓ **DURGA-II Project:** The Defence Research and Development Organisation (DRDO) has initiated the Directionally Unrestricted Ray-Gun Array (DURGA)-II project, which focuses on developing cutting-edge laser weaponry to counter non-kinetic threats.
- **Structural Reforms and Institutional Enhancements:**
  - ✓ **Chief of Defence Staff (CDS):** The creation of the CDS position improves inter-service coordination between the Army, Navy, and Air Force.
  - ✓ **Defence AI Project Agency (DAIPA):** A dedicated agency focused on integrating Artificial Intelligence into India's defense strategy.
  - ✓ **Defence AI Council (DAIC):** This high-level body provides strategic

guidance on AI utilization in defense, ensuring India remains ahead in non-kinetic warfare technologies.

- **Strengthening Global Collaborations:**

- ✓ **General Security of Military Information Agreement (GSOMIA):** An agreement with the USA that facilitates secure sharing of military intelligence, vital for enhancing non-kinetic warfare capabilities.

- **Promoting Defence Self-Reliance:**

- ✓ **Indigenization of Defence Production:** India is prioritizing domestic development and production of advanced defense technology, reducing reliance on foreign imports and enhancing its capacity to confront non-kinetic threats with home-grown solutions.

### Conclusion:

- As emerging threats from both state and non-state actors grow in complexity, India is intensifying its focus on non-kinetic warfare.
- The Parliamentary Standing Committee's review of India's defense preparedness will ensure the nation is well-equipped with the latest technologies and strategies to counter these evolving challenges effectively.

## Cyber Fraud in India

### Context:

- Recently, the Indian Cyber Crime Coordination Centre (I4C), functioning under the Union Ministry of Home Affairs (MHA), made significant forecasts concerning the rising tide of cyber fraud in the nation. As cyber threats advance, grasping the dynamics and implementing effective mitigation strategies becomes crucial for safeguarding individuals and institutions alike.



## Understanding the Indian Cyber Crime Coordination Centre (I4C)

### ➤ Overview and Mission

- The Indian Cyber Crime Coordination Centre (I4C) was established by the Ministry of Home Affairs in 2020 to tackle a broad spectrum of cyber crimes, including the widespread issue of cyber fraud.

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## ➤ Objectives of I4C

### • The I4C aims to:

- Act as a central hub for combating cybercrime across India.
- Strengthen measures against cybercrime targeting women and children.
- Streamline the process for citizens to lodge cybercrime complaints while analyzing trends and patterns in cyber fraud.
- Serve as an early warning mechanism for law enforcement agencies to proactively prevent and detect cyber offenses.
- Enhance public awareness about cybercrime prevention.
- Assist state and union territory governments in developing the capabilities of police officers, public prosecutors, and judicial officials in areas such as cyber forensics, investigations, cyber hygiene, and cyber criminology.

## ➤ National Cyber Crime Reporting Portal

- Under the auspices of I4C, the National Cyber Crime Reporting Portal has been launched. This citizen-centric platform enables individuals to report cyber fraud online, ensuring that all complaints are efficiently routed to the appropriate law enforcement agencies for action.

### Key Projections on Cyber Fraud by I4C

## ➤ Financial Ramifications

- I4C has forecasted that Indians could lose over ₹1.2 lakh crore to cyber fraud by 2025, accounting for approximately 0.7% of India's GDP. Alarmingly, during the first half of 2024 alone, financial fraud resulted in losses of ₹11,269 crore.

## ➤ Mule Accounts and Fraud Detection

- I4C identifies around 4,000 mule bank accounts daily. Mule accounts refer to compromised accounts used to facilitate illegal activities, such as money laundering. Furthermore, 18 ATM hotspots have been pinpointed across the nation as sites for fraudulent withdrawals.

## ➤ Geographical Origins of Scams

- The government has identified “scam compounds” in Southeast Asian countries such as Cambodia, Myanmar, and Laos, which serve as operational bases for cyber fraudsters. A significant number of scams can be traced back to China or entities associated with China.

## ➤ Modus Operandi of Cyber Criminals

- These international scam compounds operate similarly to call centers, orchestrating investment scams. Fraudsters frequently contact unsuspecting victims using Indian mobile phone numbers, employing tactics such as lottery and prize scams to deceive individuals.

## ➤ Involvement in Illegal Activities

- Cyber scams have also been implicated in serious crimes such as terror financing and money laundering. For instance, between March and May 2024, ₹5.5 crore worth of cryptocurrency was acquired using Indian accounts and subsequently laundered abroad. Additionally, cash withdrawals from mule account debit cards have been reported at ATMs in countries such as Dubai, Hong Kong, Bangkok, and Russia.

## Defining Cyber Fraud

### ➤ Nature of Cyber Fraud

- Cyber fraud encompasses a variety of cyber crimes aimed at stealing money or valuable assets through online platforms. This includes a broad spectrum of deceptive activities facilitated via the internet.

### ➤ Types of Cyber Fraud

#### • Several common forms of cyber fraud include:

- Phishing: Fraudsters send deceptive emails impersonating trusted sources to extract sensitive information from victims.
- Malware: Malicious software infiltrates systems to steal personal information and gain control over devices.
- Ransomware: A type of malware that encrypts files and demands payment for decryption, exemplified by the WannaCry attack in 2016.
- Cyberbullying: Online harassment that threatens an individual's safety or coerces them into unwanted actions.
- Cyber Spying: Unauthorized access to networks to steal confidential data.
- Business Email Compromise (BEC): Scammers impersonate legitimate email accounts to defraud businesses.
- Dating Deceptions: Exploiting dating platforms to build trust and subsequently steal personal information.

### ➤ Consequences of Cyber Fraud

- For Individuals: Victims may encounter unauthorized purchases, loss of access to financial accounts, and personal distress from harassment or blackmail.
- For Businesses: Firms that neglect data security risk significant fines and legal repercussions, along with potential declines in stock value.
- For Government: Cyber breaches can endanger national security by compromising sensitive information related to defense and public safety.

## Current Scenario of Cyber Fraud in India

### ➤ Internet Usage Statistics

- With approximately 658 million internet users, India boasts the second-largest internet population globally.

### ➤ Phishing Attacks

- According to the “ThreatLabz 2024 Phishing Report” by Zscaler, India ranks third globally in phishing attacks, following the United States & the United Kingdom.

### ➤ Global Cybersecurity Commitment

- India has achieved Tier 1 status in the Global Cybersecurity Index (GCI) 2024, published by the International Telecommunication Union (ITU). With a remarkable score of 98.49 out of 100, India joins the ranks of countries recognized for exemplary cybersecurity practices.

### ➤ Notable Cyber Fraud Incidents

- Aadhaar Data Breach (2018): The personal data of over 1.1 billion Aadhaar cardholders was compromised.
- Canara Bank ATM Attack (2018): Hackers utilized skimming devices to steal over ₹20 lakh from 300 debit cards.
- Pegasus Spyware: This notorious spyware was employed to surveil over 300 verified Indian phone numbers without consent.

## Key Government Initiatives to Combat Cyber Fraud

1. National Cyber Security Policy: Establishing a framework for securing cyberspace.
2. Computer Emergency Response Team - India (CERT-In): Responding to cybersecurity incidents.
3. Cyber Surakshit Bharat Initiative: Promoting cybersecurity awareness & practices.
4. Cyber Swachhta Kendra: A malware removal & cybersecurity awareness initiative.
5. National Critical Information Infrastructure Protection Centre (NCIIPC): Safeguarding critical information infrastructure.
6. Digital Personal Data Protection Act, 2023: Protecting individuals' personal data.
7. Cyber Crime Coordination Centre: Streamlining responses to cyber crime.
8. Citizen Financial Cyber Fraud Reporting and Management System: A system for reporting and managing financial cyber fraud.

## Strategies to Mitigate Cyber Fraud

### ➤ Best Practices for Cybersecurity

- System Protections: Employ firewalls and regularly update software to address security vulnerabilities.



- Individual Vigilance: Users should remain cautious of unsolicited communications and utilize strong, unique passwords.
- Business Security Protocols: Implement two-factor authentication and data encryption for sensitive information.

### ➤ Role of Financial Institutions

- Banks should monitor for unusual transactions in low-balance accounts, as stolen funds are often temporarily parked in these accounts before being laundered through cryptocurrency. Upgrading systems to detect multiple logins from single IP addresses, especially those originating from foreign countries, is also crucial.

### ➤ Support for Content Creators

- Content creators should consider investing in creator insurance to protect against potential legal disputes, data breaches, and financial losses.

## Conclusion: Fortifying Cyber Resilience in India

- As cyber fraud continues to pose significant risks to individuals, businesses, and the nation, a multifaceted approach to prevention and response is essential. Through comprehensive strategies involving government initiatives, public awareness, and robust cybersecurity practices, India can enhance its resilience against cyber threats. By addressing vulnerabilities and fostering a culture of cybersecurity awareness, stakeholders can work collaboratively to safeguard against the evolving landscape of cyber fraud.



## Ministry of Health Issues Draft Guidelines on Passive Euthanasia

## Relevance : GS IV - Ethics

- **In News:** The Ministry of Health and Family Welfare has issued proposed guidelines for Passive Euthanasia, under the title “Guidelines for Withdrawal of Life Support in Terminally Ill Patients”.



## Key Points of the Draft Guidelines:

- **Criteria for Terminating Life-Sustaining Treatments (LST):**
  - ✓ Individuals who are certified brainstem dead according to the Transplantation of Human Organs Act, 1994.
  - ✓ Patients who are unlikely to benefit from further aggressive medical interventions.
  - ✓ If the patient or their authorized representative has formally refused LST.
- **Establishment of Medical Boards:**
  - ✓ A Primary Medical Board (PMB) will be set up to review the patient’s situation and make decisions regarding the cessation of life support.
  - ✓ A Secondary Medical Board (SMB) must endorse the PMB’s conclusions before LST can be withdrawn.
- **Role of the Clinical Ethics Committee:**
  - ✓ Hospitals must create a Clinical Ethics Committee to ensure oversight, carry out reviews, and resolve disputes concerning LST withdrawal.

## Overview of Euthanasia:

- **Definition:** Euthanasia refers to the intentional act of ending a patient’s life to relieve suffering from a debilitating and untreatable illness.
- **Forms of Euthanasia:**
  - ✓ **Passive Euthanasia:** This entails allowing the patient to pass away by halting or withdrawing life-sustaining treatments, such as ventilators or feeding tubes.

- Passive euthanasia is legally permitted in countries like Norway.
- In the landmark *Common Cause vs. Union of India & Anr.* (2018) case, the Supreme Court of India acknowledged the right to a dignified death as part of the fundamental rights under Article 21 of the Indian Constitution and upheld the legality of passive euthanasia.
- ✓ **Active Euthanasia:** This involves the deliberate action of causing the death of a terminally ill patient, usually upon the patient's voluntary request, through direct medical intervention.
  - Active euthanasia is legalized in countries like Belgium, but remains unlawful in India.

### Conclusion:

- The draft guidelines on Passive Euthanasia introduced by the Health Ministry offer a clear structure for discontinuing life-sustaining treatments in patients with terminal conditions.
- These guidelines reflect India's commitment to ensuring respectful end-of-life care while ensuring accountability through medical boards and ethics committees to promote transparency and collective decision-making.

## Medical Ethics and Consumer Rights in India

### Context:

- The National Consumer Disputes Redressal Commission (NCDRC) recently imposed a monetary penalty of ₹35 lakh on Johnson & Johnson for delivering defective medical devices. This decision followed a complaint from a consumer who experienced complications due to a flawed hip replacement. This incident emphasizes the urgent requirement for strict adherence to medical ethics and guidelines within the healthcare sector.



### Overview of Hip Replacement Surgery:

- **Objective:** Hip replacement surgery (hip arthroplasty) aims to mitigate pain, enhance the function of the hip joint, and improve patients' mobility.
- **Materials Used:** Hip implants are composed of various materials, such as metal, ceramic, and plastic. Typically, the ball component is constructed from cobalt-

chromium alloy or ceramic, while the stem is usually made of titanium or cobalt-chromium alloy.

## Role of Ethics in Medical Practices

### ➤ Definition of Medical Ethics

- Medical ethics addresses the moral principles that guide conduct in healthcare, distinguishing between right and wrong based on cultural contexts. It outlines the responsibilities of healthcare providers—including doctors, hospitals, and society—toward patients. Ethical principles serve as fundamental guides for healthcare professionals' actions, often superseding legal obligations.

### ➤ Fundamental Principles of Medical Ethics

1. **Respect for Autonomy:** Recognizes the right of patients to make informed decisions regarding their treatment, emphasizing the importance of obtaining proper informed consent.
2. **Beneficence:** Focuses on prioritizing the health and well-being of the patient throughout the surgical process, ensuring that actions are in their best interests.
3. **Non-Maleficence:** Obligates medical practitioners and equipment suppliers to prevent harm to patients, ensuring they receive necessary care without negligence.
4. **Justice:** Mandates fair and impartial treatment for all patients, irrespective of their religion, nationality, race, or social status.
5. **Hippocratic Oath:** This essential commitment for newly graduated medical professionals binds them to a code of ethics. The Hippocratic Oath reflects the principles outlined in the Indian Medical Council (Professional Conduct, Etiquette, and Ethics) Regulations, 2002. This oath serves as a moral guide, directing physicians to uphold ethical standards within the medical profession.

## National Consumer Disputes Redressal Commission (NCDRC)

### ➤ Overview

- The National Consumer Disputes Redressal Commission (NCDRC) is a quasi-judicial authority established in 1988 under the Consumer Protection Act (CPA), 1986. Its primary objective is to provide affordable, swift, and summary resolutions of consumer disputes.

### ➤ Leadership and Jurisdiction

- The NCDRC is presided over by a sitting or retired Supreme Court judge or a sitting or retired Chief Justice of the High Court.

- Authority: Under Section 21 of the CPA, 1986, the NCDRC has the jurisdiction to entertain complaints valued over ₹2 crore, along with appellate and revisional authority over decisions made by State Commissions and District Forums.

### ➤ Appellate Process

- Consumers dissatisfied with decisions from District Forums can appeal to the State Commission. If they remain unsatisfied, they may escalate their case to the NCDRC. According to Section 23 of the Act, individuals aggrieved by NCDRC decisions may appeal to the Supreme Court within 30 days.

### ➤ Scope of Application

- The CPA encompasses both "goods" and "services," ensuring consumer protection across diverse sectors.

### ➤ Structure of Consumer Forums

- The CPA, 2019, allows complaints to be filed at District, State, and National levels based on the value of the claim:
- District Consumer Disputes Redressal Commission (DCDRC): For claims up to ₹50 lakh.
- State Consumer Disputes Redressal Commission (SCDRC): For claims ranging from ₹50 lakh to ₹2 crore.
- National Consumer Disputes Redressal Commission (NCDRC): For claims exceeding ₹2 crore.

### Central Consumer Protection Authority (CCPA)

- Established under Section 10 of the CPA, 2019, the CCPA oversees matters concerning consumer rights violations and unfair trade practices, functioning under the Ministry of Consumer Affairs, Food, and Public Distribution.
- ### ➤ Powers of CCPA:
- Consumer Rights Advocacy: Safeguards the collective rights of consumers.
  - Prevention of Unfair Trade Practices: Deters individuals from engaging in unethical trading activities.
  - Advertisement Oversight: Grants the CCPA the authority to issue directives and penalties against misleading advertisements.

### Challenges in Medical Ethics in India

1. Informed Consent: There is often insufficient or no informed consent obtained from patients, particularly in clinical trials involving vulnerable populations, such as the controversy surrounding COVID-19 vaccine trials.



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2. **Patient Confidentiality:** There is a significant lack of robust measures to protect patient data and ensure confidentiality. For instance, a major data breach in 2023 exposed sensitive information from millions of patients in the ESIC database.
3. **Conflicts of Interest:** Situations arise where medical professionals have financial interests in the treatments or procedures they endorse. For example, a prominent cardiologist in Delhi was discovered to have financial connections to a stent manufacturing company.
4. **Trust between Doctors and Patients:** The commercialization of healthcare and lack of transparency have led to a decline in trust between doctors and patients, particularly when physicians in government hospitals engage in private practice and charge excessive fees.
5. **Regulatory Oversight:** Weak enforcement and compliance with ethical guidelines result in abuses within clinical trials and patient care.

### Consumer Protection Initiatives in India

1. **Consumer Welfare Fund:** Aimed at promoting consumer rights and welfare.
2. **Central Consumer Protection Council:** Advises the government on consumer issues.
3. **Consumer Protection Rules, 2021:** Established to enhance consumer rights.
4. **Consumer Protection (E-Commerce) Rules, 2020:** Regulates online consumer transactions.
5. **National Consumer Day:** Celebrated to raise awareness about consumer rights.

### Future Directions

- **Fostering Ethical Awareness in Healthcare**
  - Implement extensive training programs and workshops to educate healthcare professionals on ethical principles and their practical applications.
  - Encourage a culture of open communication and transparency within healthcare institutions to facilitate discussions on ethical dilemmas and share best practices.
- **Implementing Structured Communication Protocols**
  - Adopting structured communication techniques, such as SBAR (Situation-Background-Assessment-Recommendation), can enhance clarity and reduce errors. Ensuring informed consent should include comprehensive explanations of procedures, risks, benefits, and alternatives, along with verification of patient understanding.
- **Enhancing Redressal Mechanisms**
  - The government should bolster consumer complaint resolution by utilizing

existing infrastructures of Alternative Dispute Resolution (ADR) and Online Dispute Resolution (ODR) through Public-Private Partnerships (PPP).

➤ **Establishing a National Consumer Lok Adalat Helpline**

- Creating a technology-enabled National Consumer Lok Adalat helpline can facilitate communication between complainants, companies, and legal authorities, ensuring quicker resolutions.

